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ATTACHMENTS FOR: AGENDA NO. 6/12
Council Meeting

Meeting Date: Tuesday 24 April 2012
Location: Council Chambers, Level 6, Civic Centre, 1 Devlin Street, Ryde
Time: 7.30pm

ATTACHMENTS

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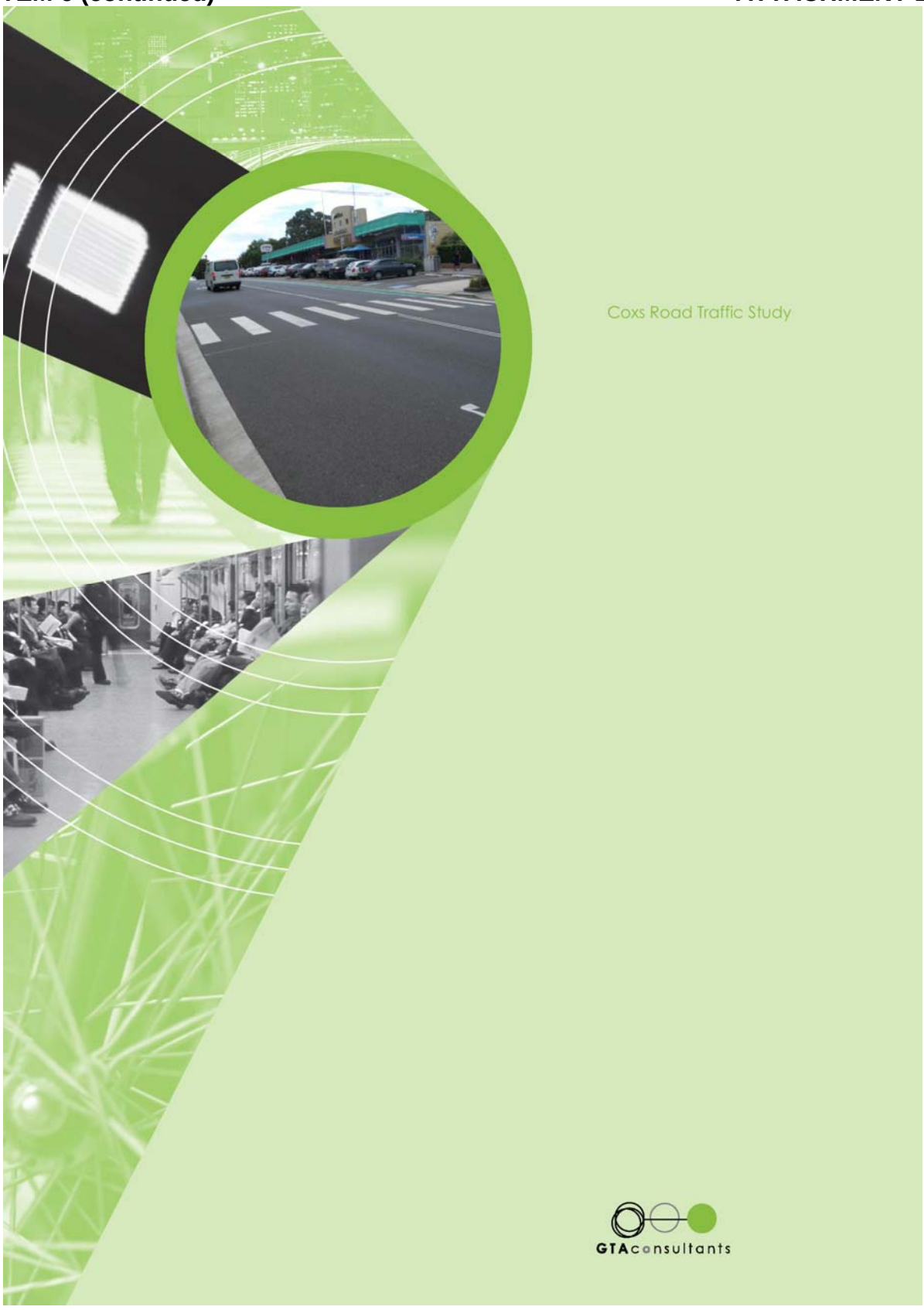
ITEM 6 (continued) **ATTACHMENT 1**



ITEM 6 (continued) **ATTACHMENT 1**

Coxs Road Traffic Study

Client: City of Ryde
Reference: IS11061
GTA Consultants Office: Sydney

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By
B	05/10/11	Revised Final	Matthew Houlden / Ashish Modessa	Alan Stewart	

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TIA Report – NSW (110415V1.1)
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Executive Summary

Background

In late 2009 the City of Ryde commissioned a Masterplan study of a number of small centres in the city. The largest of these was the Coxs Road small centre in North Ryde.

Following the reporting of the Ryde small centres Masterplan study to Council in 2010, Council resolved that a more detailed transport impact study be undertaken for the Coxs Road centre, given the current levels of traffic and limited local access opportunities.

GTA Consultants was commissioned by the City of Ryde in January 2011 to undertake a detailed transport impact study.

Study Objectives

The objective of the transport impact study was to assess the expected impacts of the proposed Masterplan on the surrounding road network and to determine the most suitable future access requirements and road/intersection upgrades to support the future land use growth proposed for the centre.

Existing Centre Operation

The existing conditions investigation undertaken by GTA Consultants included understanding the existing traffic, transport and parking situation through conducting traffic (Intersection & tube counts), car parking and interview surveys.

Key Observations & Issues

The key observations and issues identified during these surveys were as follows:

- The traffic conditions on Coxs Road were particularly congested during the 3:00pm school pick up period with eastbound and westbound queues on the approaches to Wicks Road and Lane Cove Road. This is further exacerbated by the delays associated with the use of the pedestrian crossings and vehicles turning into and out of parking spaces accessible from Coxs Road.
- Both traffic and parking congestion was worse on a Thursday than on a Saturday.
- Coxs Road traffic volumes exceeded the RTA's environmental capacity standards for a collector road classification although it is noted that traffic is generally slow moving on Coxs Road.
- The interview surveys identified that on a Thursday, 40% of customers / staff accessing the Coxs Road centre originate from the west with 60% of customers / staff originating from the east.
- Approximately 50% of all people interviewed on the Thursday lived in North Ryde.
- The average overall[1] parking demand for Coxs Road is approximately 65% with a peak overall parking demand of approximately 75% which occurs daily at 3:00pm and is influenced by the school pick up activity.
- The peak short term (on and off street) parking demand, which is parking of particular importance to a retail centre, also occurs at 3:00pm and is also approximately 75% occupied.
- There is adequate short-term and long-term parking capacity within the existing Coxs Road centre to meet current parking demand.

[1] Overall parking includes on and off street short term (>4 hours) and long term parking

Masterplan Proposal

The Masterplan proposals for the Coxs Road centre would include an upgraded supermarket, increased community uses and mixed retail / commercial uses with residential dwellings above. In addition, stand-alone residential development is also proposed.

Road Network Options Modelling Assessment

A number of road network changes were discussed with the City of Ryde to improve the existing road network resulting in two preferred options as indicated in Figure 1 and Figure 2.

Figure 1 includes three proposed road connections as follows:

- Coxs Road to Cooney Street
- Cooney Street to Marilyn Street
- Marilyn Street to Wicks Road.

Figure 1: Proposed Road Option 1 - New Road Connections

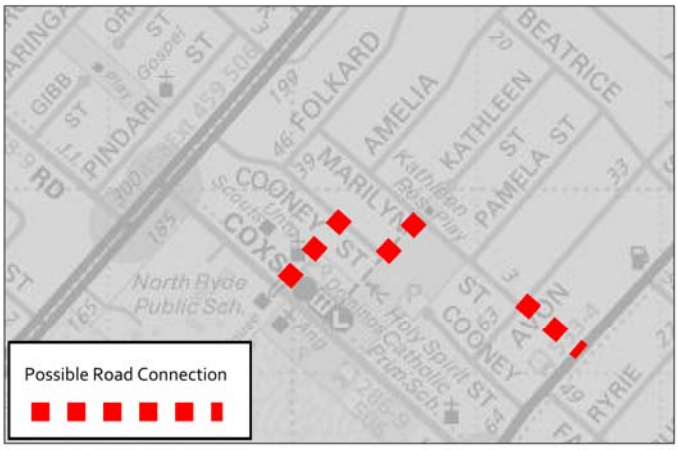


Figure 2 includes two proposed road connections as follows:

- Coxs Road to Cooney Street
- Cooney Street to Marilyn Street.

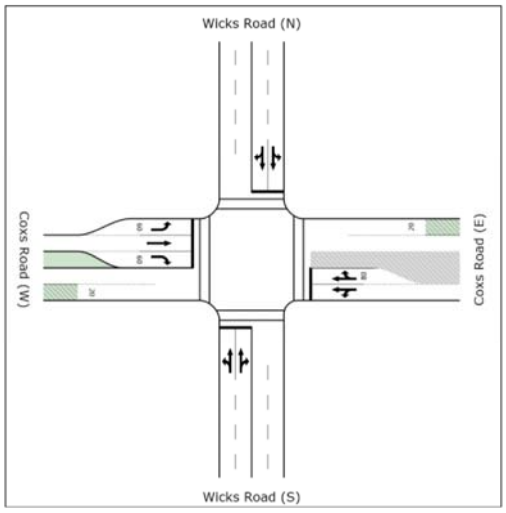
ITEM 6 (continued) **ATTACHMENT 1**

Figure 2: Proposed Road Option 2 – New Road Connections

The traffic distribution patterns for the two proposed road options 1 and 2 result in the same levels of traffic volumes at the intersections of Coxs Road / Wicks Road and Coxs Road / Lane Cove Road i.e. Option 1 provides no additional benefit to Coxs Road in traffic volume terms but would cost significantly more to implement due the associated land acquisition costs.

In addition to the above road options GTA Consultants also identified localised improvements at the intersection of Coxs Road / Wicks Road which would provide further traffic operational benefits to Coxs Road. This included widening of Coxs Road on the west approach to Wicks Road and reconfiguration of this approach to include two short 60m left and right turn lanes as indicated in Figure 3.

Figure 3: Coxs Road / Wicks Road Localised Intersection Improvements



A total of 11 modelling scenarios were assessed to compare the operation of a number of proposed road network options which are summarised in Table 1.

Table 1: Modelling Scenarios Tested

Modelling Scenario		A - 2011	B – 2021
1	Existing	✓	✓
2	Existing + Masterplan	✓	
3	Existing + Proposed Road Option 1 + Masterplan	✓	
4	Existing + Proposed Road Option 2 + Masterplan	✓	
5	Existing + Cox / Wicks Improvements + Masterplan	✓	✓
6	Existing + Cox / Wicks Improvements + Masterplan x 130%	✓	✓
7	Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan	✓	✓

Key Traffic Modelling Outcomes

Following the analysis undertaken as part of this study, the key modelling outcomes include:

- The traffic modeling assessment of the draft Coxs Road Masterplan, in its current form, indicated that the existing road network could not support the proposed future growth, particularly relating to the queues and delays at the Coxs Road / Wick Road intersection and to a lesser extent at the intersection of Lane Cove Road / Coxs Road.
- The additional volumes associated with the Coxs Road Masterplan represent a very small percentage of the total volumes on Lane Cove Road and there is very little scope to physically widen Coxs Road due to existing development and narrow footpaths. Any localised improvements on Coxs Road would do little to improve the overall capacity of the Lane Cove Road corridor.
- It was determined that there would be far more benefit for the road network in focussing on improvements at the Coxs Road/Wicks Road intersection.
- Improvements to the intersection of Coxs Road/Wicks Road would significantly improve the performance of the Coxs Road/Wicks Road intersection and would be able to support the expected future Masterplan traffic volumes (this would result in a loss of 10 car parking spaces proposed in the Masterplan).
- The introduction of potential new road links (Options 1 and 2), as indicated in Figure 1 and Figure 2 in isolation, would provide some improvement to road network operation but not provide sufficient capacity to support the expected future Masterplan traffic volumes.
- The additional traffic volumes on the local roads in the residential area to the north of Coxs Road would not result in any of the roads exceeding their environmental capacity as set out by the RTA.
- Road Options 1 and 2 would provide other qualitative improvements relating to improved access for customers and service vehicles and as a consequence of removing some traffic from Coxs Road, would provide some safety benefits for cyclists and pedestrians travelling along or crossing Coxs Road which is part of the Ryde Bicycle Strategy and M2 Alternative Cycle Route.
- The modelling results were able to demonstrate the relative impact of each option on the road network which allowed a preferred option to be determined.

Parking Implications

The City of Ryde DCP indicates a total future car parking requirement of approximately 830 parking spaces based on the Masterplan proposals.

However taking into account the increase in the number of parking spaces proposed within the Masterplan, the decrease in parking as a result of the localised widening proposals at Coxs Road/Wicks Road and the current peak on and off street parking availability it is expected that approximately 783 additional spaces would be required as part of the Masterplan.

It is also important to note that the 783 parking spaces should be regarded as an upper limit as in reality car parking demand varies by time of day corresponding to varying land use types and there is always an element of sharing of car parking spaces at different times of the day.

Conclusions

Based on the analysis and investigation undertaken as part of this study, the following conclusions are made:

- The localised improvements at the intersection of Coxs Road / Wicks Road (Figure 3) combined with proposed Option 2 will provide the greatest benefit to the Coxs Road centre and wider study area and should be adopted by the City of Ryde in support the Masterplan.
- The implications for the Masterplan as a result of the Coxs Road/Wicks Road intersection improvements is that approximately 2m to 3m of land (for approximately 60m) on the north-west corner of Coxs Road / Wicks Road would be required, resulting in a loss of approximately 10 on street car parking spaces and a change to the Masterplan built form in that location.
- In addition, as a result of the connection from Coxs Road to Cooney Street and from Cooney Street to Marilyn Street, road reserves of approximately 15m would need to be defined within the Masterplan built form.
- The Coxs Road/Wicks Road intersection improvements should be implemented as a priority, prior to any development increase within the Coxs Road centre.
- Road option 2 provides access and safety (pedestrians, cyclists and general traffic) benefits and should be considered in the longer term depending on the timing of development take up within the Coxs Road centre.

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Tables

1. Introduction

1.1 Background

Between March 2010 and May 2010 GTA Consultants provided broad traffic advice to Olsson & Associates as part of the Ryde Small Centres Masterplan Study which was being undertaken to ensure the continued use of these centres and to promote growth and increased usage where possible.

In July 2010, GTA Consultants provided further traffic advice relating specifically to the Coxs Road centre land use Masterplan and urban design proposals.

Following the reporting of the Ryde Small Centres Masterplan Study to City of Ryde it was resolved that a more detailed transport impact study be undertaken of the Coxs Road centre given the current levels of traffic congestion and limited local access opportunities. GTA Consultants was commissioned by the City of Ryde in January 2011 to undertake this assessment.

1.2 Purpose of this Report

This report sets out an assessment of the existing conditions of Coxs Road, between Lane Cove Road and Wicks Road, and Lane Cove Road between Coxs Road and Bridge Road/Twin Road. It also provides an assessment of the anticipated traffic implications of future development highlighted in the Ryde Small Centres Masterplan. The following have been considered in the assessment:

i existing traffic and parking conditions surrounding the site
ii service vehicle requirements
iii pedestrian and bicycle requirements
iv the traffic generating characteristics of future planned development
v suitability of the proposed access arrangements for the centre
vi the transport impact of future planned development on the surrounding road network.

1.3 References

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

- an inspection of the site and its surrounds
- City of Ryde Development Control Plan (DCP) 2010
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard, Parking Facilities, Part 5: On-Street Parking AS 2890.5-1993
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- traffic and car parking surveys as referenced in the context of this report
- plans for the proposed development prepared by Olsson & Associates Architects Pty Ltd, Drawing Number [0915], Revision F dated 29 September 2010
- other documents and data as referenced in this report.

2. Existing Conditions

The study area of Coxs Road, North Ryde is bound by the intersections of:

- Coxs Road/Lane Cove Road (Signalised T-intersection)
- Coxs Road/Wicks Road (Signalised X-intersection).

In addition to this, the intersection of Lane Cove Road / Kent Road and Lane Cove Road/Bridge Road/Twin Road has been included in the analysis based on advice received from the RTA.

The land use classifications of the study area include:

- Low Density Residential R2
- Neighbourhood Centre B1.

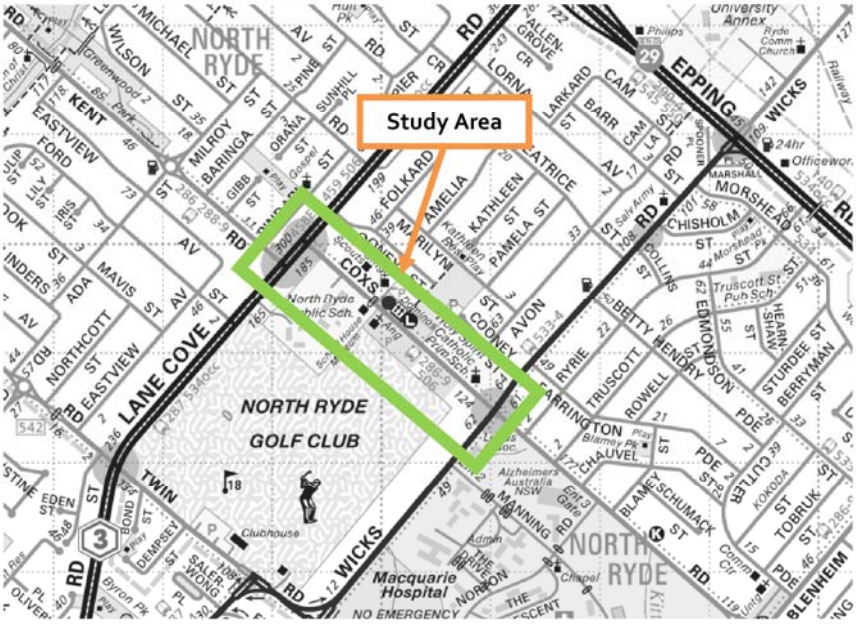
The area includes a mixture of residential, educational, community, religious and commercial/retail uses including North Ryde Public School to the southwest and Holy Spirit Primary School to the northeast.

The Coxs Road shopping strip has a frontage of approximately:

- 110m on the northern side of Coxs Road
- 180m on the southern side of Coxs Road.

The location of the study area and its surroundings are shown in Figure 2.1.

Figure 2.1: Study Area and Surroundings



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2.1 Road Hierarchy & Network

The *RTA Road Design Guide* states that the purpose of a functional road hierarchy is to establish a logical integrated network in which roads of similar functional classifications are:

- Provided with the same general level of traffic service with regards to trip purpose, traffic composition, capacity and operational speed.
- Designed, constructed and maintained to the same general level of structure with regard to alignment, cross section, pavement strength and access control.
- Assigned to the appropriate administrative control.

2.1.1 Functional Classification

This classification includes arterial, sub-arterial, collector and local roads. Together the roads make up a road network. The functional road classifications in NSW are:

- Arterial – Predominantly carry through traffic from one region to another forming principal avenues of communication for urban traffic movements.
- Sub-Arterial – Connects the arterial road to areas of development and carry traffic directly from one part of the region to another. They may also relieve traffic on arterial roads in some circumstances.
- Collector – Connects the sub-arterial roads to the local road system in developed areas.
- Local – The sub-divisional roads within a particular developed area. These are used solely as local access roads.

2.1.2 Adjoining Roads

Coxs Road

Coxs Road is classified as a Collector Road and is under the care, control and management of the City of Ryde. It generally runs in an east-west direction and is a two-way road, configured with one lane in each direction, with an approximate 11 metre wide carriageway. The posted speed limit on Coxs Road is 50 km/h but there are 40km/h speed restrictions from 8:00am to 9:30am and 2:30pm to 4:00pm on school days.

Kerbside parking is permitted; however parking fronting the schools and commercial/retail development are subject to time restrictions of 1 hour with the exception of parking fronting Holy Spirit Primary School with 15 minute restrictions. No Parking between 4:00pm-7:00pm Monday to Friday applies for the kerbside parking fronting North Ryde Public School. Unrestricted parking exists on residential frontages.

Coxs Road is shown in Figure 2.2 and Figure 2.3 and carries approximately 7,600 vehicles per day immediately east of Lane Cove Road and approximately 10,100 vehicles per day immediately west of Wicks Road[2].

2 Based on the peak hour traffic counts undertaken on 10 February 2011 and assuming a peak-to-daily ratio of 10%.

Figure 2.2: Coxs Road looking west

Figure 2.3: Coxs Road at Lane Cove Road looking east

Lane Cove Road

Lane Cove Road is classified as a State Arterial Road and is under the care, control and management of the RTA. In the vicinity of the study area it is generally aligned in a north-south direction and is a two-way road configured with three lanes in each direction. The posted speed limit is 70 km/h.

Lane Cove Road is shown in Figure 2.4 and Figure 2.5 and carries approximately 61,400 vehicles per day[3].

Figure 2.4: Lane Cove Road at Coxs Road looking north

Figure 2.5: Lane Cove Road at Coxs Road looking south

Wicks Road

Wicks Road is classified as a Regional Road and is under the care, control and management of the City of Ryde and in the vicinity of the study area is aligned in a north-south direction. It is a two-way road configured with two lanes in each direction. The posted speed limit is 60 km/h.

Wicks Road is shown in Figure 2.6 and Figure 2.7 and carries approximately 25,400 vehicles per day[4].

3 Based on the peak hour traffic counts undertaken between Coxs Road and Kent Road on 10 February 2011 and assuming a peak-to-daily ratio of 8%.

4 Based on the peak hour traffic counts undertaken by GTA immediately north of Coxs Road on 10 March 2011 and assuming a peak-to-daily ratio of 8%.

Figure 2.6: Wicks Road at Coxs Road looking north

Figure 2.7: Wicks Road at Coxs Road looking south

Other Local Roads

Other local roads controlled by the City of Ryde in the surrounding road network include:

- Kent Road – connects north western suburbs such as Marsfield to Lane Cove
- Twin Road / Bridge Road – Twin Road and Bridge Road meet at the south western corner of North Ryde Golf Club. Twin Road connects East Ryde to Lane Cove Road and Bridge Road connects suburbs such as Eastwood and Denistone East to Lane Cove Road.

Figure 2.8: Kent Road at Lane Cove Road looking west

Figure 2.9: Twin Road at Lane Cove Road looking east

2.1.3 Surrounding Intersections

The following intersections are located in the vicinity of the site:

- Coxs Road/Wicks Road (Signalised X-Intersection)
- Coxs Road/Lane Cove Road (Signalised T-Intersection)
- Lane Cove Road/Kent Road (Signalised T-Intersection)
- Lane Cove Road/Bridge Road/Twin Road (Signalised X-Intersection).

2.2 Traffic Volumes

The following sections provide a summary of the existing traffic volumes within and immediately surrounding the study area.

2.2.1 Intersection Counts

GTA Consultants commissioned traffic movement counts on 10 and 12 February 2011 at the intersections of:

- Coxs Road/Lane Cove Road
- Lane Cove Road/Kent Road
- Lane Cove Road/Bridge Road/ Twin Road.

The counts were undertaken during the following peak periods:

- Thursday - 4:00pm and 7:00pm
- Saturday - 11:00am and 2:00pm.

The Weekday PM counts at the intersection of Coxs Road/Wicks Road were undertaken by GTA Consultants on Thursday 10 March 2011. Saturday Midday peak hour traffic volumes for this intersection were available from the traffic advice provided for the Ryde Small Centres Masterplan Study dated April 2010.

The Thursday PM and Saturday Midday peak hour traffic volumes are summarised in Figure 2.10 and Figure 2.11, with full results contained in Appendix A.

Figure 2.10: Existing Thursday PM Peak Hour Traffic Volumes

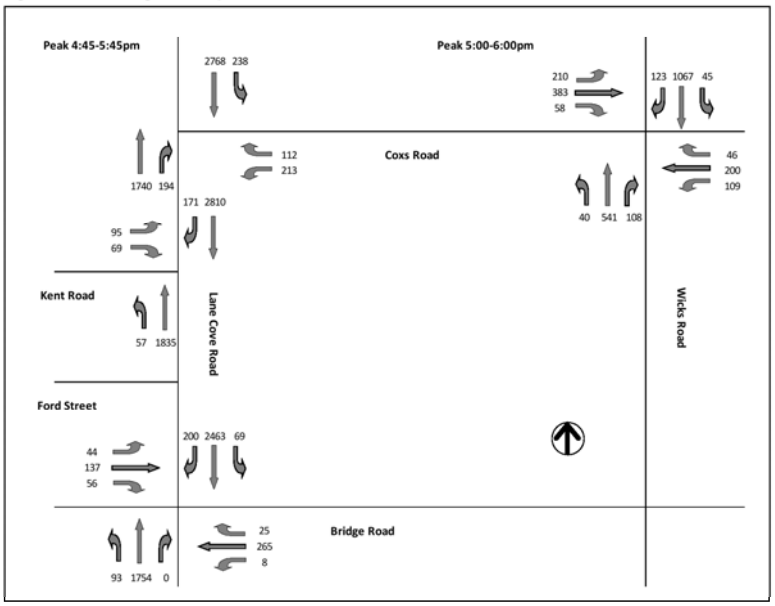


Figure 2.11: Existing Saturday Peak Hour Traffic Volumes

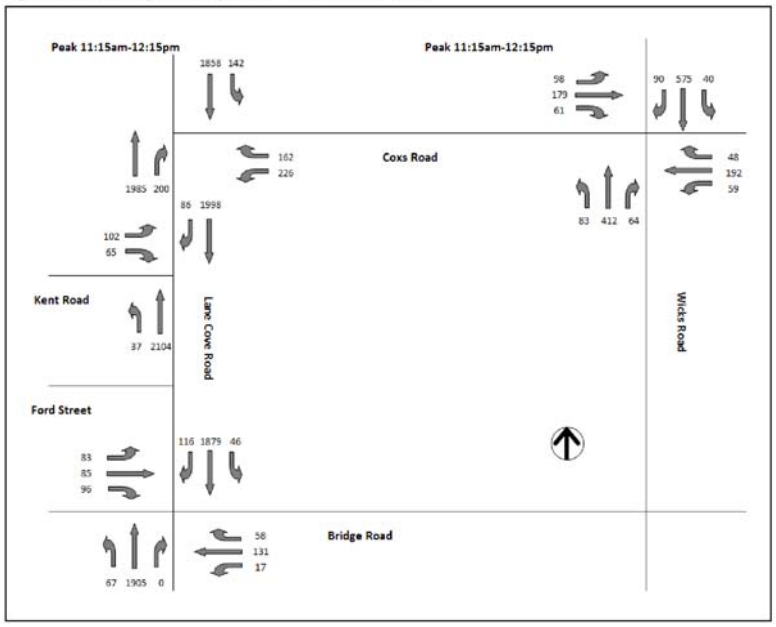


Figure 2.10 illustrates that the major movement along Lane Cove Road is the southbound movement during the Thursday PM peak hour. The southbound movement along Wicks Road is also the major movement. Along Coxs Road, eastbound movement is the major movement.

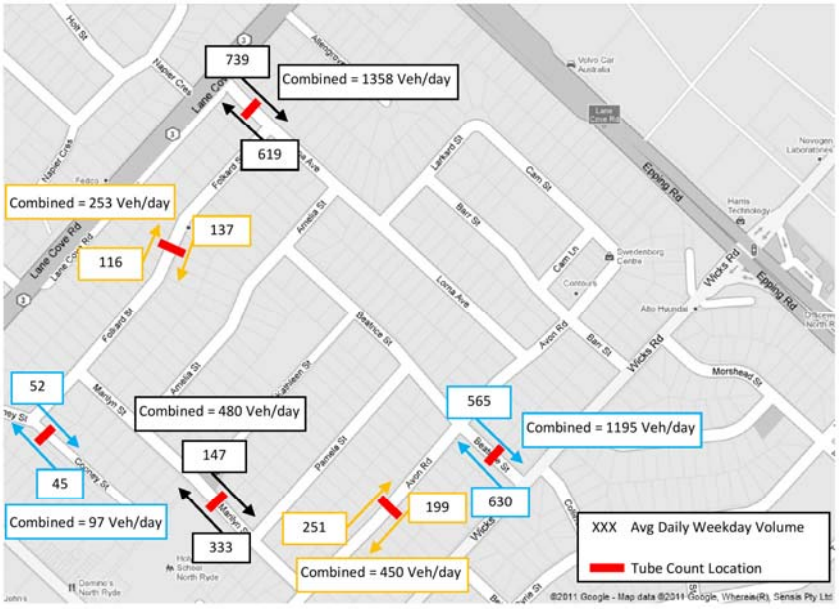
Figure 2.11 illustrates that during the peak hour on a Saturday, the major movements along Lane Cove Road are in both the northbound and southbound direction. Similarly northbound and southbound movements on Wicks Road and eastbound and westbound on Coxs Road are equally the major movements.

2.2.2 Tube Surveys

GTA Consultants also commissioned CFE Information Technologies to under 24hr / 7 day tube surveys on six key local roads which would be used to provide access to the Coxs Road centre under Proposed Road Option 1 or Proposed Road Option 2. The survey locations and average weekday daily traffic volumes are shown in Figure 2.12.

The surveys were undertaken between 6 June 2011 and 12 June 2011.

Figure 2.12: Location of Traffic Tube Surveys and Five-Day Average Daily Traffic



Base map source: maps.google.com.au

Detailed traffic count data is provided in Appendix G.

Environmental Capacity and Speed Performance Standards

The RTA Guide to Traffic Generating Developments specifies the environmental limits for each road class which are detailed in Table 2.1.

Further criteria specified by the RTA is that traffic volumes on local and collector roads should not exceed a maximum of 2,000 vehicles per day and 5,000 vehicles per day respectively[5].

These two sets of criteria have been used as the basis for identifying traffic speed and volume issues within the streets of North Ryde.

Table 2.1: Environmental Capacity and Speed Performance Standards

Road Class	Road Type	Maximum Speed (km/h)	Max Peak hour volume (veh/hr)[6]
Local	Access way	25	100
	Street	40	200 (desirable) and 300 (absolute)
Collector	Street	50	300 (desirable) and 500 (absolute)

(Source: RTA Guide to Traffic Generating Developments, 2002)

It is important to note that these standards are based on RTA research relating to safety (cross-ability, visibility, pedestrian delay) and amenity (noise and air quality). These standards were developed to assist practitioners in the design of residential subdivisions to ensure a level of safety and amenity was maintained when designing these types of roads.

5 RTA Road Design Guide 1991 – Table 1.2.6

6 This figure can be used to calculate daily traffic volumes by assuming a peak to daily ratio of 10%.

In practice if these standards or limits are met then it is reasonable to assume that the street can be crossed safely and with minimal delay and that the traffic noise and air quality levels are acceptable. The research indicated that a 300 vehicle/hour limit was required for aged pedestrians to safely cross the average street.

Existing Traffic and Speed Assessment

An analysis of the existing tube survey results compared to the RTA environmental capacity and speed performance standards is provided in Table 2.2.

Table 2.2: North Ryde Local Streets Survey Data

Street Name	Between	Time Period	Survey			Compliance		
			Existing Volume (veh)	Speed (85th % km/hr)	Speed (50th % km/hr)	Volume (veh/hr)	Speed (85th % km/hr)[2]	Speed (50th % km/hr) [2]
Lorna Avenue	Lane Cove Road and Folkard Street	Daily	1,358	42	25	Yes	No	Yes
		PM Peak Hour (5:00pm to 6:00pm)	127	44 [1]	26 [1]	Yes	No	Yes
Folkard Street	Marilyn Street and Lorna Avenue	Daily	253	48	38	Yes	No	Yes
		PM Peak Hour (5:00pm to 6:00pm)	19	47	38	Yes	No	Yes
Cooney Street	Folkard Street and End	Daily	97	38	27	Yes	Yes	Yes
		PM Peak Hour (5:00pm to 6:00pm)	10	38	27	Yes	Yes	Yes
Marilyn Street	Pamela Street and Kathleen Street	Daily	480	55	44	Yes	No	No
		PM Peak Hour (5:00pm to 6:00pm)	40	57	45	Yes	No	No
Avon Road	Marilyn Street and Beatrice Street	Daily	450	50	40	Yes	Yes	Yes
		PM Peak Hour (5:00pm to 6:00pm)	34	53	41	Yes	No	No
Beatrice Street	Wicks Road and Avon Road	Daily	1,195	47	39	Yes	Yes	No
		PM Peak Hour (5:00pm to 6:00pm)	124	48	40	Yes	Yes	No

[1] Highest direction only for all PM peak hours
[2] Based on Table 2.1
85th Percentile Speed Exceeds Speed Limit

Table 2.2 indicates that, existing traffic volumes on the six local roads are within an acceptable range. Two of the roads have 85th percentile vehicle speeds which are higher than the posted speed limit of 50km/h.

2.3 Site Observations

The following traffic-related issues were observed during site visits carried out during the project:

- Coxs Road

  During the afternoon school pick up period between 3:00pm and 3:30pm, significant queuing was observed along Coxs Road with traffic queuing back from Coxs Road/Lane Cove Road and Coxs Road/Wicks Road intersections. Queuing also occurred as a result of usage of pedestrian crossing facilities and vehicles turning into 90-degree car spaces and off-street car parks.

- Coxs Road/Wicks Road Intersection

  The right turn movement from Coxs Road to Wicks Road in both directions was observed to be difficult especially from the eastern leg of Coxs Road. This is primarily as a result of heavy through movement along Coxs Road, especially eastbound. Vehicles turning right would generally

complete the movement during the amber phase at the end of the cycle with vehicles also observed turning when red.

Near incidents involving turning vehicles and through movements were observed on Coxs Road. This was primarily a result of:

- Eastbound traffic merging across the intersection two lanes on the western leg to one lane on the eastern leg.
- Right turning traffic in line with through traffic.

2.4 Existing Intersection Operation

The operation of the Coxs Road/Wicks Road intersection within the study area has been assessed using SIDRA INTERSECTION[7], a computer based modelling package which calculates intersection performance.

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. The existing cycle times were provided by the RTA for all intersections on Lane Cove Road and GTA Consultants obtained the existing cycle times for the intersection of Coxs Road / Wicks Road via a site survey. The SCATS IDM data provided by the RTA is presented in Appendix B.

Table 2.3 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.3: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	0 to 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.4 presents a summary of the existing Thursday PM and Saturday Midday peak operations of the intersection, with full results presented in Appendix C of this report.

[7] Program used under license from Akcelik & Associates Pty Ltd.

Table 2.4: Existing Operating Conditions of Intersection of Coxs / Wicks Road

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.95	79	194	F
	Wicks Road S (Lane 2)	0.95	80	196	F
	Coxs Road E (Lane 1)	0.54	39	114	C
	Coxs Road E (Lane 2)	0.54	65	38	E
	Wicks Road N (Lane 1)	0.95	58	317	E
	Wicks Road N (Lane 2)	0.95	59	319	E
	Coxs Road W (Lane 1)	0.92	47	115	D
	Coxs Road W (Lane 2)	0.92	67	193	E
	Overall	0.95	62	319	E
Sat	Wicks Road S (Lane 1)	0.57	43	110	D
	Wicks Road S (Lane 2)	0.57	42	116	C
	Coxs Road E (Lane 1)	0.40	41	77	C
	Coxs Road E (Lane 2)	0.40	49	56	D
	Wicks Road N (Lane 1)	0.58	35	121	C
	Wicks Road N (Lane 2)	0.58	36	123	C
	Coxs Road W (Lane 1)	0.56	40	66	C
	Coxs Road W (Lane 2)	0.56	49	81	D
	Overall	0.58	41	123	C

Table 2.4 indicates that the intersection of Coxs Road/Wicks Road experiences notable queuing and delays on the all legs during the Thursday PM peak hour and, to a lesser extent, the Saturday Midday peak hour. The overall intersection operates near full capacity during the Thursday PM peak hour with a degree of saturation of 0.95 and a level of service of E. During the Saturday Midday peak hour the overall intersection operates with less queuing and delays with a Degree of Saturation of 0.58 and level of service of C.

The following intersections were modelled using LinSig:

- Coxs Road/Lane Cove Road
- Lane Cove Road/Kent Road
- Lane Cove Road/Bridge Road/ Twin Road.

LinSig is a computer software package used 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, signalled 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 key assumptions have been made:

- Given that traffic flow in LinSig are represented in passenger car units (pcu), the following conversion was adopted for the existing traffic volumes:
  - Car = 1pcu
  - Heavy Vehicle = 2.3pcu.
- Saturation flow values were provided by the RTA for the majority of the signalised lane approaches. Where the saturation flows were not available, saturation flow values of 1,800 were adopted for through and turning lanes respectively. This saturation flow is an industry accepted value.

- 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 existing models have been based on SCATS IDM data and offset information provided by the RTA. The intersection of Coxs Road / Wicks Road is an isolated intersection and the phase time was obtained from on-site observations.
- Phase intergreens (i.e. combined red and amber) times of 6 seconds have been applied to all intersections.
- 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.

A summary of the results from the existing analysis are provided in Table 2.5 and Table 2.6 for Thursday PM and Saturday Midday peak hours respectively. Full details and results are provided in Appendix C.

Table 2.5: Thursday PM Peak Hour – Existing Operating Conditions

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	605	53.1%	18.5	B	86
	Lane Cove Road South Ahead	665	56.5%	17.8	B	95
	Lane Cove Road South Ahead	680	57.8%	18.1	B	98
	Lane Cove Road North Ahead Left	907	64.1%	11.4	A	84
	Lane Cove Road North Ahead	1087	74.9%	13.0	A	95
	Lane Cove Road North Ahead Right	900	85.0%	27.3	B	66
	Bridge Road West Left	46	9.8%	46.4	D	9
	Bridge Road West Right Ahead	191	80.3%	101.2	F	55
	Twin Road East Left Ahead	148	64.9%	84.3	F	40
	Twin Road East Right Ahead	154	66.1%	86.2	F	41
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	873	58.2%	4.3	A	20
	Lane Cove Road North Ahead	1071	71.4%	4.5	A	13
	Lane Cove Road North Ahead	884	58.9%	3.4	A	10
	Lane Cove Road North Right	181	108.5%	328.6	F	119
	Kent Road West Left	99	28.4%	58.9	E	22
	Kent Road West Right Left	69	38.1%	78.6	F	17
	Lane Cove Road South Left Ahead	523	40.4%	3.3	A	7
	Lane Cove Road South Ahead	688	51.7%	4.0	A	11
	Lane Cove Road South Ahead	715	53.7%	4.4	A	14
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	997	92.3%	46.1	D	254
	Lane Cove Road North Ahead	1030	92.3%	43.9	D	260
	Lane Cove Road North Ahead	1013	90.8%	40.8	C	247
	Lane Cove Road South Ahead	567	38.7%	5.0	A	28
	Lane Cove Road South Ahead	688	47.0%	2.8	A	6
	Lane Cove Road South Ahead	524	35.8%	2.4	A	4
	Lane Cove Road South Right	194	67.4%	72.2	F	41
	Coxs Road East Left Right	334	48.0%	53.0	D	44

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assumes 6.0m per pcu.

Table 2.5 shows that Lane Cove Road experiences significant queuing during the Thursday PM peak hour and is reaching or is over capacity on a number of approaches including the right turn into Kent Road and southbound on Lane Cove Road at the Coxs Road intersection. The right turn into Coxs Road is currently

operating at a level of service F. Coxs Road is currently operating at a level of service D and an average delay of 53 seconds per vehicle.

Table 2.6: Saturday Midday Peak – Existing Operating Conditions

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	570	49.8%	16.7	B	73
	Lane Cove Road South Ahead	653	55.2%	16.3	B	85
	Lane Cove Road South Ahead	672	56.8%	16.6	B	89
	Lane Cove Road North Ahead Left	573	43.7%	11.0	A	52
	Lane Cove Road North Ahead	753	55.8%	11.8	A	70
	Lane Cove Road North Ahead Right	781	57.5%	15.4	B	47
	Bridge Road West Left	74	16.4%	45.9	D	14
	Bridge Road West Right Ahead	185	59.7%	68.8	E	39
	Twin Road East Left Ahead	83	25.8%	57.1	E	17
	Twin Road East Right Ahead	116	34.0%	59.4	E	20
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	564	36.9%	2.2	A	5
	Lane Cove Road North Ahead	734	48.0%	2.4	A	5
	Lane Cove Road North Ahead	736	48.1%	2.8	A	9
	Lane Cove Road North Right	88	47.3%	89.7	F	23
	Kent Road West Left	95	29.6%	57.8	E	20
	Kent Road West Right Left	77	53.9%	88.2	F	20
	Lane Cove Road South Left Ahead	540	41.2%	4.4	A	41
	Lane Cove Road South Ahead	690	51.1%	4.5	A	76
	Lane Cove Road South Ahead	719	53.3%	5.1	A	85
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	640	63.0%	25.4	B	106
	Lane Cove Road North Ahead	696	66.0%	24.6	B	115
	Lane Cove Road North Ahead	694	65.8%	24.5	B	115
	Lane Cove Road South Ahead	595	42.1%	4.9	A	28
	Lane Cove Road South Ahead	690	48.8%	3.4	A	9
	Lane Cove Road South Ahead	509	36.0%	3.0	A	7
	Lane Cove Road South Right	214	71.8%	75.5	F	43
	Coxs Road East Left Right	387	60.7%	50.5	D	45

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu.

Table 2.6 shows that a typical Saturday does not experience significant delays or queuing and generally operates better than on a typical Thursday.

2.5 Car Parking

2.5.1 Supply

The study area contains a total of 411 car parking spaces including 96 on-street spaces and 315 off-street spaces. This includes private parking for North Ryde Public School and St. Johns Church.

The study area includes 20 x 1/4P spaces, 72 x 1P spaces and 157 x 2P spaces for a total of 249 short-term parking spaces. This equates to approximately 60% of the total parking spaces in the study area being short-term. The spaces that are unrestricted front the residential sections of Coxs Road, or are off-street parking spaces located behind the commercial buildings. 'No Parking' restrictions between 4:00pm and 7:00pm Monday to Friday[8] apply on the frontage of North Ryde Public School.

[8] The parking demand has been adjusted during this period to reflect the reduction in parking supply.

The full inventory is presented in Appendix D of this report.

2.5.2 Demand

A parking demand survey was undertaken by GTA Consultants of the study area on Thursday 10 February 2011 between 7:00am and 7:00pm at half-hourly intervals. Figure 2.13 shows the total demand and percentage occupancy for all spaces over the day.

Figure 2.13: Total Parking Demand - Thursday

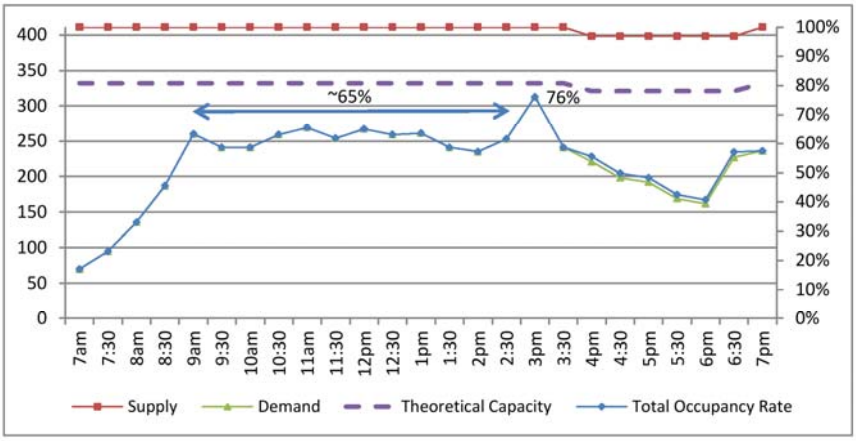


Figure 2.13 indicates that demand for parking spaces is lowest before 9am. During the day the occupancy rate is generally constant at approximately 65% until the 3:00pm peak, varying between 59% and 65%. Peak demand occurs at 3:00pm, when 76% of all spaces are occupied.

After 3:00pm, demand for parking reduces until 6:30pm, where a spike in demand occurs and occupancy rates return to similar levels exhibited during the day.

Results for the peak period (3:00-3:30pm) are summarised in Table 2.7.

Table 2.7: Thursday Peak Parking Demand and Occupancy – 3:00pm

Type of parking	Restrictions [1]	Supply (Available Spaces)	Demand	Occupancy
On-street	Short-term	77	51	66%
	Long-term	16	14	88%
	Sub-Total	**93**	**65**	**70%**
Off-street	Short-term	172	135	79%
	Long-term	126	101	80%
	Sub-Total	**298**	**236**	**79%**
Subtotal	Short-term	249	186	75%
	Long-term	142	115	81%
	Sub-Total	**391**	**301**	**77%**
Disabled	NA	12	7	58%
Other (Taxi, Mail Zone)	NA	8	5	63%
Total		**411**	**313**	**76%**

[1] Short-term is less than 4hrs, long-term is 4hrs or more

Table 2.7 indicates relatively high demand for parking in Coxs Road during the peak period. The occupancy rate for on-street parking is 70% (28 vacant spaces) and the rate for off-street parking is 79% (62 vacant spaces). This is still below the theoretical capacity of 85%.

Currently, short-term parking spaces account for 64% of all long-term and short-term parking spaces. Typically, in the order of 75% of all parking spaces associated with retail uses are short-term. Further discussion in relation to the adequacy of the existing parking restrictions is set out later in this section.

Figure 2.14 shows the occupancy rates for on and off-street parking spaces over the survey period.

Figure 2.14: Parking Demand for on-street and off-street parking spaces - Thursday

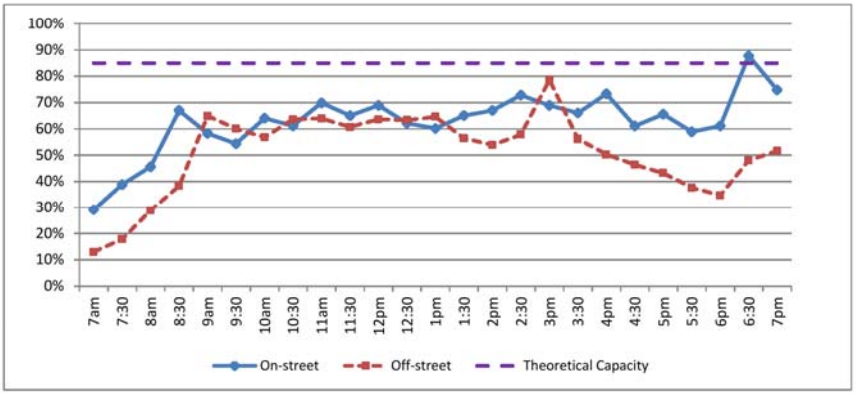


Figure 2.14 indicates that peak demand for on-street spaces occurred at 6:30pm when 88% of spaces were occupied. The peak demand for off-street parking occurred at 3:00pm when 79% of spaces were occupied. Between 9:00am and 3:30pm, occupancy rates for on-street and off-street car parking approximately matched however after 3:30pm, the occupancy difference between on-street and off-street car parking spaces increased suggesting that customers prefer to park on-street rather than off-street.

Figure 2.15 shows parking demand over the day for standard short-term and long-term parking spaces.

Figure 2.15: Parking Demand for Short and Long-Term Parking Spaces – Thursday

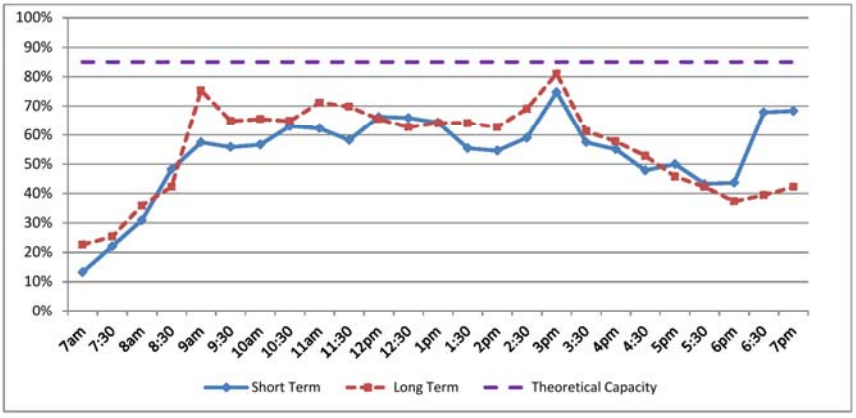


Figure 2.15 indicates that demand for short-term spaces is relatively constant throughout the day with the highest recorded demand recorded at 3:00pm associated with the school pick up period. Demand for long-term spaces peaks at 9:00am and 3:00pm as a result of the school drop-off and pick up periods respectively. In both cases, the theoretical capacity of the parking supply is not exceeded.

A more detailed breakup of the short-term supply and demand is provided in Figure 2.16.

Figure 2.16: Detailed Short-term Supply and Demand – Thursday 10 February 2011

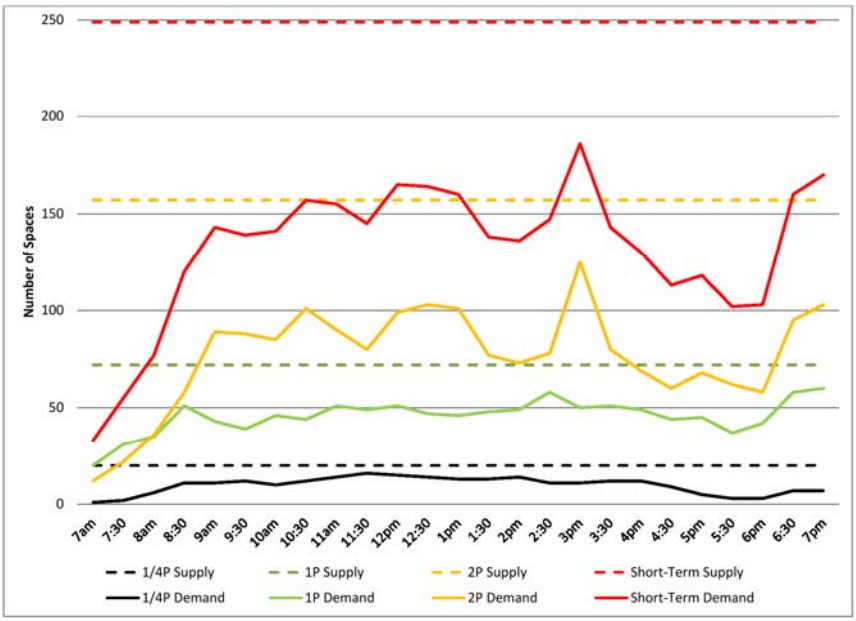


Figure 2.16 indicates that the 1/4P spaces are approaching full occupancy during the day with demand for other spaces at a moderate demand level throughout the course of the day. This suggests that overall, the

amount of short-term parking currently provided for the centre is sufficient and there is no immediate need to convert long-term parking to short-term parking.

Full results of the parking demand survey are provided in Appendix D.

2.6 Interview Survey

Interview surveys were undertaken with staff and customers in Coxs Road to determine trip purpose and origin. These surveys were conducted on the following days:

- Thursday 17 Feb 2011 (noon – 2pm)
- Saturday 12 Feb 2011 (noon – 2pm).

A total of 55 responses were received across the two survey days as follows:

- Thursday 17 Feb 2011 – 23 responses
- Sat 12 Feb 2011 – 32 responses.

Some of the key findings are presented in Figure 2.17 to Figure 2.23, with full results provided in Appendix E.

Question 1 asked respondents from which suburb they had come from.

Figure 2.17: Q1 What suburb have you come from today?

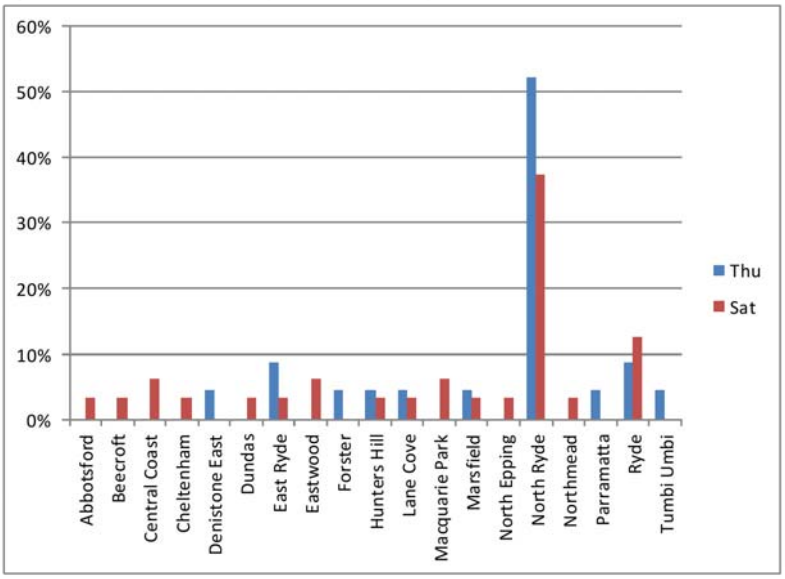


Figure 2.17 indicates the following:

- The highest number of respondents were from North Ryde (52% Thu/ 38% Sat), followed by Ryde (9% Thu /13% Sat) and East Ryde (9% Thu / 12% Sat).
- On Thursday 78% of respondents came from suburbs within the City of Ryde or suburbs in neighbouring local government areas. On Saturday this figure was 69%.

To provide a better understanding of the origin of staff and customers at the Coxs Road centre, the information in Figure 2.17 has been mapped as indicated in Figure 2.18.

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Figure 2.18: Origin of Respondents

Question 3 asked respondents to give reasons for their visit to Coxs Road. If a respondent cited multiple reasons for their visit, these were also recorded.

Figure 2.19: Q3. What is your reason for visiting Coxs Road today?

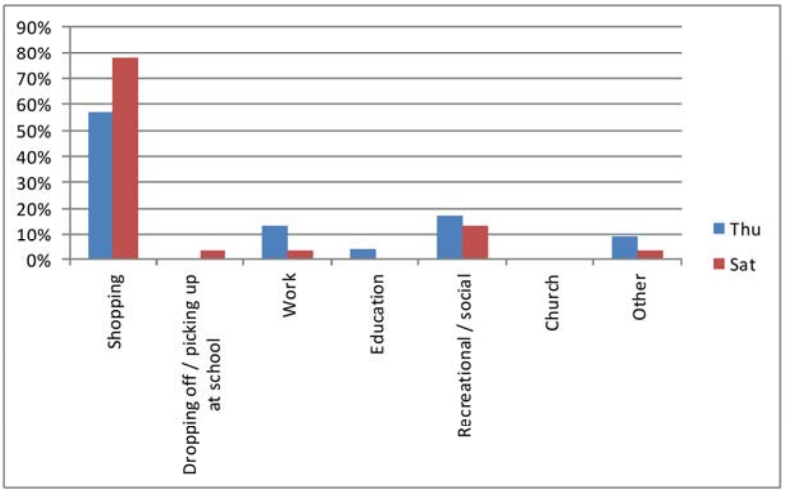


Figure 2.19 indicates the following:

- Shopping was the most common reason for visiting Coxs Road (57% Thu / 78% Sat).
- Other respondents included those visiting Coxs Road for recreational or social purposes (17% Thu / 13% Sat), work (Thu 13% / Sat 3%), other reasons (Thu 9% / Sat 3%), education (Thu 4%) and dropping off / picking up at children at the local schools (3% Sat).

Question 4 asked respondents what method of transport they used to travel to the study area.

Figure 2.20: Q4. What mode of transport did you use to get to Coxs Road today?

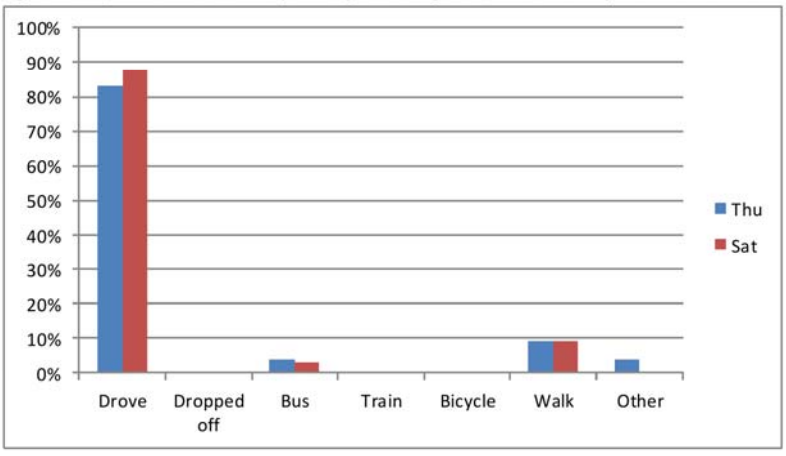


Figure 2.20 indicates the following:

- The majority of respondents drove to the study area (83% Thu / 88% Sat)
- Other modes of transport accounted for only a small proportion of trips, with walking being the second most popular method of visiting the area (9% of respondents on both days).

Question 7 asked respondents to estimate how long they intended staying in Coxs Road for their visit.

Figure 2.21: Q7. How long do you intend on staying for this visit today?

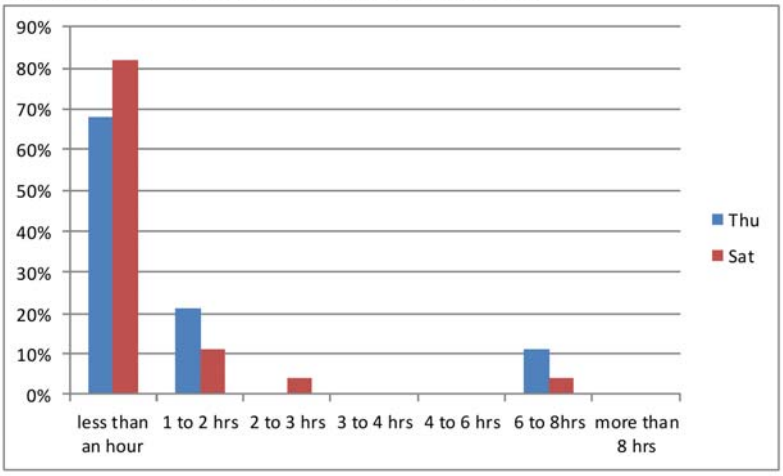


Figure 2.21 indicates the following:

- Most visits were for less than an hour (68% Thu / 82% Sat) or 1 to 2 hrs (21% Thu / 11% Sat).
- A smaller number of visitors surveyed were staying for 6 to 8hrs (11% Thu / 4% Sat) with survey results indicating these people worked in the area.

Question 8 asked respondents to rate their experience finding a parking space in the study area as either easy, average or difficult.

Figure 2.22: Q8. How would you rate finding a car park in Coxs Road? Thursday

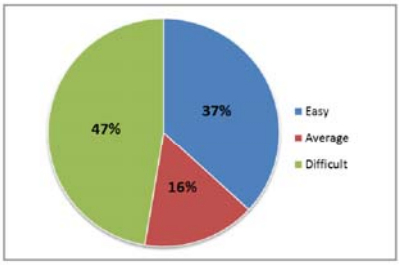


Figure 2.23: Q8. How would you rate finding a car park in Coxs Road? Saturday

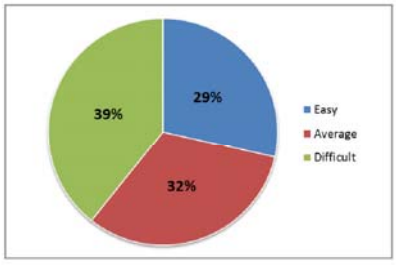


Figure 2.23 and Figure 2.24 indicate the following:

- On Thursday, almost half (47%) of respondents found it difficult to find a parking space, while 53% found it easy or average

- On Saturday 39% of respondents found it difficult to find a parking space, while 68% found it easy or average.
- Between the two days, respondents found it more difficult to locate a car parking space on Thursday.

If a respondent came to the Coxs Road centre via car, the intersection they used to access the centre was determined.

Figure 2.24: Which intersection did you use to come to Coxs Road on Thursday?

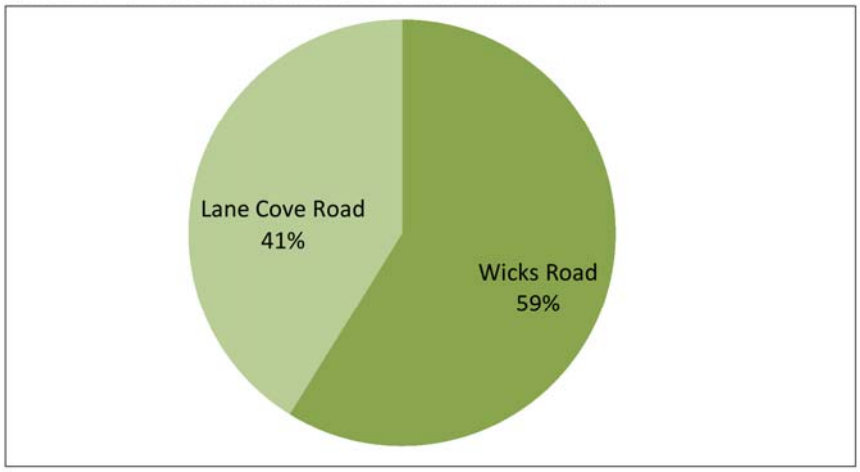
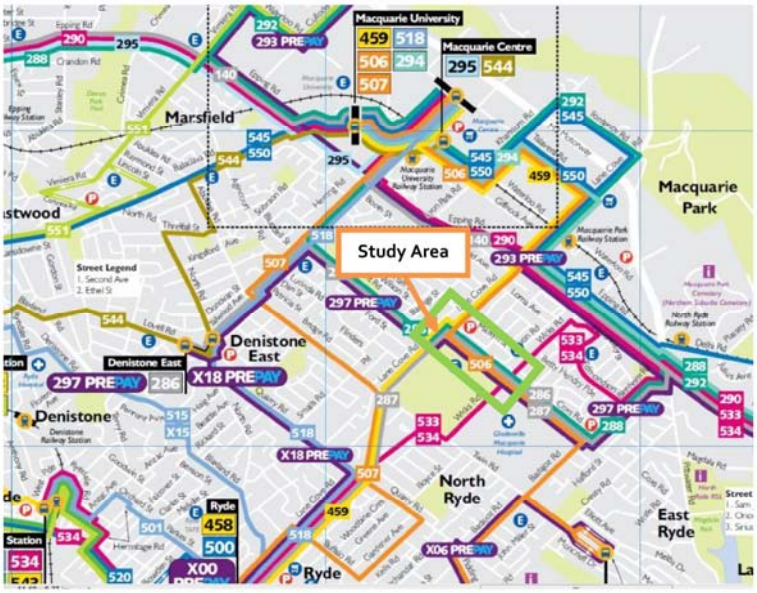


Figure 2.24 indicates that during the Thursday PM peak hour, approximately 60% of respondents came to the Coxs Road centre via the intersection of Coxs Road / Wicks Road with the remaining using the intersection of Lane Cove Road / Coxs Road.

2.7 Public Transport

The study area is well-served by a number of bus services. The network of bus routes and location of nearby railway stations are shown in Figure 2.25.

Figure 2.25: Bus routes and train stations in vicinity of study area



source: sydneybuses.info

A summary of the public transport options available in the area are provided in Table 2.8.

Table 2.8: Public Transport Options

Service	Route	Route Description	Distance to Nearest Stop
Bus	286, 297	Denistone East to City	Bus Stops within study area
Bus	287	Ryde to Milsons Point	Bus Stops within study area
Bus	288	Epping to City	Bus Stops within study area
Bus	459	Macquarie University to Strathfield	300m from midpoint of Coxs Road
Bus	506	Macquarie University to City	Bus Stops within study area
Bus	533	Olympic Park to Chatswood	300m from midpoint of Coxs Road
Bus	534	West Ryde to Chatswood	300m from midpoint of Coxs Road
Train	Northern Line	Hornsby/Epping to City	1.5km (accessible by 459, 506 buses)

2.8 Pedestrian Infrastructure

Formal pedestrian paths are located as follows:

- Along both sides of Coxs Road
- Along both sides of Wicks Road
- Along both sides of Lane Cove Road except for the southern side adjacent to North Ryde Golf Club

- Alongside the western boundary of Holy Spirit Primary School, linking Coxs Road through to Marilyn Street, and then through to Kathleen Reserve and Kathleen Street.

Signalised pedestrian crossings exist at the following locations which provide safe access for pedestrians:

- Southern and eastern legs of the Lane Cove Road / Coxs Road intersection
- All four legs of the Wicks Road / Coxs Road intersection
- All four legs of the Twin Road / Bridge Road / Lane Cove Road intersection.

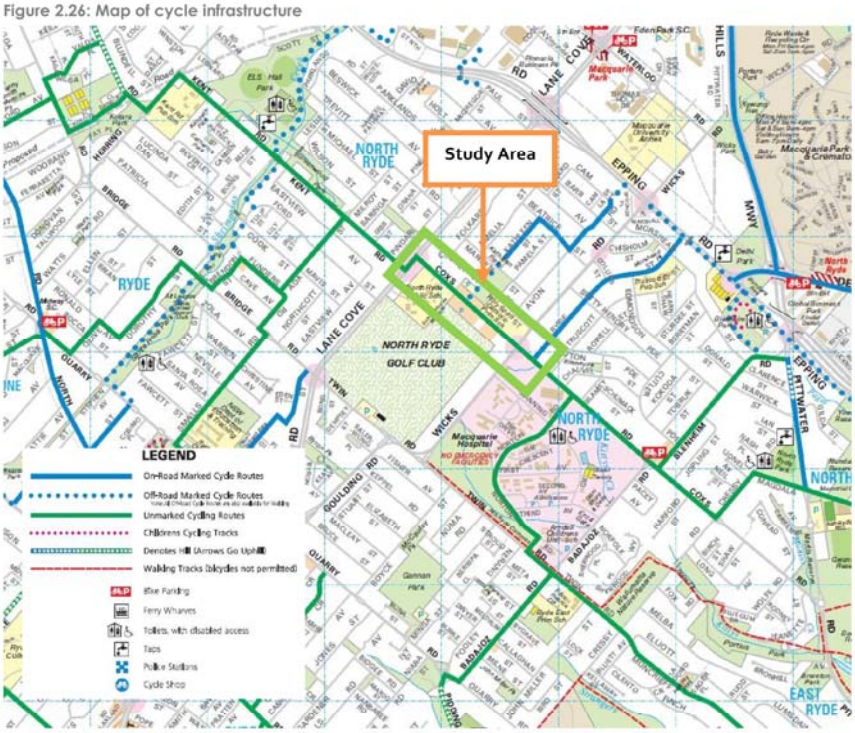
There are also three marked zebra crossings located on Coxs Road as follows:

- In the western half of Coxs Road outside North Ryde Public School (raised)
- At the midpoint of Coxs Road in front of the library (at grade)
- In the eastern half of Coxs Road outside Holy Spirit Primary School (raised).

2.9 Cycle Infrastructure

The study area contains a number of cycleways, both marked and unmarked as shown in Figure 2.26. Coxs Road contains an unmarked cycleway for the majority of its length, with a marked green painted section in the middle section located on the northern side of the carriageway. The pedestrian path alongside the western boundary of Holy Spirit Primary School is also a designated cycle path. It connects Coxs Road through to Marilyn Street and then further through Kathleen Reserve and Kathleen Street.

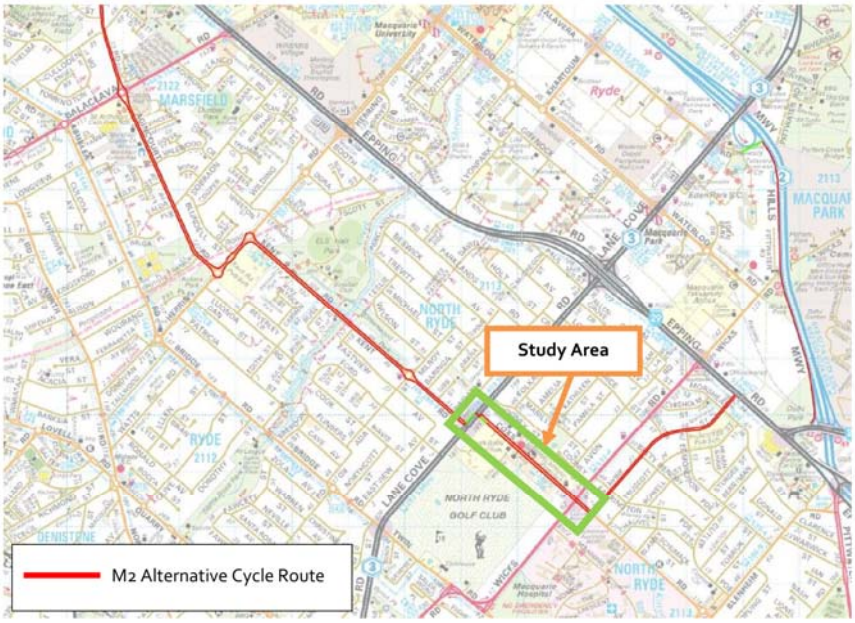
Figure 2.26: Map of cycle infrastructure



The study area also encompasses part of the M2 alternative cycle route. The M2 motorway is being upgraded between Windsor Road and Lane Cove Road, and during the construction period the existing cycle route located within the motorway breakdown lane is not available for cyclists. This has necessitated the creation of the M2 alternative cycle route, which is a route utilising part of the City of Ryde's bicycle network. This new route runs directly through the Coxs Road study area on both marked and unmarked bicycle paths.

Figure 2.27 shows the existing M2 alternative cycle way in the context of the study area.

Figure 2.27: M2 Alternative Cycle Route



3. Existing Centre Traffic

3.1 Existing Traffic Generation

GTA Consultants estimated the existing centre traffic generation based on land use information provided by Olsson and Associates using rates contained within standard RTA publications and GTA Consultants' database. A summary is provided in Table 3.1.

Table 3.1: Existing Peak Hour Traffic Generation

Existing Use	Size	Unit	PM Peak hour rate	Unit	Peak Hour Total
Office	414	GFA	2 [1]	/100sqm GFA	8
Supermarket	3,355	GFA	13.175 [2]	/100sqm GFA	442
Specialty Retail	2,692	GFA	3.91 [3]	/100sqm GFA	105
Community (Library)	1,500	GFA	3.07 [4]	/100sqm GFA	46
Total	7,961	GFA	7.45	Existing Total	593

[1] RTA Guide to Traffic Generating Developments
[2] RTA Guide to Traffic Generating Developments assuming a ratio of GLFA to GFA of 85%
[3] RTA Guide to Traffic Generating Developments assuming a ratio of GLFA to GFA of 85%
[4] GTA Consultants survey database

Table 3.1 shows that the existing centre generates approximately 593 movements during the Thursday PM peak hour.

3.2 Existing Traffic Distribution

Based on the interview survey conducted by GTA Consultants, Figure 3.1 has been prepared to set out our estimation of the existing Coxs Road traffic distribution.

Existing traffic distribution as per Figure 3.1 has been assumed based on the interview surveys conducted by GTA Consultants with the turn flow distribution based on the existing turn volumes at each intersection.

ITEM 6 (continued) **ATTACHMENT 1**

Figure 3.1: Existing Coxs Road Centre Traffic Distribution

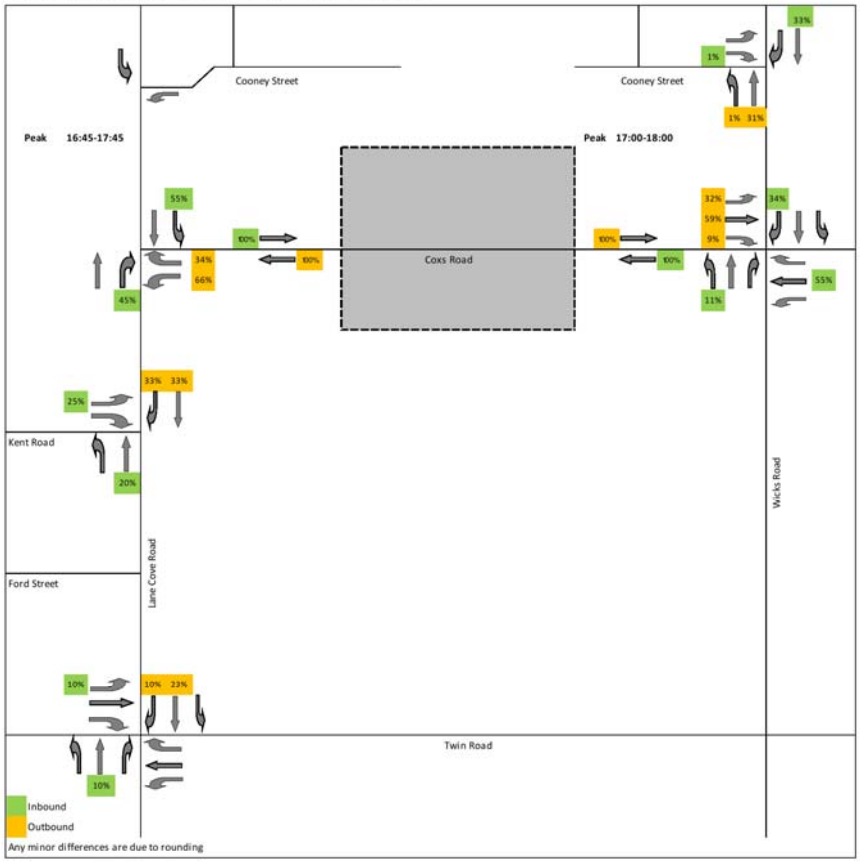


Figure 3.1 assumes the following distribution:

- 50% in / out split during peak hours
- 60% of traffic in via the Coxs Road / Wicks Road intersection based on interview surveys
- 50% of traffic out via the Coxs Road / Wicks Road intersection.

4. Masterplan Proposal

4.1 Future Development

Figure 4.1 shows the proposed Masterplan for the Coxs Road centre.

Figure 4.1: Masterplan for Coxs Road

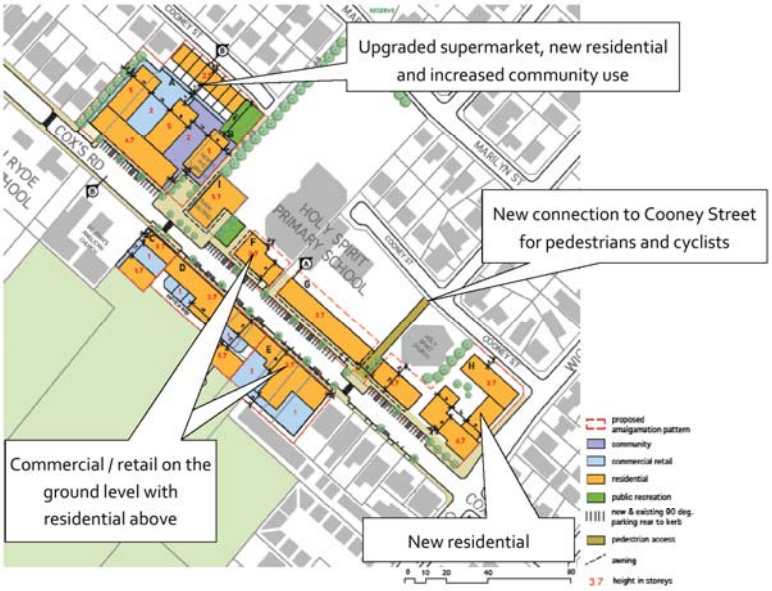


Figure 4.1 indicates that the redevelopment of the Coxs Road centre would include an upgraded supermarket, increased community uses and mixed retail / commercial uses with residential dwellings above. In addition, stand-alone residential development is also proposed.

Olsson and Associates provided GTA Consultants with the expected proposed future development which is summarised in Table 4.1. Some stand alone residential development is also proposed resulting in an increase of approximately 11,300sqm GFA and 300 dwellings. An alternate development scenario where the proposed Masterplan floor areas multiplied by 130% are developed is also provided.

Table 4.1: Masterplan Development

Use	Increase in Size	Units	Masterplan x 130%	Units
Residential	300	Dwellings	390	Dwellings
Office	2,546	sqm GFA	3,310	sqm GFA
Supermarket	205	sqm GFA	267	sqm GFA
Specialty Retail	6,388	sqm GFA	8,304	sqm GFA
Community	1,820	sqm GFA	2,366	sqm GFA
Community (Library)	350	sqm GFA	455	sqm GFA
Total	300 dwellings + 11309 sqm GFA		390 dwellings + 14,702sqm GFA	

4.2 Possible Future Road Network Changes

A number of road network changes were discussed with the City of Ryde and as part of this study, two preferred options were modelled as indicated in Figure 4.2 and Figure 4.3.

4.2.1 Proposed Road Connections

Figure 4.2 includes three proposed road connections as follows:

- Coxs Road to Cooney Street
- Cooney Street to Marilyn Street
- Marilyn Street to Wicks Road.

Figure 4.2: Proposed Road Option 1 – New Road Connections

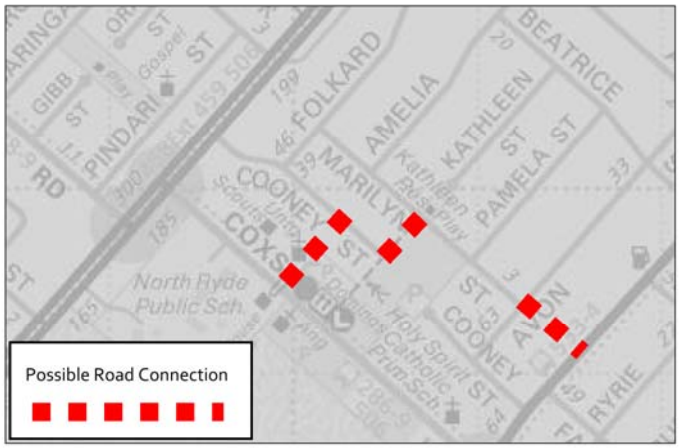
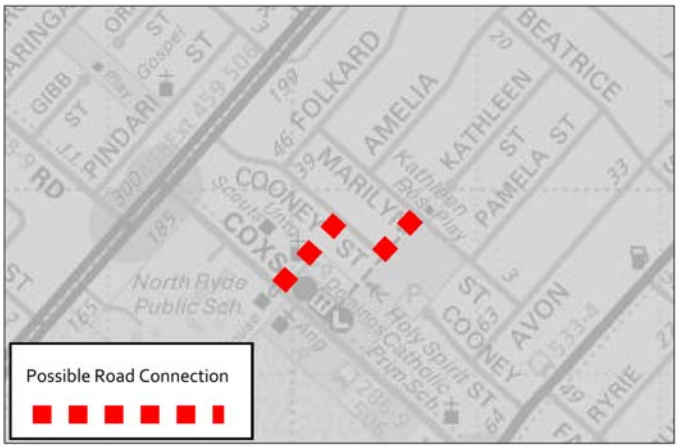


Figure 4.3 includes two proposed road connections as follows:

- Coxs Road to Cooney Street
- Cooney Street to Marilyn Street.

Figure 4.3: Proposed Road Option 2 – New Road Connections



4.2.2 Comparative Cost

Based on Figure 4.2 and Figure 4.3, between the two options, there is not expected to be any difference to the impact on traffic distribution for the intersections of Coxs Road / Wicks Road and Lane Cove Road / Coxs Road. Option 1 is expected to be more costly than Option 2 as a result of land acquisition costs.

5. Masterplan Operational Assessment

5.1 Introduction

The modelling of existing conditions was undertaken for a typical Thursday PM and Saturday midday peak hour. The existing surveys and modelling results show that a typical Thursday is the peak day for the road network and as such, the modelling for all future scenarios has been undertaken for a typical Thursday only.

In order to compare like with like, the LinSig optimisation process which changes the phasing, cycle times and offsets, to reduce the overall delay for the road network was not used for the Lane Cove Modelling. This was to enable a direct comparison of the impacts of each scenario on the Lane Cove Road with other scenarios and to identify any improvement as a result of each proposed road network option.

5.2 Traffic Generation

Russell Olsson and Associates provided GTA Consultants with the anticipated increase in development floor area at the Coxs Road Centre based on the Masterplan provided in Figure 4.1. This information, along with the expected additional peak hour traffic volume rate is summarised in Table 5.1.

Table 5.1: Summary of Masterplan Development and Additional Traffic Volumes

Use	Increase in Size	Unit	PM Peak hour rate	Unit	Peak Hour Total
Residential	300	Dwellings	0.5	/ dwelling	150
Office	2546	GFA	2	/100sqm GFA	51
Supermarket	205	GFA	13.175	/100sqm GFA	27
Specialty Retail	6388	GFA	3.91	/100sqm GFA	250
Community	1820	GFA	2 [1]	/100sqm GFA	36
Community (Library)	350	GFA	3.07	/100sqm GFA	11
Total Additional Trips					525
20% Reduction for Linked Trips					420

[1] GTA Consultants database rate for typical community uses

Table 5.1 shows that an additional 420 peak hour trips could be expected following full development of the Masterplan. The reason for the 20% reduction is set out in Section 5.2.1.

5.2.1 Linked Trips

An important characteristic of the traffic generation of the above uses is the different types of trips which may occur. These different trip types correspond to:

- 'Primary Trips'
- 'Link-diverted Trips'
- 'Non-link-diverted Trips'.

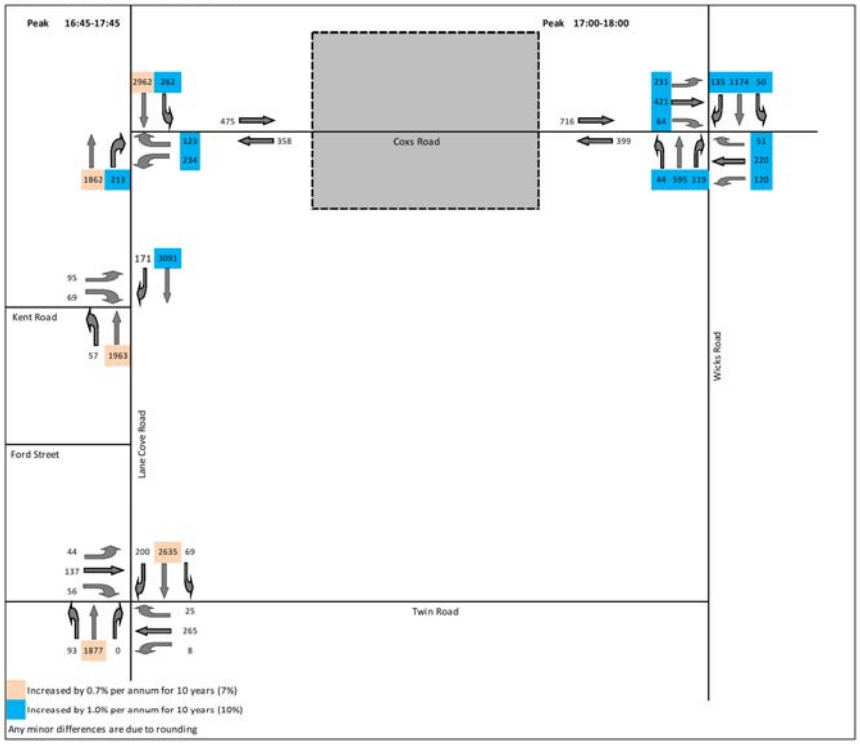
Primary trips and *link-diverted trips* involve a vehicle either making a special trip or a modification of the route to an existing trip. *Non-link-diverted trips,* on the other hand, correspond to those trips which do not involve a diversion from the route that would otherwise have been taken, or in other words are trips generated by passing traffic. The important distinction here is that it is only *primary trips* and *link-diverted trips* which impact upon the external road network. *Non-link-diverted trips* are already present on the adjacent road network, and although these trips need to be considered in the design of access driveways, turning lanes and so on, they do not constitute additional traffic per se.

Advice on this matter has been sought from a report prepared for the RTA by Chris Hallam and Associates, '*Linked Trips and Traffic Generation Review*', August 1987, which indicates that where new shops / shopping centres are proposed to be built within existing centres, a discount of 20% is to be applied to trips applicable to the new floor area. Based on this, the total of 525 peak hour trips has been discounted by 20% to reflect a likely future increase of 420 trips during the Thursday PM peak hour.

5.2.2 Background Traffic Growth

Advice on the likely background growth along Lane Cove Road was sought from the RTA. They indicated a growth rate of 0.7% per annum or 7% over the next 10 years. As there was no information available on Wicks Road or Coxs Road, in order to provide a conservative assessment, a growth rate of 1% per annum was applied to all movements on Coxs Road (including existing vehicles associated with the Coxs Road centre). The future 2021 base traffic volumes are provided in Figure 5.1.

Figure 5.1: Base 2021 Volumes



5.3 Traffic Distribution

The additional Masterplan traffic volumes were distributed in accordance with the existing Coxs Road centre traffic as set out in Figure 3.1. The Thursday PM peak hour volumes are set out in Figure 5.2.

Figure 5.2: Masterplan Development Traffic Volumes – Thursday PM Peak (Modelling Scenario 2A)

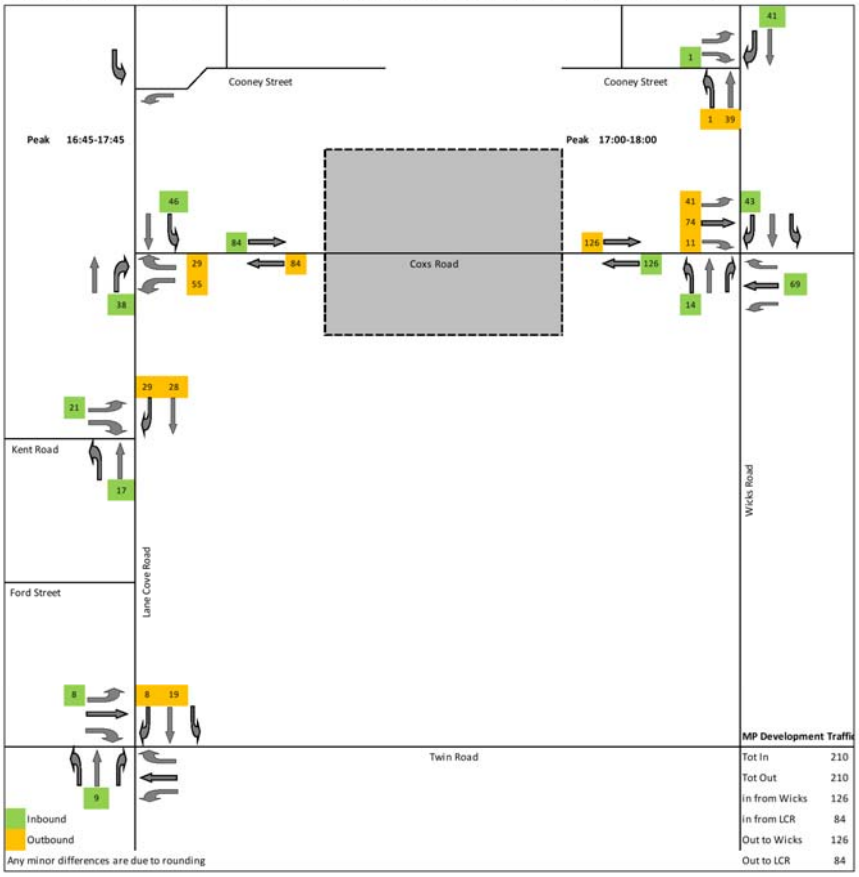


Figure 5.2 shows that 168 vehicle movements are expected to enter and exit the centre via the intersection with Lane Cove Road / Coxs Road and 252 vehicle movements are expected to enter and exit the centre via Wicks Road /Coxs Road.

5.4 Traffic Modelling / Options Assessment

Section 5.4 sets out a summary of the traffic modelling undertaken as part of the Masterplan assessment.

5.4.1 Summary of Modelling Scenarios

A summary of the existing and future modelling scenarios analysed as part of this study are provided in Table 5.2.

Table 5.2: Modelling Scenarios Tested

Modelling Scenario		A - 2011	B – 2021
1	Existing	✓	✓
2	Existing + Masterplan	✓	
3	Existing + Proposed Road Option 1 + Masterplan	✓	
4	Existing + Proposed Road Option 2 + Masterplan	✓	
5	Existing + Cox / Wicks Improvements + Masterplan	✓	✓
6	Existing + Cox / Wicks Improvements + Masterplan x 130%	✓	✓
7	Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan	✓	✓

Eleven options have been analysed as part of this study. The results are set out in the following sections with detailed results for each future scenario provided in Appendix F.

5.4.2 Modelling Scenario 1B – Existing + Background Growth to 2021

Based on the volumes in Figure 5.1, Table 5.3 presents a summary of the expected operating conditions, with full results presented in Appendix F.

Table 5.3: Modelling Scenario 1B – 2021 Operating Conditions Intersection of Coxs Road / Wicks Road

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	1.05	130	272	F
	Wicks Road S (Lane 2)	1.05	131	275	F
	Coxs Road E (Lane 1)	0.61	39	131	C
	Coxs Road E (Lane 2)	0.61	70	35	F
	Wicks Road N (Lane 1)	1.07	127	505	F
	Wicks Road N (Lane 2)	1.07	128	508	F
	Coxs Road W (Lane 1)	1.00	42	115	C
	Coxs Road W (Lane 2)	1.02	109	270	F
	Overall	1.07	108	508	F

Table 5.3 shows that given no change to the road network layout between 2011 and 2021, the maximum degree of saturation is expected to increase from 0.95 (existing) to 1.07 in 2021. The longest queue is expected to increase from 319m on the north approach to 508m on the north approach.

Table 5.4: Modelling Scenario 1B - 2021 Operating Conditions – Lane Cove Road – Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	653	57.3%	19.5	B	98
	Lane Cove Road South Ahead	710	60.4%	18.7	B	105
	Lane Cove Road South Ahead	725	61.6%	19.1	B	110
	Lane Cove Road North Ahead Left	966	68.2%	12.9	A	97
	Lane Cove Road North Ahead	1129	77.8%	15.0	B	110
	Lane Cove Road North Ahead Right	972	85.4%	28.1	B	79
	Bridge Road West Left	48	10.3%	46.5	D	10
	Bridge Road West Right Ahead	190	79.9%	100.6	F	55
	Twin Road East Left Ahead	147	64.5%	84.0	F	40
	Twin Road East Right Ahead	153	65.6%	85.9	F	41
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	936	62.4%	5.0	A	26
	Lane Cove Road North Ahead	1118	74.5%	5.0	A	13
	Lane Cove Road North Ahead	948	63.2%	3.7	A	10
	Lane Cove Road North Right	180	109.6%	342.3	F	122
	Kent Road West Left	100	28.7%	58.9	E	23
	Kent Road West Right Left	68	37.5%	78.4	F	17
	Lane Cove Road South Left Ahead	573	44.2%	3.3	A	7
	Lane Cove Road South Ahead	731	54.9%	4.2	A	11
	Lane Cove Road South Ahead	763	57.3%	4.7	A	15
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1052	97.4%	65.4	E	316
	Lane Cove Road North Ahead	1086	97.3%	62.5	E	322
	Lane Cove Road North Ahead	1083	97.0%	61.0	E	319
	Lane Cove Road South Ahead	617	42.1%	5.0	A	29
	Lane Cove Road South Ahead	731	49.9%	2.9	A	7
	Lane Cove Road South Ahead	553	37.8%	2.5	A	4
	Lane Cove Road South Right	213	74.0%	79.3	F	48
	Coxs Road East Left Right	363	54.2%	54.5	D	49

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu.

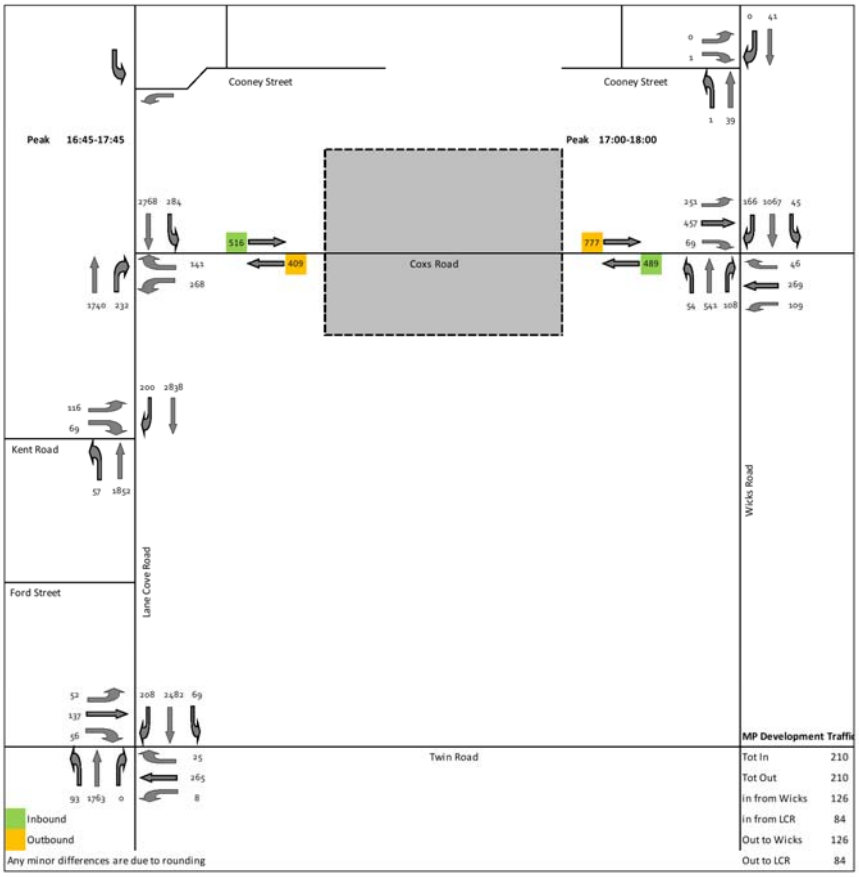
Table 5.4 shows that by 2021, Lane Cove Road in the vicinity of Coxs Road is expected to be operating with increased degrees of saturation and longer delays when compared with the existing conditions. At the intersection of Lane Cove Road / Coxs Road the north approach is expected to increase from approximately 92% of capacity to 97% of capacity. Queues and delays are also expected to increase with the longest queue (north approach of Lane Cove Road / Coxs Road) extending from 260 to 322m. The traffic exiting Coxs Road is expected to operate at a level of service D.

5.4.3 Modelling Scenario 2A – Existing + Masterplan

Under this modelling scenario, the existing centre traffic distribution, all existing roads, access lanes and intersections have remained unchanged and the full development expected from the Masterplan has been added.

The development traffic volumes under this scenario are shown in Figure 5.2 with the post development traffic volumes shown in Figure 5.3.

Figure 5.3: Modelling Scenario 2A - Masterplan Post Development Volumes – Thursday PM Peak



The expected future volumes in Figure 5.3 have been modelled as per the existing conditions and the results are shown in Table 5.5 and Table 5.6. The full results for all future modelling is provided in Appendix F.

Table 5.5: Modelling Scenario 2A – Existing Base + Masterplan - Coxs / Wicks Road – Thursday PM Peak

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	1.02	111	232	F
	Wicks Road S (Lane 2)	1.02	112	237	F
	Coxs Road E (Lane 1)	0.61	37	139	C
	Coxs Road E (Lane 2)	0.61	69	36	E
	Wicks Road N (Lane 1)	1.05	120	459	F
	Wicks Road N (Lane 2)	1.05	121	460	F
	Coxs Road W (Lane 1)	1.00	41	115	C
	Coxs Road W (Lane 2)	1.06	135	335	F
	Overall	1.06	102	460	F

Table 5.5 shows that under the full Masterplan, the maximum degree of saturation has increased from 0.95 in the existing conditions to 1.06 under full Masterplan development. The longest queue has also increased from 319m on the north approach to 460m on the north approach.

Table 5.6: Modelling Scenario 2A – Existing Base + Masterplan - Lane Cove Road - Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	606	53.2%	18.6	B	86
	Lane Cove Road South Ahead	668	56.8%	17.9	B	95
	Lane Cove Road South Ahead	684	58.2%	18.2	B	99
	Lane Cove Road North Ahead Left	944	66.7%	11.5	A	88
	Lane Cove Road North Ahead	1122	77.3%	13.9	A	103
	Lane Cove Road North Ahead Right	854	87.8%	32.3	C	72
	Bridge Road West Left	55	11.8%	46.7	D	11
	Bridge Road West Right Ahead	191	80.3%	101.2	F	55
	Twin Road East Left Ahead	148	64.9%	84.3	F	40
	Twin Road East Right Ahead	153	65.7%	85.9	F	41
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	902	60.1%	5.5	A	32
	Lane Cove Road North Ahead	1106	73.7%	5.1	A	17
	Lane Cove Road North Ahead	846	56.4%	3.0	A	7
	Lane Cove Road North Right	209	125.4%	547.9	F	213
	Kent Road West Left	118	33.9%	60.0	E	27
	Kent Road West Right Left	71	39.1%	78.4	F	18
	Lane Cove Road South Left Ahead	524	40.4%	3.3	A	7
	Lane Cove Road South Ahead	695	52.2%	4.2	A	12
	Lane Cove Road South Ahead	723	54.3%	4.7	A	15
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1016	94.1%	50.9	D	271
	Lane Cove Road North Ahead	1048	93.9%	48.2	D	277
	Lane Cove Road North Ahead	1025	91.8%	43.0	D	256
	Lane Cove Road South Ahead	587	40.1%	5.5	A	33
	Lane Cove Road South Ahead	695	47.5%	2.8	A	6
	Lane Cove Road South Ahead	496	33.9%	2.3	A	4
	Lane Cove Road South Right	232	80.6%	89.0	F	56
	Coxs Road East Left Right	416	60.5%	56.0	D	58

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu.

Table 5.6 shows that there are no significant changes expected at the intersections on Lane Cove Road in the vicinity of Coxs Road. The right turn from Lane Cove Road into Kent Road is expected to increase a degree of saturation from 109% to 125%. The right turn queue is expected to increase from approximately 119m to 213m as a result. The traffic exiting Coxs Road is expected to operate at a level of service D.

5.4.4 Modelling Scenario 3A, 4A and 7A

The City of Ryde provided two possible road network options aimed at improving traffic flow around the study area. The analysis of the two road options is set out in the following sections.

Modelling Methodology

In order to test the impact of the change in the road network, the following methodology was used:

i Identify the existing Coxs Road Centre traffic on the road network (Figure 5.4).
ii Remove it from the existing intersection volumes, leaving the intersection volumes without centre traffic (Figure 5.5).
iii Redistribute centre traffic in accordance with the new distribution (Figure 5.6 and Figure 5.7).
iv Add the Masterplan traffic volumes to the existing volumes and new distribution (Figure 5.8 and Figure 5.9).

Figure 5.4: Existing Coxs Road Centre Traffic

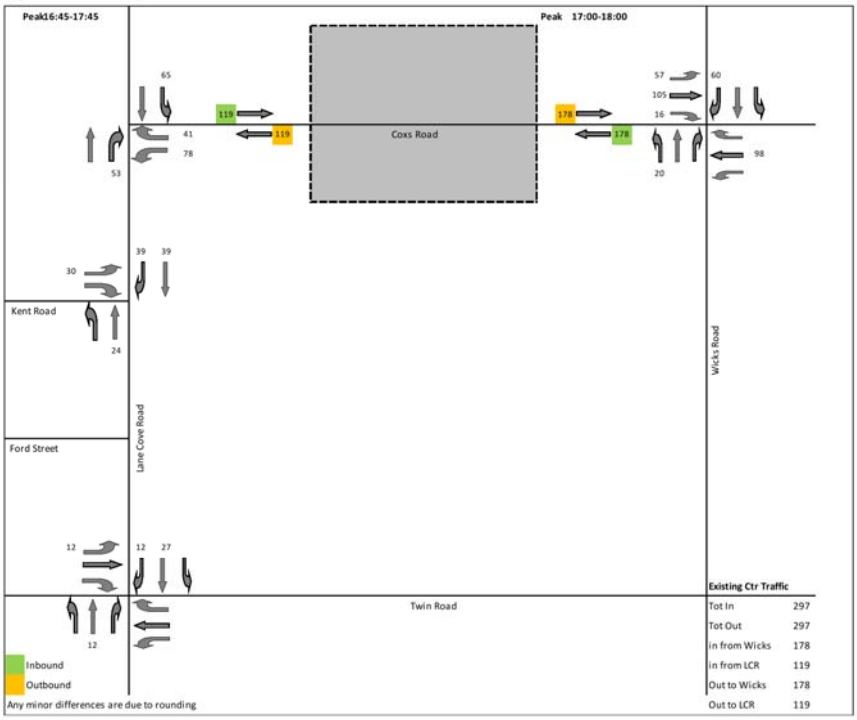


Figure 5.5: Existing Intersection Volumes with no Coxs Road Centre Traffic

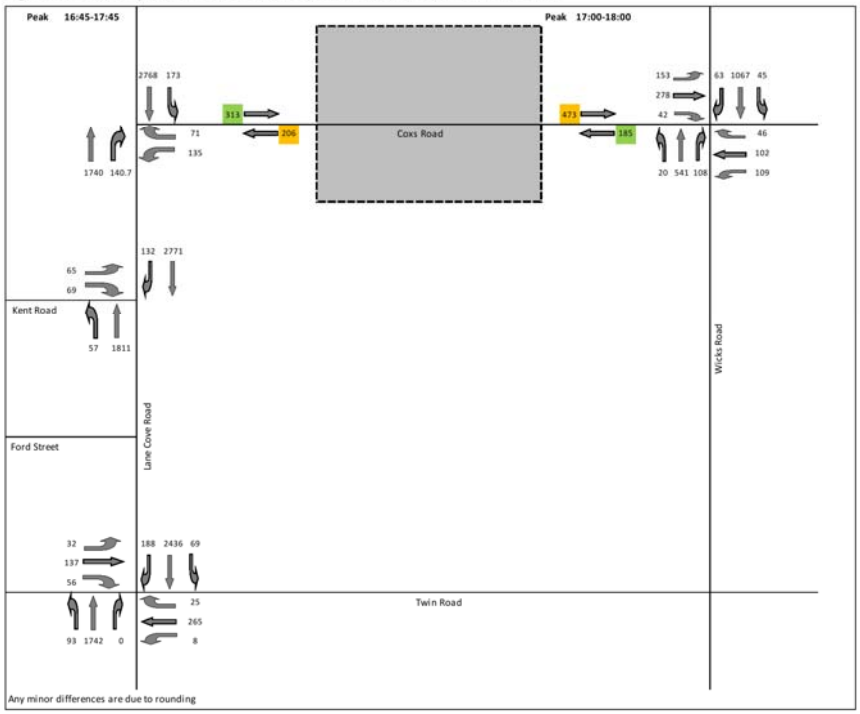


Figure 5.6: Modelling Scenario 3A - Proposed Road Option 1 Centre Traffic Distribution

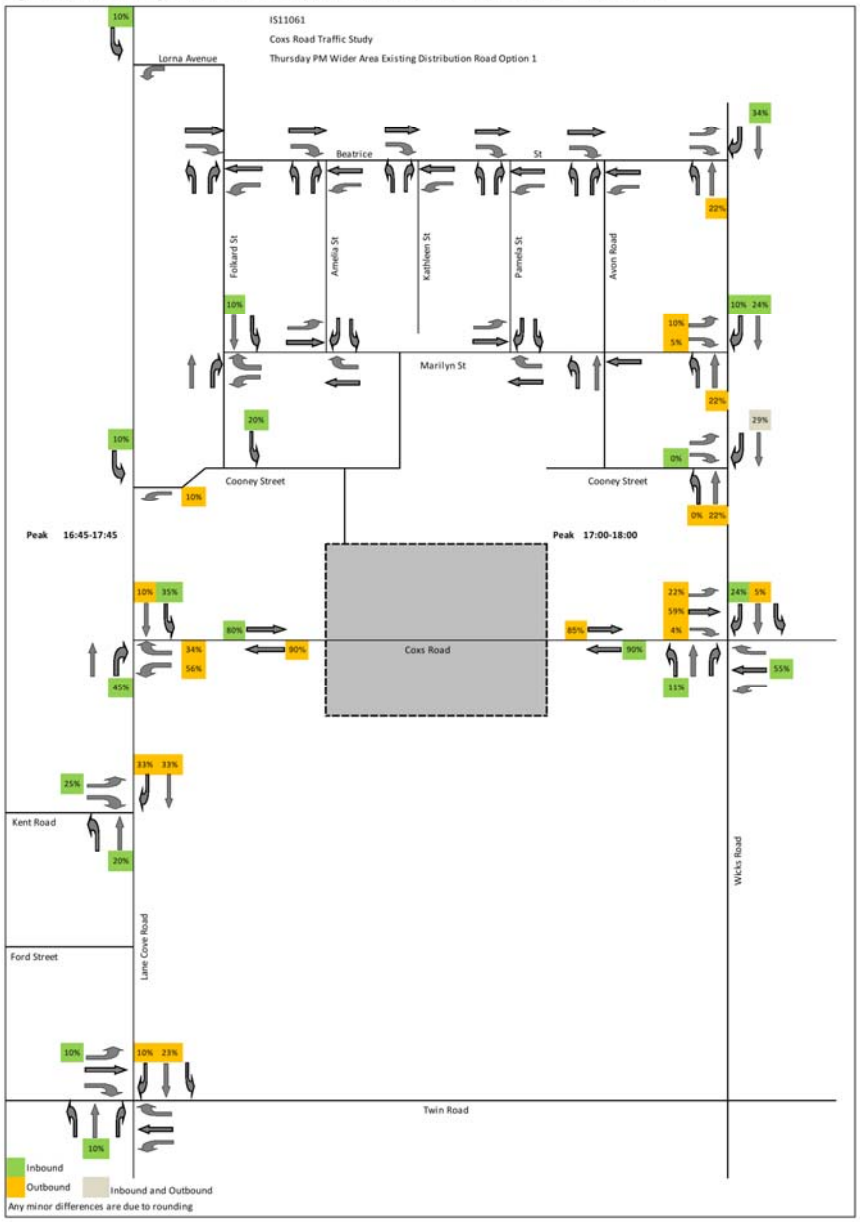
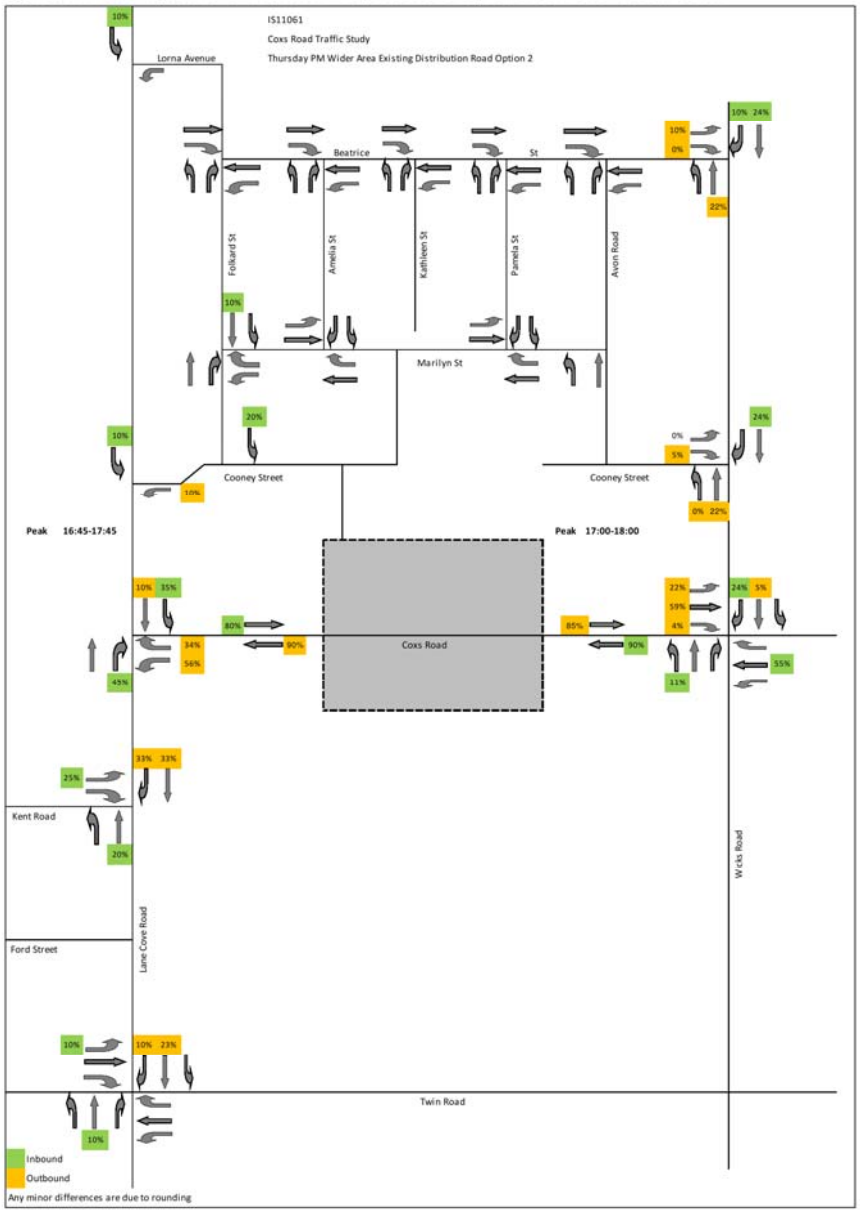


Figure 5.7: Modelling Scenario 4A and 7A - Proposed Road Option 2 Centre Traffic Distribution



ITEM 6 (continued) **ATTACHMENT 1**

Figure 5.8: Modelling Scenario 3A - Existing Centre Traffic + Masterplan Traffic Volumes

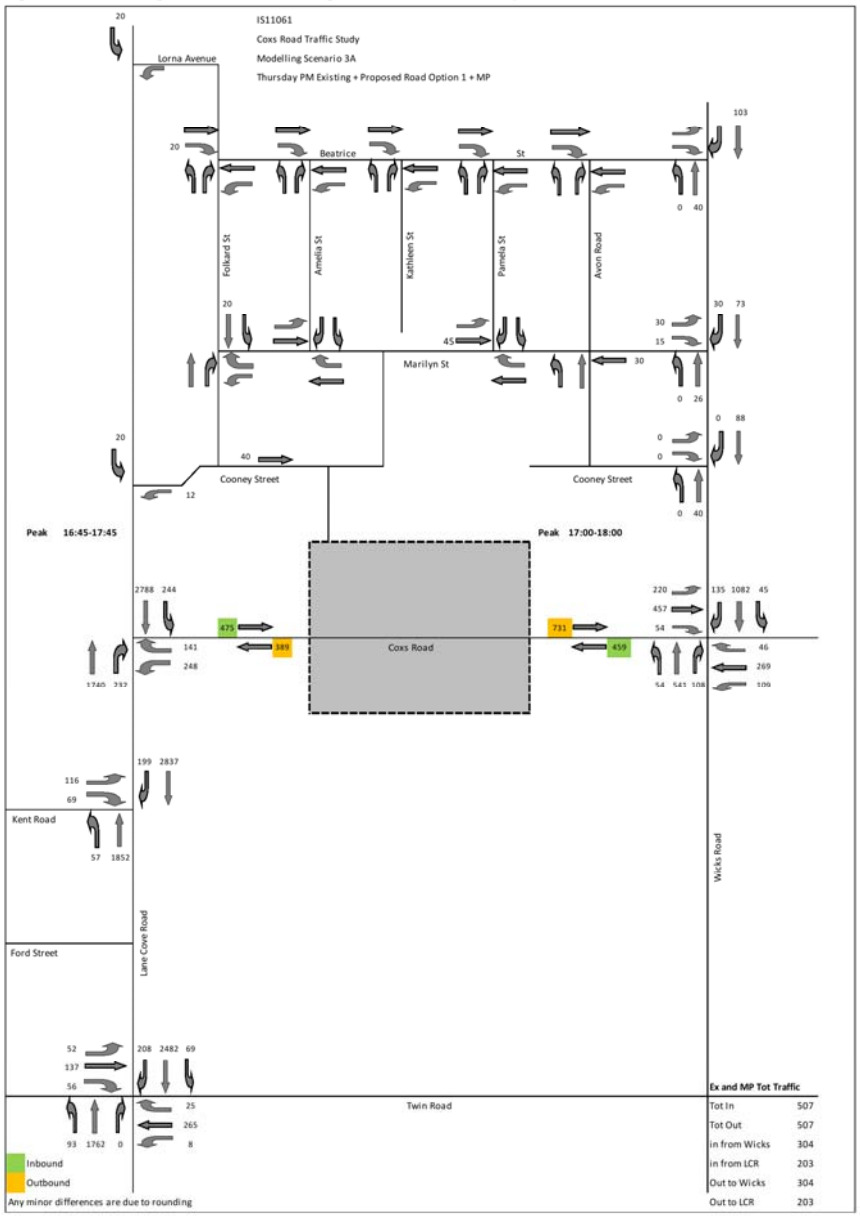
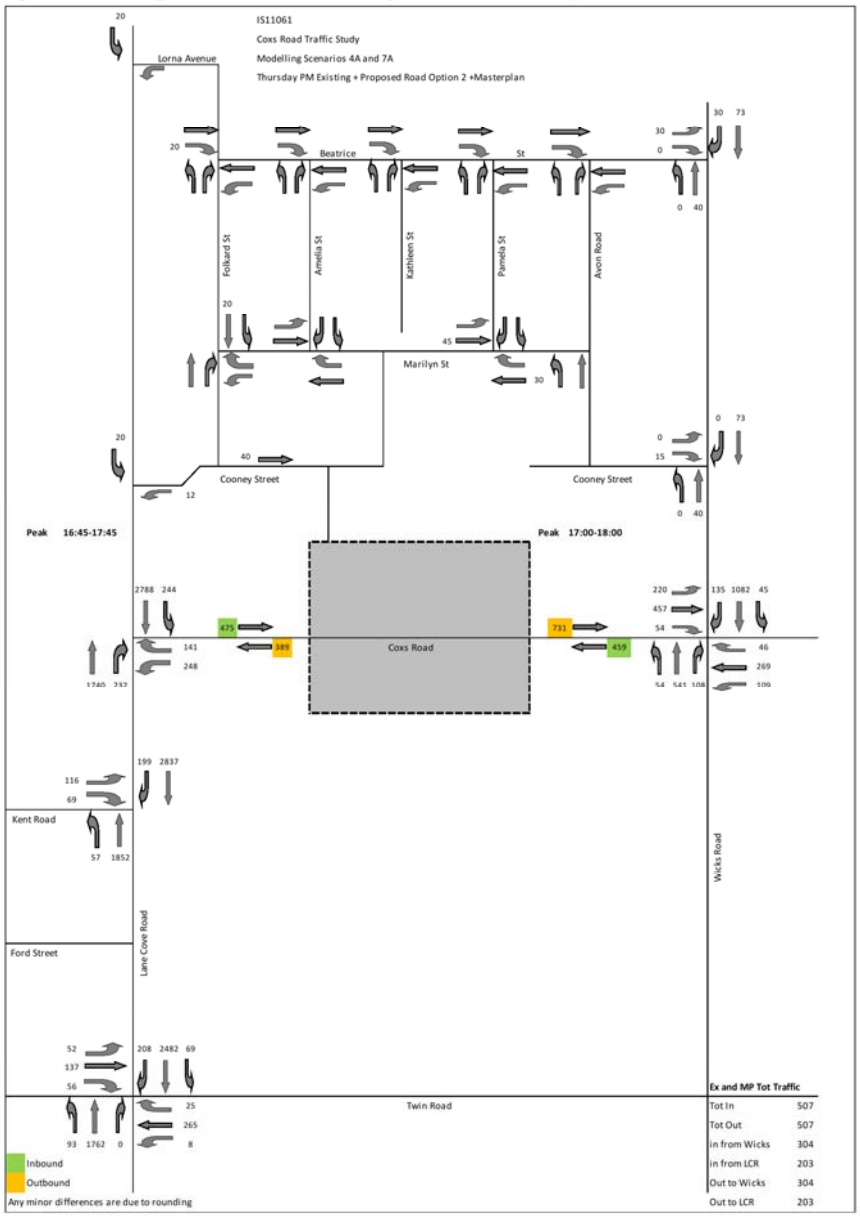


Figure 5.9: Modelling Scenario 4A and 7A - Existing Centre Traffic + Masterplan Traffic Volumes



Modelling Results for Coxs Road and Lane Cove Road

The volumes in Figure 5.8 and Figure 5.9 have been analysed and are summarised in Table 5.7 and Table 5.8. The volumes at the intersection of Coxs Road / Wicks Road and the intersections on Lane Cove Road are identical in both options.

Table 5.7: Modelling Scenario 3A and 4A Intersection of Coxs / Wicks Road – Thursday PM Peak

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	1.02	111	232	F
	Wicks Road S (Lane 2)	1.02	112	237	F
	Coxs Road E (Lane 1)	0.63	38	141	C
	Coxs Road E (Lane 2)	0.63	71	35	F
	Wicks Road N (Lane 1)	1.01	92	403	F
	Wicks Road N (Lane 2)	1.01	93	406	F
	Coxs Road W (Lane 1)	0.98	43	115	D
	Coxs Road W (Lane 2)	0.98	88	254	F
	Overall	1.02	84	406	F

Table 5.7 shows that when compared to the previous post development Masterplan with no change to the road network (Table 5.5) the overall degree of saturation has reduced from 1.06 to 1.02 and maximum queues have reduced by approximately 50m. The overall average delay has reduced by approximately 20 seconds.

Table 5.7 shows that both proposed options will result in significant delays as a result of the proposed Masterplan volumes and as such, another option should be considered to reduce delays at the intersection of Coxs Road / Wicks Road.

Table 5.8: Modelling Scenario 3A / 4A / 7A – Lane Cove Road – Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	606	53.2%	18.6	B	86
	Lane Cove Road South Ahead	667	56.7%	17.8	B	95
	Lane Cove Road South Ahead	685	58.2%	18.2	B	99
	Lane Cove Road North Ahead Left	956	67.5%	11.8	A	89
	Lane Cove Road North Ahead	1116	76.9%	13.6	A	101
	Lane Cove Road North Ahead Right	848	87.8%	32.1	C	72
	Bridge Road West Left	55	11.8%	46.7	D	11
	Bridge Road West Right Ahead	191	80.3%	101.2	F	55
	Twin Road East Left Ahead	148	64.9%	84.3	F	40
	Twin Road East Right Ahead	153	65.7%	85.9	F	41
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	917	61.1%	5.1	A	28
	Lane Cove Road North Ahead	1097	73.1%	5.0	A	16
	Lane Cove Road North Ahead	840	56.0%	3.1	A	8
	Lane Cove Road North Right	210	126.0%	555.5	F	217
	Kent Road West Left	118	33.9%	60.0	E	27
	Kent Road West Right Left	71	39.1%	78.4	F	18
	Lane Cove Road South Left Ahead	525	40.5%	3.4	A	7
	Lane Cove Road South Ahead	694	52.1%	4.2	A	12
	Lane Cove Road South Ahead	723	54.3%	4.6	A	15
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1009	93.4%	49.0	D	265
	Lane Cove Road North Ahead	1042	93.4%	46.6	D	271
	Lane Cove Road North Ahead	1016	91.0%	41.3	C	248
	Lane Cove Road South Ahead	588	40.2%	5.5	A	33
	Lane Cove Road South Ahead	694	47.4%	2.8	A	6
	Lane Cove Road South Ahead	496	33.9%	2.3	A	4
	Lane Cove Road South Right	232	80.6%	89.0	F	56
	Coxs Road East Left Right	398	66.9%	58.5	E	55

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu,

Table 5.8 shows that the results are largely unchanged from the existing conditions Masterplan development option based on the existing road layout. The exception is the increase in delay and queuing associated with the right turn from Lane Cove Road into Kent Road. The traffic exiting Coxs Road is expected to operate at a level of service E with a delay of 58.5 seconds. This has increased from an existing delay of 53 seconds per vehicle.

Implications for Local Roads north of Coxs Road Centre

Figure 5.8 and Figure 5.9 show the additional volumes that are expected to utilise the local roads during the road network peak hour to access the Coxs Road centre. To determine the impact on the local road network, additional analysis has been undertaken and is presented in the following Section.

Future Traffic Assessment

Figure 5.8 and Figure 5.9 show the expected future increase in traffic movements for the local roads for a typical weekday PM peak hour. Advice on the daily traffic generation has been sourced from the RTA Guide to Traffic Generating Developments (October 2002) and the GTA Consultants Traffic Generation Database. For shopping centres, the results show an average PM peak hour to daily ratio of 10.85. Based on this, Table

5.9 provides an assessment of the adequacy of the local roads to cater for the expected additional traffic volumes.

Table 5.9: Assessment of Local Roads to Cater for Expected Additional Volumes

Road	Period	Existing Volume	Expected Increase Option 1 3A [Option 2 4A]	Expected Future Volume Option 1 3A [Option 2 4A]	Compliant Option 1 3A [Option 2 4A]	Traffic Volumes are Higher in Option 1 or Option 2
Lorna Avenue	Daily	1,358	217 [217]	1,575 [1,575]	Yes [Yes]	No Difference
	PM Peak Hour (5:00pm to 6:00pm)	127	20 [20]	147 [147]	Yes [Yes]	No Difference
Folkard Street	Daily	253	217 [217]	470 [470]	Yes [Yes]	No Difference
	PM Peak Hour (5:00pm to 6:00pm)	19	20 [20]	39 [39]	Yes [Yes]	No Difference
Cooney Street	Daily	97	564 [564]	661 [661]	Yes [Yes]	No Difference
	PM Peak Hour (5:00pm to 6:00pm)	10	52 [52]	62 [62]	Yes [Yes]	No Difference
Marilyn Street	Daily	480	814 [814]	1,294 [1,294]	Yes [Yes]	No Difference
	PM Peak Hour (5:00pm to 6:00pm)	40	75 [75]	115 [115]	Yes [Yes]	No Difference
Avon Road	Daily	450	0 [651]	450 [1,101]	Yes [Yes]	Option 2
	PM Peak Hour (5:00pm to 6:00pm)	34	0 [60]	34 [94]	Yes [Yes]	Option 2
Beatrice Street	Daily	1,195	0 [651]	1,195 [1,846]	Yes [Yes]	Option 2
	PM Peak Hour (5:00pm to 6:00pm)	124	0 [60]	124 [184]	Yes [Yes]	Option 2

Table 5.9 indicates that for Option 1 and Option 2, all roads are still expected to operate below the accepted volume threshold for daily and peak hour limits for their classifications. There is no difference to the expected future volumes on Lorna Avenue, Folkard Street, Cooney Street or Marilyn Street between Option 1 and Option 2. Under Option 2, the future volumes are expected to be higher on Avon Road and Beatrice Street. Should either option be implemented, it is recommended that the speeds and volumes in the affected local roads be monitored to determine whether any traffic calming measure are required in the future as a result of additional traffic volumes.

As previously stated, there is no difference to the traffic volumes that result at the intersections Coxs Road / Wicks Road and Coxs Road / Lane Cove Road between either option. As such, the only difference is the additional land acquisition costs associated with Option 1. This means that Option 2 will provide better value to Council to proceed with than Option 1.

5.4.5 Modelling Scenario 5A and 5B

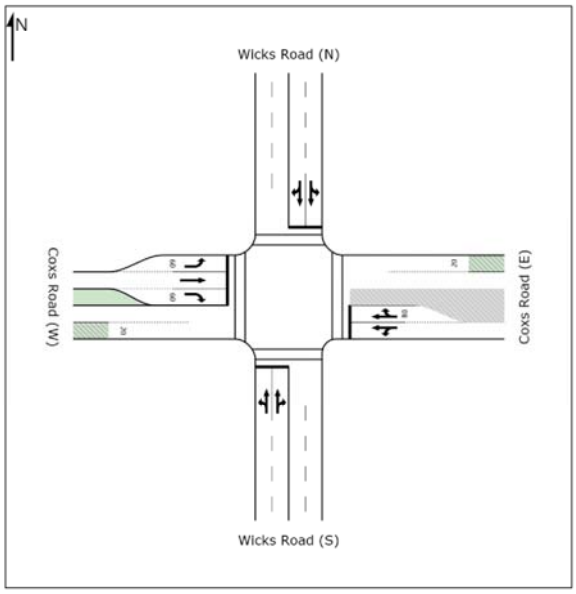
Modelling Scenario 5A and 5B are set out in the following sections.

Localised Intersection Improvements at Coxs Road / Wicks Road

Based on the expected future results, GTA Consultants has undertaken additional options testing at the intersection of Coxs Road / Wicks Road to identify localised improvements which may provide a better outcome in terms of average delay and also in terms of benefit to cost ratio for the Coxs Road Centre.

The preferred option involves widening Coxs Road on the west approach at the intersection with Wicks Road and reconfiguration to including a short left-turn lane and a short right-turn lane, both 60m in length. The layout is shown in Figure 5.10.

Figure 5.10: Coxs Road / Wicks Road Localised Intersection Improvements



Modelling Scenario 5A

Based on the revised intersection layout in Figure 5.10, Table 5.10 presents a summary of the intersection operation. The volumes used are identical to those in Modelling Scenario 2A.

Table 5.10: Modelling Scenario 5A - Existing Thursday PM Peak + Masterplan - Coxs / Wicks Road Improved

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.43	24	110	B
	Wicks Road S (Lane 2)	0.43	26	112	B
	Coxs Road E (Lane 1)	0.39	25	96	B
	Coxs Road E (Lane 2)	0.39	37	53	C
	Wicks Road N (Lane 1)	0.77	24	204	B
	Wicks Road N (Lane 2)	0.77	26	205	B
	Coxs Road W (Lane 1)	0.77	37	91	C
	Coxs Road W (Lane 2)	0.54	25	148	B
	Coxs Road W (Lane 3)	0.29	40	31	C
	Overall	0.77	27	205	B

Table 5.10 shows a better level of service, degree of saturation and reduced delays when compared to existing conditions (Table 2.4) and the previously tested full Masterplan options 2A, 3A and 4A.

For the expected changes Lane Cove Road refer to Modelling Scenario 2A.

Modelling Scenario 5B

Modelling Scenario 5B tests the impact of the Masterplan traffic added to the 2021 base volumes. The volumes are shown in Figure 5.11. The Modelling Scenario 5B results for the intersection of Coxs Road / Wicks Road are provided in Table 5.11.

Figure 5.11: Modelling Scenario 5B Traffic Volumes

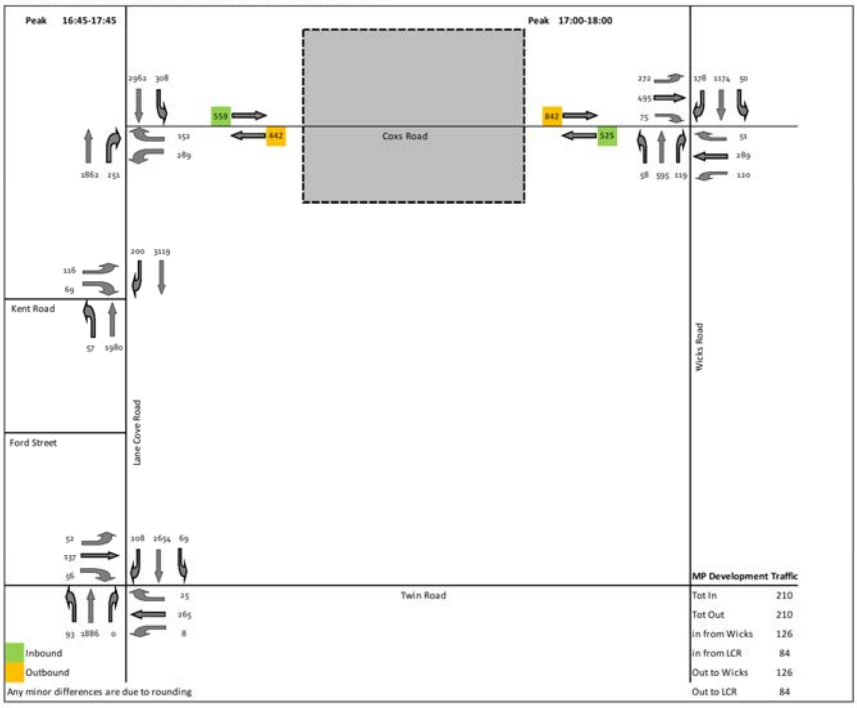


Table 5.11: Modelling Scenario 5B - 2021 Thursday PM Peak + Masterplan - Coxs / Wicks Road

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.46	25	121	B
	Wicks Road S (Lane 2)	0.46	26	123	B
	Coxs Road E (Lane 1)	0.42	26	106	B
	Coxs Road E (Lane 2)	0.42	40	58	C
	Wicks Road N (Lane 1)	0.84	29	255	C
	Wicks Road N (Lane 2)	0.84	30	256	C
	Coxs Road W (Lane 1)	0.83	46	108	D
	Coxs Road W (Lane 2)	0.58	26	163	B
	Coxs Road W (Lane 3)	0.31	42	35	C
	Overall	0.84	30	256	C

Table 5.11 shows that in 2021 and based on the full Masterplan implemented, the intersection of Coxs Road / Wicks Road is expected to operate well with acceptable degrees of saturation, queues and delays on all approaches.

The Modelling Scenario 5B results for Lane Cove Road are provided in Table 5.12.

Table 5.12: Modelling Scenario 5B – Lane Cove Road – Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	655	57.5%	19.6	B	97.8
	Lane Cove Road South Ahead	712	60.5%	18.8	B	106.8
	Lane Cove Road South Ahead	728	61.9%	19.1	B	110.4
	Lane Cove Road North Ahead Left	1005	71.0%	12.8	A	102
	Lane Cove Road North Ahead	1157	79.7%	15.9	B	116.4
	Lane Cove Road North Ahead Right	933	88.6%	33.1	C	82.2
	Bridge Road West Left	56	12.0%	46.8	D	10.8
	Bridge Road West Right Ahead	190	79.9%	100.6	F	54.6
	Twin Road East Left Ahead	147	64.5%	84.0	F	40.2
	Twin Road East Right Ahead	153	65.6%	85.9	F	40.8
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	960	64.0%	6.2	A	39
	Lane Cove Road North Ahead	1146	76.4%	5.4	A	15.6
	Lane Cove Road North Ahead	924	61.6%	3.4	A	9
	Lane Cove Road North Right	209	127.3%	569.5	F	220.8
	Kent Road West Left	119	34.2%	60.1	E	27
	Kent Road West Right Left	70	38.5%	78.2	F	18
	Lane Cove Road South Left Ahead	573	44.2%	3.3	A	7.2
	Lane Cove Road South Ahead	739	55.5%	4.4	A	13.2
	Lane Cove Road South Ahead	770	57.8%	4.9	A	16.8
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1070	99.1%	76.8	F	346.2
	Lane Cove Road North Ahead	1105	99.0%	74.0	F	355.2
	Lane Cove Road North Ahead	1098	98.4%	69.3	E	343.2
	Lane Cove Road South Ahead	636	43.4%	5.4	A	33.6
	Lane Cove Road South Ahead	739	50.5%	3.0	A	6.6
	Lane Cove Road South Ahead	525	35.9%	2.4	A	4.2
	Lane Cove Road South Right	250	86.9%	102.0	F	66
	Coxs Road East Left Right	445	66.7%	57.9	E	63.6

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu.

Table 5.12 shows that the results are largely unchanged from the existing conditions Masterplan development option based on the existing road layout. This option is expected to result in increased delays to the right turn into Kent Road.

5.4.6 Modelling Scenario 6A

Modelling Scenario 6A tests the impact of a Masterplan that is 30% larger than the original Masterplan traffic volumes to see whether a floor area increase could be supported by the surrounding road network. The volumes for this scenario are provided in Figure 5.12. The Modelling Scenario 6A results for the intersection of Coxs Road / Wicks Road are provided in Table 5.13.

Figure 5.12: Modelling Scenario 6A Traffic Volumes

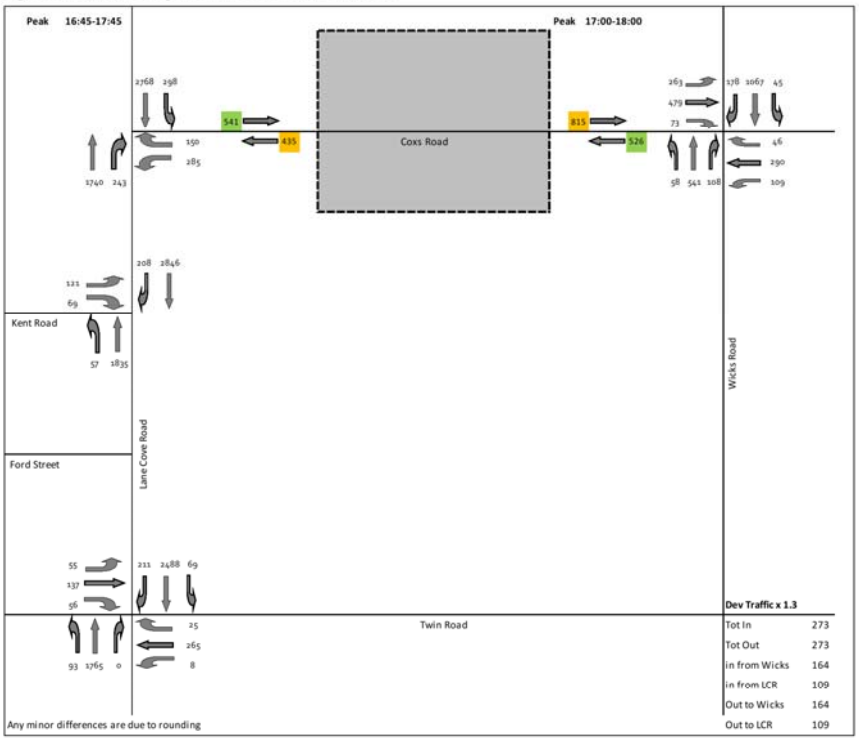


Table 5.13: Modelling Scenario 6A - 2021 Thursday PM Peak + MP x 130% Coxs / Wicks Road Improved

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.44	25	112	B
	Wicks Road S (Lane 2)	0.44	26	114	B
	Coxs Road E (Lane 1)	0.40	25	100	B
	Coxs Road E (Lane 2)	0.40	37	55	C
	Wicks Road N (Lane 1)	0.79	26	214	B
	Wicks Road N (Lane 2)	0.79	27	215	B
	Coxs Road W (Lane 1)	0.79	40	98	C
	Coxs Road W (Lane 2)	0.56	25	154	B
	Coxs Road W (Lane 3)	0.30	40	33	C
	Overall	0.79	28	215	B

Table 5.13 shows that in 2021 and based on the full Masterplan implemented x 130%, the intersection of Coxs Road / Wicks Road is expected to operate well with acceptable degrees of saturation, queues and delays on all approaches.

Table 5.14: Modelling Scenario 5B – Lane Cove Road – Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	607	53.2%	18.6	B	86.4
	Lane Cove Road South Ahead	667	56.7%	17.8	B	94.8
	Lane Cove Road South Ahead	685	58.2%	18.2	B	99
	Lane Cove Road North Ahead Left	948	66.9%	11.4	A	88.8
	Lane Cove Road North Ahead	1129	77.8%	14.1	A	104.4
	Lane Cove Road North Ahead Right	850	89.0%	34.3	C	75.6
	Bridge Road West Left	58	12.4%	46.8	D	11.4
	Bridge Road West Right Ahead	191	80.3%	101.3	F	55.2
	Twin Road East Left Ahead	152	66.7%	85.6	F	42
	Twin Road East Right Ahead	157	67.5%	87.1	F	42
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	904	60.3%	5.7	A	34.8
	Lane Cove Road North Ahead	1113	74.2%	5.2	A	17.4
	Lane Cove Road North Ahead	845	56.3%	3.1	A	7.8
	Lane Cove Road North Right	217	130.2%	604.5	F	241.2
	Kent Road West Left	123	35.3%	60.4	E	28.2
	Kent Road West Right Left	71	39.0%	78.2	F	18
	Lane Cove Road South Left Ahead	525	40.5%	3.2	A	6.6
	Lane Cove Road South Ahead	695	52.2%	4.3	A	12.6
	Lane Cove Road South Ahead	726	54.5%	4.7	A	15.6
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1022	94.6%	52.7	D	277.8
	Lane Cove Road North Ahead	1054	94.4%	49.9	D	282.6
	Lane Cove Road North Ahead	1027	92.0%	43.3	D	256.8
	Lane Cove Road South Ahead	593	40.5%	5.6	A	34.2
	Lane Cove Road South Ahead	695	47.5%	2.8	A	6
	Lane Cove Road South Ahead	490	33.5%	2.3	A	3.6
	Lane Cove Road South Right	242	84.1%	95.5	F	60.6
	Coxs Road East Left Right	441	64.1%	57.0	E	62.4

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu,

Table 5.14 shows that the results are largely unchanged from the existing conditions Masterplan development option based on the existing road layout. This option is expected to result in increased delays to the right turn into Kent Road. The traffic exiting Coxs Road is expected to operate at a level of service E with an average delay of 57 seconds per vehicle.

5.4.7 Modelling Scenario 6B

Modelling Scenario 6B tests the impact of a Masterplan that is 30% larger than the original Masterplan traffic volumes to see whether a floor area increase could be supported by the surrounding road network in 2021. The traffic volumes associated with this scenario are provided in Figure 5.13. The Modelling Scenario 6B results for the intersection of Coxs Road / Wicks Road are provided in Table 5.15.

Figure 5.13: Modelling Scenario 6B Traffic Volumes

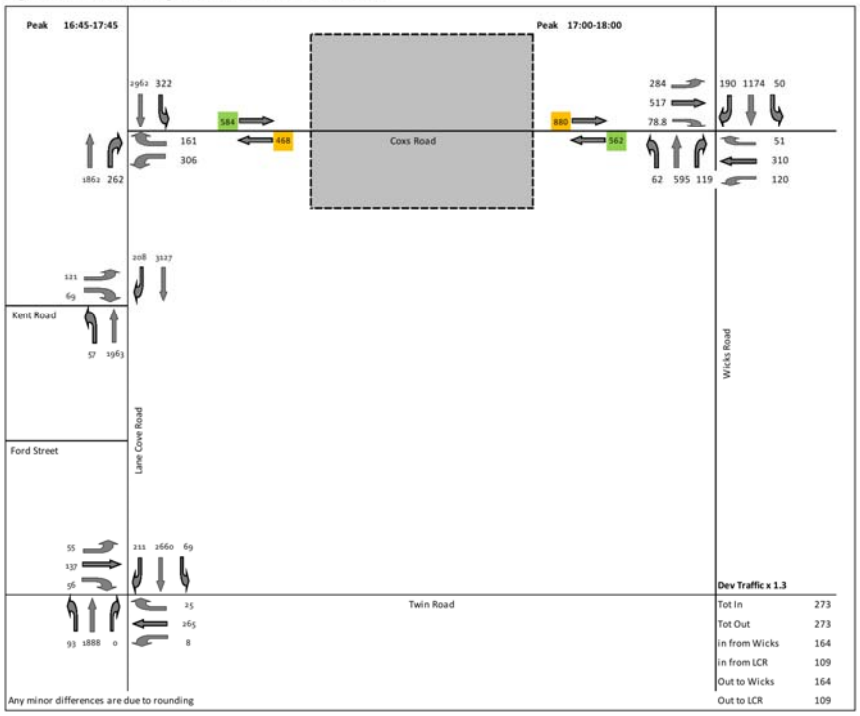


Table 5.15: Modelling Scenario 6B – 2021 Thursday PM Peak + MP x 130% - Coxs / Wicks Road Improved

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.47	26	122	B
	Wicks Road S (Lane 2)	0.47	27	124	B
	Coxs Road E (Lane 1)	0.44	25	110	B
	Coxs Road E (Lane 2)	0.44	39	59	C
	Wicks Road N (Lane 1)	0.86	32	275	C
	Wicks Road N (Lane 2)	0.86	33	276	C
	Coxs Road W (Lane 1)	0.86	45	108	D
	Coxs Road W (Lane 2)	0.60	25	169	B
	Coxs Road W (Lane 3)	0.33	42	36	C
	Overall	0.86	31	276	C

Table 5.15 shows that in 2021 and based on the full Masterplan implemented x 130%, the intersection of Coxs Road / Wicks Road is expected to operate well with acceptable degrees of saturation, queues and delays on all approaches.

Table 5.16: Modelling Scenario 6B – Lane Cove Road – Thursday PM Peak + Masterplan x 130%

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	655	57.5%	19.6	B	97.8
	Lane Cove Road South Ahead	712	60.5%	18.8	B	106.8
	Lane Cove Road South Ahead	729	62.0%	19.2	B	110.4
	Lane Cove Road North Ahead Left	1018	71.9%	12.8	A	103.8
	Lane Cove Road North Ahead	1164	80.2%	16.1	B	117.6
	Lane Cove Road North Ahead Right	921	89.8%	35.4	C	84
	Bridge Road West Left	58	12.4%	46.8	D	11.4
	Bridge Road West Right Ahead	190	79.9%	100.6	F	54.6
	Twin Road East Left Ahead	146	64.0%	83.8	F	39.6
	Twin Road East Right Ahead	152	65.2%	85.6	F	40.2
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	968	64.5%	6.6	A	43.2
	Lane Cove Road North Ahead	1155	77.0%	5.6	A	16.8
	Lane Cove Road North Ahead	916	61.1%	3.3	A	8.4
	Lane Cove Road North Right	217	132.2%	625.5	F	249.6
	Kent Road West Left	124	35.6%	60.4	E	28.2
	Kent Road West Right Left	70	38.4%	78.0	F	17.4
	Lane Cove Road South Left Ahead	573	44.2%	3.3	A	7.2
	Lane Cove Road South Ahead	739	55.5%	4.5	A	13.2
	Lane Cove Road South Ahead	772	58.0%	5.0	A	16.8
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1075	99.5%	80.7	F	356.4
	Lane Cove Road North Ahead	1111	99.6%	78.4	F	366.6
	Lane Cove Road North Ahead	1102	98.7%	71.9	F	349.2
	Lane Cove Road South Ahead	641	43.8%	5.5	A	34.8
	Lane Cove Road South Ahead	739	50.5%	3.0	A	6.6
	Lane Cove Road South Ahead	518	35.4%	2.4	A	4.2
	Lane Cove Road South Right	260	90.3%	112.8	F	72.6
	Coxs Road East Left Right	470	70.3%	59.3	E	68.4

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu,

Table 5.16 shows that the results are largely unchanged from the existing conditions Masterplan development option based on the existing road layout. This option is expected to result in increased delays to the right turn into Kent Road. The traffic exiting Coxs Road is expected to operate at a level of service E with an average delay of 59 seconds per vehicle.

5.4.8 Modelling Scenario 7A

Modelling Scenario 7A tests the option of the road network option 2 with the road network improvements at the intersection of Coxs Road / Wicks Road for 2011. The traffic volumes associated with this scenario are provided in Figure 5.9. The Modelling Scenario 7A results for the intersection of Coxs Road / Wicks Road are provided in Table 5.17.

Table 5.17: Modelling Scenario 7A – 2021 Thursday PM Peak + Masterplan - Coxs / Wicks Road Improved

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.40	22	104	B
	Wicks Road S (Lane 2)	0.40	23	106	B
	Coxs Road E (Lane 1)	0.41	28	100	B
	Coxs Road E (Lane 2)	0.41	41	57	C
	Wicks Road N (Lane 1)	0.70	20	177	B
	Wicks Road N (Lane 2)	0.70	21	178	B
	Coxs Road W (Lane 1)	0.71	34	79	C
	Coxs Road W (Lane 2)	0.58	28	156	B
	Coxs Road W (Lane 3)	0.23	44	26	D
	Overall	0.71	25	178	B

Table 5.17 shows that based on the full Masterplan implemented and Proposed Road Option 2, the intersection of Coxs Road / Wicks Road is expected to operate well with acceptable degrees of saturation, queues and delays on all approaches.

Refer to Modelling Scenario 4A for Lane Cove Road modelling results.

5.4.9 Modelling Scenario 7B

Modelling Scenario 7B tests the same scenario as Modelling Scenario 7A for the year 2021. The volumes associated with scenario are provided in Figure 5.14. The Modelling Scenario 7B results for the intersection of Coxs Road / Wicks Road are provided in Table 5.18.

Figure 5.14: Modelling Scenario 7B Traffic Volumes

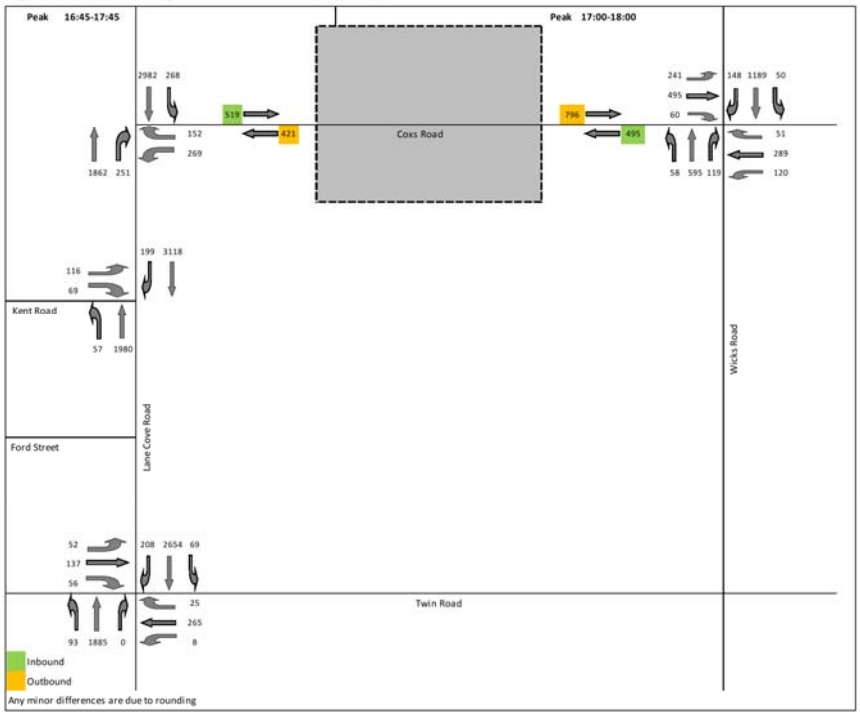


Table 5.18: Modelling Scenario 7B – 2021 Thursday PM Peak + Masterplan - Coxs / Wicks Road Improved

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu PM	Wicks Road S (Lane 1)	0.44	22	115	B
	Wicks Road S (Lane 2)	0.44	23	117	B
	Coxs Road E (Lane 1)	0.45	29	110	C
	Coxs Road E (Lane 2)	0.45	45	62	D
	Wicks Road N (Lane 1)	0.77	21	211	B
	Wicks Road N (Lane 2)	0.77	22	212	B
	Coxs Road W (Lane 1)	0.77	39	92	C
	Coxs Road W (Lane 2)	0.63	29	172	C
	Coxs Road W (Lane 3)	0.26	46	30	D
	Overall	0.77	26	212	B

Table 5.18 shows that based on the full Masterplan implemented and Proposed Road Option 2, the intersection of Coxs Road / Wicks Road is expected to operate well with acceptable degrees of saturation, queues and delays on all approaches.

Table 5.19: Modelling Scenario 7B – Lane Cove Road – Thursday PM Peak

Item	Lane Description	Demand Flow (pcu)	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Level of Service [1]	Mean Max Queue (m) [2]
J1: Lane Cove Road, Bridge Road and Twin Road	Lane Cove Road South Ahead Left	655	57.5%	19.6	B	97.8
	Lane Cove Road South Ahead	710	60.4%	18.7	B	105
	Lane Cove Road South Ahead	728	61.9%	19.1	B	110.4
	Lane Cove Road North Ahead Left	1013	71.5%	13.2	A	103.2
	Lane Cove Road North Ahead	1155	79.5%	15.7	B	115.2
	Lane Cove Road North Ahead Right	927	88.6%	33.1	C	81
	Bridge Road West Left	59	12.6%	46.9	D	11.4
	Bridge Road West Right Ahead	190	79.9%	100.6	F	54.6
	Twin Road East Left Ahead	146	64.0%	83.8	F	39.6
	Twin Road East Right Ahead	152	65.2%	85.6	F	40.2
J2: Lane Cove Road and Kent Road	Lane Cove Road North Ahead	971	64.7%	5.8	A	34.2
	Lane Cove Road North Ahead	1141	76.1%	5.4	A	15.6
	Lane Cove Road North Ahead	918	61.2%	3.4	A	9
	Lane Cove Road North Right	208	126.7%	562.1	F	217.2
	Kent Road West Left	119	34.2%	60.1	E	27
	Kent Road West Right Left	70	38.5%	78.2	F	18
	Lane Cove Road South Left Ahead	574	44.3%	3.3	A	7.2
	Lane Cove Road South Ahead	737	55.3%	4.4	A	13.2
	Lane Cove Road South Ahead	770	57.8%	4.9	A	16.8
J3: Lane Cove Road and Coxs Road	Lane Cove Road North Ahead Left	1062	98.3%	71.3	F	333
	Lane Cove Road North Ahead	1097	98.3%	68.7	E	340.2
	Lane Cove Road North Ahead	1090	97.7%	64.6	E	328.8
	Lane Cove Road South Ahead	637	43.5%	5.4	A	33.6
	Lane Cove Road South Ahead	737	50.3%	3.0	A	6.6
	Lane Cove Road South Ahead	525	35.9%	2.4	A	4.2
	Lane Cove Road South Right	250	86.9%	102.0	F	66
	Coxs Road East Left Right	427	73.4%	61.4	E	61.2

[1] Level of Service (LOS) based on the RTA criteria for vehicle delay.
[2] Assume 6.0m per pcu,

Table 5.19 shows that the results are largely unchanged from the existing conditions Masterplan development option based on the existing road layout. This option is expected to result in increased delays to the right turn into Kent Road. The traffic exiting Coxs Road is expected to operate at a level of service E with an average delay of 61 seconds per vehicle.

5.5 Summary of Modelling Results

The following section provides a brief summary of all the modelling results for each option. Table 5.20 provides the results for the intersection of Coxs Road / Wicks road with Table 5.22 providing a summary of the Lane Cove LinSig models for each scenario.

Table 5.20: Summary of Modelling Results – Intersection of Coxs Road / Wicks Road – Overall Intersection

Scenario	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
1A – Existing 2011	0.95	62	319	E
1B – Existing 2021	1.07	108	508	F
2A - Existing + Masterplan 2011	1.06	102	460	F
3A - Existing + Proposed Road Option 1 + Masterplan 2011	1.02	84	406	F
4A - Existing + Proposed Road Option 2 + Masterplan	1.02	84	406	F
5A - Existing + Cox / Wicks Improvements + Masterplan 2011	0.77	27	205	B
5B - Existing + Cox / Wicks Improvements + Masterplan 2021	0.84	30	256	C
6A - Existing + Cox / Wicks Improvements + Masterplan x 130% 2011	0.79	28	215	B
6B - Existing + Cox / Wicks Improvements + Masterplan x 130% 2021	0.86	31	276	C
7A - Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan 2011	0.71	25	178	B
7B - Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan 2021	0.84	29	249	C

Table 5.20 shows that modelling scenario 7A provides the best outcome for the intersection for 2011 and for 2021 modelling scenario 7B provides the best outcome.

Scenarios 1B to 4A are not expected to cater for the future traffic volumes with Scenarios 5A to 7B expected to adequately cater for the future traffic volumes.

A comparison between the scenarios for the models of Lane Cove Road is provided in Table 5.21.

Table 5.21: Summary of Modelling Results – Lane Cove Road – Overall Model Performance

Scenario	Total Delay at Bridge / Twin (pcuHr)	Total Delay at Kent (pcuHr)	Total Delay at Coxs (pcuHr)	Total Model Delay (pcuHr)
1A – Existing 2011	36.56	25.00	47.32	108.87
1B – Existing 2021	39.84	26.43	68.29	134.56
2A - Existing + Masterplan 2011	38.09	41.19	54.57	133.86
3A - Existing + Proposed Road Option 1 + Masterplan 2011	38.03	41.66	52.54	132.54
4A - Existing + Proposed Road Option 2 + Masterplan	38.03	41.66	52.54	132.54
5A - Existing + Cox / Wicks Improvements + Masterplan 2011	38.09	41.19	54.57	133.86
5B - Existing + Cox / Wicks Improvements + Masterplan 2021	41.53	43.32	82.85	167.69
6A - Existing + Cox / Wicks Improvements + Masterplan x 130% 2011	38.98	46.06	57.11	142.15
6B - Existing + Cox / Wicks Improvements + Masterplan x 130% 2021	42.13	48.22	88.11	178.46
7A - Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan 2011	38.03	41.66	52.54	132.54
7B - Existing + Cox / Wicks Improvements + Proposed Road Option 2 + Masterplan 2021	41.49	42.63	77.80	161.91

Table 5.21 shows that the model of the existing conditions provides the least overall delay. In order to compare like with like, the LinSig optimisation process which changes the phasing, cycle times and offsets,

to reduce the overall delay for the road network was not used. This was to enable a direct comparison of the impacts of each scenario on the road network with other scenarios and to identify any improvement as a result of each proposed road network option.

A comparison between Scenario 2A and 3A/4A shows the impact of either proposed road option. The results show that any change in the road network will have minimal effect on the operation of Lane Cove Road and as such, it is recommended that the preferred scenario be selected based on its impact on the intersection of Coxs Road / Wicks Road.

The modelling undertaken at this stage has been completed to identify which option would provide the best overall outcome. Once a preferred scenario is selected, it is recommended that the modelling on Lane Cove Road be undertaken again to include optimisation, before approval is sought from the RTA.

The modelling indicates that the intersection of Lane Cove Road / Coxs Road is already at capacity and as such, any marginal increase in traffic at this location will result in increased delays to vehicles on Lane Cove Road.

The additional volumes associated with the Coxs Road Masterplan represent a very small percentage of the total volumes on Lane Cove Road and there is very little scope to physically widen Coxs Road due to existing development and narrow footpaths. Any localised improvements on Coxs Road would do little to improve the overall capacity of the Lane Cove Road corridor.

It was determined that there would be far more benefit for the road network in focussing on improvements at the Coxs Road/Wicks Road intersection. These improvements could result in some traffic currently travelling on Lane Cove Road being diverted to Wicks Road, providing some relief to the intersections of Lane Cove Road / Bridge Road / Twin Road and Lane Cove Road / Kent Road.

This can be investigated in more detail as part of the DA process for future developments in the Coxs Road centre.

6. Qualitative Assessment of Proposed Road Network Options

This section sets out a qualitative assessment of the benefits of proposed road Option 1 and 2. There is no difference to the impact on Coxs Road between the two proposed road options and as such the benefits outlined in this section would apply equally to both.

6.1 General Operation

Between Wicks Road and Lane Cove Road, Coxs Road caters for a many users and land uses. Pedestrians, cyclists, cars, buses and trucks are all competing for a finite amount of road space. Congestion during peak times can result in increases in travel time and safety concerns for all road users. The conflict between vehicles turning into and out of car parking spaces and off-street car parks as well as pedestrians crossing Coxs Road also contribute to this congestion.

Any measures that can be made to reduce the amount of traffic using Coxs Road will improve the safety for all road users, but especially for pedestrians and cyclists. By providing a secondary access location to the Coxs Road centre, residents that live to the north of the Coxs Road centre that currently drive via Coxs Road can now enter via this access, reducing the volumes on Lane Cove Road, Wicks Road and Coxs Road.

6.2 Pedestrians and Cyclists

Coxs Road is designated as a regional bicycle route in the Ryde Bicycle Strategy and Masterplan as well as being part of the M2 Alternative Cycle Route. Additional road network connections will provide the local residents of North Ryde with simpler access to the Coxs Road centre, removing the need for them to drive through the intersection of Coxs Road / Wicks Road or Lane Cove Road / Coxs Road, reducing conflict with pedestrians and cyclists on Coxs Road.

Coxs Road is already exceeding its environmental capacity for volume for a collector road. Additional Masterplan development traffic volumes will increase the risk to pedestrians and cyclists crossing and travelling along Coxs Road, although it is noted that speeds are currently low. If some of the increased volumes can be removed through road network changes, it will provide a direct safety benefit to pedestrians and cyclists on Coxs Road.

6.3 Loading

In a busy centre, it is desirable that loading occurs via rear laneways, away from conflicting traffic movements. The addition of a secondary access location will allow some of the smaller / light delivery vehicles (such as panel vans) to avoid Coxs Road and the intersections of Coxs Road / Lane Cove Road and Coxs Road / Wicks Road, reducing conflict with other road users.

7. Masterplan Parking Requirements

Table 7.1 sets out the expected additional car parking as a result of the Masterplan proposal for Coxs Road.

Table 7.1: Future Additional Anticipated Car Parking

Use	Increase in Size	Unit	Peak Car Parking Rate	Unit	Source	Peak Car Parking Demand
Residential	300	Dwellings	1.4	/ dwelling	Ryde DCP >400m from Epping Road	420
Office	2546	GFA	3.33	/100sqm GFA	Ryde DCP 1 per 30ssqm GFA	85
Supermarket	205	GFA	4	/100sqm GFA	Ryde DCP	8
Specialty Retail	6388	GFA	4	/100sqm GFA	Ryde DCP	256
Community	1820	GFA	3	/100sqm GFA	GTA Database	55
Community (Library)	350	GFA	1.92	/100sqm GFA	GTA Database	7
Additional Car Parking Spaces Required						831
Additional On-Street Spaces Provided (minus the 10 spaces lost at the intersection of Coxs Rd / Wicks Rd						- 17
Existing Surplus ((391x0.85)-301=90 spaces) – Table 2.7 [1]						- 31
Total Car Parking Spaces Required						783

[1] Value of existing long-term and short-term supply multiplied by 0.85 to account for theoretical capacity

Based on the current level of on-street and off-street car parking demand during the peak period (3:00pm) additional car parking will have to be provided as part of the Masterplan development.

As part of the Masterplan proposals the on-street car parking along Coxs Road would increase by approximately 27 spaces due to the parking changing from parallel to 90 degree parking in some locations.

Taking into account the loss of 10 on-street parking spaces as a result of the recommended widening of the Coxs Road/Wicks Road intersection there would be a net increase of 17 car parking spaces.

The existing peak parking demand surveys indicated that there would be 31 available short-term and long-term (on & off street parking spaces) based on the theoretical supply (391 spaces x 85%)

As such, it is expected that a maximum of 783 additional car parking spaces would be required as part of the Masterplan development. It is important to note that in reality, a sharing of parking spaces occurs relating to different land use types peaking at different times of the day and as such, the 783 additional parking spaces should be considered as the upper limit.

The parking requirements for each individual development should be refined by the various applicants during the DA process.

8. Conclusions and Recommendations

Based on the investigations and analysis undertaken during this study, the following conclusions and recommendations are made:

- The intersections on Lane Cove Road are already at or very close to capacity.
- The intersection of Coxs Road / Wicks Road is near capacity.
- If no land use and transport improvements are undertaken (i.e. business as usual), general background traffic growth will result in capacity of the intersection of Coxs Road / Wicks Road and to a lesser extent, the intersection of Lane Cove Road / Coxs Road, being exceeded with unacceptable congestion outcomes.
- The proposed Masterplan for the Coxs Road centre will result in increases in floor area and associated traffic movements. There is insufficient capacity in the existing road network to cater for this expected increase in traffic movements.
- The additional volumes associated with the Coxs Road Masterplan represent a very small percentage of the total volumes on Lane Cove Road and any localised improvements on Coxs Road at Lane Cove Road would do little to improve the overall capacity of the Lane Cove Road corridor.
- It would be far more beneficial in capacity terms to focus on improvements at the Coxs Road/Wicks Road intersection.
- The road network options 1 and 2, considered within this study, will provide some performance benefit to the intersections of Lane Cove Road / Coxs Road and Coxs Road / Wicks Road however these benefits would not be significant enough to cater for the expected future background traffic growth or the proposed Masterplan volumes.
- The road network options, when considered in isolation, would not provide sufficient capacity at the intersection of Coxs Road / Wicks Road or at the intersections of Lane Cove Road to cater for the expected future Masterplan traffic volumes.
- The traffic distribution patterns for the two proposed road options 1 and 2 result in the same levels of traffic volumes at the intersections of Coxs Road / Wicks Road and Coxs Road / Lane Cove Road i.e. Option 1 provides no additional benefit to Coxs road in traffic volume terms but would cost significantly more to implement due the associated land acquisition costs.
- Both road network options would result in the distribution of additional traffic onto local streets north of Coxs Road. However the resultant level of traffic on these local streets would not exceed the environmental capacity standards set by the RTA.
- Localised intersection improvements to widen the western leg of the intersection of Coxs Road / Wicks Road and change the lane configuration to cater for a short left-turn, one through lane and a short right-turn lane, combined with signal optimisation is expected to cater for all additional Masterplan traffic movements into the future.
- The localised improvements at the intersection of Coxs Road / Wicks Road (Figure 3) combined with proposed Option 2 will provide the greatest benefit to the Coxs Road centre and wider study area and should be adopted by the City of Ryde in support the Masterplan.
- The implication for the Masterplan is that approximately 2m to 3m of land (for approximately 60m) on the north-west corner of Coxs Road / Wicks Road would be required, resulting in a loss of 10 on-street car parking spaces and a change to the Masterplan built form in that location.

- In addition, as a result of the connection from Coxs Road to Cooney Street and from Cooney Street to Marilyn Street, road reserves of approximately 15m would need to be defined within the Masterplan built form.
- The Coxs Road/Wicks Road intersection improvements should be implemented as a priority, prior to any development increase within the Coxs Road centre.
- Road option 2 provides access and safety (pedestrians, cyclists and general traffic) benefits and should be considered in the longer term depending on the timing of development take up within the Coxs Road centre.

Appendix A

Appendix A

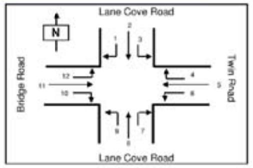
Traffic Count Results

ITEM 6 (continued) **ATTACHMENT 1**

Intersection of Lane Cove Road, Twin Road and Bridge Road **Thursday, 10 February 2011**

Austraffic

Survey Start	16:00 PM
Intersection Type	Cross Junction
Intersection No.	1
North Approach	Lane Cove Road
East Approach	Twin Road
South Approach	Lane Cove Road
West Approach	Bridge Road
Date	10/02/11
Classification	Light Heavy



TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	49	0	49	554	38	592	26	1	27	14	2	16	62	0	62	1	1	2
16:15 - 16:30	46	0	46	541	34	575	15	0	15	14	1	15	63	0	63	1	0	1
16:30 - 16:45	49	2	51	583	16	599	16	0	16	14	1	15	54	0	54	1	0	1
16:45 - 17:00	64	1	65	545	36	581	19	1	20	5	0	5	60	0	60	0	0	0
17:00 - 17:15	54	1	55	627	26	653	4	1	5	8	0	8	91	1	92	2	0	2
17:15 - 17:30	32	0	32	610	17	627	22	0	22	6	0	6	37	2	39	2	1	3
17:30 - 17:45	48	0	48	573	29	602	22	0	22	6	0	6	74	0	74	3	0	3
17:45 - 18:00	40	0	40	396	16	412	7	0	7	2	0	2	77	0	77	5	0	5
18:00 - 18:15	49	0	49	570	21	591	19	0	19	12	0	12	95	1	96	1	0	1
18:15 - 18:30	39	0	39	447	19	466	18	0	18	9	0	9	52	0	52	9	0	9
18:30 - 18:45	37	0	37	424	13	437	8	0	8	8	0	8	42	0	42	3	0	3
18:45 - 19:00	33	0	33	504	16	520	13	0	13	15	0	15	46	3	49	3	0	3
Σ	540	4	544	6374	281	6655	189	3	192	113	4	117	753	7	760	31	2	33

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	0	0	0	456	17	473	11	1	12	12	1	13	16	0	16	9	0	9	1210	61	1271
16:15 - 16:30	0	0	0	429	20	449	13	2	15	17	2	19	21	0	21	15	1	16	1175	60	1235
16:30 - 16:45	0	0	0	511	17	528	27	0	27	13	0	13	43	1	44	22	0	22	1333	37	1370
16:45 - 17:00	0	0	0	436	12	448	24	1	25	8	1	9	33	1	34	12	0	12	1206	53	1259
17:00 - 17:15	0	0	0	497	4	501	21	2	23	19	0	19	23	0	23	6	0	6	1352	35	1387
17:15 - 17:30	0	0	0	414	7	421	20	2	22	10	0	10	40	0	40	11	0	11	1204	29	1233
17:30 - 17:45	0	0	0	375	9	384	21	2	23	17	1	18	40	0	40	15	0	15	1194	41	1235
17:45 - 18:00	0	0	0	387	10	397	24	1	25	15	1	16	30	0	30	11	0	11	994	28	1022
18:00 - 18:15	0	0	0	382	6	388	17	0	17	11	0	11	29	0	29	9	0	9	1194	28	1222
18:15 - 18:30	0	0	0	414	9	423	18	0	18	18	1	19	34	1	35	25	0	25	1083	30	1113
18:30 - 18:45	0	0	0	441	10	451	18	0	18	12	0	12	27	1	28	14	0	14	1034	24	1058
18:45 - 19:00	0	0	0	346	8	354	26	0	26	13	0	13	25	0	25	21	0	21	1045	27	1072
Σ	0	0	0	5088	129	5217	240	11	251	165	7	172	361	4	365	170	1	171	14024	453	14477

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 17:00	208	3	211	2223	124	2347	76	2	78	47	4	51	239	0	239	3	1	4
16:15 - 17:15	**213**	**4**	**217**	**2296**	**112**	**2408**	**54**	**2**	**56**	**41**	**2**	**43**	**268**	**1**	**269**	**4**	**0**	**4**
16:30 - 17:30	199	4	203	2365	95	2460	61	2	63	33	1	34	242	3	245	5	1	6
16:45 - 17:45	198	2	200	2355	108	2463	67	2	69	25	0	25	262	3	265	7	1	8
17:00 - 18:00	174	1	175	2206	88	2294	55	1	56	22	0	22	279	3	282	12	1	13
17:15 - 18:15	169	0	169	2149	83	2232	70	0	70	26	0	26	283	3	286	11	1	12
17:30 - 18:30	176	0	176	1986	85	2071	66	0	66	29	0	29	298	1	299	18	0	18
17:45 - 18:45	165	0	165	1837	69	1906	52	0	52	31	0	31	266	1	267	18	0	18
18:00 - 19:00	158	0	158	1945	69	2014	58	0	58	44	0	44	235	4	239	16	0	16

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	0	0	0	1832	66	1898	75	4	79	50	4	54	113	2	115	58	1	59	4924	211	5135	
16:15 - 17:15	**0**	**0**	**0**	**1873**	**53**	**1926**	**85**	**5**	**90**	**57**	**3**	**60**	**120**	**2**	**122**	**55**	**1**	**56**	**5066**	**185**	**5251**	**Peak**
16:30 - 17:30	0	0	0	1858	40	1898	92	5	97	50	1	51	139	2	141	51	0	51	5095	154	5249	
16:45 - 17:45	0	0	0	1722	32	1754	86	7	93	54	2	56	136	1	137	44	0	44	4956	158	5114	
17:00 - 18:00	0	0	0	1673	30	1703	86	7	93	61	2	63	133	0	133	43	0	43	4744	133	4877	
17:15 - 18:15	0	0	0	1558	32	1590	82	5	87	53	2	55	139	0	139	46	0	46	4586	126	4712	
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17:45 - 18:45	0	0	0	1624	35	1659	77	1	78	56	2	58	120	2	122	59	0	59	4305	110	4415	
18:00 - 19:00	0	0	0	1583	33	1616	79	0	79	54	1	55	115	2	117	69	0	69	4356	109	4465	

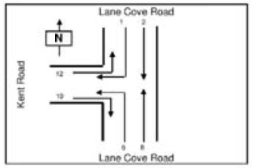
February 2011

ITEM 6 (continued) **ATTACHMENT 1**

Intersection of Lane Cove Road and Kent Road **Thursday, 10 February 2011**

Austraffic

Survey Start	16:00 PM
Intersection Type	T Junction
Intersection No.	2
North Approach	Lane Cove Road
East Approach	
South Approach	Lane Cove Road
West Approach	Kent Road
Date	10/02/11
Classification	Light Heavy



TIME PERIOD	VEHICLE MOVEMENT																																						
	1			2			3			4			5			6			7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	24	3	27	673	39	712																527	20	547	12	0	12	13	0	13				15	1	16	1264	63	1327
16:15 - 16:30	31	3	34	607	31	638																506	20	526	11	0	11	14	1	15				12	2	14	1181	57	1238
16:30 - 16:45	29	2	31	547	19	566																486	18	504	14	0	14	14	0	14				11	2	13	1101	41	1142
16:45 - 17:00	27	1	28	643	32	675																498	12	510	12	0	12	20	0	20				18	0	18	1218	45	1263
17:00 - 17:15	45	2	47	680	26	706																524	3	527	16	0	16	16	0	16				26	2	28	1307	33	1340
17:15 - 17:30	44	2	46	703	25	728																394	7	401	12	0	12	13	0	13				22	0	22	1188	34	1222
17:30 - 17:45	49	1	50	674	27	701																388	9	397	17	0	17	20	0	20				26	1	27	1174	38	1212
17:45 - 18:00	35	3	38	453	20	473																353	8	361	11	0	11	17	0	17				22	2	24	891	33	924
18:00 - 18:15	29	3	32	642	21	663																455	10	465	16	0	16	24	0	24				36	2	38	1202	36	1238
18:15 - 18:30	38	3	41	524	18	542																468	10	478	17	0	17	22	0	22				30	2	32	1099	33	1132
18:30 - 18:45	18	4	22	478	16	494																426	9	435	11	0	11	19	0	19				16	0	16	968	29	997
18:45 - 19:00	24	3	27	568	14	582																413	6	419	9	0	9	12	0	12				24	0	24	1050	23	1073
Σ	393	30	423	7192	288	7480																5438	132	5570	158	0	158	204	1	205				258	14	272	13643	465	14108

TIME PERIOD	VEHICLE MOVEMENT																																							
	1			2			3			4			5			6			7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	111	9	120	2470	121	2591																2017	70	2087	49	0	49	61	1	62				56	5	61	4764	206	4970	
16:15 - 17:15	132	8	140	2477	108	2585																2014	53	2067	53	0	53	64	1	65				67	6	73	4807	176	4983	
16:30 - 17:30	145	7	152	2573	102	2675																1902	40	1942	54	0	54	63	0	63				77	4	81	4814	153	4967	
16:45 - 17:45	**165**	**6**	**171**	**2700**	**110**	**2810**																**1804**	**31**	**1835**	**57**	**0**	**57**	**69**	**0**	**69**				**92**	**3**	**95**	**4887**	**150**	**5037**	**Peak**
17:00 - 18:00	173	8	181	2510	98	2608																1659	27	1686	56	0	56	66	0	66				96	5	101	4560	138	4698	
17:15 - 18:15	157	9	166	2472	93	2565																1590	34	1624	56	0	56	74	0	74				106	5	111	4455	141	4596	
17:30 - 18:30	151	10	161	2293	86	2379																1664	37	1701	61	0	61	83	0	83				114	7	121	4366	140	4506	
17:45 - 18:45	120	13	133	2097	75	2172																1702	37	1739	55	0	55	82	0	82				104	6	110	4160	131	4291	
18:00 - 19:00	109	13	122	2212	69	2281																1762	35	1797	53	0	53	77	0	77				106	4	110	4319	121	4440	

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ITEM 6 (continued) **ATTACHMENT 1**

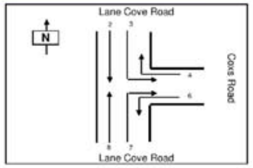
Intersection of Lane Cove Road and Coxs Road **Thursday, 10 February 2011**

Austraffic

Survey Start 16:00 PM
Intersection Type T Junction
Intersection No. 3
North Approach Lane Cove Road
East Approach Coxs Road
South Approach Lane Cove Road
West Approach

Date 10/02/11

Classification Light Heavy



TIME PERIOD	1 Light	1 Heavy	1 Σ	2 Light	2 Heavy	2 Σ	3 Light	3 Heavy	3 Σ	4 Light	4 Heavy	4 Σ	5 Light	5 Heavy	5 Σ	6 Light	6 Heavy	6 Σ	7 Light	7 Heavy	7 Σ	8 Light	8 Heavy	8 Σ	9 Light	9 Heavy	9 Σ	10 Light	10 Heavy	10 Σ	11 Light	11 Heavy	11 Σ	12 Light	12 Heavy	12 Σ	GRAND TOTAL Light	GRAND TOTAL Heavy	GRAND TOTAL Σ
16:00 - 16:15				656	39	695	36	1	37	47	4	51				41	3	44	27	0	27	536	24	560													1343	71	1414
16:15 - 16:30				583	31	614	42	3	45	34	1	35				55	3	58	29	4	33	479	20	499													1222	62	1284
16:30 - 16:45				545	19	564	30	0	30	18	1	19				31	2	33	30	6	36	469	17	486													1123	45	1168
16:45 - 17:00				623	32	655	56	0	56	32	2	34				47	1	48	39	1	40	481	10	491													1278	46	1324
17:00 - 17:15				671	26	697	60	2	62	28	0	28				54	2	56	52	1	53	486	5	491													1351	36	1387
17:15 - 17:30				699	23	722	70	0	70	32	1	33				48	4	52	45	1	46	396	9	405													1290	38	1328
17:30 - 17:45				667	27	694	50	0	50	17	0	17				56	1	57	54	1	55	344	9	353													1188	38	1226
17:45 - 18:00				438	19	457	49	1	50	23	1	24				50	4	54	40	2	42	360	9	369													960	36	996
18:00 - 18:15				625	21	646	51	1	52	22	0	22				46	3	49	47	1	48	434	9	443													1225	35	1260
18:15 - 18:30				514	18	532	44	1	45	18	1	19				48	3	51	64	2	66	413	9	422													1101	34	1135
18:30 - 18:45				459	13	472	33	1	34	23	0	23				37	7	44	44	1	45	408	11	419													1004	33	1037
18:45 - 19:00				555	14	569	32	1	33	14	0	14				37	3	40	47	0	47	402	8	410													1087	26	1113
Σ				7035	282	7317	553	11	564	308	11	319				550	36	586	518	20	538	5208	140	5348													14172	500	14672

TIME PERIOD	1 Light	1 Heavy	1 Σ	2 Light	2 Heavy	2 Σ	3 Light	3 Heavy	3 Σ	4 Light	4 Heavy	4 Σ	5 Light	5 Heavy	5 Σ	6 Light	6 Heavy	6 Σ	7 Light	7 Heavy	7 Σ	8 Light	8 Heavy	8 Σ	9 Light	9 Heavy	9 Σ	10 Light	10 Heavy	10 Σ	11 Light	11 Heavy	11 Σ	12 Light	12 Heavy	12 Σ	GRAND TOTAL Light	GRAND TOTAL Heavy	GRAND TOTAL Σ	
16:00 - 17:00				2407	121	2528	164	4	168	131	8	139				174	9	183	125	11	136	1965	71	2036													4966	224	5190	
16:15 - 17:15				2422	108	2530	186	5	190	112	4	116				187	8	195	150	12	162	1915	52	1967													4974	189	5163	
16:30 - 17:30				2538	100	2638	216	2	218	110	4	114				180	9	189	166	9	175	1832	41	1873													5042	165	5207	
16:45 - 17:45				**2660**	**108**	**2768**	**236**	**2**	**238**	**109**	**3**	**112**				**205**	**8**	**213**	**190**	**4**	**194**	**1707**	**33**	**1740**													**5107**	**158**	**5265**	**Peak**
17:00 - 18:00				2475	95	2570	229	3	232	100	2	102				208	11	219	191	5	196	1586	32	1618													4789	148	4937	
17:15 - 18:15				2429	90	2519	220	2	222	94	2	96				200	12	212	186	5	191	1534	36	1570													4663	147	4810	
17:30 - 18:30				2244	85	2329	194	3	197	80	2	82				200	11	211	205	6	211	1551	36	1587													4474	143	4617	
17:45 - 18:45				2036	71	2107	177	4	181	86	2	88				181	17	198	195	6	201	1615	38	1653													4290	138	4428	
18:00 - 19:00				2153	66	2219	160	4	164	77	1	78				168	16	184	202	4	206	1657	37	1694													4417	128	4545	

110215xls-Ø71061 4818 - GTA - Lane Cove Road, North Ryde - IC - Thursday.xlsx February 2011

ITEM 6 (continued) **ATTACHMENT 1**

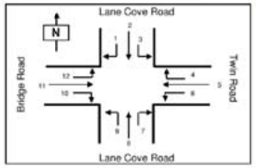
Intersection of Lane Cove Road, Twin Road and Bridge Road

Saturday, 12 February 2011
Austraffic

Survey Start: 11:00 AM
Intersection Type: Cross Junction
Intersection No.: 1
North Approach: Lane Cove Road
East Approach: Twin Road
South Approach: Lane Cove Road
West Approach: Bridge Road

Date: 12/02/11

Classification: Light Heavy



TIME PERIOD	1 Light	1 Heavy	1 Σ	2 Light	2 Heavy	2 Σ	3 Light	3 Heavy	3 Σ	4 Light	4 Heavy	4 Σ	5 Light	5 Heavy	5 Σ	6 Light	6 Heavy	6 Σ
11:00 - 11:15	37	0	37	434	13	447	15	0	15	15	0	15	30	0	30	0	0	0
11:15 - 11:30	33	0	33	449	9	458	9	0	9	16	0	16	22	0	22	1	0	1
11:30 - 11:45	29	0	29	509	13	522	19	0	19	9	0	9	33	0	33	7	0	7
11:45 - 12:00	26	0	26	371	13	384	6	0	6	16	0	16	27	1	28	3	0	3
12:00 - 12:15	28	0	28	498	17	515	12	0	12	17	0	17	48	0	48	6	0	6
12:15 - 12:30	25	0	25	518	9	527	17	0	17	13	0	13	17	1	18	2	0	2
12:30 - 12:45	15	0	15	452	9	461	14	0	14	15	0	15	35	0	35	3	0	3
12:45 - 13:00	24	0	24	421	9	430	10	0	10	14	0	14	26	0	26	2	0	2
13:00 - 13:15	17	3	20	449	18	467	17	0	17	11	0	11	18	0	18	1	0	1
13:15 - 13:30	34	0	34	542	12	554	16	0	16	2	0	2	25	0	25	3	0	3
13:30 - 13:45	18	1	19	435	10	445	8	0	8	14	0	14	23	0	23	1	0	1
13:45 - 14:00	23	0	23	357	10	367	13	0	13	13	0	13	31	0	31	1	0	1
Σ	309	4	313	5435	142	5577	156	0	156	155	0	155	335	2	337	30	0	30

TIME PERIOD	7 Light	7 Heavy	7 Σ	8 Light	8 Heavy	8 Σ	9 Light	9 Heavy	9 Σ	10 Light	10 Heavy	10 Σ	11 Light	11 Heavy	11 Σ	12 Light	12 Heavy	12 Σ	GRAND TOTAL Light	GRAND TOTAL Heavy	GRAND TOTAL Σ
11:00 - 11:15	0	0	0	501	14	515	21	0	21	20	0	20	23	0	23	19	1	20	1115	28	1143
11:15 - 11:30	0	0	0	463	8	471	25	0	25	24	2	26	18	0	18	18	0	18	1078	19	1097
11:30 - 11:45	0	0	0	519	17	536	15	1	16	37	0	37	20	0	20	19	0	19	1216	31	1247
11:45 - 12:00	0	0	0	404	7	411	12	0	12	25	0	25	14	0	14	27	0	27	931	21	952
12:00 - 12:15	0	0	0	481	6	487	14	0	14	8	0	8	33	0	33	18	1	19	1163	24	1187
12:15 - 12:30	0	0	0	482	14	496	11	2	13	16	2	18	24	0	24	12	0	12	1137	28	1165
12:30 - 12:45	0	0	0	528	10	538	25	2	27	29	1	30	22	0	22	21	0	21	1159	22	1181
12:45 - 13:00	0	0	0	489	8	497	22	1	23	34	0	34	21	0	21	7	0	7	1070	18	1088
13:00 - 13:15	0	0	0	455	11	466	17	0	17	17	0	17	17	0	17	24	0	24	1043	32	1075
13:15 - 13:30	0	0	0	510	3	513	12	0	12	12	2	14	20	0	20	23	1	24	1199	18	1217
13:30 - 13:45	0	0	0	508	8	516	18	1	19	21	0	21	14	0	14	16	0	16	1076	20	1096
13:45 - 14:00	0	0	0	496	8	504	12	1	13	15	0	15	16	0	16	12	0	12	989	19	1008
Σ	0	0	0	5836	114	5950	204	8	212	258	7	265	242	0	242	216	3	219	13176	280	13456

TIME PERIOD	1 Light	1 Heavy	1 Σ	2 Light	2 Heavy	2 Σ	3 Light	3 Heavy	3 Σ	4 Light	4 Heavy	4 Σ	5 Light	5 Heavy	5 Σ	6 Light	6 Heavy	6 Σ
11:00 - 12:00	125	0	125	1763	48	1811	49	0	49	56	0	56	112	1	113	11	0	11
11:15 - 12:15	116	0	116	1827	52	1879	46	0	46	58	0	58	130	1	131	17	0	17
11:30 - 12:30	108	0	108	1896	52	1948	54	0	54	55	0	55	125	2	127	18	0	18
11:45 - 12:45	94	0	94	1839	48	1887	49	0	49	61	0	61	127	2	129	14	0	14
12:00 - 13:00	**92**	**0**	**92**	**1889**	**44**	**1933**	**53**	**0**	**53**	**59**	**0**	**59**	**126**	**1**	**127**	**13**	**0**	**13**
12:15 - 13:15	81	3	84	1840	45	1885	58	0	58	53	0	53	96	1	97	8	0	8
12:30 - 13:30	90	3	93	1864	48	1912	57	0	57	42	0	42	104	0	104	9	0	9
12:45 - 13:45	93	4	97	1847	49	1896	51	0	51	41	0	41	92	0	92	7	0	7
13:00 - 14:00	92	4	96	1783	50	1833	54	0	54	40	0	40	97	0	97	6	0	6

TIME PERIOD	7 Light	7 Heavy	7 Σ	8 Light	8 Heavy	8 Σ	9 Light	9 Heavy	9 Σ	10 Light	10 Heavy	10 Σ	11 Light	11 Heavy	11 Σ	12 Light	12 Heavy	12 Σ	GRAND TOTAL Light	GRAND TOTAL Heavy	GRAND TOTAL Σ	
11:00 - 12:00	0	0	0	1887	46	1933	73	1	74	106	2	108	75	0	75	83	1	84	4340	99	4439	
11:15 - 12:15	0	0	0	1867	38	1905	66	1	67	94	2	96	85	0	85	82	1	83	4388	95	4483	
11:30 - 12:30	0	0	0	1886	44	1930	52	3	55	86	2	88	91	0	91	76	1	77	4447	104	4551	
11:45 - 12:45	0	0	0	1895	37	1932	62	4	66	78	3	81	93	0	93	78	1	79	4390	95	4485	
12:00 - 13:00	**0**	**0**	**0**	**1980**	**38**	**2018**	**72**	**5**	**77**	**87**	**3**	**90**	**100**	**0**	**100**	**58**	**1**	**59**	**4529**	**92**	**4621**	**Peak**
12:15 - 13:15	0	0	0	1954	43	1997	75	5	80	96	3	99	84	0	84	64	0	64	4409	100	4509	
12:30 - 13:30	0	0	0	1982	32	2014	76	3	79	92	3	95	80	0	80	75	1	76	4471	90	4561	
12:45 - 13:45	0	0	0	1962	30	1992	69	2	71	84	2	86	72	0	72	70	1	71	4388	88	4476	
13:00 - 14:00	0	0	0	1969	30	1999	59	2	61	65	2	67	67	0	67	75	1	76	4307	89	4396	

February 2011

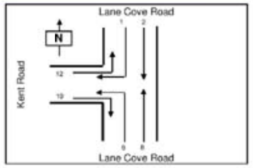
ITEM 6 (continued) **ATTACHMENT 1**

Intersection of Lane Cove Road and Kent Road

Saturday, 12 February 2011

Austraffic

Survey Start	11:00 AM
Intersection Type	T Junction
Intersection No.	2
North Approach	Lane Cove Road
East Approach	
South Approach	Lane Cove Road
West Approach	Kent Road
Date	12/02/11
Classification	Light Heavy



TIME PERIOD	1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 11:15	19	2	21	432	14	446												
11:15 - 11:30	21	0	21	481	11	492												
11:30 - 11:45	18	1	19	505	11	516												
11:45 - 12:00	25	1	26	426	15	441												
12:00 - 12:15	19	1	20	536	13	549												
12:15 - 12:30	21	1	22	501	6	507												
12:30 - 12:45	19	2	21	498	9	507												
12:45 - 13:00	18	0	18	407	12	419												
13:00 - 13:15	26	2	28	504	17	521												
13:15 - 13:30	27	0	27	544	11	555												
13:30 - 13:45	25	1	26	468	11	479												
13:45 - 14:00	21	2	23	416	9	425												
Σ	259	13	272	5718	139	5857												

TIME PERIOD	7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 11:15				489	16	505	10	0	10	23	0	23				33	0	33	1006	32	1038
11:15 - 11:30				539	9	548	9	0	9	13	1	14				31	2	33	1094	23	1117
11:30 - 11:45				501	16	517	9	0	9	29	0	29				28	1	29	1090	29	1119
11:45 - 12:00				505	7	512	8	1	9	15	0	15				25	3	28	1004	27	1031
12:00 - 12:15				519	8	527	10	0	10	6	1	7				11	1	12	1101	24	1125
12:15 - 12:30				433	13	446	11	0	11	15	0	15				28	1	29	1009	21	1030
12:30 - 12:45				532	8	540	12	0	12	22	0	22				26	1	27	1109	20	1129
12:45 - 13:00				428	10	438	15	0	15	20	0	20				23	1	24	911	23	934
13:00 - 13:15				441	7	448	5	1	6	19	0	19				26	1	27	1021	28	1049
13:15 - 13:30				486	5	491	10	0	10	17	0	17				18	1	19	1102	17	1119
13:30 - 13:45				445	7	452	10	0	10	21	0	21				27	2	29	996	21	1017
13:45 - 14:00				497	9	506	12	0	12	17	0	17				20	2	22	983	22	1005
Σ				5815	115	5930	121	2	123	217	2	219				296	16	312	12426	287	12713

TIME PERIOD	1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 12:00	83	4	87	1844	51	1895												
11:15 - 12:15	**83**	**3**	**86**	**1948**	**50**	**1998**												
11:30 - 12:30	83	4	87	1968	45	2013												
11:45 - 12:45	84	5	89	1961	43	2004												
12:00 - 13:00	77	4	81	1942	40	1982												
12:15 - 13:15	84	5	89	1910	44	1954												
12:30 - 13:30	90	4	94	1953	49	2002												
12:45 - 13:45	96	3	99	1923	51	1974												
13:00 - 14:00	99	5	104	1932	48	1980												

TIME PERIOD	7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
11:00 - 12:00				2034	48	2082	36	1	37	80	1	81				117	6	123	4194	111	4305	
11:15 - 12:15				**2064**	**40**	**2104**	**36**	**1**	**37**	**63**	**2**	**65**				**95**	**7**	**102**	**4209**	**103**	**4392**	**Peak**
11:30 - 12:30				1958	44	2002	38	1	39	65	1	66				92	6	98	4204	101	4305	
11:45 - 12:45				1989	36	2025	41	1	42	58	1	59				90	6	96	4223	92	4315	
12:00 - 13:00				1912	39	1951	48	0	48	63	1	64				88	4	92	4130	88	4218	
12:15 - 13:15				1834	38	1872	43	1	44	76	0	76				103	4	107	4050	92	4142	
12:30 - 13:30				1887	30	1917	42	1	43	78	0	78				93	4	97	4143	88	4231	
12:45 - 13:45				1800	29	1829	40	1	41	77	0	77				94	5	99	4030	89	4119	
13:00 - 14:00				1869	28	1897	37	1	38	74	0	74				91	6	97	4102	88	4190	

110217xls-B11061 4818 - GTA - Lane Cove Road, North Ryde - IC - Saturday.xlsx

February 2011

ITEM 6 (continued) **ATTACHMENT 1**

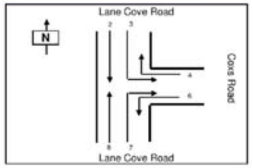
Intersection of Lane Cove Road and Coxs Road **Saturday, 12 February 2011**

Austraffic

Survey Start: 11:00 AM
Intersection Type: T Junction
Intersection No.: 3
North Approach: Lane Cove Road
East Approach: Coxs Road
South Approach: Lane Cove Road
West Approach:

Date: 12/02/11

Classification: Light Heavy



TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 11:15				410	14	424	28	2	30	29	1	30				41	2	43
11:15 - 11:30				451	10	461	27	0	27	33	0	33				51	1	52
11:30 - 11:45				452	9	461	32	0	32	50	1	51				71	3	74
11:45 - 12:00				401	15	416	27	1	28	39	1	40				50	1	51
12:00 - 12:15				507	13	520	54	1	55	36	2	38				48	1	49
12:15 - 12:30				470	7	477	26	0	26	36	0	36				52	0	52
12:30 - 12:45				481	9	490	25	1	26	37	1	38				36	2	38
12:45 - 13:00				395	10	405	16	0	16	32	1	33				30	2	32
13:00 - 13:15				493	17	510	31	1	32	39	2	41				37	2	39
13:15 - 13:30				517	11	528	20	0	20	24	1	25				54	0	54
13:30 - 13:45				451	10	461	20	1	21	32	1	33				42	2	44
13:45 - 14:00				411	10	421	30	0	30	35	0	35				26	1	27
Σ				5439	135	5574	336	7	343	422	11	433				538	17	555

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 11:15	50	0	50	459	13	472													1017	32	1049
11:15 - 11:30	50	3	53	504	9	513													1116	23	1139
11:30 - 11:45	54	1	55	463	18	481													1122	32	1154
11:45 - 12:00	51	1	52	479	7	486													1047	26	1073
12:00 - 12:15	39	1	40	499	6	505													1183	24	1207
12:15 - 12:30	52	1	53	409	13	422													1045	21	1066
12:30 - 12:45	48	2	50	544	9	553													1171	24	1195
12:45 - 13:00	36	1	37	401	10	411													910	24	934
13:00 - 13:15	50	0	50	446	8	454													1096	30	1126
13:15 - 13:30	33	1	34	482	5	487													1130	18	1148
13:30 - 13:45	41	2	43	438	7	445													1024	23	1047
13:45 - 14:00	37	1	38	490	9	499													1029	21	1050
Σ	541	14	555	5614	114	5728													12890	298	13188

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
11:00 - 12:00				1714	48	1762	114	3	117	151	3	154				213	7	220
11:15 - 12:15				**1811**	**47**	**1858**	**140**	**2**	**142**	**158**	**4**	**162**				**220**	**6**	**226**
11:30 - 12:30				1830	44	1874	139	2	141	161	4	165				221	5	226
11:45 - 12:45				1859	44	1903	132	3	135	148	4	152				186	4	190
12:00 - 13:00				1853	39	1892	121	2	123	141	4	145				166	5	171
12:15 - 13:15				1839	43	1882	98	2	100	144	4	148				155	6	161
12:30 - 13:30				1886	47	1933	92	2	94	132	5	137				157	6	163
12:45 - 13:45				1856	48	1904	87	2	89	127	5	132				163	6	169
13:00 - 14:00				1872	48	1920	101	2	103	130	4	134				159	5	164

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
11:00 - 12:00	205	5	210	1905	47	1952													4302	113	4415	
11:15 - 12:15	**194**	**6**	**200**	**1945**	**40**	**1985**													**4468**	**105**	**4573**	**Peak**
11:30 - 12:30	196	4	200	1850	44	1894													4397	103	4500	
11:45 - 12:45	190	5	195	1931	35	1966													4446	95	4541	
12:00 - 13:00	175	5	180	1853	38	1891													4309	93	4402	
12:15 - 13:15	186	4	190	1800	40	1840													4222	99	4321	
12:30 - 13:30	167	4	171	1873	32	1905													4307	96	4403	
12:45 - 13:45	160	4	164	1767	30	1797													4160	95	4255	
13:00 - 14:00	161	4	165	1856	29	1885													4279	92	4371	

February 2011

ITEM 6 (continued) **ATTACHMENT 1**

GTAconsultants

TURNING MOVEMENT SURVEY

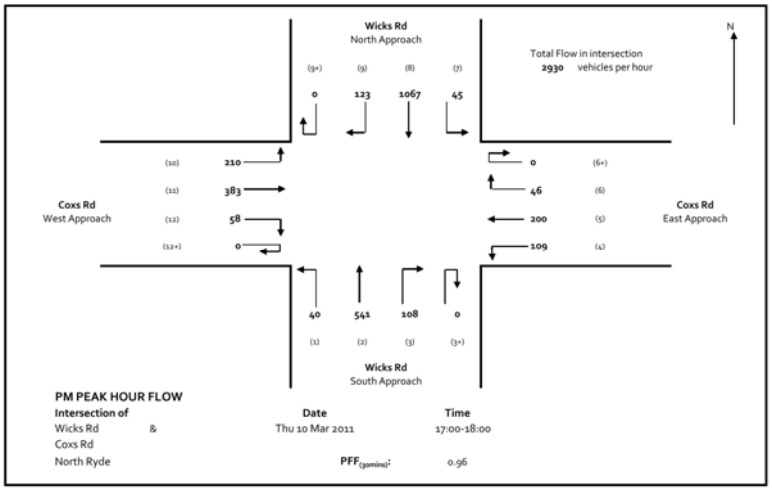
Intersection of Wicks Rd & Coxs Rd, North Ryde
Date: Thu 10 Mar 2011

15 minute Data

Time	Movement																Total
	Wicks Rd South Approach				Coxs Rd East Approach				Wicks Rd North Approach				Coxs Rd West Approach				
	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	
	1	2	3	3+	4	5	6	6+	7	8	9	9+	10	11	12	12+	
15:00-15:15																	
15:15-15:30																	
15:30-15:45																	
15:45-16:00																	
16:00-16:15																	
16:15-16:30																	
16:30-16:45	9	116	19	0	32	72	24	0	9	226	34	0	27	87	22	0	677
16:45-17:00	9	123	20	0	19	43	10	0	9	234	30	0	45	110	24	0	676
17:00-17:15	9	143	20	0	29	49	13	0	10	250	31	0	42	99	16	0	713
17:15-17:30	15	137	25	0	36	59	9	0	7	294	30	0	56	92	15	0	775
17:30-17:45	6	136	31	0	28	44	12	0	7	272	30	0	64	106	11	0	747
17:45-18:00	10	125	32	0	16	48	12	0	21	251	32	0	48	86	16	0	697
18:00-18:15																	
18:15-18:30																	
18:30-18:45																	
18:45-19:00																	
Total	58	780	147	0	160	315	80	0	63	1527	187	0	282	580	104	0	4283

Hourly flows

Time	Movement																Total
	Wicks Rd South Approach				Coxs Rd East Approach				Wicks Rd North Approach				Coxs Rd West Approach				
	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	
	1	2	3	3+	4	5	6	6+	7	8	9	9+	10	11	12	12+	
15:00-16:00																	
15:15-16:15																	
15:30-16:30																	
15:45-16:45																	
16:00-17:00																	
16:15-17:15																	
16:30-17:30	42	519	84	0	116	223	56	0	35	1004	125	0	170	388	77	0	2839
16:45-17:45	39	539	96	0	112	195	44	0	33	1050	121	0	207	407	66	0	2909
17:00-18:00	40	541	108	0	109	200	46	0	45	1067	123	0	210	383	58	0	2930
17:15-18:15																	
17:30-18:30																	
17:45-18:45																	
18:00-19:00																	
Peak Hour	40	541	108	0	109	200	46	0	45	1067	123	0	210	383	58	0	2930



ITEM 6 (continued) **ATTACHMENT 1**

GTAconsultants

TURNING MOVEMENT SURVEY

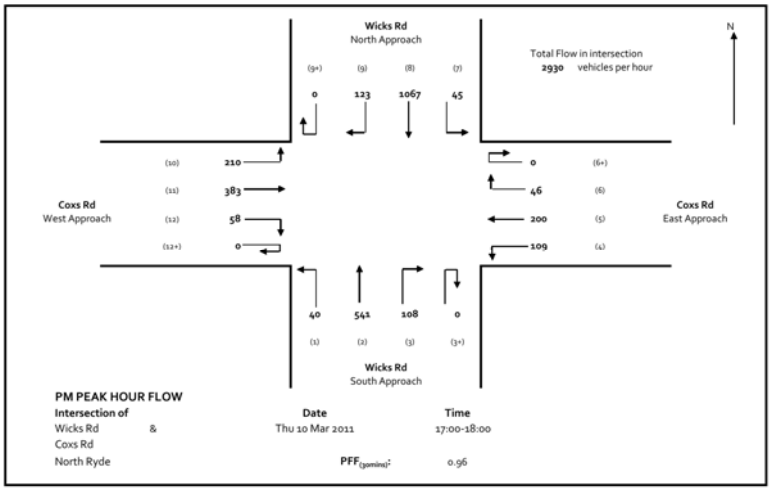
Intersection of Wicks Rd & Coxs Rd, North Ryde
Date: Thu 10 Mar 2011

15 minute Data

Time	Movement																Total
	Wicks Rd South Approach				Coxs Rd East Approach				Wicks Rd North Approach				Coxs Rd West Approach				
	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	
	1	2	3	3+	4	5	6	6+	7	8	9	9+	10	11	12	12+	
15:00-15:15																	
15:15-15:30																	
15:30-15:45																	
15:45-16:00																	
16:00-16:15																	
16:15-16:30																	
16:30-16:45	9	116	19	0	32	72	24	0	9	226	34	0	27	87	22	0	677
16:45-17:00	9	123	20	0	19	43	10	0	9	234	30	0	45	110	24	0	676
17:00-17:15	9	143	20	0	29	49	13	0	10	250	31	0	42	99	16	0	713
17:15-17:30	15	137	25	0	36	59	9	0	7	294	30	0	56	92	15	0	775
17:30-17:45	6	136	31	0	28	44	12	0	7	272	30	0	64	106	11	0	747
17:45-18:00	10	125	32	0	16	48	12	0	21	251	32	0	48	86	16	0	697
18:00-18:15																	
18:15-18:30																	
18:30-18:45																	
18:45-19:00																	
Total	58	780	147	0	160	315	80	0	63	1527	187	0	282	580	104	0	4283

Hourly flows

Time	Movement																Total
	Wicks Rd South Approach				Coxs Rd East Approach				Wicks Rd North Approach				Coxs Rd West Approach				
	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	Left	Through	Right	U Turn	
	1	2	3	3+	4	5	6	6+	7	8	9	9+	10	11	12	12+	
15:00-16:00																	
15:15-16:15																	
15:30-16:30																	
15:45-16:45																	
16:00-17:00																	
16:15-17:15																	
16:30-17:30	42	519	84	0	116	223	56	0	35	1004	125	0	170	388	77	0	2839
16:45-17:45	39	539	96	0	112	195	44	0	33	1050	121	0	207	407	66	0	2909
17:00-18:00	40	541	108	0	109	200	46	0	45	1067	123	0	210	383	58	0	2930
17:15-18:15																	
17:30-18:30																	
17:45-18:45																	
18:00-19:00																	
Peak Hour	40	541	108	0	109	200	46	0	45	1067	123	0	210	383	58	0	2930



Appendix B

Traffic Sequence/Cycle Time/Duration

Appendix B

Lane Cove Road/ Coxs Road Intersection - Phase Diagram

Figure B1: SCATS Phasing Diagram – Lane Cove Road/Coxs Road Intersection

Offset Data

PP1=0,0C!PP2=0,0C!

PP3=0,0C!PP4=0,0D!

Table B1: Summary of Timing Data – Lane Cove Road/Coxs Road Intersection

Intersection	Phase	Thrus 17 Feb 2011- 16:45-17:45		Offset	Sat 19 Feb 2011 11:15:12:15		Offset	Plan	#LP	
		Frequency	Ave. Second		Frequency	Ave. Second			Thurs 17	Sat 19
Lane Cove Rd/ Coxs Rd - 851	A	28	98	0	30	87.25	0	1	0	0
	B	25	17.25	0	29	14.25	0	2	20	12
	C	28	25	0	29	26.25	0	3	0	0
	D	19	14	0	24	14.25	0	4	8	18

Lane Cove Road / Kent Road Intersection – Phase Diagram

Figure B2: SCATS Phasing Diagram – Lane Cove Road/Kent Road Intersection

Offset Data

PP1=0,0C!PP2=0,0D!

PP3=0,0C!PP4=0,0C!

Table B2: Summary of Timing Data – Lane Cove Road/Kent Road Intersection

Intersection	Phase	Thrus 17 Feb 2011- 16:45-17:45		Offset	Sat 19 Feb 2011 11:15:12:15		Offset	Plan	#LP	
		Frequency	Ave. Second		Frequency	Ave. Second			Thurs 17	Sat 19
Lane Cove Rd/ Kent Rd - 2997	A	29	103.25	0	31	97.75	0	1	0	0
	B	24	12.75	0	25	12.75	0	2	20	13
	C	27	19.75	0	31	15.75	0	3	0	0
	D	20	14.25	0	17	14	0	4	9	18

Lane Cover Road / Twin Road / Bridge Road Intersection - Phase Diagram

Figure B3: SCATS Phasing Diagram – Lane Cove Road/Twin Road/Bridge Road Intersection

Offset Data

PP1=-33,-33C!PP2=-33,-23C!

PP3=-33,-15C!PP4=33,28C!

Table B3: Summary of Timing Data – Lane Cove Road/Twin Road/Bridge Road Intersection

Intersection	Phase	Thrus 17 Feb 2011- 16:45-17:45		Offset	Sat 19 Feb 2011 11:15:12:15		Offset	Plan	#LP	
		Frequency	Ave. Second		Frequency	Ave. Second			Thurs 17	Sat 19
Lane Cove Rd/	A	28	102	-23	31	97.75	23	1	0	0
Bridge Rd/	B	22	16.25	-23	11	13.25	23	2	22	12
Twin Rd - 916	C	28	29.25	-23	31	30	23	3	0	0

PHASING SUMMARY

Site: Existing - Thurs PM

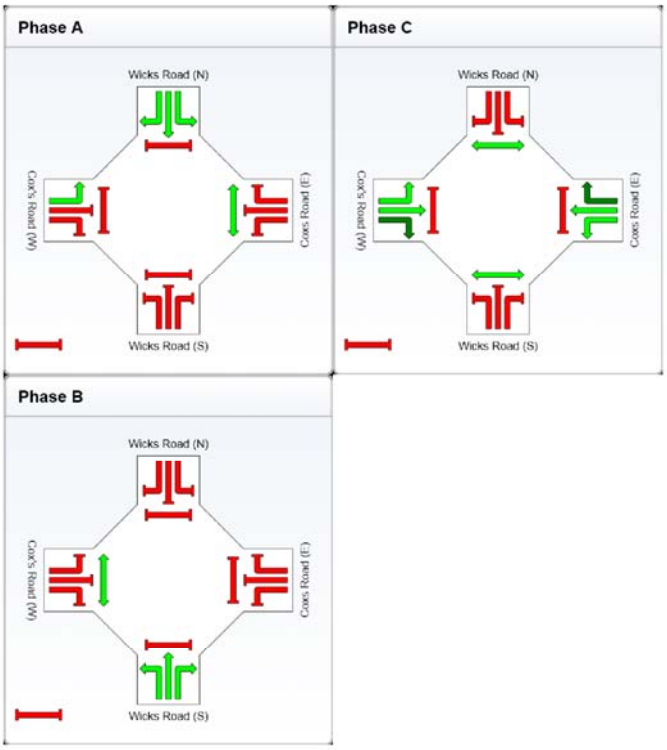
Coxs Road - Wicks Road
Existing Conditions
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Three-phase
Input Sequence: A, C, B
Output Sequence: A, C, B

Phase Timing Results

Phase	A	C	B
Green Time (sec)	43	38	24
Yellow Time (sec)	3	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	48	43	29
Phase Split	40 %	36 %	24 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

PHASING SUMMARY

Site: Existing - Sat

Coxs Road - Wicks Road
Existing Conditions
Saturday (11:15 - 12:15)

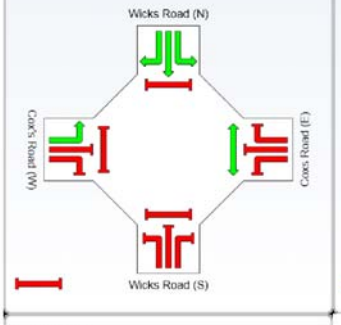
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Three-phase
Input Sequence: A, C, B
Output Sequence: A, C, B

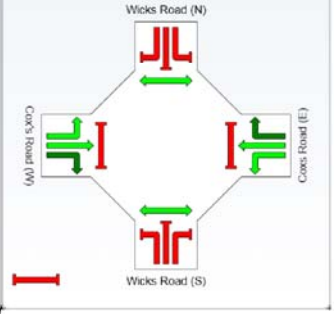
Phase Timing Results

Phase	A	C	B
Green Time (sec)	40	32	33
Yellow Time (sec)	3	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	45	37	38
Phase Split	38 %	31 %	32 %

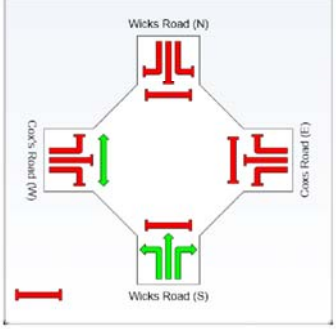
Phase A



Phase C



Phase B



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Appendix C

Existing Intersection Analysis Results

Appendix C

Modelling Scenario 1A - Thursday PM Peak – Coxs / Wicks

LANE SUMMARY

Site: Existing - Thurs PM

IS11061
Coxs Road - Wicks Road
Existing Conditions
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: Wicks Road (S)																
Lane 1	42	315	0	357	2.0	374	0.953	100	76.5	LOS F	27.2	193.7	500	–	0.0	0.0
Lane 2	0	249	113	361	2.0	379	0.953	100	79.8	LOS F	27.5	195.6	500	–	0.0	0.0
Approach	42	564	113	718	2.0		0.953		79.1	LOS F	27.5	195.6				
East: Coxs Road (E)																
Lane 1	114	190	0	304	2.0	559	0.544	100	39.2	LOS C	16.0	114.1	500	–	0.0	0.0
Lane 2	0	16	46	66	2.0	121	0.544	100	65.2	LOS E	5.4	38.1	60	Turn Bay	0.0	0.0
Approach	114	206	46	370	2.0		0.544		43.8	LOS D	16.0	114.1				
North: Wicks Road (N)																
Lane 1	47	594	0	641	2.0	678	0.945	100	58.2	LOS E	44.5	317.1	500	–	0.0	0.0
Lane 2	0	517	126	646	2.0	683	0.945	100	59.0	LOS E	44.8	319.0	500	–	0.0	0.0
Approach	47	1111	126	1286	2.0		0.945		58.6	LOS E	44.8	319.0				
West: Cox's Road (W)																
Lane 1	219	79	0	298	2.0	325[1]	0.915	100	46.9[2]	LOS D[2]	16.2[2]	115.3[2]	65	Parking	0.0	50.0
Lane 2	0	320	60	381	2.0	416	0.915	100	66.9	LOS E	27.1	192.6	500	–	0.0	0.0
Approach	219	399	60	678	2.0		0.915		58.1	LOS E	27.1	192.6				
Intersection				3052	2.0		0.953		61.5	LOS E	44.8	319.0				

Level of Service (Aver. Int. Delay): LOS E. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS F. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect
2 Delay, queue length and stops for the short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

Saturday Midday Peak – Coxs / Wicks

LANE SUMMARY

Site: Existing - Sat

IS11061
Coxs Road - Wicks Road
Existing Conditions
Saturday (11:15 - 12:15)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: Wicks Road (S)																
Lane 1	86	196	0	282	1.0	496	0.569	100	42.7	LOS D	15.6	110.3	500	–	0.0	0.0
Lane 2	0	233	67	300	1.0	527	0.569	100	42.0	LOS C	16.4	115.9	500	–	0.0	0.0
Approach	86	429	67	582	1.0		0.569		42.4	LOS C	16.4	115.9				
East: Coxs Road (E)																
Lane 1	61	129	0	190	1.0	479	0.397	100	41.3	LOS C	10.8	76.5	500	–	0.0	0.0
Lane 2	0	71	50	121	1.0	306	0.397	100	46.7	LOS D	8.0	56.3	60	Turn Bay	0.0	0.0
Approach	61	200	50	311	1.0		0.397		44.2	LOS D	10.8	76.5				
North: Wicks Road (N)																
Lane 1	42	323	0	365	1.0	628	0.580	100	34.9	LOS C	17.2	121.1	500	–	0.0	0.0
Lane 2	0	276	94	370	1.0	638	0.580	100	35.9	LOS C	17.4	122.6	500	–	0.0	0.0
Approach	42	599	94	734	1.0		0.580		35.4	LOS C	17.4	122.6				
West: Cox's Road (W)																
Lane 1	102	66	0	168	1.0	300[1]	0.560	100	39.6	LOS C	9.4	66.2	65	Parking	0.0	5.6
Lane 2	0	120	64	184	1.0	328	0.560	100	49.2	LOS D	11.5	81.2	500	–	0.0	0.0
Approach	102	186	64	352	1.0		0.560		44.6	LOS D	11.5	81.2				
Intersection				1980	1.0		0.560		40.5	LOS C	17.4	122.6				

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS D. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect

ITEM 6 (continued) **ATTACHMENT 1**

Appendix C

GTAconsultants

Modelling Scenario 1A - Thursday PM Peak – Lane Cove Road

Item	Item Desc	Lane Typ	Ctl Stn	Rte Pos	Fwd SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Dyn Sat	TDly pcuh	Dly s/pcu	MMQ pcu
J1:1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		605	1800	1140	53.1%	3.1	18.5	14.3
J1:1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		665	1800	1176	56.5%	3.3	17.0	15.0
J1:1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		680	1800	1176	57.8%	3.4	18.1	16.4
J1:3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		907	1800	1416	64.1%	2.9	11.4	14.0
J1:3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1087	1800	1452	74.9%	3.9	13.0	15.9
J1:3/3+J1:3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		900	1800:1800	1059	85.0%	6.8	27.3	11.0
J1:5/1	Bridge Road West Left	U	N/A	N/A	C1:6		46	1800	468	9.8%	0.6	46.4	1.5
J1:5/2+J1:5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		191	1800:1800	238	80.3%	5.4	101.2	9.2
J1:7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		148	1800	228	64.9%	3.5	84.3	6.7
J1:7/2+J1:7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		154	1800:1800	233	66.1%	3.7	86.2	6.8
J2:1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		673	1800	1500	58.2%	1.0	4.3	3.3
J2:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1071	1800	1500	71.4%	1.3	4.5	2.1
J2:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		894	1800	1500	59.9%	0.8	3.4	1.7
J2:1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		181	1800	167	108.5%	16.5	328.6	19.8
J2:4/1	Kent Road West Left	U	N/A	N/A	C2:2		99	1800	348	28.4%	1.6	58.9	3.7
J2:4/2+J2:4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		69	1800:1800	181	38.1%	1.5	78.6	2.9
J2:6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		523	1800	1296	40.4%	0.5	3.3	1.2
J2:6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		688	1800	1332	51.7%	0.8	4.0	1.8
J2:6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		715	1800	1332	53.7%	0.9	4.4	2.3
J3:1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		997	1800	1080	92.3%	12.8	46.1	42.4
J3:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1030	1800	1116	92.3%	12.6	43.9	43.4
J3:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1013	1800	1116	90.8%	11.5	40.8	41.1
J3:2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		567	1800	1464	38.7%	0.8	5.0	4.7
J3:2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		688	1800	1464	47.0%	0.5	2.8	1.0
J3:2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		524	1800	1464	35.8%	0.3	2.4	0.7
J3:2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		194	1800	268	67.4%	3.9	72.2	6.8
J3:6/2+J3:6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		334	1800:1800	696	48.0%	4.9	53.0	7.4
J3:P1	Lane Cove Coxs E	-	N/A	-	C3:7		10	-	- 44160	0.0%	0.0	11.5	0.2
J3:P2	Lane Cove and Coxs South	-	N/A	-	C3:8		10	-	8160	0.1%	0.2	59.8	0.4
J2:P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	- 46560	0.0%	0.0	9.6	0.1
J1:P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	- 8640	0.1%	0.2	58.9	0.4
J1:P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	- 57600	0.0%	0.0	3.2	0.1
J1:P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	- 8640	0.1%	0.2	58.9	0.4
J1:P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	- 46560	0.0%	0.0	9.6	0.1

C1	PRC for Signalled Lanes (%):	5.9
C2	PRC for Signalled Lanes (%):	-20.5
C3	PRC for Signalled Lanes (%):	-2.6
	PRC Over All Lanes (%):	-20.5

Total Delay for Signalled Lanes (pcuHr):	36.56
Total Delay for Signalled Lanes (pcuHr):	25.00
Total Delay for Signalled Lanes (pcuHr):	47.32
Total Delay Over All Lanes(pcuHr):	108.87

Cycle Time (s): 150

ITEM 6 (continued) **ATTACHMENT 1**

Appendix C

GTAconsultants

Saturday Midday Peak – Lane Cove Road

Item	Item Desc	Lne Typ	DI Sim	Flr Pos	Fwd SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	MMQ pcu
J1:1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		570	1800	1144	49.8%	2.6	16.7	12.2
J1:1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		653	1800	1183	55.2%	3.0	16.3	14.2
J1:1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		672	1800	1183	56.8%	3.1	16.6	14.8
J1:3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		573	1800	1311	43.7%	1.8	11.0	8.6
J1:3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		753	1800	1350	55.8%	2.5	11.8	11.7
J1:3/3+J1:3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		781	1800:1800	1357	57.5%	3.3	15.4	7.9
J1:5/1	Bridge Road West Left	U	N/A	N/A	C1:6		74	1800	450	16.4%	0.9	48.9	2.3
J1:5/2+J1:5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		185	1800:1800	310	59.7%	3.5	68.8	6.5
J1:7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		83	1800	321	25.8%	1.3	57.1	2.9
J1:7/2+J1:7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		116	1800:1800	342	34.0%	1.9	59.4	3.4
J2:1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		564	1800	1530	36.9%	0.3	2.2	0.8
J2:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		734	1800	1530	48.0%	0.5	2.4	0.8
J2:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		736	1800	1530	48.1%	0.6	2.8	1.5
J2:1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		88	1800	186	47.3%	2.2	89.7	3.8
J2:4/1	Kent Road West Left	U	N/A	N/A	C2:2		95	1800	321	29.6%	1.5	57.8	3.4
J2:4/2+J2:4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		77	1800:1800	143	53.9%	1.9	86.2	3.4
J2:6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		540	1800	1311	41.2%	0.7	4.4	6.9
J2:6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		690	1800	1350	51.1%	0.9	4.5	12.6
J2:6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		719	1800	1350	53.3%	1.0	5.1	14.2
J3:1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		640	1800	1016	63.0%	4.5	25.4	17.6
J3:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		696	1800	1054	66.0%	4.8	24.6	19.1
J3:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		694	1800	1054	65.8%	4.7	24.5	19.1
J3:2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		595	1800	1414	42.1%	0.8	4.9	4.7
J3:2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		690	1800	1414	48.8%	0.7	3.4	1.5
J3:2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		509	1800	1414	36.0%	0.4	3.0	1.1
J3:2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		214	1800	298	71.8%	4.5	75.5	7.1
J3:6/2+J3:6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		367	1800:1800	638	60.7%	5.4	50.5	7.5
J3:P1	Lane Cove Coxs E	-	N/A	-	C3:7		10	-	41657	0.0%	0.0	12.7	0.2
J3:P2	Lane Cove and Coxs South	-	N/A	-	C3:8		10	-	9771	0.1%	0.1	53.1	0.3
J2:P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46800	0.0%	0.0	8.8	0.1
J1:P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	12343	0.1%	0.1	46.8	0.3
J1:P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	53486	0.0%	0.0	4.8	0.1
J1:P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	12343	0.1%	0.1	46.8	0.3
J1:P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46800	0.0%	0.0	8.8	0.1

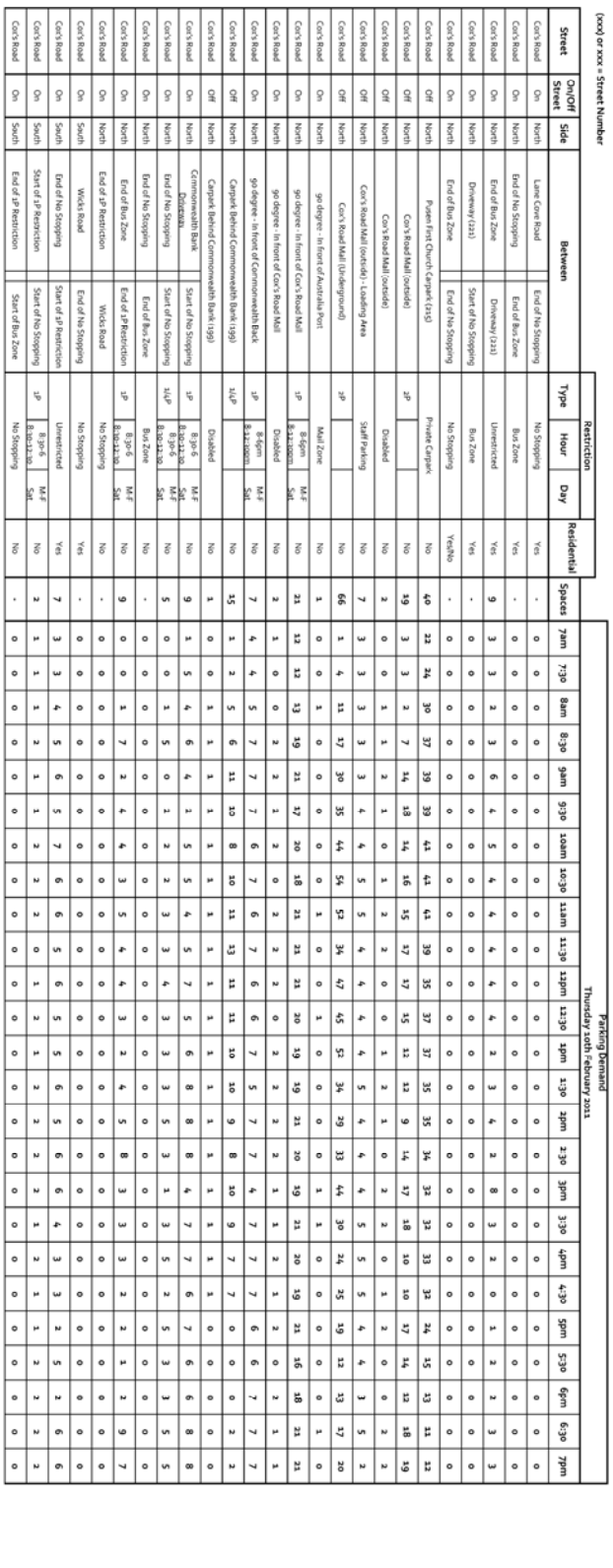
PRC for Signalled Lanes (%):	50.8	Total Delay for Signalled Lanes (pcuHr):	23.98
PRC for Signalled Lanes (%):	67.0	Total Delay for Signalled Lanes (pcuHr):	9.54
PRC for Signalled Lanes (%):	25.4	Total Delay for Signalled Lanes (pcuHr):	25.81
PRC Over All Lanes (%):	25.4	Total Delay Over All Lanes(pcuHr):	59.32
		Cycle Time (s):	140

Appendix D

Inventory and Parking Demand Results

Appendix D

ITEM 6 (continued) **ATTACHMENT 1**



Client ID: I511065
Job Name: Cox's Road Small Centre
Date: 10th February 2011
Weather: Cloudy
(xxx) or xxx = Street Number

Parking Demand
Thursday 10th February 2011

Street	On/Off Street	Side	Between		Restriction Type	Restriction Hour	Restriction Day	Residential	Spaces	7am	7:30	8am	8:30	9am	9:30	10am	10:30	11am	11:30	12pm	12:30	1pm	1:30	2pm	2:30	3pm	3:30	4pm	4:30	5pm	5:30	6pm	6:30	7pm
Cox's Road	On	North	Lane Cove Road	End of No Stopping		No Stopping		Yes	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	North	End of No Stopping	End of Bus Zone		Bus Zone		Yes	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	North	End of Bus Zone	Driveway (121)		Unrestricted		Yes	9	3	3	3	3	4	4	5	4	4	4	4	4	2	3	4	2	8	3	2	0	1	2	2	3	3
Cox's Road	On	North	Driveway (121)	Start of No Stopping		Bus Zone		Yes	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	North	End of Bus Zone	End of No Stopping		No Stopping		Yes/No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	Off	North	Pusen First Church Carpark (115)		2P			No	40	22	24	30	37	39	39	41	41	41	39	35	37	37	35	35	34	32	32	33	32	24	15	13	11	12
Cox's Road	Off	North	Cox's Road Mall (outside)		2P			No	19	3	3	2	7	14	13	14	16	15	17	17	15	11	12	9	14	17	18	10	10	17	14	12	18	19
Cox's Road	Off	North	Cox's Road Mall (outside)	Cox's Road Mall (outside) - Loading Area		Disabled		No	2	0	0	1	1	2	1	0	1	2	2	0	1	2	1	0	2	2	0	1	2	0	0	2	2	2
Cox's Road	Off	North	Cox's Road Mall (underground)			Staff Parking		No	7	3	3	3	3	4	4	5	5	4	4	4	4	4	5	4	4	5	5	5	5	4	4	3	5	2
Cox's Road	Off	North	90 degree - In front of Australia Post		2P			No	66	1	4	11	17	30	35	44	54	52	34	47	45	52	34	29	33	44	30	24	25	19	12	13	17	20
Cox's Road	On	North	90 degree - In front of Cox's Road Mall		1P	Mail Zone		No	1	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0
Cox's Road	On	North	90 degree - In front of Cox's Road Mall		1P	8-6pm 8.30-12.30pm	M-F Sat.	No	21	12	12	13	19	21	17	20	18	21	21	21	20	19	19	21	20	19	21	20	19	21	16	18	21	21
Cox's Road	On	North	90 degree - In front of Commonwealth Bank		1P	Disabled 8-6pm 8.30-12.30pm	M-F Sat.	No	2	1	0	0	2	2	1	2	0	2	2	2	0	2	2	2	1	1	1	2	1	2	0	2	1	1
Cox's Road	Off	North	Carpark Behind Commonwealth Bank (159)		1/4P			No	15	1	2	5	6	11	10	8	10	11	13	11	11	10	10	9	8	10	9	7	7	7	0	0	2	2
Cox's Road	Off	North	Carpark Behind Commonwealth Bank (159)			Disabled		No	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Cox's Road	On	North	Commonwealth Bank Doorways	Start of No Stopping	1P	8.30-6 8.30-12.30	M-F Sat.	No	9	1	5	4	6	4	1	5	5	4	5	7	5	6	8	8	8	4	7	7	6	7	6	6	8	8
Cox's Road	On	North	End of No Stopping	Start of No Stopping	1/4P	8.30-6 8.30-12.30	M-F Sat.	No	5	0	0	1	5	0	1	2	2	3	3	4	3	3	3	5	3	1	3	5	2	5	3	3	5	5
Cox's Road	On	North	End of No Stopping	End of Bus Zone		Bus Zone		No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	North	End of Bus Zone	End of 1P Restriction	1P	8.30-6 8.30-12.30	M-F Sat.	No	9	0	0	1	7	2	4	4	3	5	4	5	4	4	3	2	4	5	8	3	3	3	2	2	1	2
Cox's Road	On	North	End of 1P Restriction	Wicks Road		No Stopping		No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	Wicks Road	End of No Stopping		No Stopping		Yes	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	End of No Stopping	Start of 1P Restriction		Unrestricted		Yes	7	3	3	4	5	6	5	7	6	6	5	6	5	5	6	5	6	6	4	3	3	2	5	2	6	6
Cox's Road	On	South	Start of 1P Restriction	Start of No Stopping	1P	8.30-6 8.30-12.30	M-F Sat.	No	2	1	1	1	2	1	2	2	2	2	0	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2
Cox's Road	On	South	End of 1P Restriction	Start of Bus Zone		No Stopping		No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Parking Inventory and Survey

ITEM 6 (continued)

ATTACHMENT 1

(xxx) or xxx = Street Number

Street	On/Off Street	Side	Between		Restriction: Type	Restriction: Hour	Restriction: Day	Residential	Spaces	Parking Demand Thursday 10th February 2011: 7am	7:30	8am	8:30	9am	9:30	10am	10:30	11am	11:30	12pm	12:30	1pm	1:30	2pm	2:30	3pm	3:30	4pm	4:30	5pm	5:30	6pm	6:30	7pm
Cox's Road	Off	South	Parking behind 132		Customer/Tenant Parking			No	18	0	0	1	1	10	15	12	11	16	17	15	14	16	15	13	13	12	13	12	11	10	9	11	7	9
Cox's Road	Off	South	Parking for 134 + 2 infront		Customer/Staff Parking			No	10	0	2	2	3	3	3	3	4	5	4	2	2	3	5	5	4	3	1	0	0	0	0	0	0	1
Cox's Road	Off	South	Parking behind 136		Customer/Staff Parking			No	15	2	2	7	6	12	12	10	10	11	11	13	12	11	8	10	11	17	16	13	14	14	15	11	6	3
Cox's Road	Off	South	Parking behind 138		Customer/Staff Parking			No	8	0	0	0	0	1	3	4	4	5	5	4	3	4	5	5	6	8	6	7	6	7	7	6	6	7
Cox's Road	On	South	Driveway (138)	Driveway (140-148)	Bus Zone			No	-	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	Off	South	Parking behind 140 + 1 infront		2P	8-6pm	M-F	No	16	2	2	2	3	3	6	6	4	6	6	7	8	6	6	7	7	6	4	4	3	6	6	8	11	11
Cox's Road	Off	South	Parking behind 140		Disabled			No	2	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Cox's Road	Off	South	Parking behind 142-148		2P	8-6pm	M-F	No	29	0	1	1	5	20	12	9	12	8	9	7	12	12	8	13	9	31	8	10	7	10	10	10	22	26
Cox's Road	Off	South	Parking behind 142-148		Disabled			No	2	1	0	0	0	0	1	0	0	2	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	Driveway (140-148)	Entrance to Council Carpark	1P	8:30-6 8:30-12:30	M-F Sat	No	11	2	9	10	9	8	7	8	8	11	11	11	10	10	9	6	11	11	11	10	9	8	6	7	11	11
Cox's Road	Off	South	Council Carpark		2P	8:45-6 6-9	M-F Sat	No	27	6	12	20	26	22	17	12	15	9	14	21	23	19	17	15	15	27	20	21	15	16	20	15	27	27
Cox's Road	Off	South	Council Carpark		Disabled			No	2	0	1	1	0	1	1	0	1	0	1	1	0	2	1	1	0	2	0	1	2	1	1	0	2	1
Cox's Road	On	South	Entrance to Council Carpark	Exit to Council Carpark	No Stopping			No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	Exit to Council Carpark	Start of No Stopping	Taxi Zone			No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Cox's Road	Off	South	St John's Church Carpark (only at Pick-Up section)		Private Carpark			No	11	1	1	1	1	10	5	2	2	3	3	2	2	2	4	2	5	3	2	4	4	2	2	3	3	6
Cox's Road	Off	South	St John's Church (Staff Parking at back)		Private Carpark			No	10	1	1	4	4	5	4	4	4	4	6	6	6	6	6	5	5	5	6	5	5	5	5	5	5	5
Cox's Road	On	South	End of Taxi Zone	Start of No Stopping	No Parking			No	-	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Cox's Road	On	South	End of No Parking	Start of Bus Zone	No Stopping			No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	End of No Stopping	End of Bus Zone	Bus Zone			No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	End of Bus Zone	School Driveway (2)	1P	9:30-2:30pm 8:30-	M-F Sat	No	4	0	0	0	0	0	0	1	1	1	1	0	1	1	1	0	1	2	0	0	0	0	0	0	0	4
Cox's Road	Off	South	School Carpark		Private Carpark			No	14	0	0	0	0	15	2	5	6	6	5	6	4	5	4	5	12	20	4	3	0	0	0	0	9	8
Cox's Road	Off	South	School Carpark		Disabled			No	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Cox's Road	On	South	School Driveway (2)	End of 1P Restriction	1P	8-4pm 8:30-	M-F Sat	No	9	0	0	1	1	0	1	0	0	1	0	1	0	0	0	0	1	5	1	0	0	0	0	0	0	0
Cox's Road	On	South	End of 1P Restriction	Start of No Stopping	Bus Zone			Yes/No	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cox's Road	On	South	End of Bus Zone	Lane Cove Road	No Stopping			Yes	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						Supply			411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	398	398	398	398	398	398	411
						Supply - No Parking (Time Restraint)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	13	13	13	13	-
						Demand				70	95	136	187	260	241	241	259	269	254	267	259	261	241	235	253	312	241	221	198	192	169	162	227	236
						% Occupancy				17%	23%	33%	45%	63%	59%	59%	63%	65%	62%	65%	63%	64%	59%	57%	62%	76%	59%	56%	50%	48%	42%	41%	57%	57%

No Parking 4-7pm

Parking Inventory and Survey

Appendix E

Interview Survey

Appendix E

ITEM 6 (continued) **ATTACHMENT 1**

GTAconsultants

SYDNEY Level 10, 816 Pacific Highway CHATSWOOD NSW 2067 • PO Box 5254 WEST CHATSWOOD NSW 1515 AUSTRALIA • T 02 9406 1900 • F 02 9406 1910 • E sydney@gta.com.au

Purpose of the Survey
GTA Consultants is currently undertaking a study of the Coxs Road shopping centre on behalf of City of Ryde.
As part of the study we are undertaking surveys to gather information on travel patterns and parking.
The survey data will be used to look at ways of improving the traffic flow along Coxs Road and will also be used to assist the future planning of the Coxs Road shopping centre.

Survey No.: ☐ Survey Day Sat 12/2/11 Tue 15/2/11

Time: _____

My name is _____ and I am conducting a short survey on behalf of the City of Ryde Could you please help in answering a few questions? It will only take a minute or two.

Q1 Where have you come from today?

Suburb _____ 1

OR

Postcode _____ 2

Ask question if person is local to Cox's Road (i.e. North Ryde or Postcode 2113)

Otherwise proceed to Q3

Q2 Could you indicate on this map approximately where you have come from?

Zone Number ☐ 3

Q3 What is your reason for visiting Coxs Road today? (could be more than one)

Shopping ☐ 4

Dropping off / picking up kids at school ☐ 5

Work ☐ 6

Education ☐ 7

Recreation/Social (Café/Restaurant) meeting friends, etc) ☐ 8

Church ☐ 9

Other (please specify) _____ 10

Q4 What mode of transport did you use to get to Coxs Road today?

Car (Drove) ☐ 11

Car (dropped off) ☐ 12

Bus ☐ 13

Train ☐ 14

Bicycle ☐ 15

Walk ☐ 16

Other ☐ 17

If they came by car continue with Qs 5-8, otherwise, THANK YOU FOR YOUR COOPERATION

Q5 From what direction have you come from?

Use map to get them to show approximate direction or ask and point

North ☐ 18

South ☐ 19

East ☐ 20

West ☐ 21

Q7 Did you park on or off street today?

On-Street ☐ Off-Street ☐ 22

Q6 How long do you intend on staying for this visit today?

less than an hour ☐ 23

1 to 2 hours ☐ 24

2 to 3 hours ☐ 25

3 to 4 hours ☐ 26

4 to 6 hours ☐ 27

6 to 8 hours ☐ 28

more than 8 hours ☐ 29

Q8 How would you rate finding a car park at Coxs Road?

Easy ☐ 30

Average ☐ 31

Difficult ☐ 32

THANK YOU FOR YOUR COOPERATION

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ITEM 6 (continued) **ATTACHMENT 1**

Cox's Road Interview Survey Results
Thursday - 17/02/2011

		Q1		Q2	Q3								Q4					
No	Time	1 Origin	2 Postcode	3 Zone	4 Shopping	5 Dropping Off/ Pick Up	6 Work	7 Education	8 Recreational/ Social	9 Church	10 Other	11 Drove	12 Dropped Off	13 Bus	14 Train	15 Bicycle	16 Walk	17 Other
1	12:05	North Ryde	2113	3	1							1					1	
2	12:08	North Ryde	2113	9														
3	12:10	Macquarie Park	2113			1			1			1						
4	12:15	Macquarie Park	2113														1	
5	12:17	North Ryde	2113	4	1							1						
6	12:19	North Ryde	2113	4							1	1						
7	12:24	North Ryde	2113	3								1						
8	12:30	North Ryde	2113	6	1							1						
9	12:35	North Ryde	2113	3	1				1			1						
10	12:37	Gerrale Coast	2113	7	1							1						
11	12:41	North Ryde	2113	10	1							1						
12	12:45	North Ryde	2113	4	1				1			1						
13	12:48	North Ryde	2119				1					1						
14	12:49	Beecroft	2192									1						
15	12:53	Normmead	2192				1					1						
16	12:55	Chelenham	2119									1						
17	1:00	Macquarie Park	2113				1					1						
18	1:05	Ryde	2112		1							1		1				
19	1:08	Ryde	2112		1							1						
20	1:09	Central Coast			1							1						
21	1:15	North Ryde	2113	7	1							1						
22	1:19	Dundas	2117				1					1						
23	1:21	Lane Cove	2066		1							1						
24	1:26	Eastwood	2122		1							1						
25	1:30	Ryde	2112		1							1					1	
26	1:30	Ryde	2112		1							1						
27	1:33	Eastwood	2122		1							1					1	
28	1:35	North Ryde	2113		1							1						
29	1:43	Hunters Hill	2110		1							1						
30	1:45	Ryde	2112		1							1						
31	1:52	East Ryde	2113						1			1						
32	1:57	North Epping	2121		1							1						
					25	1	1	0	4	0	1	28	0	1	0	0	3	0
					78.13%	3.13%	3.13%	0.00%	12.50%	0.00%	3.13%	87.50%	0.00%	3.13%	0.00%	0.00%	9.38%	0.00%

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ITEM 6 (continued) **ATTACHMENT 1**

Cox's Road Interview Survey Results
Thursday - 17/02/2011

No	Time	Q1		Q5			Q6		Q7							Q8	
		1 Origin	2 Postcode	18 North	19 South	20 East	21 West	22-On On-Street	22-Off Off-Street	23 Less than 1hr	24 1-2hrs	25 2-3hrs	26 3-4hrs	27 4-5hrs	28 5-6hrs	29 more than 6hrs	30 Easy	31 Average	32 Difficult
1	12:05	North Ryde	2113	1					1	1								1	
2	12:08	North Ryde	2113																
3	12:10	Abbotsleigh	2046	1					1	1								1	
4	12:15	Macquarie Park	2113	1				1		1								1	
5	12:17	North Ryde	2113																
6	12:19	North Ryde	2113				1		1									1	
7	12:24	North Ryde	2113	1		1		1		1							1		
8	12:30	North Ryde	2113					1		1							1		
9	12:35	North Ryde	2113			1			1	1								1	
10	12:37	Central Coast																	
11	12:41	North Ryde	2113						1	1									1
12	12:45	North Ryde	2113		1			1		1								1	
13	12:46	North Ryde	2113	1					1	1							1		
14	12:48	Boorooll	2119				1		1		1								1
15	12:53	North Ryde	2113			1			1	1							1		
16	12:55	Cheltenham	2119			1			1	1							1		
17	1:00	Macquarie Park	2113						1	1									1
18	1:05	Ryde	2112			1		1		1							1		
19	1:08	Ryde	2112	1				1		1								1	
20	1:09	Central Coast																	
21	1:15	North Ryde	2113	1					1	1		1						1	
22	1:19	Ryde	2112			1									1				1
23	1:21	Dural	2158				1	1		1								1	
24	1:26	Eastwood	2122					1			1						1		
25	1:28	Marsfield	2122	1				1		1							1		
26	1:30	Ryde	2112						1										
27	1:33	Eastwood	2122	1				1		1								1	
28	1:35	North Ryde	2113			1		1		1								1	
29	1:45	Hornsby Hts	2159	1				1		1							1		
30	1:45	Ryde	2112				1	1		1									1
31	1:52	East Ryde	2113			1			1	1									1
32	1:57	North Epping	2121	1					1	1									1
				11	1	10	4	13	15	23	3	1	0	0	1	0	8	9	11
				42.31%	3.85%	38.46%	15.38%	48.15%	55.56%	82.14%	10.71%	3.57%	0.00%	0.00%	3.57%	0.00%	28.57%	32.14%	39.29%

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ITEM 6 (continued) **ATTACHMENT 1**

Cox's Road Interview Survey Results
Saturday - 17/02/2011

	Q1		Q2	Q3									Q4					
N.o	Time	1 Origin	2 Postcode	3 Zone	4 Shopping	5 Dropping Off/Pick Up	6 Work	7 Education	8 Recreational/Social	9 Church	10 Other	11 Drove	12 Dropped Off	13 Bus	14 Train	15 Bicycle	16 Walk	17 Other
1	12:08	Forsiter	2428								1	1						
2	12:12	Denistone East	2112		1													1
3	12:14	Ryde	2112						1									
4	12:16	North Ryde	2113	9			1					1						
5	12:20	Ryde	2112				1					1						
6	12:23	North Ryde	2113	6			1					1					1	
7	12:26	Tumbi Umbi	2261								1	1						
8	12:31	Parramatta	2145	7	1		1					1		1				
9	12:34	North Ryde	2113	1					1									
10	12:36	North Ryde	2113	7								1						
11	12:37	North Ryde	2113		1				1			1					1	
12	12:45	East Ryde	2113															
13	12:49	Marsfield	2122						1			1						
14	12:52	North Ryde	2113	5	1												1	
15	1:00	North Ryde	2113	10	1							1						
16	1:13	Lane Cove	2066		1							1						
17	1:18	North Ryde	2113	5	1							1						
18	1:37	East Ryde	2113		1						1	1						
19	1:40	North Ryde	2113	6	1													
20	1:50	Hunters Hill	2110		1													
21	1:53	North Ryde	2113	11	1			1				1						
22	1:57	North Ryde	2113	4	1							1						
23	2:00	North Ryde	2113															
					13 56.52%	0 0.00%	3 13.04%	1 4.35%	4 17.39%	0 0.00%	3 13.04%	19 82.61%	0 0.00%	1 4.35%	0 0.00%	0 0.00%	2 8.70%	1 4.35%

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ITEM 6 (continued) **ATTACHMENT 1**

Cox's Road Interview Survey Results
Saturday - 17/02/2011

	Q1		Q5				Q6		Q7						Q8		Q9	
N.o	Time	1 Origin	2 Postcode	18 North	19 South	20 East	21 West	22-On Street	22-Off Street	Less than 1hr	1-2hrs	2-3hrs	3-4hrs	4-6hrs	6-8hrs	more than 8hrs	Easy	Average	Difficult
1	12:08	Forsiter	2428				1	1	1	1							1		
2	12:12	Denistone East	2112				1	1		1							1		
3	12:14	Ryde	2112																
4	12:16	North Ryde	2113			1		1	1	1					1			1	
5	12:20	Ryde	2112	1					1	1								1	
6	12:23	North Ryde	2113	1					1	1	1							1	
7	12:26	Tumbi Umbi	2261	1					1	1					1				1
8	12:31	Parramatta	2145				1		1										1
9	12:34	North Ryde	2113																
10	12:36	North Ryde	2113				1	1		1									1
11	12:37	North Ryde	2113																
12	12:45	East Ryde	2113					1	1	1							1		
13	12:49	Mansfield	2122				1		1	1							1		
14	12:52	North Ryde	2113						1	1								1	
15	1:00	North Ryde	2113		1				1	1								1	
16	1:13	Lane Cove	2066			1		1	1	1							1		
17	1:18	North Ryde	2113	1					1	1									1
18	1:37	East Ryde	2113			1		1			1								1
19	1:40	North Ryde	2113						1	1							1		
20	1:50	Hunters Hill	2110		1			1		1								1	
21	1:53	North Ryde	2113	1				1	1	1							1		
22	1:57	North Ryde	2113	1	1			1	1	1								1	
23	2:00	North Ryde	2113						1	1								1	
				7	3	4	5	9	10	13	4	0	0	0	2	0	7	3	9
				36.84%	15.79%	21.05%	26.32%	47.37%	52.63%	68.42%	21.05%	0.00%	0.00%	0.00%	10.53%	0.00%	36.84%	15.79%	47.37%

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Appendix F

Modelling Scenario Results

Appendix F

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

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Modelling Scenario 1B - Base Case at 2021 – Coxs / Wicks

LANE SUMMARY

Site: MS1B-Base 2021 - Thurs PM

IS11061
Coxs Road - Wicks Road
MS1B-Base 2021
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows					Deg. Sat'n	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	St. Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)																
Lane 1	46	347	0	392	2.0	374	1.048	100	130.1	LOS F	38.2	272.2	500	-	0.0	0.0
Lane 2	0	273	124	397	2.0	379	1.048	100	131.4	LOS F	38.6	275.2	500	-	0.0	0.0
Approach	46	620	124	790	2.0		1.048	100	130.8	LOS F	38.6	275.2				
East: Coxs Road (E)																
Lane 1	125	225	0	350	2.0	576	0.608	100	39.3	LOS C	18.4	130.8	500	-	0.0	0.0
Lane 2	0	4	53	57	2.0	94	0.608	100	70.1	LOS E	4.9	34.8	60	Turn Bay	0.0	0.0
Approach	125	229	53	407	2.0		0.608		43.6	LOS D	18.4	130.8				
North: Wicks Road (N)																
Lane 1	52	653	0	705	2.0	662	1.065	100	127.3	LOS F	70.9	504.8	500	-	0.0	5.9
Lane 2	0	570	141	711	2.0	667	1.065	100	128.1	LOS F	71.4	508.3	500	-	0.0	6.5
Approach	52	1223	141	1416	2.0		1.065		127.7	LOS F	71.4	508.3				
West: Coxs Road (W)																
Lane 1	88	241	0	329	2.0	329[1]	1.000[3]	99[5]	423[6]	LOS C[6]	162[6]	115.3[6]	65	Parking	0.0	50.0
Lane 2	0	351	67	417	2.0	411	1.015	100	109.0	LOS F	37.6	269.5	500	-	0.0	0.0
Approach	241	439	67	746	2.0		1.015		79.6	LOS F	37.8	269.5				
Intersection				3358	2.0		1.065		107.5	LOS F	71.4	508.3				

Level of Service (Aver. Int. Delay): LOS F. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS F. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1. Reduced capacity due to a short lane effect
3. x = 1.00 due to short lane.
5. Lane under-utilisation determined by program
6. Delay, queue length and stops for the short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

ITEM 6 (continued) **ATTACHMENT 1**

PHASING SUMMARY

Site: MS1B-Base 2021 - Thurs PM

IS1106
Coxs Road - Wicks Road
MS1B-Base 2021
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Three phase
Input Sequence: A, C, B
Output Sequence: A, C, B

Phase Timing Results

Phase	A	C	B
Green Time (sec)	42	39	24
Yellow Time (sec)	3	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	47	44	29
Phase Split	39 %	37 %	24 %

Phase A

Phase C

Phase B

Normal Movement
Slip-Lane Movement
Stopped Movement
Turn On Red
Permitted/Opposed
Opposed Slip-Lane
Continuous Movement
Undetected Movement
Phase Transition Applied

Appendix F

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IS1106
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

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Modelling Scenario 1B – Base Case at 2021 – Lane Cove Road

Item	Item Desc	Lne Typ	Ctl Stm	Rte Pos	Ful SG	Arr SG	Flw pcu	Sat Flow pcu/hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	Dly pcu	MMQ pcu
J1:1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		653	1800	1140	57.3%	3.5	19.5	16.3	
J1:1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		710	1800	1176	60.4%	3.7	18.7	17.5	
J1:1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		725	1800	1176	61.6%	3.8	19.1	18.3	
J1:3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		966	1800	1416	68.2%	3.5	12.9	16.2	
J1:3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1129	1800	1452	77.8%	4.7	15.0	18.3	
J1:3/3+J1:3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		972	1800:1800	1138	85.4%	7.6	28.1	13.1	
J1:5/1	Bridge Road West Left	U	N/A	N/A	C1:6		48	1800	468	10.3%	0.6	46.5	1.6	
J1:5/2+J1:5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		190	1800:1800	238	79.9%	5.3	100.6	9.1	
J1:7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		147	1800	220	64.5%	3.4	84.0	6.7	
J1:7/2+J1:7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		153	1800:1800	233	65.6%	3.6	85.9	6.8	
J2:1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		936	1800	1500	62.4%	1.3	5.0	4.4	
J2:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1118	1800	1500	74.5%	1.5	5.0	2.1	
J2:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		948	1800	1500	63.2%	1.0	3.7	1.7	
J2:1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		180	1800	164	109.6%	17.1	342.3	20.4	
J2:4/1	Kent Road West Left	U	N/A	N/A	C2:2		100	1800	348	28.7%	1.6	58.9	3.8	
J2:4/2+J2:4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		68	1800:1800	181	37.5%	1.5	78.4	2.9	
J2:6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		573	1800	1296	44.2%	0.5	3.3	1.2	
J2:6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		731	1800	1332	54.9%	0.9	4.2	1.9	
J2:6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		763	1800	1332	57.3%	1.0	4.7	2.5	
J3:1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1052	1800	1080	97.4%	19.1	65.4	52.7	
J3:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1086	1800	1116	97.3%	18.8	62.5	53.7	
J3:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1083	1800	1116	97.0%	18.3	61.0	53.2	
J3:2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		617	1800	1464	42.1%	0.8	5.0	4.8	
J3:2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		731	1800	1464	49.9%	0.6	2.9	1.1	
J3:2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		553	1800	1464	37.8%	0.4	2.5	0.7	
J3:2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		213	1800	288	74.0%	4.7	79.3	8.0	
J3:6/2+J3:6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		363	1800:1800	670	54.2%	5.5	54.5	8.2	
J3:P1	Lane Cove and Coxs E	-	N/A	-	C3:7		10	-	44160	0.0%	0.0	11.5	0.2	
J3:P2	Lane Cove and Coxs South	-	N/A	-	C3:8		10	-	8160	0.1%	0.2	59.8	0.4	
J2:P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46560	0.0%	0.0	9.6	0.1	
J1:P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	9840	0.1%	0.2	58.9	0.4	
J1:P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	57600	0.0%	0.0	3.2	0.1	
J1:P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4	
J1:P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1	

C1	PRC for Signalled Lanes (%):	5.4	Total Delay for Signalled Lanes (pcuHr): 39.84
C2	PRC for Signalled Lanes (%):	-21.8	Total Delay for Signalled Lanes (pcuHr): 26.43
C3	PRC for Signalled Lanes (%):	-8.2	Total Delay for Signalled Lanes (pcuHr): 68.29
	PRC Over All Lanes (%):	-21.8	Total Delay Over All Lanes(pcuHr): 134.56 Cycle Time (s): 150

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 2A/5A - Thursday PM Peak Existing + Masterplan – Coxs / Wicks

LANE SUMMARY

Site: MS2A-Post Full MP - Thurs PM

IS11061
Coxs Road - Wicks Road
MS2A-Full MP Post Dev
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows			HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	St. Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total %	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)															
Lane 1	56	306	0	362 2.0	356	1.019	100	111.2	LOS F	32.6	232.3	500	-	0.0	0.0
Lane 2	0	258	113	370 2.0	363	1.019	100	111.9	LOS F	33.2	236.7	500	-	0.0	0.0
Approach	56	564	113	732 2.0		1.019		111.6	LOS F	33.2	236.7				
East: Coxs Road (E)															
Lane 1	114	269	0	383 2.0	629	0.609	100	38.8	LOS C	19.5	138.8	500	-	0.0	0.0
Lane 2	0	11	46	59 2.0	97	0.609	100	69.1	LOS E	5.0	35.7	60	Turn Bay	0.0	0.0
Approach	114	280	46	442 2.0		0.609		41.1	LOS C	19.5	138.8				
North: Wicks Road (N)															
Lane 1	47	618	0	664 2.0	631	1.053	100	119.5	LOS F	64.4	458.8	500	-	0.0	0.0
Lane 2	0	494	173	667 2.0	633	1.053	100	120.9	LOS F	64.6	460.2	500	-	0.0	0.0
Approach	47	1111	173	1331 2.0		1.053		120.2	LOS F	64.6	460.2				
West: Coxs Road (W)															
Lane 1	261	62	0	344 2.0	344[4]	1.000[3]	95[5]	40.5[3]	LOS C[3]	16.2[3]	115.3[3]	65	Parking	0.0	50.0
Lane 2	0	394	72	466 2.0	442	1.055	100	134.7	LOS F	47.0	334.8	500	-	0.0	0.0
Approach	261	476	72	809 2.0		1.055		94.7	LOS F	47.0	334.8				
Intersection				3315 2.0		1.055		101.5	LOS F	64.6	460.2				

Level of Service (Aver. Int. Delay): LOS F. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS F. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect
3 x = 1.00 due to short lane
5 Lane under-utilisation determined by program
8 Delay, queue length and stops for the short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

ITEM 6 (continued) **ATTACHMENT 1**

PHASING SUMMARY

Site: MS2A-Post Full MP - Thurs PM

IS11061
Coxs Road - Wicks Road
MS2A-Full MP Post Dev
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Three-phase
Input Sequence: A, C, B
Output Sequence: A, C, B

Phase Timing Results

Phase	A	C	B
Green Time (sec)	40	42	23
Yellow Time (sec)	3	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	45	47	28
Phase Split	38 %	39 %	23 %

Phase A
Wicks Road (N)
Coxs Road (W)
Wicks Road (S)
Coxs Road (E)

Phase C
Wicks Road (N)
Coxs Road (W)
Wicks Road (S)
Coxs Road (E)

Phase B
Wicks Road (N)
Coxs Road (W)
Wicks Road (S)
Coxs Road (E)

Normal Movement
Slip-Lane Movement
Stopped Movement
Turn On Red
Permitted/Opposed
Opposed Slip-Lane
Continuous Movement
Undetected Movement
Phase Transition Applied

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

Appendix F

GTAconsultants

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

Modelling Scenario 2A/5A - Thursday PM Peak Existing + Masterplan – Lane Cove Road

†	Item	Item Desc	Lane Typ	Dir Sim	Rte Fac	Fol SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	MMQ pcu
	J1:1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		606	1800	1140	53.2%	3.1	18.6	14.4
	J1:1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		668	1800	1176	56.8%	3.3	17.9	15.9
	J1:1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		684	1800	1176	58.2%	3.5	18.2	16.5
	J1:3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		944	1800	1416	66.7%	3.0	11.5	14.7
	J1:3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1122	1800	1452	77.3%	4.3	13.9	17.1
	J1:3/3+J1:3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		864	1800:1800	973	87.8%	7.7	32.3	12.0
	J1:5/1	Bridge Road West Left	U	N/A	N/A	C1:5		55	1800	468	11.8%	0.7	46.7	1.8
	J1:5/2+J1:5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		191	1800:1800	238	80.3%	5.4	101.2	9.2
	J1:7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		148	1800	228	64.9%	3.5	84.3	6.7
	J1:7/2+J1:7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		153	1800:1800	233	65.7%	3.7	85.9	6.8
	J2:1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		902	1800	1500	60.1%	1.4	5.5	5.4
	J2:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1106	1800	1500	73.7%	1.6	5.1	2.8
	J2:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		846	1800	1500	56.4%	0.7	3.0	1.2
	J2:1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		209	1800	167	125.4%	31.8	547.9	35.5
	J2:4/1	Kent Road West Left	U	N/A	N/A	C2:2		110	1800	340	33.9%	2.0	60.0	4.5
	J2:4/2+J2:4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		71	1800:1800	182	39.1%	1.5	78.4	3.0
	J2:6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		524	1800	1296	40.4%	0.5	3.3	1.2
	J2:6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		695	1800	1332	52.2%	0.8	4.2	2.0
	J2:6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		723	1800	1332	54.3%	0.9	4.7	2.5
	J3:1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1016	1800	1080	94.1%	14.4	50.9	45.2
	J3:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1048	1800	1116	93.9%	14.0	48.2	46.1
	J3:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1025	1800	1116	91.8%	12.2	43.0	42.7
	J3:2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		587	1800	1464	40.1%	0.9	5.5	5.5
	J3:2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		695	1800	1464	47.5%	0.5	2.8	1.0
	J3:2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		496	1800	1464	33.9%	0.3	2.3	0.6
	J3:2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		232	1800	288	80.6%	5.7	89.0	9.3
	J3:4/2+J3:4/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		416	1800:1800	608	60.5%	6.5	56.0	9.6
	J3:P1	Lane Cove Coxs E	-	N/A	-	C3:7		10	-	44160	0.0%	0.0	11.5	0.2
	J3:P2	Lane Cove and Coxs South	-	N/A	-	C3:8		10	-	8160	0.1%	0.2	59.8	0.4
	J2:P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46560	0.0%	0.0	9.6	0.1
	J1:P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	8640	0.1%	0.2	58.9	0.4
	J1:P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	57600	0.0%	0.0	3.2	0.1
	J1:P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4
	J1:P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1

C1	PRC for Signalled Lanes (%):	2.5
C2	PRC for Signalled Lanes (%):	-39.3
C3	PRC for Signalled Lanes (%):	-4.5
	PRC Over All Lanes (%):	-39.3

Total Delay for Signalled Lanes (pcuHr):	38.09
Total Delay for Signalled Lanes (pcuHr):	41.19
Total Delay for Signalled Lanes (pcuHr):	54.57
Total Delay Over All Lanes(pcuHr):	133.86
Cycle Time (s):	150

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 3A and 4A - Road Network Option 1 and 2 – Coxs / Wicks

LANE SUMMARY

Site: MS3A/4A-Post Full MP Thurs PM Opt 1/2

IS11061
Coxs Road - Wicks Road
MS3A/4A-Post Full MP Road Network Opt 1/2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block:
	L veh/h	T veh/h	R veh/h	Total veh/h	HV %	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)																
Lane 1	56	306	0	362	2.0	356	1.019	100	111.2	LOS F	32.6	232.3	500	-	0.0	0.0
Lane 2	0	258	113	370	2.0	363	1.019	100	111.9	LOS F	33.2	236.7	500	-	0.0	0.0
Approach	56	564	113	732	2.0		1.019		111.6	LOS F	33.2	236.7				
East: Coxs Road (E)																
Lane 1	114	271	0	385	2.0	614	0.627	100	37.7	LOS C	19.9	141.3	500	-	0.0	0.0
Lane 2	0	9	48	57	2.0	90	0.627	100	70.6	LOS F	4.9	34.8	60	Turn Bay	0.0	0.0
Approach	114	280	48	442	2.0		0.627		42.0	LOS C	19.9	141.3				
North: Wicks Road (N)																
Lane 1	47	608	0	655	2.0	647	1.013	100	91.8	LOS F	56.7	403.3	500	-	0.0	0.0
Lane 2	0	519	141	659	2.0	651	1.013	100	82.6	LOS F	57.0	405.6	500	-	0.0	0.0
Approach	47	1127	141	1315	2.0		1.013		92.3	LOS F	57.0	405.6				
West: Coxs Road (W)																
Lane 1	229	97	0	326	2.0	333[1]	0.980	100	42.7[2]	LOS D[2]	16.2[2]	115.3[2]	65	Parking	0.0	50.0
Lane 2	0	379	56	435	2.0	444	0.980	100	68.1	LOS F	35.7	253.8	500	-	0.0	0.0
Approach	229	476	56	761	2.0		0.980		66.6	LOS E	35.7	253.8				
Intersection				3250	2.0		1.019		64.3	LOS F	57.0	405.6				

Level of Service (Aver. Int. Delay): LOS F. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS F. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect
2 Delay, queue length and stops for the short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

PHASING SUMMARY

Site: MS3A/4A-Post Full MP Thurs PM Opt 1/2

IS11061
Coxs Road - Wicks Road
MS3A/4A-Post Full MP Road Network Opt 1/2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User Given Cycle Time)

Phase times determined by the program
Sequence: Three-phase
Input Sequence: A, C, B
Output Sequence: A, C, B

Phase Timing Results

Phase	A	C	B
Green Time (sec)	41	41	23
Yellow Time (sec)	3	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	46	46	28
Phase Split	38 %	38 %	23 %

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

Modelling Scenario 3A/4A/7A-Future Road Network Option 1 and 2 – Lane Cove Road

Item	Item Desc	Lne Typ	Ctl Stm	Fte Pos	Fwd SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Dsg Sat	TDly pcuh	Dly s/pcu	Dly MMQ pcu
J1:1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1	606	1800	1140	53.2%	3.1	18.6	14.4
J1:1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1	667	1800	1176	56.7%	3.3	17.8	15.8
J1:1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1	685	1800	1176	58.2%	3.5	18.2	16.5
J1:3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2	956	1800	1416	67.5%	3.1	11.8	14.9
J1:3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2	1116	1800	1452	76.9%	4.2	13.6	16.9
J1:3/3+J1:3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3	848	1800:1800	966	87.8%	7.6	32.1	12.0
J1:5/1	Bridge Road West Left	U	N/A	N/A	C1:6	55	1800	468	11.8%	0.7	46.7	1.8
J1:5/2+J1:5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4	191	1800:1800	238	80.3%	5.4	101.2	9.2
J1:7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5	148	1800	228	64.9%	3.5	84.3	6.7
J1:7/2+J1:7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11	153	1800:1800	233	65.7%	3.7	85.9	6.8
J2:1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4	917	1800	1500	61.1%	1.3	5.1	4.6
J2:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4	1097	1800	1500	73.1%	1.5	5.0	2.6
J2:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4	840	1800	1500	56.0%	0.7	3.1	1.3
J2:1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3	210	1800	157	126.0%	32.4	555.5	36.1
J2:4/1	Kent Road West Left	U	N/A	N/A	C2:2	118	1800	348	33.9%	2.0	60.0	4.5
J2:4/2+J2:4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5	71	1800:1800	102	39.1%	1.5	70.4	3.0
J2:6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1	525	1800	1296	40.5%	0.5	3.4	1.2
J2:6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1	694	1800	1332	52.1%	0.8	4.2	2.0
J2:6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1	723	1800	1332	54.3%	0.9	4.6	2.5
J3:1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6	1009	1800	1080	93.4%	13.7	49.0	44.2
J3:1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1	1042	1800	1116	93.4%	13.5	46.6	45.1
J3:1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1	1016	1800	1116	91.0%	11.7	41.3	41.3
J3:2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4	568	1800	1464	40.2%	0.9	5.5	5.5
J3:2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4	694	1800	1464	47.4%	0.5	2.8	1.0
J3:2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4	496	1800	1464	33.9%	0.3	2.3	0.6
J3:2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3	232	1800	288	80.6%	5.7	89.0	9.3
J3:4/2+J3:6/1	Coxs Road East Left/Right	U	N/A	N/A	C3:2 C3:5	398	1800:1800	595	66.9%	6.5	58.5	9.2
J3:P1	Lane Cove Coxs E	-	N/A	-	C3:7	10	-	44160	0.0%	0.0	11.5	0.2
J3:P2	Lane Cove and Coxs South	-	N/A	-	C3:8	10	-	8160	0.1%	0.2	59.8	0.4
J2:P1	Lane Cove and Kent West	-	N/A	-	C2:6	10	-	46560	0.0%	0.0	9.6	0.1
J1:P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8	10	-	8640	0.1%	0.2	58.9	0.4
J1:P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10	10	-	57600	0.0%	0.0	3.2	0.1
J1:P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7	10	-	8640	0.1%	0.2	58.9	0.4
J1:P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9	10	-	46560	0.0%	0.0	9.6	0.1

C1	PRC for Signalled Lanes (%):	2.5	Total Delay for Signalled Lanes (pcuHr): 38.03
C2	PRC for Signalled Lanes (%):	-40.0	Total Delay for Signalled Lanes (pcuHr): 41.66
C3	PRC for Signalled Lanes (%):	-3.8	Total Delay for Signalled Lanes (pcuHr): 52.84
	PRC Over All Lanes (%):	-40.0	Total Delay Over All Lanes(pcuHr): 132.54 Cycle Time (s): 150

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 5A – Coxs / Wicks Improvements + Masterplan – Coxs / Wicks

LANE SUMMARY

Site: MS5A-Post Full MP - Thurs PM Int W L+R SL

IS11061
Coxs Road - Wicks Road
MS5A-Full MP Post Dev - W L+R SL
GTA Consultants Option 1
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total %	HV veh/h	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)																
Lane 1	56	306	0	362	2.0	850	0.426	100	24.4	LOS B	15.5	110.1	500	–	0.0	0.0
Lane 2	0	258	113	370	2.0	869	0.426	100	25.5	LOS B	15.7	112.1	500	–	0.0	0.0
Approach	56	564	113	732	2.0		0.426		25.0	LOS B	15.7	112.1				
East: Coxs Road (E)																
Lane 1	114	200	0	314	2.0	811	0.387	100	25.4	LOS B	13.5	96.0	500	–	0.0	0.0
Lane 2	0	80	46	128	2.0	331[1]	0.387	100	36.8	LOS C	7.4	52.9	80	Turn Bay	0.0	0.0
Approach	114	280	46	442	2.0		0.387		28.7	LOS C	13.5	96.0				
North: Wicks Road (N)																
Lane 1	47	618	0	664	2.0	867	0.766	100	24.4	LOS B	28.6	203.8	500	–	0.0	0.0
Lane 2	0	494	173	667	2.0	871	0.766	100	25.8	LOS B	28.7	204.5	500	–	0.0	0.0
Approach	47	1111	173	1331	2.0		0.766		25.1	LOS B	28.7	204.5				
West: Coxs Road (W)																
Lane 1	261	0	0	261	2.0	341[1]	0.767	100	36.8	LOS C	12.8	91.4	60	Turn Bay	0.0	31.9
Lane 2	0	476	0	476	2.0	882	0.540	100	24.9	LOS B	20.7	147.6	65	–	0.0	77.3
Lane 3	0	0	72	72	2.0	259[1]	0.278	100	40.0	LOS C	4.4	31.1	60	Turn Bay	0.0	0.0
Approach	261	476	72	809	2.0		0.767		30.1	LOS C	20.7	147.6				
Intersection				3315	2.0		0.767		26.8	LOS B	28.7	204.5				

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS C. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect

ITEM 6 (continued) **ATTACHMENT 1**

PHASING SUMMARY

Site: MS5A-Post Full MP - Thurs PM Int W L+R SL

IS11061
Coxs Road - Wicks Road
MS5A-Full MP Post Dev - W L+R SL
GTA Consultants Option 1
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	55	55
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	60	60
Phase Split	50 %	50 %

Appendix F

GTAconsultants

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 5B – 2021 + Coxs / Wicks Improvements + Masterplan – Coxs / Wicks

LANE SUMMARY

Site: MS5B-Post Full MP 2021 - Thurs PM - WL+RSL

IS11061
Coxs Road - Wicks Road
MS5B-2021 + MP + Works

Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows			HV	Cap.	Deg. Satn	Lane Util	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total %	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)															
Lane 1	56	340	0	396 2.0	853	0.465	100	24.9	LOS B	17.0	121.1	500	–	0.0	0.0
Lane 2	0	280	124	404 2.0	869	0.465	100	26.1	LOS B	17.3	123.0	500	–	0.0	0.0
Approach	56	620	124	800 2.0		0.465		25.5	LOS B	17.3	123.0				
East: Coxs Road (E)															
Lane 1	125	219	0	344 2.0	811	0.424	100	25.9	LOS B	14.8	105.5	500	–	0.0	0.0
Lane 2	0	82	53	135 2.0	318[1]	0.424	100	40.0	LOS C	8.1	57.7	80	Turn Bay	0.0	0.0
Approach	125	301	53	479 2.0		0.424		29.9	LOS C	14.8	105.5				
North: Wicks Road (N)															
Lane 1	52	677	0	729 2.0	867	0.840	100	28.6	LOS C	35.9	255.3	500	–	0.0	0.0
Lane 2	0	548	185	732 2.0	871	0.840	100	29.9	LOS C	36.0	256.2	500	–	0.0	0.0
Approach	52	1223	185	1460 2.0		0.840		29.3	LOS C	36.0	256.2				
West: Coxs Road (W)															
Lane 1	283	0	0	283 2.0	341[1]	0.832	100	46.2[8]	LOS D[8]	15.1[8]	107.8[8]	60	Turn Bay	0.0	50.0
Lane 2	0	516	0	516 2.0	862	0.594	100	25.6	LOS B	22.6	162.6	500	–	0.0	0.0
Lane 3	0	0	78	78 2.0	252[1]	0.310	100	42.0	LOS C	4.9	34.6	60	Turn Bay	0.0	0.0
Approach	283	516	78	877 2.0		0.832		33.7	LOS C	22.8	162.6				
Intersection				3617 2.0		0.840		29.6	LOS C	36.0	256.2				

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS D. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect
8 Delay, queue length and stops for the short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

PHASING SUMMARY

Site: MS5B-Post Full MP 2021 - Thurs PM - WL+RSL

IS11061
Coxs Road - Wicks Road
MS5B-2021 + MP + Works

Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	55	55
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	60	60
Phase Split	50 %	50 %

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 5B – 2021 + Coxs / Wicks Improvements + MP – Lane Cove Road

Appendix F

GTAconsultants

Item	Item Desc	Lane Typ	Dir Stm	Rte Pos	Ful SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	MMQ pcu
– J1: Lane Cove Road, Bridge Road and Twin Road	-	-	N/A	-	-	-	-	-	-	88.6%	41.5	-	-
1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:11		655	1800	1140	57.5%	3.6	19.6	16.3
1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:11		712	1800	1176	60.5%	3.7	18.8	17.8
1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:11		728	1800	1176	61.9%	3.9	19.1	18.4
3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		1005	1800	1416	71.0%	3.6	12.8	17.0
3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1157	1800	1452	79.7%	5.1	15.9	19.4
3/3+3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		933	1800:1800	1053	88.6%	8.6	33.1	13.7
5/1	Bridge Road West Left	U	N/A	N/A	C1:6		56	1800	468	12.0%	0.7	46.8	1.8
5/2+5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		190	1800:1800	238	79.9%	5.3	100.6	9.1
7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		147	1800	228	64.5%	3.4	94.0	6.7
7/2+7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		153	1800:1800	233	65.6%	3.6	85.9	6.8
+ Ped Link: P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	57600	0.0%	0.0	3.2	0.1
+ Ped Link: P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1
– J2: Lane Cove Road and Kent Road	-	-	N/A	-	-		-	-	-	127.3%	43.3	-	-
1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		960	1800	1500	64.0%	1.7	6.2	6.5
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1146	1800	1500	76.4%	1.7	5.4	2.6
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		924	1800	1500	61.6%	0.9	3.4	1.5
1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		209	1800	164	127.3%	33.1	559.5	36.8
4/1	Kent Road West Left	U	N/A	N/A	C2:2		119	1800	348	34.2%	2.0	60.1	4.5
4/2+4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		70	1800:1800	182	38.5%	1.5	78.2	3.0
6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		573	1800	1296	44.2%	0.5	3.3	1.2
6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		739	1800	1332	55.5%	0.9	4.4	2.2
6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		770	1800	1332	57.8%	1.1	4.9	2.8
+ Ped Link: P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46560	0.0%	0.0	9.6	0.1
– J3: Lane Cove Road and Coxs Road	-	-	N/A	-	-		-	-	-	99.1%	82.8	-	-
1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1070	1800	1080	99.1%	22.8	76.8	57.7
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1105	1800	1116	99.0%	22.7	74.0	59.2
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1098	1800	1116	98.4%	21.1	69.3	57.2
2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		636	1800	1464	43.4%	1.0	5.4	5.6
2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		739	1800	1464	50.5%	0.6	3.0	1.1
2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		525	1800	1464	35.9%	0.3	2.4	0.7
2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		250	1800	288	86.9%	7.1	102.0	11.0
6/2+6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		445	1800:1800	667	66.7%	7.2	57.9	10.6

C1	PRC for Signalled Lanes (%):	1.6	Total Delay for Signalled Lanes (pcuHr): 41.53
C2	PRC for Signalled Lanes (%):	-41.5	Total Delay for Signalled Lanes (pcuHr): 43.32
C3	PRC for Signalled Lanes (%):	-10.1	Total Delay for Signalled Lanes (pcuHr): 82.85
	PRC Over All Lanes (%):	-41.5	Total Delay Over All Lanes(pcuHr): 167.69 Cycle Time (s): 150

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 6A – 2011 + Coxs / Wicks Improvements + MP x 130% -Coxs/Wicks

LANE SUMMARY

Site: MS6A-Post Full MP - Thurs PM x 130%

IS11061
Coxs Road - Wicks Road
Full MP Post Dev x 130%
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	SL	Cap.	Prob.
	L	T	R	Total	HV		Sat'n	Uni.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)																
Lane 1	60	303	0	364	2.0	833	0.437	100	25.3	LOS B	15.8	112.2	500	-	0.0	0.0
Lane 2	0	260	113	373	2.0	853	0.437	100	26.3	LOS B	16.1	114.4	500	-	0.0	0.0
Approach	60	564	113	736	2.0		0.437		25.8	LOS B	16.1	114.4				
East: Coxs Road (E)																
Lane 1	114	218	0	332	2.0	830	0.400	100	24.8	LOS B	14.1	100.1	500	-	0.0	0.0
Lane 2	0	84	48	132	2.0	330[1]	0.400	100	36.8	LOS C	7.7	54.5	60	Turn Bay	0.0	0.0
Approach	114	302	48	464	2.0		0.400		28.2	LOS B	14.1	100.1				
North: Wicks Road (N)																
Lane 1	47	624	0	671	2.0	852	0.788	100	25.9	LOS B	30.1	214.2	500	-	0.0	0.0
Lane 2	0	487	185	673	2.0	854	0.788	100	27.4	LOS B	30.1	214.7	500	-	0.0	0.0
Approach	47	1111	185	1344	2.0		0.788		26.5	LOS B	30.1	214.7				
West: Coxs Road (W)																
Lane 1	274	0	0	274	2.0	345[1]	0.794	100	40.0	LOS C	13.8	98.5	60	Turn Bay	0.0	39.4
Lane 2	0	499	0	499	2.0	898	0.555	100	24.5	LOS B	21.6	154.0	500	-	0.0	0.0
Lane 3	0	0	76	76	2.0	258[1]	0.295	100	40.2	LOS C	4.6	32.9	60	Turn Bay	0.0	0.0
Approach	274	499	76	849	2.0		0.794		30.9	LOS C	21.6	154.0				
Intersection				3393	2.0		0.794		27.7	LOS B	30.1	214.7				

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS C. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

PHASING SUMMARY

Site: MS6A-Post Full MP - Thurs PM x 130%

IS11061
Coxs Road - Wicks Road
Full MP Post Dev x 130%
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	54	56
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	59	61
Phase Split	49 %	51 %

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

Modelling Scenario 6A – 2011 + Coxs / Wicks Improvements + MPx130%-Lane Cove Rd

Item	Item Desc	Lane Typ	Ctl Stm	Rte Pos	Full SG	Aux SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	NMQ pcu
J1: Lane Cove Road, Bridge Road and Twin Road	-	-	N/A	-	-		-	-	-	89.0%	39.0	-	-
1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:11		607	1800	1140	53.2%	3.1	18.6	14.4
1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:11		667	1800	1176	56.7%	3.3	17.8	15.8
1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:11		685	1800	1176	58.2%	3.5	18.2	16.5
3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		948	1800	1416	66.9%	3.0	11.4	14.8
3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1129	1800	1452	77.8%	4.4	14.1	17.4
3/3+3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		850	1800:1800	955	89.0%	8.1	34.3	12.6
5/1	Bridge Road West Left	U	N/A	N/A	C1:6		58	1800	468	12.4%	0.8	46.8	1.9
5/2+5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		191	1800:1800	238	80.3%	5.4	101.3	9.2
7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		152	1800	228	66.7%	3.6	85.6	7.0
7/2+7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		157	1800:1800	233	67.5%	3.8	87.1	7.0
Ped Link: P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	8640	0.1%	0.2	58.9	0.4
Ped Link: P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	57600	0.0%	0.0	3.2	0.1
Ped Link: P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4
Ped Link: P4	Lane Cove Rd / Bridge west	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1
J2: Lane Cove Road and Kent Road	-	-	N/A	-	-		-	-	-	130.2%	46.1	-	-
1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		904	1800	1500	60.3%	1.4	5.7	5.8
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1113	1800	1500	74.2%	1.6	5.2	2.9
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		845	1800	1500	56.3%	0.7	3.1	1.3
1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		217	1800	167	130.2%	36.4	604.5	40.2
4/1	Kent Road West Left	U	N/A	N/A	C2:2		123	1800	348	35.3%	2.1	60.4	4.7
4/2+4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		71	1800:1800	182	39.0%	1.5	78.2	3.0
6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		525	1800	1296	40.5%	0.5	3.2	1.1
6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		695	1800	1332	52.2%	0.8	4.3	2.1
6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		726	1800	1332	54.5%	1.0	4.7	2.6
Ped Link: P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46560	0.0%	0.0	9.6	0.1
J3: Lane Cove Road and Coxs Road	-	-	N/A	-	-		-	-	-	94.6%	57.1	-	-
1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1022	1800	1080	94.6%	15.0	52.7	46.3
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1054	1800	1116	94.4%	14.6	49.9	47.1
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1027	1800	1116	92.0%	12.4	43.3	42.8
2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		593	1800	1464	40.5%	0.9	5.6	5.7
2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		695	1800	1464	47.5%	0.5	2.8	1.0
2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		490	1800	1464	33.5%	0.3	2.3	0.6
2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		242	1800	288	84.1%	6.4	95.5	10.1
6/2+6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		441	1800:1800	688	64.1%	7.0	57.0	10.4

C1	PRC for Signalled Lanes (%):	1.1	Total Delay for Signalled Lanes (pcuHr): 38.99
C2	PRC for Signalled Lanes (%):	-44.7	Total Delay for Signalled Lanes (pcuHr): 46.06
C3	PRC for Signalled Lanes (%):	-5.1	Total Delay for Signalled Lanes (pcuHr): 57.11
	PRC Over All Lanes (%):	-44.7	Total Delay Over All Lanes(pcuHr): 142.15 Cycle Time (s): 150

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 6B – 2021 + Cox / Wicks Improvements + MP x 130% -Cox/Wicks

LANE SUMMARY

Site: MS6B-Post Full MP - 2021 Thurs PM x 130%

IS11061
Coxs Road - Wicks Road
2021 Full MP Post Dev x 130%
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane	SL	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total veh/h	HV %	veh/h	v/c	%	sec		Vehicles veh	Distance m	Length m	Type	%	%
South: Wicks Road (S)															
Lane 1	54	341	0	396	2.0	838	0.472	100	25.6	LOS B	17.2	122.5	500	–	0.0	0.0
Lane 2	0	278	124	402	2.0	853	0.472	100	26.8	LOS B	17.4	124.2	500	–	0.0	0.0
Approach	54	620	124	798	2.0		0.472		26.2	LOS B	17.4	124.2				
East: Coxs Road (E)															
Lane 1	125	237	0	362	2.0	829	0.437	100	25.3	LOS B	15.4	109.8	500	–	0.0	0.0
Lane 2	0	86	53	139	2.0	318[1]	0.437	100	39.4	LOS C	8.3	58.9	60	Turn Bay	0.0	0.0
Approach	125	323	53	501	2.0		0.437		29.2	LOS C	15.4	109.8				
North: Wicks Road (N)															
Lane 1	52	683	0	735	2.0	852	0.863	100	31.9	LOS C	38.6	275.0	500	–	0.0	0.0
Lane 2	0	540	196	738	2.0	854	0.863	100	33.3	LOS C	38.7	275.7	500	–	0.0	0.0
Approach	52	1223	196	1473	2.0		0.863		32.6	LOS C	38.7	275.7				
West: Coxs Road (W)															
Lane 1	296	0	0	296	2.0	345[1]	0.858	100	44.8[2]	LOS D[2]	15.1[2]	107.8[2]	60	Turn Bay	0.0	50.0
Lane 2	0	539	0	539	2.0	898	0.599	100	25.2	LOS B	23.8	169.3	500	–	0.0	0.0
Lane 3	0	0	82	82	2.0	251[1]	0.328	100	42.2	LOS C	5.1	36.4	60	Turn Bay	0.0	0.0
Approach	296	539	82	917	2.0		0.858		33.1	LOS C	23.8	169.3				
Intersection				3689	2.0		0.863		30.9	LOS C	38.7	275.7				

Level of Service (Aver. Int. Delay): LOS C. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS D. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect
2 Delay, queue length and stops for this short lane have been cut down to fit in the queuing space. You may wish to change the short lane to a full lane to investigate the effect on the adjacent lane performance.

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

PHASING SUMMARY

Site: MS6B-Post Full MP - 2021
Thurs PM x 130%

IS11061
Coxs Road - Wicks Road
2021 Full MP Post Dev x 130%
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	54	56
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	59	61
Phase Split	49 %	51 %

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

Modelling Scenario 6B – 2021 + Coxs / Wicks Improvements + MPx130%-Lane Cove Rd

Item	Item Desc	Lne Typ	Ctl Sim	Rte Pos	Ful SG	Arr SG	Flw pcu	Sat Flow pcu/Hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	MMQ pcu
J1: Lane Cove Road, Bridge Road and Twin Road	-	U	N/A	-	-	-	-	-	-	89.0%	42.1	-	-
1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		655	1800	1140	57.5%	3.6	19.6	15.3
1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		712	1800	1176	60.5%	3.7	18.8	17.8
1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		729	1800	1176	62.0%	3.9	19.2	18.4
3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		1018	1800	1416	71.9%	3.6	12.8	17.3
3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1164	1800	1452	80.2%	5.2	16.1	19.6
3/3+3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		921	1800:1800	1026	89.8%	9.1	35.4	14.0
5/1	Bridge Road West Left	U	N/A	N/A	C1:6		58	1800	468	12.4%	0.8	46.8	1.9
5/2+5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		190	1800:1800	238	79.9%	5.3	100.6	9.1
7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		146	1800	228	64.0%	3.4	83.8	5.6
7/2+7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		152	1800:1800	293	66.2%	3.6	85.6	5.7
+ Ped Link: P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	-	57600	0.0%	0.0	3.2	0.1
+ Ped Link: P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1
J2: Lane Cove Road and Kent Road	-	-	N/A	-	-	-	-	-	132.2%	40.2	-	-	-
1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		968	1800	1500	64.5%	1.8	6.6	7.2
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1155	1800	1500	77.0%	1.8	5.6	2.8
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		916	1800	1500	61.1%	0.9	3.3	1.4
1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		217	1800	164	132.2%	37.7	625.5	41.6
4/1	Kent Road West Left	U	N/A	N/A	C2:2		124	1800	348	35.6%	2.1	60.4	4.7
4/2+4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		70	1800:1800	182	38.4%	1.5	78.0	2.9
6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		573	1800	1296	44.2%	0.5	3.3	1.2
6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		739	1800	1332	55.5%	0.9	4.5	2.2
6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		772	1800	1332	58.0%	1.1	5.0	2.6
+ Ped Link: P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	-	46560	0.0%	0.0	9.6	0.1
J3: Lane Cove Road and Coxs Road	-	-	N/A	-	-	-	-	-	-	99.6%	88.1	-	-
1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1075	1800	1080	99.5%	24.1	80.7	59.4
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1111	1800	1116	99.6%	24.2	78.4	61.1
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1102	1800	1116	98.7%	22.0	71.9	59.2
2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		641	1800	1464	43.8%	1.0	5.5	5.8
2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		739	1800	1464	50.5%	0.6	3.0	1.1
2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		518	1800	1464	35.4%	0.3	2.4	0.7
2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		260	1800	288	90.3%	0.1	112.0	12.1
6/2+6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		470	1800:1800	669	70.3%	7.7	59.3	11.4

C1	PRC For Signalled Lanes (%):	0.2	Total Delay for Signalled Lanes (pcuHr):	42.13
C2	PRC For Signalled Lanes (%):	-46.9	Total Delay for Signalled Lanes (pcuHr):	46.22
C3	PRC For Signalled Lanes (%):	-10.6	Total Delay for Signalled Lanes (pcuHr):	88.11
	PRC Over All Lanes (%):	-46.9	Total Delay Over All Lanes(pcuHr):	178.46 Cycle Time (s): 150

IS11061
Coxs Road Traffic Study

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Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 7A–2011+Coxs/Wicks Improvements + Rd Option 2+MP–Coxs/Wicks

LANE SUMMARY

Site: MS7A-Post Full MP Thurs PM Opt 2

IS11061
Coxs Road - Wicks Road
MS7A-Post Full MP Road Network Opt 2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows					Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	St. Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total veh/h	HV %	veh/h	v/c	%	sec		veh	m	m		%	%
South: Wicks Road (S)																
Lane 1	56	306	0	362	2.0	912	0.397	100	21.6	LOS B	14.6	104.2	500	-	0.0	0.0
Lane 2	0	258	113	370	2.0	932	0.397	100	22.7	LOS B	14.9	106.1	500	-	0.0	0.0
Approach	56	564	113	732	2.0		0.397		22.2	LOS B	14.9	106.1				
East: Coxs Road (E)																
Lane 1	114	196	0	310	2.0	752	0.412	100	28.3	LOS B	14.0	99.9	500	-	0.0	0.0
Lane 2	0	84	48	132	2.0	319[1]	0.412	100	41.1	LOS C	8.0	57.0	80	Turn Bay	0.0	0.0
Approach	114	280	48	442	2.0		0.412		32.1	LOS C	14.0	99.9				
North: Wicks Road (N)																
Lane 1	47	608	0	655	2.0	930	0.704	100	20.2	LOS B	24.8	177.3	500	-	0.0	0.0
Lane 2	0	519	141	659	2.0	936	0.704	100	21.3	LOS B	25.0	178.3	500	-	0.0	0.0
Approach	47	1127	141	1315	2.0		0.704		20.7	LOS B	25.0	178.3				
West: Coxs Road (W)																
Lane 1	229	0	0	229	2.0	325[1]	0.706	100	34.4	LOS C	11.1	79.4	60	Turn Bay	0.0	16.5
Lane 2	0	476	0	476	2.0	818	0.582	100	28.1	LOS B	21.9	156.0	500	-	0.0	0.0
Lane 3	0	0	56	56	2.0	248[1]	0.227	100	43.6	LOS D	3.7	26.1	60	Turn Bay	0.0	0.0
Approach	229	476	56	761	2.0		0.706		31.2	LOS C	21.9	156.0				
Intersection				3250	2.0		0.706		25.1	LOS B	25.0	178.3				

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS D. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

PHASING SUMMARY

Site: MS7A-Post Full MP Thurs PM Opt 2

IS11061
Coxs Road - Wicks Road
MS7A-Post Full MP Road Network Opt 2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	59	51
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	64	56
Phase Split	53 %	47 %

ITEM 6 (continued) **ATTACHMENT 1**

Modelling Scenario 7B–2021+Coxs/Wicks Improvements + Rd Option 2+MP–Coxs/Wicks

LANE SUMMARY

Site: MS7B-Post Full MP Thurs PM Opt 2

IS11061
Coxs Road - Wicks Road
MS7B-Post Full MP Road Network Opt 2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L veh/h	T veh/h	R veh/h	Total veh/h	HV %	veh/h	v/c	%	sec		Vehicles veh	Distance m	m		%	%
South: Wicks Road (S)																
Lane 1	60	338	0	398	2.0	913	0.436	100	22.1	LOS B	16.2	115.1	500	-	0.0	0.0
Lane 2	0	282	124	406	2.0	932	0.436	100	23.2	LOS B	16.4	117.1	500	-	0.0	0.0
Approach	60	620	124	804	2.0		0.436		22.7	LOS B	16.4	117.1				
East: Coxs Road (E)																
Lane 1	125	215	0	340	2.0	751	0.452	100	28.9	LOS C	15.4	109.7	500	-	0.0	0.0
Lane 2	0	86	53	139	2.0	308	0.452	100	44.6	LOS D	8.8	62.4	80	Turn Bay	0.0	0.0
Approach	125	301	53	479	2.0		0.452		33.5	LOS C	15.4	109.7				
North: Wicks Road (N)																
Lane 1	52	668	0	720	2.0	930	0.774	100	21.3	LOS B	29.6	210.6	500	-	0.0	0.0
Lane 2	0	571	154	725	2.0	936	0.774	100	22.3	LOS B	29.8	211.9	500	-	0.0	0.0
Approach	52	1239	154	1445	2.0		0.774		21.8	LOS B	29.8	211.9				
West: Coxs Road (W)																
Lane 1	251	0	0	251	2.0	325[1]	0.774	100	39.2	LOS C	13.0	92.4	60	Turn Bay	0.0	33.0
Lane 2	0	516	0	516	2.0	818	0.630	100	26.9	LOS C	24.2	172.1	500	-	0.0	0.0
Lane 3	0	0	63	63	2.0	241	0.259	100	45.7	LOS D	4.2	29.6	60	Turn Bay	0.0	0.0
Approach	251	516	63	829	2.0		0.774		33.3	LOS C	24.2	172.1				
Intersection				3557	2.0		0.774		26.3	LOS B	29.8	211.9				

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all lanes. LOS Method: Delay (RTA NSW).
Level of Service (Worst Lane): LOS D. LOS Method for individual lanes: Delay (RTA NSW).
Approach LOS values are based on average delay for all lanes.

1 Reduced capacity due to a short lane effect

ITEM 6 (continued) **ATTACHMENT 1**

PHASING SUMMARY

Site: MS7B-Post Full MP Thurs PM Opt 2

IS11061
Coxs Road - Wicks Road
MS7B-Post Full MP Road Network Opt 2
Thursday (17:00 - 18:00)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Phase times determined by the program
Sequence: Two-phase
Input Sequence: A, B
Output Sequence: A, B

Phase Timing Results

Phase	A	B
Green Time (sec)	59	51
Yellow Time (sec)	3	3
All-Red Time (sec)	2	2
Phase Time (sec)	64	56
Phase Split	53 %	47 %

Phase A

Phase B

Coxs Road (W)
Wicks Road (N)
Wicks Road (S)
Coxs Road (E)

Normal Movement
Slip-Lane Movement
Stopped Movement
Turn On Red
Permitted/Opposed
Opposed Slip-Lane
Continuous Movement
Undetected Movement
Phase Transition Applied

Appendix F

GTAconsultants

IS11061
Coxs Road Traffic Study

05/10/11
Issue: B

ITEM 6 (continued) **ATTACHMENT 1**

Appendix F

GTAconsultants

Modelling Scenario 7B-2021+Coxs/Wicks Improvements + Rd Option 2+MP-Lane Cove

Item	Item Desc	Lne Typ	Ctl Stm	Rte Pos	Full SG	Arr SG	Flw pcu	Sat Flow pcu/hr	Cap pcu	Deg Sat	TDly pcuh	Dly s/pcu	MMQ pcu
J1: Lane Cove Road/ Bridge Road and Twin Road	-	-	N/A	-	-	-	-	-	-	88.6%	41.5	-	-
1/1	Lane Cove Road South Ahead Left	U	N/A	N/A	C1:1		655	1800	1140	57.5%	3.6	19.6	16.3
1/2	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		710	1800	1176	60.4%	3.7	18.7	17.5
1/3	Lane Cove Road South Ahead	U	N/A	N/A	C1:1		728	1800	1176	61.9%	3.9	19.1	18.4
3/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C1:2		1013	1800	1416	71.5%	3.7	13.2	17.2
3/2	Lane Cove Road North Ahead	U	N/A	N/A	C1:2		1155	1800	1452	79.5%	5.0	15.7	19.2
3/3+3/4	Lane Cove Road North Ahead Right	U+O	N/A	N/A	C1:2 C1:3		927	1800:1800	1046	86.6%	8.5	33.1	13.5
5/1	Bridge Road West Left	U	N/A	N/A	C1:6		59	1800	468	12.6%	0.8	46.9	1.9
5/2+5/3	Bridge Road West Right Ahead	U+O	N/A	N/A	C1:4		190	1800:1800	238	79.9%	5.3	100.6	9.1
7/1	Twin Road East Left Ahead	U	N/A	N/A	C1:5		146	1800	228	64.0%	3.4	83.8	6.6
7/2+7/3	Twin Road East Right Ahead	U+O	N/A	N/A	C1:11		152	1800:1800	233	65.2%	3.6	85.6	6.7
+ Ped Link: P1	Lane Cove Rd / Bridge Nth	-	N/A	-	C1:8		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P2	Lane Cove Rd / Bridge East	-	N/A	-	C1:10		10	- 57600	0.0%	0.0	0.2	3.2	0.1
+ Ped Link: P3	Lane Cove Rd / Bridge Sth	-	N/A	-	C1:7		10	-	8640	0.1%	0.2	58.9	0.4
+ Ped Link: P4	Lane Cove Rd / Bridge West	-	N/A	-	C1:9		10	-	46560	0.0%	0.0	9.6	0.1
J2: Lane Cove Road and Kent Road	-	-	N/A	-	-		-	-	-	126.7%	42.6	-	-
1/1	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		971	1800	1500	64.7%	1.6	5.8	5.7
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		1141	1800	1500	76.1%	1.7	5.4	2.6
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C2:4		918	1800	1500	61.2%	0.9	3.4	1.5
1/4	Lane Cove Road North Right	O	N/A	N/A	C2:3		208	1800	164	126.7%	32.5	562.1	36.2
4/1	Kent Road West Left	U	N/A	N/A	C2:2		119	1800	348	34.2%	2.0	60.1	4.5
4/2+4/3	Kent Road West Right Left	U	N/A	N/A	C2:2 C2:5		70	1800:1800	182	38.5%	1.5	78.2	3.0
6/1	Lane Cove Road South Left Ahead	U	N/A	N/A	C2:1		574	1800	1296	44.3%	0.5	3.3	1.2
6/2	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		737	1800	1332	55.3%	0.9	4.4	2.2
6/3	Lane Cove Road South Ahead	U	N/A	N/A	C2:1		770	1800	1332	57.8%	1.1	4.9	2.8
+ Ped Link: P1	Lane Cove and Kent West	-	N/A	-	C2:6		10	- 46560	0.0%	0.0	9.6	0.1	
J3: Lane Cove Road and Coxs Road	-	-	N/A	-	-		-	-	-	96.3%	77.8	-	-
1/1	Lane Cove Road North Ahead Left	U	N/A	N/A	C3:6		1062	1800	1080	98.3%	21.0	71.3	55.5
1/2	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1097	1800	1116	98.3%	20.9	68.7	56.7
1/3	Lane Cove Road North Ahead	U	N/A	N/A	C3:1		1090	1800	1116	97.7%	19.6	64.6	54.8
2/1	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		637	1800	1464	43.5%	1.0	5.4	5.6
2/2	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		737	1800	1464	50.3%	0.6	3.0	1.1
2/3	Lane Cove Road South Ahead	U	N/A	N/A	C3:4		525	1800	1464	35.9%	0.3	2.4	0.7
2/4	Lane Cove Road South Right	O	N/A	N/A	C3:3		250	1800	288	86.9%	7.1	102.0	11.0
6/2+6/1	Coxs Road East Left Right	U	N/A	N/A	C3:2 C3:5		427	1800:1800	582	73.4%	7.3	61.4	10.2

C1	PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	41.49
C2	PRC for Signalled Lanes (%):	-40.3	Total Delay for Signalled Lanes (pcuHr):	42.63
C3	PRC for Signalled Lanes (%):	-9.3	Total Delay for Signalled Lanes (pcuHr):	77.80
	PRC Over All Lanes (%):	-40.3	Total Delay Over All Lanes(pcuHr):	161.91
			Cycle Time (s):	150

IS11061
Coxs Road Traffic Study

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Issue: B

Appendix G

Appendix G

Traffic Tube Counts

ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

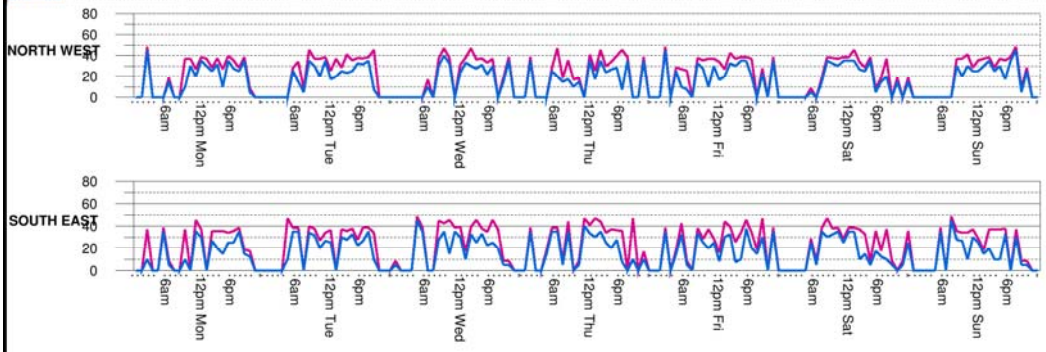
One Page Summary

Count Number	7594
Lat/Long	S33 47 36.9 / E151 07 20.2
UBD	194 B-9
Street	COONEY STREET, NORTH RYDE : Between WICKS ROAD & LANE COVE ROAD (bidirectional)
Location	Between Holy Spirit Church and Folkard Street, House No. 41, ELP GL33352

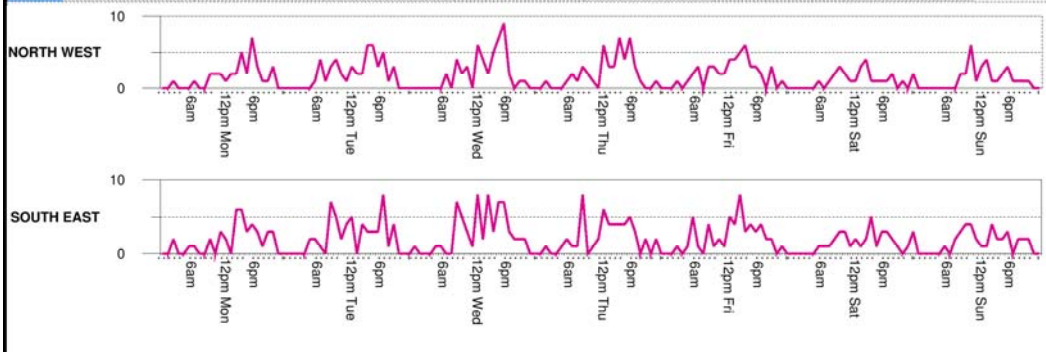
Start Date	06-JUN-11
Start Time	1200
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH WEST	SOUTH EAST	COMBINED
Weekly 50th Percentile Speed	27	28	27
Weekly 85th Percentile Speed	38	38	38
Five Day AADT	45	52	97
Seven Day AADT	40	47	87

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	37.7	36.2	36.9	37.3	37.7	37.5	37.3	39.8	38.6	38.5	40.4	39.5	37.3	38.4	37.8	37.2	36.9	37.0	37.9	37.3	37.6	37.6	38.1	37.9
50%ile	28.6	22.5	26.1	24.5	28.8	27.2	27.9	28.8	28.3	26.2	31.3	28.8	27.5	26.4	27.0	27.9	24.0	26.3	28.5	26.5	27.5	27.3	26.9	27.3
> 60 k	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%age	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
> 70 k	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%age	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	85.7	82.5	84.0	93.6	92.6	93.1	93.8	85.7	89.2	93.5	88.2	90.7	91.7	80.8	86.0	96.3	72.2	82.5	93.1	82.9	87.5	92.5	84.3	88.1
Med %	2.9	.0	1.3	2.1	1.9	2.0	.0	4.8	2.7	2.2	3.9	3.1	6.3	9.6	8.0	.0	5.6	3.2	.0	.0	.0	2.1	3.9	3.1
Long %	11.4	17.5	14.7	4.3	5.6	5.0	6.3	9.5	8.1	4.3	7.8	6.2	2.1	9.6	6.0	3.7	22.2	14.3	6.9	17.1	12.5	5.4	11.8	8.8
AM Pk Vo	2	3	5	4	7	10	4	7	11	3	8	11	3	5	7	3	3	6	6	4	10	4	5	9
PM Pk Vo	7	6	11	6	8	13	9	8	16	7	6	12	6	8	13	4	5	6	4	4	6	6	6	11
7-7pm	28	29	57	38	44	82	44	54	98	40	42	82	37	39	76	21	27	48	26	28	54	33	38	71
24Hr Tot	35	40	75	47	54	101	48	63	111	46	51	97	48	52	100	27	36	63	29	35	64	40	47	87
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	30	33	63	44	50	94	45	54	99	43	45	88	44	42	86	26	26	52	27	29	56	37	40	77
Class 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 3	1	0	1	0	0	0	1	0	1	0	0	0	1	1	2	0	1	1	0	0	0			1
Class 4	0	0	0	1	1	2	0	2	2	1	1	2	2	4	6	0	1	1	0	0	0	1	1	2
Class 5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0			
Class 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	4	7	11	2	3	5	3	6	9	2	4	6	1	5	6	1	8	9	2	6	8	2	6	8



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ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

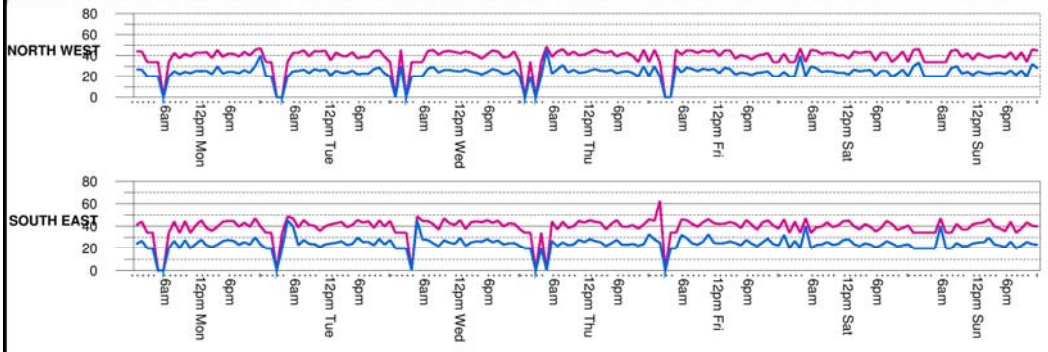
One Page Summary

Count Number	7595
Lat/Long	S33 47 23.2 / E151 07 27.6
UBD	194 B-7
Street	LORNA AVENUE, NORTH RYDE : Between AVON STREET & LANE COVE ROAD (bidirectional)
Location	Between Folkard Street and Lane Cove Road, House No. 43, ELP GL34132

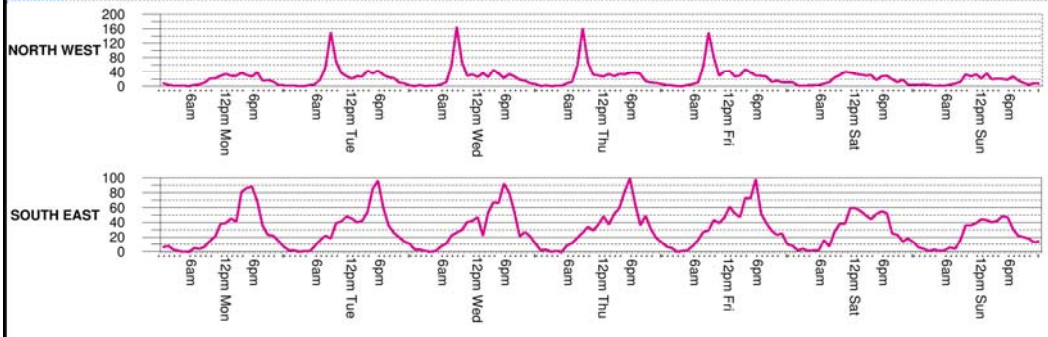
Start Date	06-JUN-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH WEST	SOUTH EAST	COMBINED
Weekly 50th Percentile Speed	25	25	25
Weekly 85th Percentile Speed	42	42	42
Five Day AADT	619	739	1358
Seven Day AADT	551	699	1250

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	42.1	42.2	42.2	41.7	42.5	42.1	42.6	43.6	43.1	42.8	42.4	42.6	42.5	42.8	42.7	41.2	40.9	41.0	40.5	39.8	40.0	41.9	42.0	42.0
50%ile	24.6	24.6	24.6	24.3	24.9	24.6	24.9	25.7	25.3	25.1	24.7	24.9	24.9	25.2	25.1	24.1	23.9	24.0	23.7	23.4	23.5	24.5	24.6	24.6
> 60 k	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1	0	.4286	.4286
%age	.0	.0	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.2	.1	.0	.1	.0
> 70 k	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	.1429	.1429
%age	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.1	.0	.0	.0



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	98.7	97.1	97.7	96.7	97.2	97.0	97.3	96.1	96.7	98.5	97.6	98.0	97.4	96.1	96.7	97.9	98.2	98.1	98.5	99.3	99.0	97.7	97.3	97.5
Med %	1.3	1.2	1.2	1.7	1.4	1.5	1.8	2.4	2.1	1.0	1.8	1.5	1.7	2.6	2.2	1.2	1.1	1.1	1.5	.7	1.0	1.5	1.7	1.6
Long %	.0	1.7	1.1	1.7	1.4	1.5	.9	1.5	1.2	.4	.5	.5	.9	1.2	1.1	.9	.8	.8	.0	.0	.0	.8	1.0	.9
AM Pk Vo	29	38	67	150	48	168	165	42	191	161	37	187	149	46	178	40	59	97	33	39	72	104	44	137
PM Pk Vo	39	88	118	43	96	139	45	92	115	38	99	136	47	98	128	34	59	93	35	48	78	40	83	115
7-7pm	314	533	847	567	590	1157	577	587	1164	579	585	1164	599	639	1238	345	534	879	273	426	699	465	556	1021
24Hr Tot	382	659	1041	664	727	1391	672	747	1419	676	759	1435	699	804	1503	429	662	1091	336	536	872	551	699	1250
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	375	637	1012	638	703	1341	654	714	1368	662	739	1401	676	769	1445	420	650	1070	331	531	862	537	678	1214
Class 2	2	3	5	4	4	8	0	4	4	4	2	6	5	4	9	0	0	0	0	1	1	2	3	5
Class 3	4	8	12	7	9	16	11	16	27	3	10	13	9	15	24	1	6	7	2	3	5	5	10	15
Class 4	1	0	1	4	1	5	0	1	1	3	4	7	3	6	9	3	1	4	1	1	2	2	2	4
Class 5	0	0	0	0	0	0	1	1	2	1	0	1	0	0	0	1	0	1	2	0	2	1		1
Class 6	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0			
Class 7	0	2	2	1	1	2	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0		1	1
Class 8	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0			
Class 9	0	0	0	1	1	2	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0			1
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0			
Class 11	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	0	9	9	7	8	15	6	9	15	3	2	5	5	9	14	3	4	7	0	0	0	3	6	9



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ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

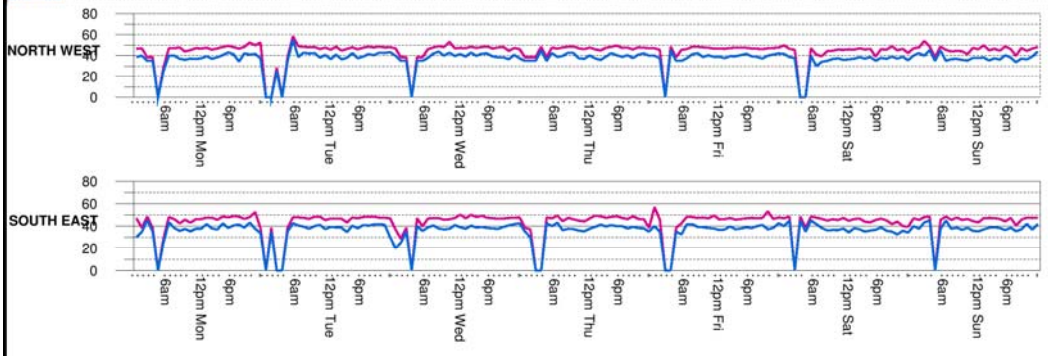
One Page Summary

Count Number	7596
Lat/Long	S33 47 36.3 / E151 07 38.8
UBD	194 D-9
Street	BEATRICE STREET, NORTH RYDE : Between WICKS ROAD & AMELIA STREET (bidirectional)
Location	Between Wicks Road and Avon Road, House No. 1A, ELP GL34224

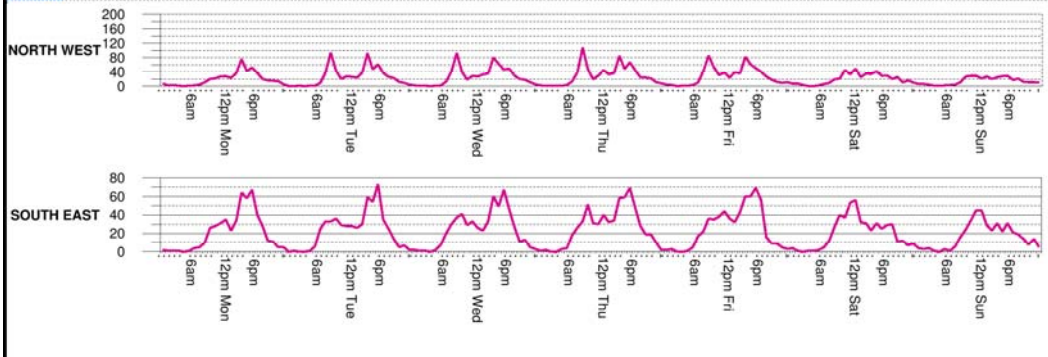
Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH WEST	SOUTH EAST	COMBINED
Weekly 50th Percentile Speed	39	38	39
Weekly 85th Percentile Speed	48	47	47
Five Day AADT	630	565	1196
Seven Day AADT	569	530	1099

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	47.7	47.2	47.4	47.5	47.1	47.4	48.0	47.4	47.8	47.9	47.4	47.7	47.5	47.1	47.3	45.9	45.7	45.8	46.4	46.1	46.2	47.3	46.9	47.1
50%ile	38.9	38.7	38.8	40.2	38.7	39.5	41.1	38.5	40.0	40.1	38.6	39.4	40.1	38.3	39.3	37.1	36.5	36.8	37.3	37.2	37.3	39.3	38.1	38.7
> 60 k	2	0	2	3	1	4	3	0	3	2	3	5	2	1	3	1	1	2	3	2	5	2.286	1.143	3.429
%age	.4	.0	.2	.5	.2	.3	.5	.0	.2	.3	.5	.4	.3	.2	.2	.2	.2	.2	.8	.5	.7	.4	.2	.3
> 70 k	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.1429	0	.1429
%age	.2	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	96.6	97.4	97.0	95.7	97.6	96.6	94.8	96.6	95.7	96.4	97.6	96.9	96.3	98.2	97.2	98.1	98.7	98.4	97.2	98.5	97.9	96.3	97.8	97.0
Med %	2.6	1.6	2.1	3.6	2.0	2.9	4.0	2.3	3.2	3.2	1.6	2.5	2.9	1.2	2.1	1.3	.6	.9	2.3	.7	1.5	3.0	1.5	2.2
Long %	.9	1.0	.9	.6	.4	.5	1.2	1.1	1.1	.4	.8	.6	.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.8	.7
AM Pk Vo	27	31	58	94	36	127	93	41	129	108	51	141	86	44	122	45	53	86	29	45	74	69	43	105
PM Pk Vo	76	67	140	92	73	151	80	67	140	85	69	143	82	69	142	49	56	105	29	45	66	70	64	127
7-7pm	379	421	800	548	464	1012	553	474	1027	603	511	1114	582	531	1113	371	396	767	267	327	594	472	446	918
24Hr Tot	465	492	957	634	550	1184	657	567	1224	715	617	1332	681	601	1282	478	479	957	355	403	758	569	530	1099
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	448	477	925	605	537	1142	623	545	1168	686	600	1286	653	587	1240	468	471	939	345	397	742	547	516	1063
Class 2	1	2	3	2	0	2	0	3	3	3	2	5	3	3	6	1	2	3	0	0	0	1	2	3
Class 3	6	7	13	10	7	17	18	12	30	15	10	25	9	5	14	3	1	4	2	3	5	9	6	15
Class 4	1	1	2	7	3	10	6	1	7	6	0	6	7	2	9	3	1	4	5	0	5	5	1	6
Class 5	5	0	5	6	1	7	2	0	2	2	0	2	4	0	4	0	1	1	1	0	1	3		3
Class 6	0	1	1	1	0	1	0	1	1	0	0	0	0	1	1	0	0	0	1	0	1			1
Class 7	0	0	0	1	0	1	0	0	0	1	1	2	1	0	1	0	0	0	0	0	0			1
Class 8	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0			
Class 9	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	2	3	0	0	0			1
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	4	3	7	2	2	4	8	5	13	2	3	5	4	3	7	1	1	2	1	3	4	3	3	6



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ITEM 6 (continued) **ATTACHMENT 1**

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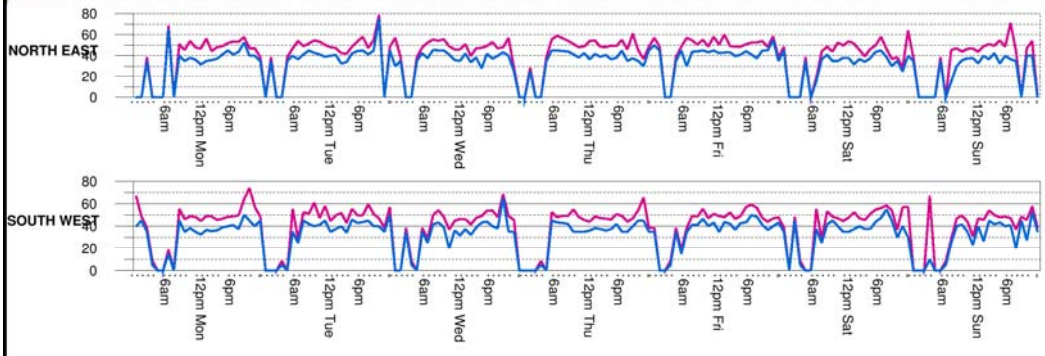
One Page Summary

Count Number	7597
Lat/Long	S33 47 38.4 / E151 07 33.3
UBD	194 C-9
Street	AVON ROAD, NORTH RYDE : Between COONEY STREET & CAM STREET (bidirectional)
Location	Between Marilyn Street and Beatrice Street, House No. 49.

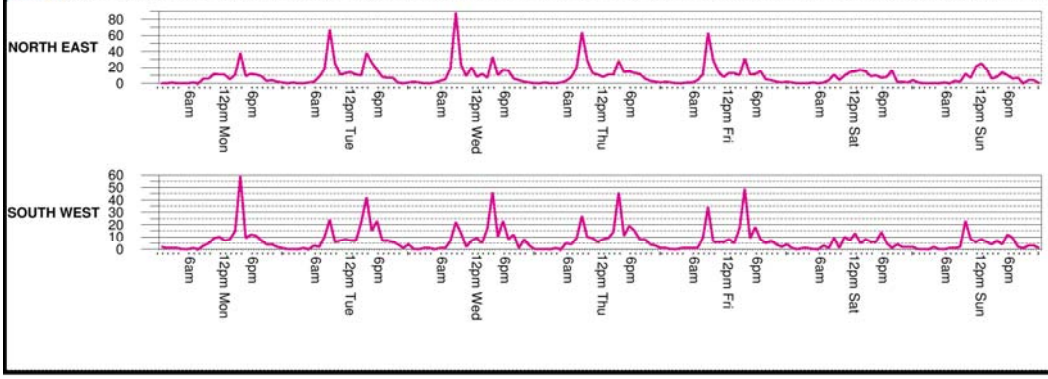
Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH EAST	SOUTH WEST	COMBINED
Weekly 50th Percentile Speed	41	39	40
Weekly 85th Percentile Speed	50	49	50
Five Day AADT	251	199	449
Seven Day AADT	222	171	393

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	49.8	47.9	48.8	49.6	49.9	49.7	51.0	48.8	49.8	52.0	48.3	49.7	51.8	49.6	50.6	48.5	50.5	49.2	47.6	48.4	48.0	50.0	49.0	49.4
50%ile	38.8	37.6	38.2	41.5	40.3	41.1	41.9	38.8	40.8	41.3	38.2	39.9	43.3	40.8	42.3	37.4	39.4	38.2	36.6	39.1	37.5	40.1	39.2	39.7
> 60 k	3	6	9	4	3	7	6	4	10	9	6	15	6	4	10	4	1	5	3	2	5	5	3.714	8.714
%age	2.0	3.5	2.8	1.4	1.5	1.4	2.1	2.0	2.1	3.3	2.8	3.1	2.4	2.0	2.2	2.6	1.0	2.0	2.0	1.9	2.0	2.2	2.1	2.2
> 70 k	0	4	4	2	1	3	1	2	3	1	1	2	1	1	2	0	1	1	1	1	2	.8571	1.571	2.429
%age	.0	2.3	1.2	.7	.5	.6	.3	1.0	.6	.4	.5	.4	.4	.5	.4	.0	1.0	.4	.7	1.0	.8	.4	1.0	.6



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	98.7	98.3	98.5	95.5	97.6	96.3	97.6	97.5	97.5	97.4	98.2	97.8	98.0	99.0	98.5	98.7	98.0	98.4	98.7	99.0	98.8	97.6	98.2	97.8
Med %	1.3	1.2	1.2	3.1	1.5	2.4	1.7	2.5	2.1	2.2	1.8	2.0	2.0	1.0	1.5	.7	2.0	1.2	.7	1.0	.8	1.9	1.6	1.7
Long %	.0	.6	.3	1.4	1.0	1.2	.7	.0	.4	.4	.0	.2	.0	.0	.0	.7	.0	.4	.7	.0	.4	.6	.3	.4
AM Pk Vo	12	10	21	67	24	91	88	22	110	64	27	91	63	34	97	14	10	21	21	23	35	47	21	67
PM Pk Vo	38	59	97	38	42	80	33	46	79	28	46	74	31	49	80	17	14	28	25	12	33	30	38	67
7-7pm	132	148	280	258	178	436	262	169	431	237	183	420	230	175	405	124	85	209	132	90	222	196	147	343
24Hr Tot	153	172	325	286	206	492	287	197	484	274	217	491	253	202	455	152	102	254	149	103	252	222	171	393
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	151	168	319	272	201	473	279	192	471	266	213	479	248	198	446	148	100	248	147	102	249	216	168	384
Class 2	0	1	1	1	0	1	1	0	1	1	0	1	0	2	2	2	0	2	0	0	0	1		1
Class 3	2	2	4	6	3	9	3	5	8	6	2	8	3	1	4	1	2	3	1	1	2	3	2	5
Class 4	0	0	0	2	0	2	2	0	2	0	1	1	1	1	2	0	0	0	0	0	0	1		1
Class 5	0	0	0	1	0	1	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0			
Class 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 9	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	0	1	1	3	2	5	2	0	2	1	0	1	0	0	0	1	0	1	1	0	1	1		2



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ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

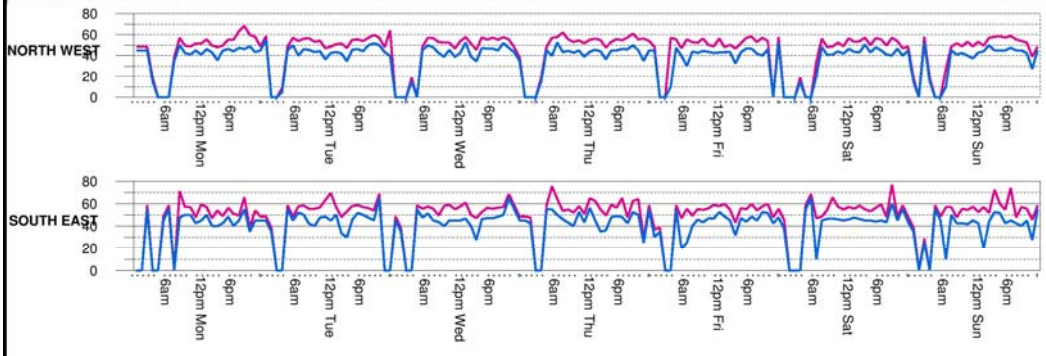
One Page Summary

Count Number	7598
Lat/Long	S33 47 37.8 / E151 07 26.0
UBD	194 B-9
Street	MARILYN STREET, NORTH RYDE : Between AVON ROAD & FOLKARD STREET (bidirectional)
Location	Between Pamela Street and Kathleen Reserve, Across from House No. 15 , ELP GL33342

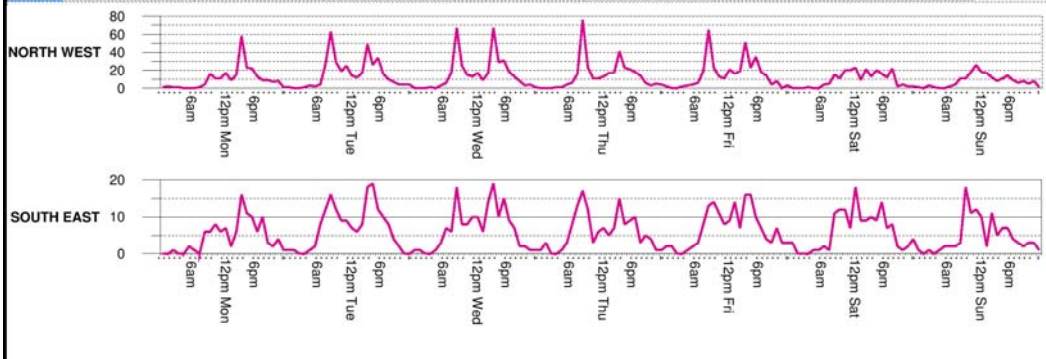
Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH WEST	SOUTH EAST	COMBINED
Weekly 50th Percentile Speed	43	45	44
Weekly 85th Percentile Speed	54	56	55
Five Day AADT	333	147	481
Seven Day AADT	297	142	439

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	52.3	54.7	53.3	54.2	57.3	55.4	53.9	55.6	54.4	54.9	57.9	55.8	53.3	56.0	54.4	53.5	56.8	54.8	54.1	55.8	54.8	53.7	56.3	54.7
50%ile	43.2	45.0	43.8	43.7	45.8	44.2	42.9	44.7	43.5	43.9	45.8	44.5	43.0	45.2	43.6	43.6	45.6	44.4	42.5	44.3	43.1	43.3	45.2	43.9
> 60 k	9	3	12	9	11	20	7	8	15	10	14	24	11	7	18	1	11	12	6	4	10	7.571	8.286	15.86
%age	3.8	2.8	3.5	2.4	6.7	3.7	1.9	5.0	2.9	3.0	9.8	5.1	3.1	4.3	3.4	.4	7.7	3.3	3.1	3.6	3.3	2.5	5.7	3.6
> 70 k	1	1	2	0	1	1	3	0	3	0	3	3	0	0	0	0	2	2	1	2	3	.7143	1.286	2
%age	.4	.9	.6	.0	.6	.2	.8	.0	.6	.0	2.1	.6	.0	.0	.0	.0	1.4	.5	.5	1.8	1.0	.3	1.0	.5



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	96.7	99.1	97.4	97.6	98.8	97.9	98.1	98.1	98.1	96.4	97.2	96.6	97.5	97.5	97.5	98.6	100.0	99.2	97.9	100.0	98.7	97.5	98.6	97.9
Med %	2.5	.9	2.0	1.9	1.2	1.7	.8	1.9	1.1	2.1	2.1	2.1	1.4	2.5	1.7	.9	.0	.5	.5	.0	.3	1.5	1.3	1.4
Long %	.8	.0	.6	.5	.0	.4	1.1	.0	.8	1.5	.7	1.3	1.1	.0	.8	.5	.0	.3	1.5	.0	1.0	1.0	.1	.7
AM Pk Vo	16	8	22	63	16	79	67	18	85	76	17	93	65	14	78	20	12	32	26	18	38	48	15	61
PM Pk Vo	58	16	74	49	19	67	67	19	86	41	15	56	51	16	67	23	18	41	18	11	28	44	16	60
7-7pm	200	84	284	331	138	469	326	133	459	287	112	399	314	133	447	185	119	304	159	92	251	257	116	373
24Hr Tot	239	108	347	371	165	536	365	159	524	331	142	473	360	163	523	222	143	365	194	111	305	297	142	439
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	230	107	337	362	163	525	357	156	513	319	138	457	348	157	505	217	142	359	190	111	301	289	139	428
Class 2	1	0	1	0	0	0	1	0	1	0	0	0	3	2	5	2	1	3	0	0	0	1		1
Class 3	4	0	4	6	2	8	3	3	6	5	3	8	2	1	3	2	0	2	1	0	1	3	1	5
Class 4	2	1	3	1	0	1	0	0	0	0	0	0	3	3	6	0	0	0	0	0	0	1	1	1
Class 5	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0			
Class 6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1			
Class 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	2	0	2	2	0	2	4	0	4	5	1	6	3	0	3	1	0	1	2	0	2	3		3



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ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

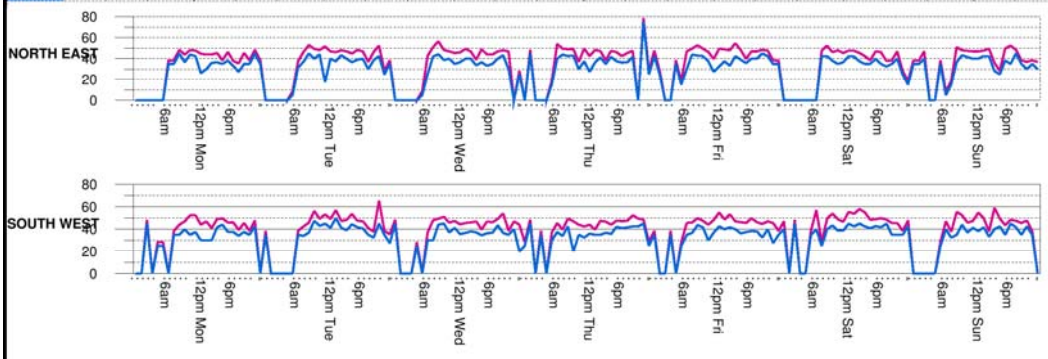
One Page Summary

Count Number	7599
Lat/Long	S33 47 28.6 / E151 07 23.6
UBD	194 B-8
Street	FOLKARD STREET, NORTH RYDE : Between COONEY STREET & LORNA AVENUE (bidirectional)
Location	Between Marilyn Street and Lorna Avenue, House No. 15, ELP GL34119

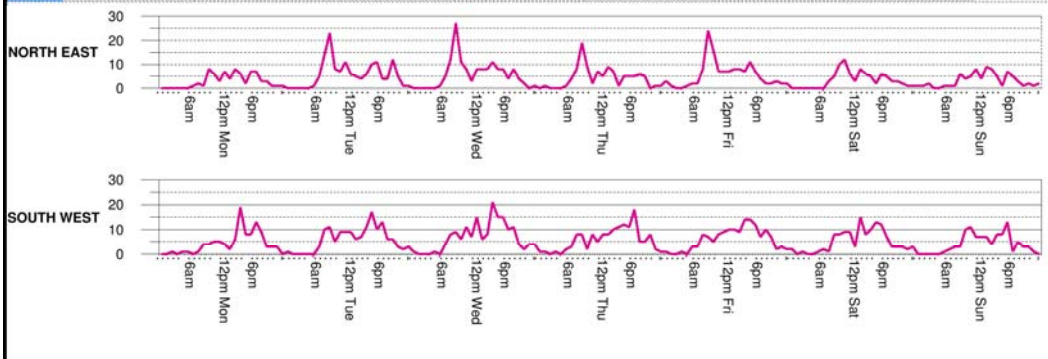
Start Date	06-JUN-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Speed Limit 50	NORTH EAST	SOUTH WEST	COMBINED
Weekly 50th Percentile Speed	38	38	38
Weekly 85th Percentile Speed	48	48	48
Five Day AADT	116	137	253
Seven Day AADT	106	129	235

	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
85%ile	45.2	47.1	46.4	48.1	48.9	48.5	48.2	46.9	47.5	48.3	46.8	47.5	48.7	47.5	48.1	46.6	49.5	48.5	47.3	48.6	48.0	47.5	47.9	47.8
50%ile	36.0	37.2	36.6	38.9	39.9	39.4	38.9	37.3	37.9	39.9	37.5	38.4	39.0	37.7	38.3	37.4	41.4	39.9	38.0	38.6	38.3	38.3	38.5	38.4
> 60 k	0	0	0	0	1	1	3	0	3	4	1	5	0	1	1	0	3	3	0	1	1	1	1	2
%age	.0	.0	.0	.0	.7	.4	2.2	.0	1.0	4.0	.7	2.1	.0	.7	.4	.0	2.4	1.5	.0	1.0	.6	.9	.8	.8
> 70 k	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	.1429	0	.1429
%age	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.1



	MON 06-JUN-11			TUE 07-JUN-11			WED 08-JUN-11			THU 09-JUN-11			FRI 10-JUN-11			SAT 11-JUN-11			SUN 12-JUN-11			SEVENDAY AVERAGE		
	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir	NORTH	SOUTH	BiDir
Short %	95.8	97.0	96.5	96.4	97.9	97.1	97.8	98.8	98.3	97.0	97.1	97.1	96.3	96.6	96.4	100.0	100.0	100.0	97.4	97.9	97.7	97.2	97.9	97.6
Med %	4.2	3.0	3.5	1.4	1.4	1.4	2.2	1.2	1.7	3.0	2.9	2.9	2.2	2.8	2.5	.0	.0	.0	1.3	1.0	1.1	2.0	1.8	1.9
Long %	.0	.0	.0	2.2	.7	1.4	.0	.0	.0	.0	.0	.0	1.5	.7	1.1	.0	.0	.0	1.3	1.0	1.1	.8	.3	.5
AM Pk Vo	8	5	12	23	11	34	27	11	36	19	8	27	24	9	31	12	9	21	8	11	16	17	9	25
PM Pk Vo	8	19	25	12	17	27	11	21	32	9	18	23	11	14	25	8	15	23	9	13	20	10	17	25
7-7pm	61	79	140	109	117	226	116	131	247	82	109	191	114	113	227	71	103	174	63	82	145	88	105	193
24Hr Tot	71	100	171	138	141	279	137	162	299	101	138	239	134	145	279	81	123	204	78	97	175	106	129	235
Class 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 1	66	96	162	133	137	270	134	160	294	98	132	230	129	140	269	81	122	203	75	94	169	102	126	228
Class 2	2	1	3	0	1	1	0	0	0	0	2	2	0	0	0	0	1	1	1	1	2		1	1
Class 3	2	3	5	2	2	4	3	2	5	2	3	5	2	2	4	0	0	0	1	0	1	2	2	3
Class 4	1	0	1	0	0	0	0	0	0	0	1	1	1	2	3	0	0	0	0	1	1		1	1
Class 5	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0			
Class 6	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0			
Class 7	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
Class 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 9	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Class 13	0	0	0	1	1	2	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1			1



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ITEM 6 (continued) **ATTACHMENT 1**

CfeIT bob.white@cfeit.com (02) 9740 8600

Traffic Count Summary Report

Count Number	7594	Ref : RYDE	Lat/Long : S33 47 36.9 / E151 07 20.2
Street	COONEY STREET, NORTH RYDE : Between WICKS ROAD & LANE COVE ROAD (bidirectional) :		UBD 194 B-9
Location	Between Holy Spirit Church and Folkard Street, House No. 41. ELP GL33352		*Carriageway*

Start Date	06-JUN-11
Start Time	1200
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	27
Weekly 85th Percentile Speed	38
Five Day AADT	97
Seven Day AADT	87

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	Total	5 Day Average	Total	7 Day Average
Midnight - 1am	0	0	1	0	0	0	0	1	0	1	0
1am - 2am	0	0	0	2	0	0	0	2	0	2	0
2am - 3am	3	0	0	0	2	0	0	5	1	5	1
3am - 4am	0	0	0	0	0	0	0	0	0	0	0
4am - 5am	0	2	1	1	2	0	0	6	1	6	1
5am - 6am	1	3	1	3	**7**	2	1	15	3	18	3
6am - 7am	2	5	2	3	4	1	0	16	3	17	2
7am - 8am	0	1	0	2	0	2	2	3	1	7	1
8am - 9am	0	**10**	**11**	**11**	**7**	4	5	**39**	**8**	**48**	**7**
9am - 10am	4	9	7	2	4	**6**	6	**26**	5	**38**	5
10am - 11am	2	4	6	2	4	5	**10**	**18**	4	**33**	5
11am - Midday	**5**	5	1	2	3	2	3	**16**	3	**21**	3
Midday - 1pm	3	8	**14**	**12**	9	3	4	**46**	9	**53**	8
1pm - 2pm	2	2	6	7	8	4	5	**25**	5	**34**	5
2pm - 3pm	8	6	10	7	**13**	**6**	5	**44**	9	**55**	8
3pm - 4pm	**11**	9	8	11	9	**6**	3	**48**	**10**	**57**	8
4pm - 5pm	5	9	14	8	7	2	4	**43**	9	**49**	7
5pm - 6pm	**11**	6	**16**	**12**	6	4	**6**	**51**	**10**	**61**	**9**
6pm - 7pm	6	**13**	5	6	6	4	1	**36**	7	**41**	6
7pm - 8pm	2	2	2	1	2	4	3	**9**	2	**16**	2
8pm - 9pm	4	7	3	2	5	1	3	**21**	4	**25**	4
9pm - 10pm	6	0	3	0	0	1	3	**9**	2	**13**	2
10pm - 11pm	0	0	0	3	2	1	0	**5**	1	**6**	1
11pm - Midnight	0	0	0	0	0	5	0	**0**	0	**5**	1
Total	**75**	**101**	**111**	**97**	**100**	**63**	**64**	**484**	**96**	**611**	**87**

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ITEM 6 (continued) **ATTACHMENT 1**

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Traffic Count Summary Report

Count Number	7595	Ref : RYDE	Lat/Long : S33 47 23.2 / E151 07 27.6
Street	LORNA AVENUE, NORTH RYDE : Between AVON STREET & LANE COVE ROAD (bidirectional) :		UBD 194 B-7
Location	Between Folkard Street and Lane Cove Road, House No. 43, ELP GL34132		*Carriageway*

Start Date	06-JUN-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	25
Weekly 85th Percentile Speed	42
Five Day AADT	1358
Seven Day AADT	1250

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	14	3	3	2	10	19	9	**32**	**6**	**60**	**9**
1am - 2am	12	3	6	5	7	4	9	**33**	**7**	**46**	**7**
2am - 3am	4	0	1	0	0	5	4	**5**	**1**	**14**	**2**
3am - 4am	2	1	1	2	1	3	4	**7**	**1**	**14**	**2**
4am - 5am	1	4	2	1	5	4	3	**13**	**3**	**20**	**3**
5am - 6am	0	13	12	16	14	5	3	**55**	**11**	**63**	**9**
6am - 7am	8	35	22	24	26	23	10	**115**	**23**	**148**	**21**
7am - 8am	9	75	79	78	83	18	11	**324**	**65**	**353**	**50**
8am - 9am	17	**168**	**191**	**187**	**178**	51	28	**741**	**148**	**820**	**117**
9am - 10am	37	108	98	100	124	69	69	**467**	**93**	**605**	**86**
10am - 11am	43	78	69	61	68	78	63	**319**	**64**	**460**	**66**
11am - Midday	**67**	76	75	67	87	**97**	**72**	**372**	**74**	**541**	**77**
Midday - 1pm	73	66	73	75	103	**93**	65	**390**	**78**	**548**	**78**
1pm - 2pm	74	68	58	71	79	87	**78**	**350**	**70**	**515**	**74**
2pm - 3pm	70	69	79	79	77	79	59	**374**	**75**	**512**	**73**
3pm - 4pm	**118**	97	112	93	120	75	63	**540**	**108**	**678**	**97**
4pm - 5pm	117	121	101	114	110	68	68	**563**	**113**	**699**	**100**
5pm - 6pm	115	**139**	**115**	**136**	**128**	83	65	**633**	**127**	**781**	**112**
6pm - 7pm	107	92	114	103	81	81	58	**497**	**99**	**636**	**91**
7pm - 8pm	51	61	81	70	66	44	38	**329**	**66**	**411**	**59**
8pm - 9pm	40	49	39	63	41	34	29	**232**	**46**	**295**	**42**
9pm - 10pm	35	30	42	41	38	32	22	**186**	**37**	**240**	**34**
10pm - 11pm	18	22	29	28	36	22	21	**133**	**27**	**176**	**25**
11pm - Midnight	9	13	17	19	21	17	21	**79**	**16**	**117**	**17**
Total	**1041**	**1391**	**1419**	**1435**	**1503**	**1091**	**872**	**6789**	**1357**	**8752**	**1250**

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ITEM 6 (continued) **ATTACHMENT 1**

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Traffic Count Summary Report

Count Number	7596	Ref : RYDE	Lat/Long : S33 47 36.3 / E151 07 38.8
Street	BEATRICE STREET, NORTH RYDE : Between WICKS ROAD & AMELIA STREET (bidirectional) :		UBD 194 D-9
Location	Between Wicks Road and Avon Road, House No. 1A, ELP GL34224		*Carriageway*

Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	39
Weekly 85th Percentile Speed	47
Five Day AADT	1196
Seven Day AADT	1099

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	Total	5 Day Average	Total	7 Day Average
Midnight - 1am	9	0	4	3	6	11	10	**22**	**4**	**43**	**6**
1am - 2am	3	1	2	3	6	8	9	**15**	**3**	**32**	**5**
2am - 3am	4	1	2	1	0	3	8	**8**	**2**	**19**	**3**
3am - 4am	2	0	0	1	1	1	2	**4**	**1**	**7**	**1**
4am - 5am	0	2	3	4	2	1	1	**11**	**2**	**13**	**2**
5am - 6am	2	7	10	7	8	4	5	**34**	**7**	**43**	**6**
6am - 7am	6	34	33	31	27	11	4	**131**	**26**	**146**	**21**
7am - 8am	9	71	71	65	64	21	10	**280**	**56**	**311**	**44**
8am - 9am	21	**127**	**130**	**141**	**122**	46	27	**541**	**108**	**614**	**88**
9am - 10am	46	79	81	98	88	61	51	**392**	**78**	**504**	**72**
10am - 11am	50	49	47	50	69	82	63	**265**	**53**	**410**	**59**
11am - Midday	**58**	56	62	60	82	**86**	**74**	**318**	**64**	**478**	**68**
Midday - 1pm	63	54	53	85	60	**105**	**66**	**315**	**63**	**486**	**69**
1pm - 2pm	46	50	56	65	71	57	56	**288**	**58**	**401**	**57**
2pm - 3pm	71	68	68	71	79	66	43	**357**	**71**	**466**	**67**
3pm - 4pm	**140**	**151**	**140**	**143**	**142**	57	56	**716**	**143**	**829**	**118**
4pm - 5pm	100	101	111	107	121	73	50	**540**	**108**	**663**	**95**
5pm - 6pm	119	134	113	136	119	54	60	**621**	**124**	**735**	**105**
6pm - 7pm	77	72	95	93	96	59	38	**433**	**87**	**530**	**76**
7pm - 8pm	48	51	57	53	43	50	40	**252**	**50**	**342**	**49**
8pm - 9pm	28	37	31	43	27	37	26	**166**	**33**	**229**	**33**
9pm - 10pm	26	17	31	41	21	22	19	**136**	**27**	**177**	**25**
10pm - 11pm	19	16	16	21	14	23	25	**86**	**17**	**134**	**19**
11pm - Midnight	10	6	8	10	14	19	15	**48**	**10**	**82**	**12**
Total	**957**	**1184**	**1224**	**1332**	**1282**	**957**	**758**	**5979**	**1195**	**7694**	**1099**

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Traffic Count Summary Report

Count Number	7597	Ref : RYDE	Lat/Long : S33 47 38.4 / E151 07 33.3
Street	AVON ROAD, NORTH RYDE : Between COONEY STREET & CAM STREET (bidirectional) :		UBD 194 C-9
Location	Between Marilyn Street and Beatrice Street, House No. 49.		*Carriageway*

Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	40
Weekly 85th Percentile Speed	50
Five Day AADT	449
Seven Day AADT	393

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	Total	5 Day Average	Total	7 Day Average
Midnight - 1am	2	0	2	0	3	2	1	7	1	10	1
1am - 2am	1	1	1	1	1	0	0	5	1	5	1
2am - 3am	2	0	1	0	0	1	0	3	1	4	1
3am - 4am	1	1	1	1	1	1	2	5	1	8	1
4am - 5am	0	1	1	1	2	1	0	5	1	6	1
5am - 6am	0	5	4	8	2	0	1	19	4	20	3
6am - 7am	2	10	6	12	5	4	1	35	7	40	6
7am - 8am	0	28	26	29	20	5	4	103	21	112	16
8am - 9am	9	**91**	**110**	**91**	**97**	20	4	**398**	**80**	**422**	**60**
9am - 10am	11	31	36	39	35	5	**35**	**152**	30	**192**	**27**
10am - 11am	**21**	18	11	22	20	20	15	**92**	18	**127**	**18**
11am - Midday	**21**	21	27	17	14	**21**	27	**100**	20	**148**	**21**
Midday - 1pm	18	21	17	16	21	**28**	**33**	**93**	19	**154**	**22**
1pm - 2pm	13	18	17	20	18	22	24	**86**	17	**132**	**19**
2pm - 3pm	26	32	24	25	27	23	10	**134**	27	**167**	**24**
3pm - 4pm	**97**	**80**	**79**	**74**	**80**	15	15	**410**	**82**	**440**	**63**
4pm - 5pm	18	41	20	25	20	16	18	**124**	25	**158**	**23**
5pm - 6pm	24	40	40	34	30	21	22	**168**	34	**211**	**30**
6pm - 7pm	22	15	24	28	23	13	15	**112**	22	**140**	**20**
7pm - 8pm	16	14	18	20	10	17	9	**78**	16	**104**	**15**
8pm - 9pm	7	13	5	14	11	6	1	**50**	10	**57**	**8**
9pm - 10pm	8	5	10	7	6	4	7	**36**	7	**47**	**7**
10pm - 11pm	4	1	4	5	3	3	7	**17**	3	**27**	**4**
11pm - Midnight	2	5	0	2	6	6	1	**15**	3	**22**	**3**
Total	**325**	**492**	**484**	**491**	**455**	**254**	**252**	**2247**	**449**	**2753**	**393**

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Traffic Count Summary Report

Count Number	7598	Ref : RYDE	Lat/Long : S33 47 37.8 / E151 07 26.0
Street	MARILYN STREET, NORTH RYDE : Between AVON ROAD & FOLKARD STREET (bidirectional) :		UBD 194 B-9
Location	Between Pamela Street and Kathleen Reserve, Across from House No. 15 , ELP GL33342		*Carriageway*

Start Date	06-JUN-11
Start Time	1400
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	44
Weekly 85th Percentile Speed	55
Five Day AADT	481
Seven Day AADT	439

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	1	2	1	1	4	3	2	**9**	**2**	**14**	**2**
1am - 2am	2	1	1	3	2	0	0	**9**	**2**	**9**	**1**
2am - 3am	2	0	0	0	0	0	4	**2**	**0**	**6**	**1**
3am - 4am	1	1	1	1	2	1	1	**6**	**1**	**8**	**1**
4am - 5am	0	4	1	2	4	1	1	**11**	**2**	**13**	**2**
5am - 6am	2	4	6	7	6	1	2	**25**	**5**	**28**	**4**
6am - 7am	1	12	13	14	9	6	4	**49**	**10**	**59**	**8**
7am - 8am	1	39	24	29	27	6	6	**120**	**24**	**132**	**19**
8am - 9am	10	**79**	**85**	**93**	**78**	26	14	**345**	**69**	**385**	**55**
9am - 10am	**22**	41	33	35	37	23	29	**168**	**34**	**220**	**31**
10am - 11am	19	28	23	14	24	**32**	29	**108**	**22**	**169**	**24**
11am - Midday	17	34	23	17	19	27	**38**	**110**	**22**	**175**	**25**
Midday - 1pm	24	21	27	20	30	**41**	**28**	**122**	**24**	**191**	**27**
1pm - 2pm	11	18	15	22	30	18	19	**96**	**19**	**133**	**19**
2pm - 3pm	21	25	31	24	26	30	23	**127**	**25**	**180**	**26**
3pm - 4pm	**74**	**67**	**86**	**56**	**67**	23	13	**350**	**70**	**386**	**55**
4pm - 5pm	34	45	39	31	39	29	18	**188**	**38**	**235**	**34**
5pm - 6pm	32	46	46	30	45	30	21	**199**	**40**	**250**	**36**
6pm - 7pm	19	26	27	28	25	19	13	**125**	**25**	**157**	**22**
7pm - 8pm	19	18	20	17	18	30	9	**92**	**18**	**131**	**19**
8pm - 9pm	12	11	10	11	7	4	10	**51**	**10**	**65**	**9**
9pm - 10pm	9	6	5	7	15	5	8	**42**	**8**	**55**	**8**
10pm - 11pm	12	4	5	6	3	4	11	**30**	**6**	**45**	**6**
11pm - Midnight	2	4	2	5	6	6	2	**19**	**4**	**27**	**4**
Total	**347**	**536**	**524**	**473**	**523**	**365**	**305**	**2403**	**480**	**3073**	**439**

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ITEM 6 (continued) **ATTACHMENT 1**

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Traffic Count Summary Report

Count Number	7599	Ref : RYDE	Lat/Long : S33 47 28.6 / E151 07 23.6
Street	FOLKARD STREET, NORTH RYDE : Between COONEY STREET & LORNA AVENUE (bidirectional) :		UBD 194 B-8
Location	Between Marilyn Street and Lorna Avenue, House No. 15, ELP GL34119		*Carriageway*

Start Date	06-JUN-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	38
Weekly 85th Percentile Speed	48
Five Day AADT	253
Seven Day AADT	235

TOTAL COUNT MATRIX

	MON *13TH / 6TH*	TUE *7TH*	WED *8TH*	THU *9TH*	FRI *10TH*	SAT *11TH*	SUN *12TH*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight - 1am	0	1	1	1	4	2	1	7	1	10	1
1am - 2am	0	0	0	2	1	0	1	3	1	4	1
2am - 3am	1	0	0	0	0	1	2	1	0	2	0
3am - 4am	0	0	0	1	1	0	0	2	0	2	0
4am - 5am	1	0	1	0	1	0	0	3	1	3	0
5am - 6am	1	1	1	3	5	1	2	11	2	14	2
6am - 7am	1	8	9	7	5	2	3	30	6	35	5
7am - 8am	3	24	20	16	16	4	4	79	16	87	12
8am - 9am	5	**34**	**36**	**27**	**31**	13	9	**133**	**27**	155	**22**
9am - 10am	**12**	13	17	11	21	18	14	74	15	106	15
10am - 11am	11	16	19	10	15	**21**	**16**	71	14	108	15
11am - Midday	8	20	10	12	16	15	15	66	13	96	14
Midday - 1pm	11	15	23	13	17	6	11	79	16	96	14
1pm - 2pm	6	11	14	17	18	**23**	16	66	13	105	15
2pm - 3pm	14	11	16	17	17	14	12	75	15	101	14
3pm - 4pm	**25**	17	**32**	12	21	15	13	**107**	**21**	135	19
4pm - 5pm	10	**27**	23	17	**25**	15	9	102	20	126	18
5pm - 6pm	15	21	23	16	19	18	**20**	94	19	132	19
6pm - 7pm	20	17	14	**23**	11	12	6	85	17	103	15
7pm - 8pm	12	10	19	11	12	6	8	64	13	78	11
8pm - 9pm	6	18	8	10	9	6	4	51	10	61	9
9pm - 10pm	4	8	4	8	5	5	5	29	6	39	6
10pm - 11pm	4	3	4	3	5	3	2	19	4	24	3
11pm - Midnight	1	4	5	2	4	4	2	16	3	22	3
Total	**171**	**279**	**299**	**239**	**279**	**204**	**175**	**1267**	**253**	**1646**	**235**

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ITEM 6 (continued) **ATTACHMENT 1**

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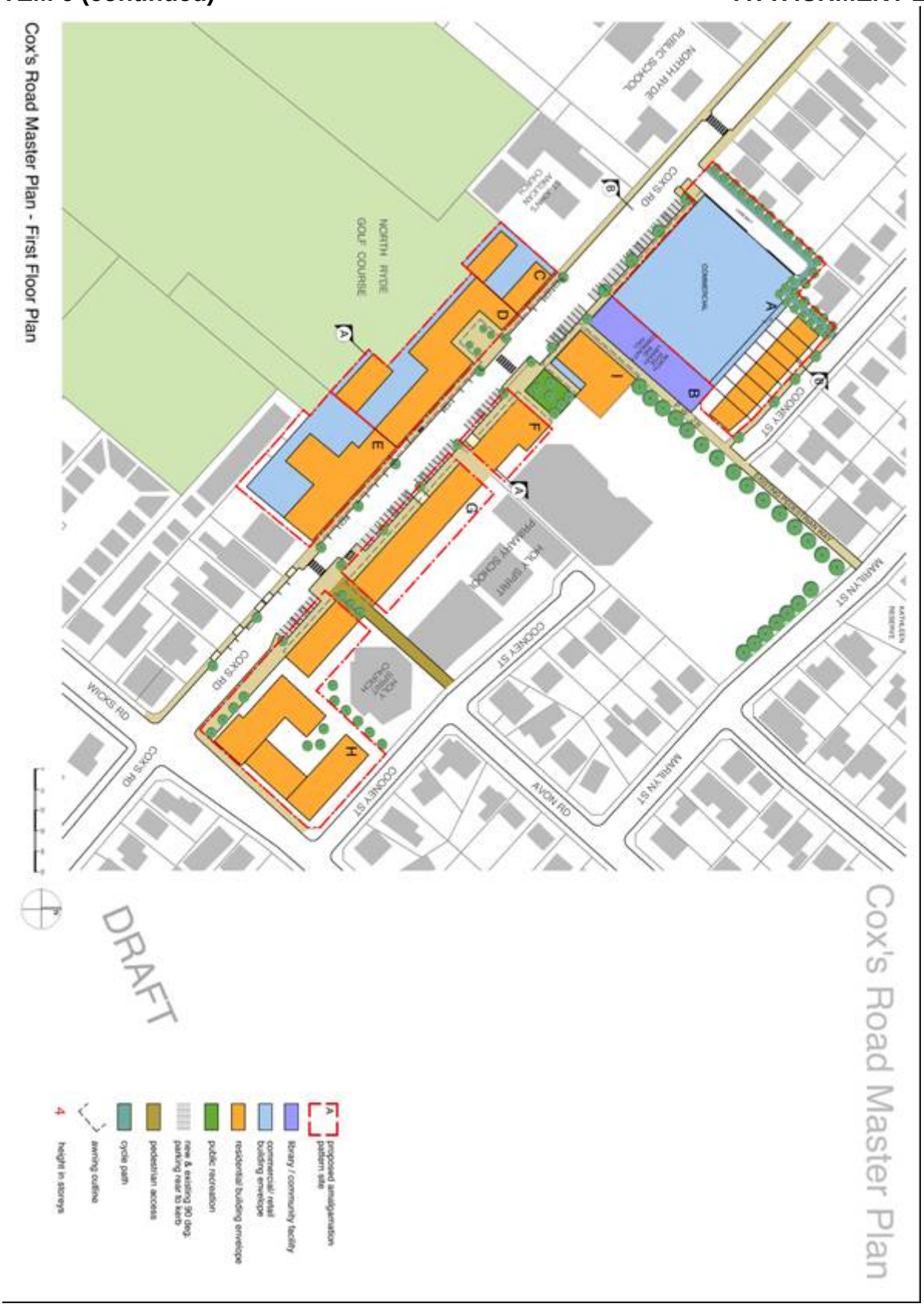
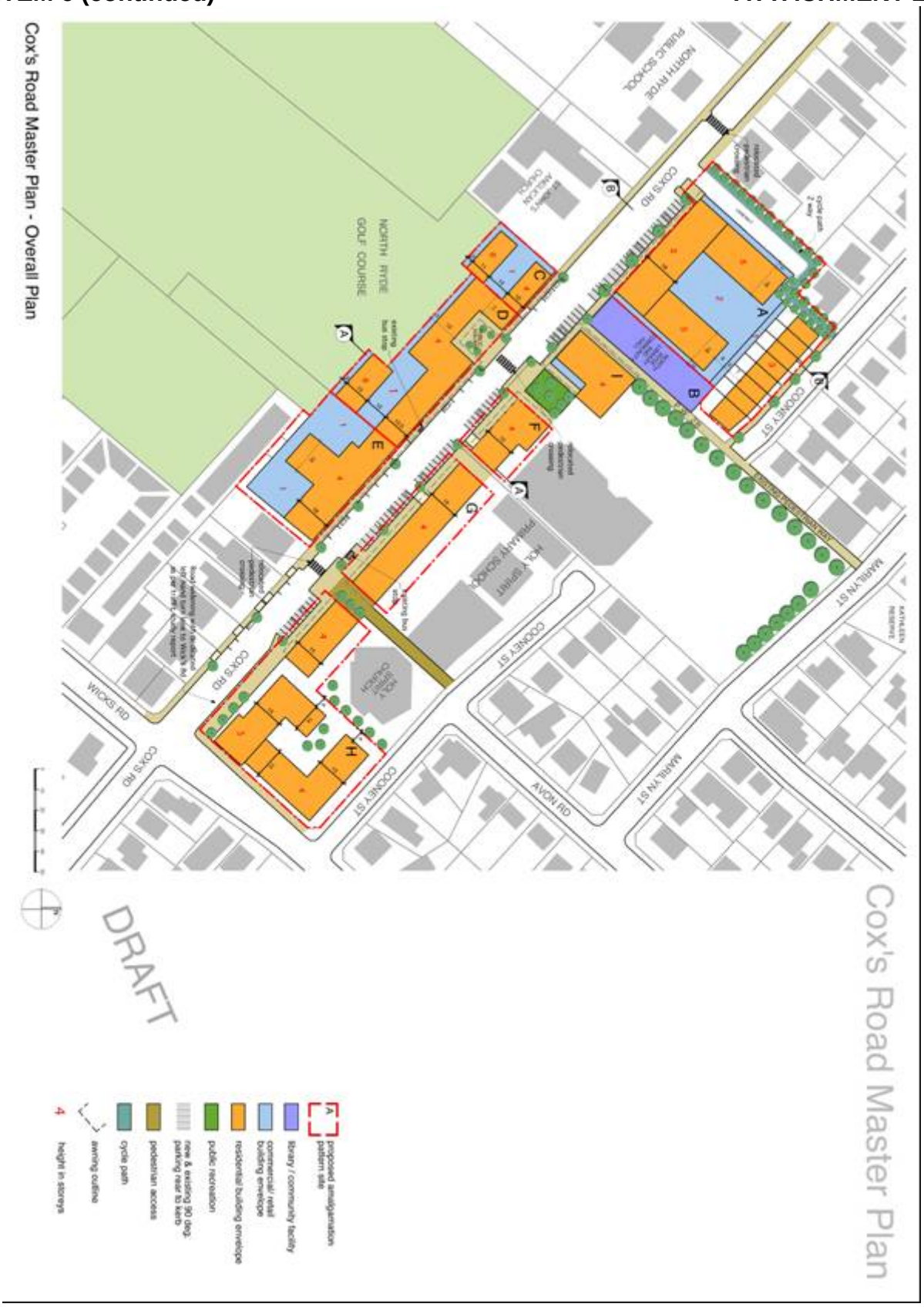
ITEM 6 (continued) **ATTACHMENT 2**

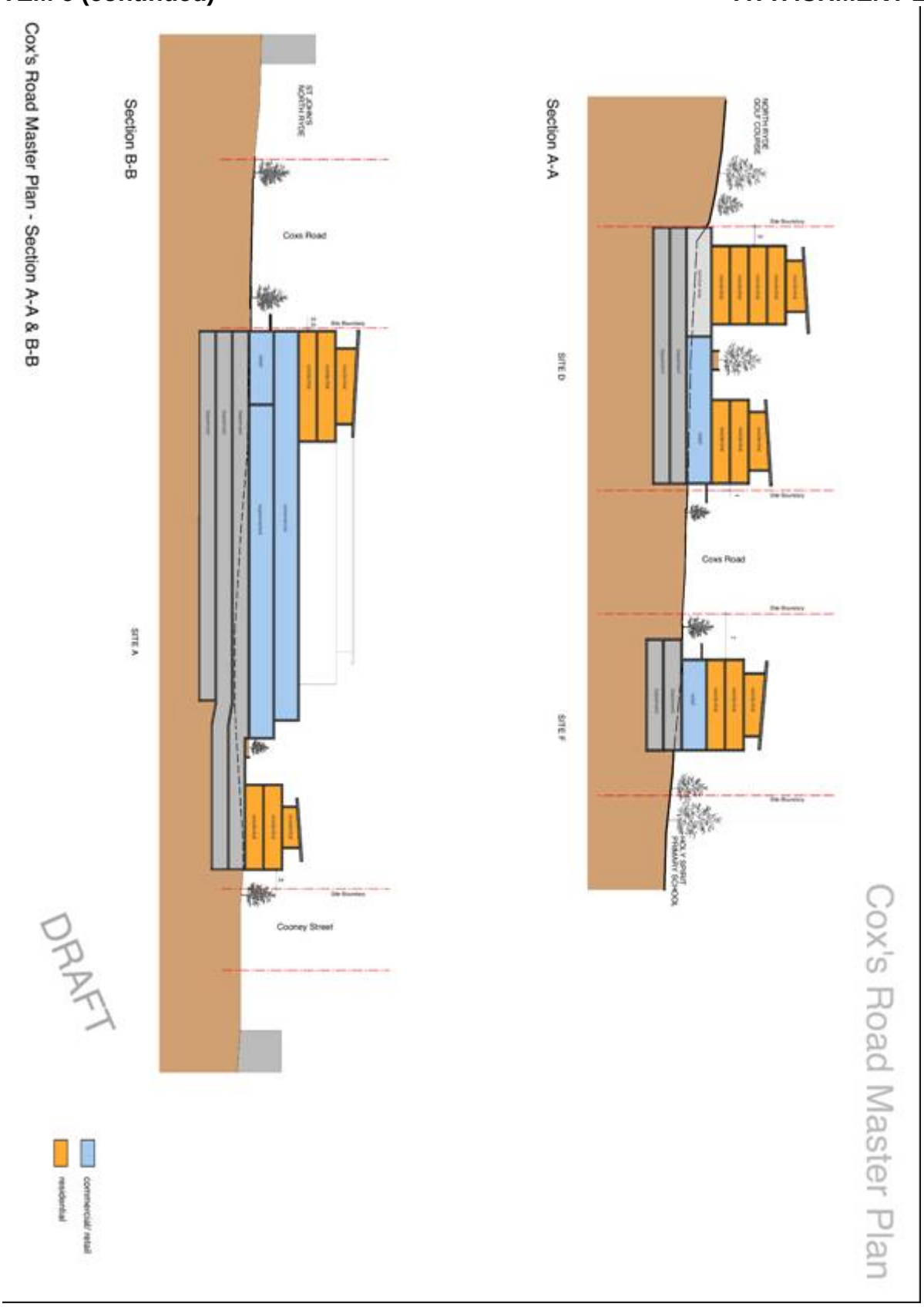
ITEM 6 (continued) **ATTACHMENT 2**



ITEM 6 (continued) **ATTACHMENT 2**



ITEM 6 (continued) **ATTACHMENT 2**



ITEM 6 (continued) **ATTACHMENT 3**

Sphere company

Cox's Road Master Plan – Commercial Assessments

Sphere Property Corporation (now called Sphere Company) prepared commercial assessments of three key sites in the Cox's Road commercial precinct as part of the master planning work undertaken for the Ryde Small Centres Study in 2010. Subsequent developments require changes to some of the assumptions behind these assessments and Council has asked Sphere to update them.

Sphere considered sites A/B, D and E in its original work. The key changes to the plan for Cox's Road are:

- the separation of sites A and B with the retention of Council library and other facilities on site B;
- the addition of a left turning lane from Cox's Road into Wicks Road at site H;
- the inclusion of a town square in site D; and
- wider footpaths and new street edge treatments across all sites.

The changes in floor space (for the three sites originally considered – i.e. A, D and E) that were made necessary by these changes are shown in the table of Gross Floor Areas (GFA) below.

Plan Issue	Date	Site A/B or A		Site D		Site E	
		Retail GFA	Residential GFA	Retail GFA	Residential GFA	Retail GFA	Residential GFA
E	11/5/2010	7,225m^2*	10,971m^2*	1,780m^2	5,855m^2	2,555m^2	3,672m^2
I	16/2/2012	7,800m^2	9,858m^2	1,990m^2	5,860m^2	2,560m^2	3,686m^2

* These areas extend over sites A and B which also included 3,665m^2 of community uses.

The community benefits that need to be funded as part of the delivery of the proposed Master Plan are:

- an upgrade of the Council library and other facilities – the cost will depend on the extent of the upgrade but has been estimated to cost up to $6 million;
- the turning lane into Wicks Road – with an estimated cost of $0.9 million;
- the inclusion of 32 public car spaces in the development of site C – at a cost of approximately $0.8 million; and
- open space and footpath improvements –estimated at $3 million.

It has been assumed in this study that the community benefits need to be achieved at no cost to Council but rather from contributions from the land owners benefiting from the proposed increases in densities. They could possibly be delivered by way of a Section 94 Plan, Voluntary Planning Agreements, Deeds of Agreement or other means. However, there would be a timing issue unless one of the voluntary methods was chosen because the road works would need to be completed before the first redevelopment occurred while the redevelopments would occur over an extended period as each land owner makes its own independent decision to proceed.

The results of updating the models for the three sites are shown in the table below. The key modelling assumptions used in the original modelling were retained in this assessment. In particular, Sphere has assumed that development would only occur if the expected development margin (defined as net sales revenue divided by total costs including debt finance costs) was at least

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.2.

20%. Consequently, its assumption has been that any contributions towards the cost of infrastructure would need to be paid from development profits above the 20% hurdle.

	Site A	Site D	Site E
2010 Conclusion	NA – part of integrated developments of Sites A and B	Viable – limited capacity to fund infrastructure	Viable – limited capacity to fund infrastructure
2012 Conclusion	Comfortably Viable – capable of making a substantial contribution towards infrastructure costs	Comfortably Viable –capable of making a contribution towards infrastructure costs	Comfortably Viable – capable of making a contribution towards infrastructure costs

This study looked at the commercial viability of the proposed master plan by examining three key sites. It took a high level approach without the benefit of site specific knowledge or cost estimates produced by a Quantity Surveyor. Consequently, it cannot be relied upon as a forecast. However, it indicates that redevelopment of the three sites as proposed by the master plan would be attractive and that these three developments would be capable of making a substantial contribution towards the cost of the proposed new infrastructure.

The new master plan has delivered substantially more floor space to Site A than contemplated under the first version and consequently, that site has the capacity to contribute substantially more to the infrastructure upgrades than either of the other two sites. Sphere believes that contributions from these sites could fund approximately 50% of the total cost of around $11 million if the full library upgrade was undertaken. While the other sites have not been examined, it is likely that they would also have the financial capacity to make contributions.

Further study would be required before deciding on whether all of the upgrades would be fundable. As mentioned above one issue may be the extended period over which development is likely to occur and Council may wish to consider its attitude to providing some funding on a bridging basis. Naturally, the need for bridging would be reduced if all of the affected properties were redeveloped in reasonably short period. However, at this stage, it appears that full redevelopment may be required for all of Council's desired upgrades were to be funded.

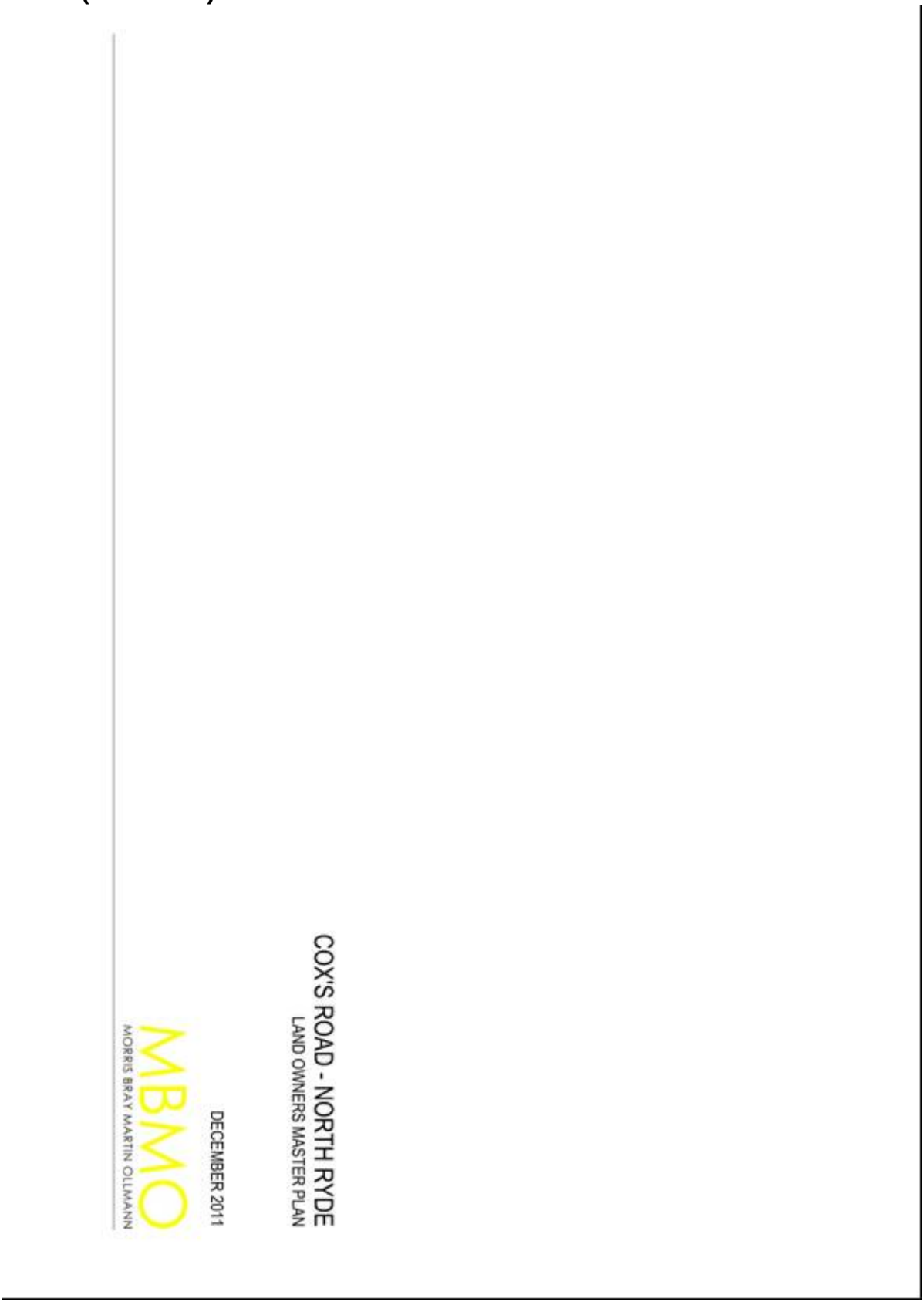
If Council decides that it would like to adopt this plan, it would then need to negotiate with the landowners on the contributions they would agree to make towards funding the community benefits. Sensible preparations for those negotiations would include a more thorough feasibility study of the developments. The object of this study would be to confirm the capacity of each development to make a contribution and to get a better estimate of the size of that contribution.

ITEM 6 (continued) **ATTACHMENT 3**

Important Note – Disclaimer

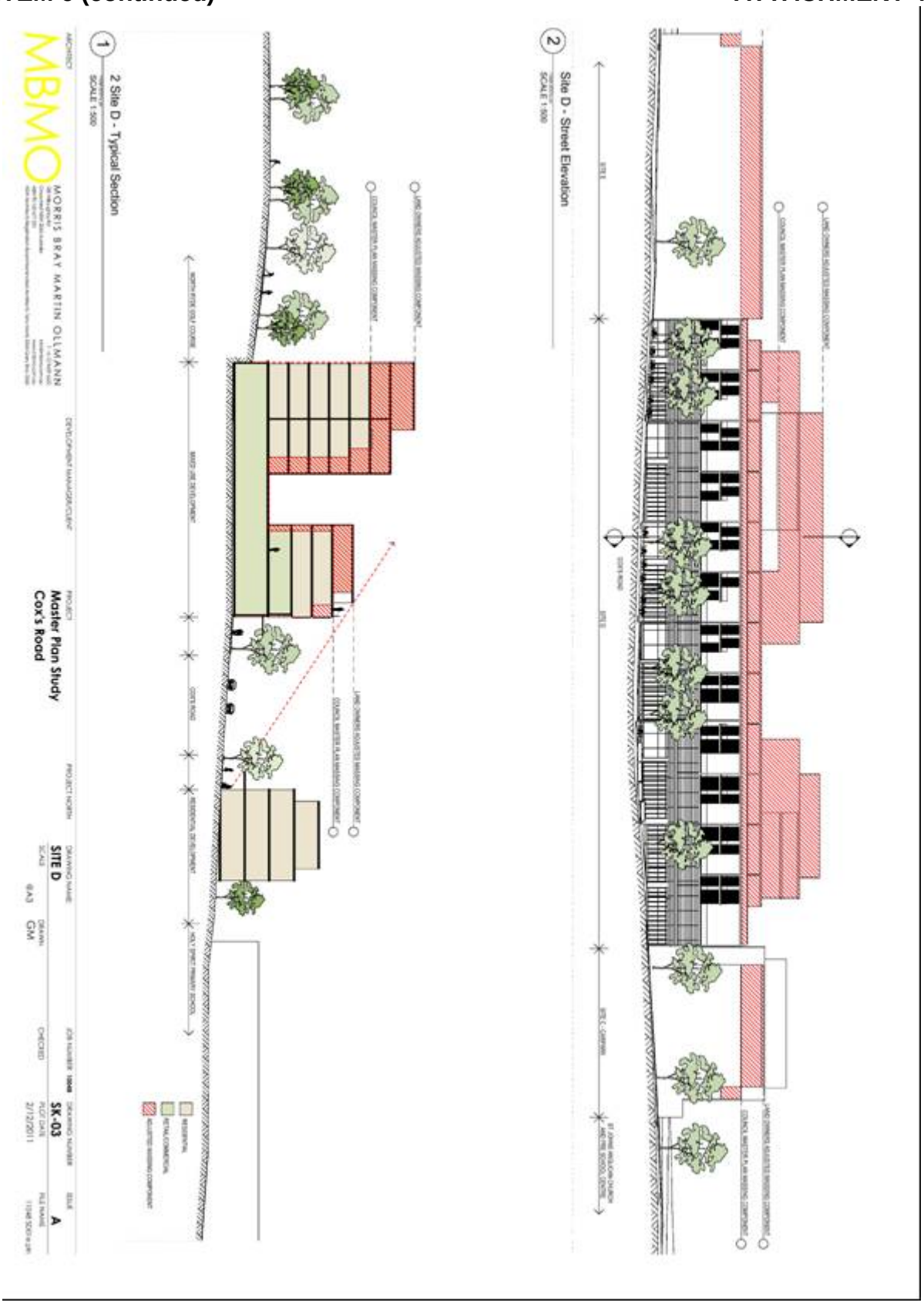
This Report is furnished without liability on the part of Sphere Property Corporation (SPC), its employees or representatives. In preparing this document SPC has relied upon information conveyed to it by third parties and SPC has where possible verified the accuracy of that information. Whilst SPC has no knowledge that any information contained in this report is incorrect at the time of writing, no statement or information contained in this document should be relied upon unless the person satisfies themselves by inspection or otherwise as to the correctness of the statement or information.

ITEM 6 (continued) **ATTACHMENT 4**



ITEM 6 (continued) **ATTACHMENT 4**

ITEM 6 (continued) **ATTACHMENT 4**



ITEM 6 (continued) **ATTACHMENT 4**

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ITEM 6 (continued) **ATTACHMENT 4**

ITEM 6 (continued) **ATTACHMENT 5**

olsson& associatesarchitects PTY LTD

SPHERE PROPERTY CORPORATION

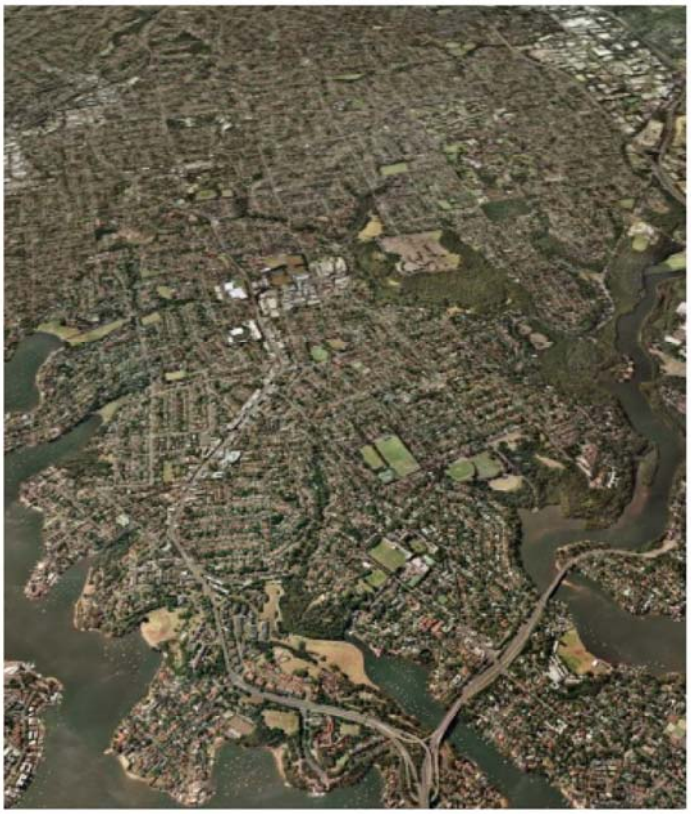
GTAconsultants

Small Centres Master Plan Study:

Master Plan
LEP and DCP Provisions

DRAFT MASTER PLAN REPORT
Cox's Road

For the City of Ryde
April 2012



ITEM 6 (continued) **ATTACHMENT 5**

CONTENTS

INTRODUCTION

The Draft Small Centres Master Plan Study is a component of the City of Ryde local study. The local strategy was developed to prepare a local land use planning strategy as required by the Department of Planning. A primary outcome of the local study was to inform the provisions of a future city wide comprehensive LEP so it is consistent with the draft Inner North sub-regional strategy. The outcomes of the small centres master plan will fit within this wider framework.

There are 27 existing small retail centres in the City of Ryde. A study of the 27 centres was carried out by the City of Ryde. Three study areas have been identified that warranted more detailed study, plus the Glen Street precinct in Eastwood.

The four study areas in this Draft Master Plan are Boronia Park, Blenheim Road, Glen Street / Lakeside Drive Eastwood and Cox's Road. Cox's Road was subject to a traffic study.

Methodology

The consultant team is comprised of Olsson & Associates Architects (OAA), Sphere Property Corporation and GTA Transport. As lead urban designers, OAA have undertaken urban analysis for each centre. From this analysis OAA produced schemes for building envelopes and public domain improvements in consultation with Sphere Property and GTA, to establish designs that are economically viable and minimise the impact of traffic in each centre. The building envelopes and public domain designs in this Draft Master Plan are the result of an iterative design process, where building envelope designs were adjusted for viability and public domain designs were adjusted for vehicles. The Appendix of the report contains Sphere Property's methodology and its outcomes of economic testing. GTA traffic counts and the RTA's guidelines for these types of roads are also contained in the Appendix.

Urban Design Principles for Small Centres

- Each small centre will have a strong sense of community, it will be safe, family-friendly and secure. The green, spacious, "high-forest" character of the area will be protected and enhanced through well designed and appropriately scaled development.
- Each small centre will have the opportunity to meet the social needs of a diverse local population including families, teenagers, children and the elderly by providing a range of activities including, local shopping, medical services, entertainment, education and leisure.
- Each small centre will be well appointed and provide for the needs of the local community by offering increased retail choice, opportunities for offices, professional services and housing.
- The range of existing shops will be expanded and made more attractive, offering a distinctive local shopping experience. Parking at the kerbside and access at the rear of some shops will improve parking and service delivery.

Public Domain Benefits

Each small centre will benefit from an enhanced public domain suited to the particular centre. This will include widening of footpaths, new street trees, new paving and street furniture. In some cases, an existing park will be enhanced and existing car parks made more attractive with tree planting. Public domain improvements are made possible with increased development potential. Public domain improvements will lead to more vibrant centres used by a greater diversity of people and under grounding of services in some centres. These centres have the potential to become urban villages with a strengthened community role and sense of place.

Housing

A variety of housing types will be provided within easy walking distance of each small centre. Shop-top apartments are located at the core of the small centres. Townhouses and apartment buildings in well-landscaped settings adjoin the centres, providing a transition to the existing residential areas. Parkside apartments are proposed along the edges of existing open spaces.

Activities and Uses

Active frontages at ground will be provided to all streets in the retail centres. The vitality of the existing retail strips will be maintained with public domain and parking improvements, whilst the range of shops will be expanded. Commercial spaces catering for small scale businesses, professional services and medical consulting rooms will have the opportunity to locate in the expanded centres.

Built Form

Building heights in all existing shopping streets will vary, so that new built form will relate appropriately in bulk and scale to the existing main street shops. Generally, buildings will have a top storey set back to reduce the apparent scale and create an articulated roof line. The proposed built form will reinforce the streetscape, create spatial definition of streets and compliment the public domain such as the pedestrian footpaths and street trees etc.

Proposed residential development adjoining the small centres ranges from 2 to 5 storeys. This includes townhouses of 2 storeys plus an attic and 3 to 5 storey apartment buildings where the top floor is setback to reduce visual impact.

Where basement parking is required under 3 to 5 storey housing, large front and side setbacks and restricted building footprints will allow for large deep soil zones for the planting of canopy trees. This will diminish the visible scale of the buildings and place them in a landscape setting.

Parks and Open Space

Existing parks and reserves will be enhanced where appropriate to provide improved access, safety and amenity.

The biodiversity of parks and reserves will be enhanced with appropriate tree planting.

Pedestrian Access and Circulation

New paving to footpaths and kerb ramps will be provided to all shopping streets.

Street furniture and lighting will be provided along the main pedestrian routes.

Where possible new well lit through block pedestrian routes will be established with active frontages along both sides to provide passive surveillance.

Pedestrian priority will be improved on shopping and residential streets with new traffic calming measures including pedestrian crossing facilities or other measures such as road narrowing and pedestrian refuges.

Signalised pedestrian crossings will be provided on the major roads at all new traffic signals.

Broad paved pedestrian paths will be provided within and around the retail core and main pedestrian routes.

Accessibility will be improved for people with disabilities and strollers.

Cycle Access and Circulation

Linkages will be provided to regional and local on-road cycleways.

Secure bicycle parking will be required for residents and visitors in all new residential buildings.

Secure bicycle parking will be provided in all public and commercial carparks.

COX'S ROAD

Existing character

Cox's Road, between Wicks and Lane Cove Roads, is a significant local centre. A number of community facilities are located in the study area, including North Ryde Public Library, community hall, two primary schools, childcare facilities and several churches.

A key local retail precinct, shops are located towards the crest of the hill with the southern side of Cox's Road defined by a retail strip with shop-top dwellings above. A major local supermarket and arcade is located towards the northwestern end of the shopping strip on the northern side of the road.

Residential development in the area is typically detached housing, setback from the street frontage, with some one to two storey apartments and townhouses along Wicks Road. Lots at either end of Cox's Road, are typically residential.

The study area is well serviced by buses and major roads and located in close proximity to a major employment area (Macquarie Park).

Recreational open space within the vicinity of Cox's Road includes the substantial grounds of Macquarie Hospital and the North Ryde Golf Course.

The current public domain and amenity of Cox's Road need improvement. The pedestrian footpaths along Cox's Road are predominately narrow, discontinuous with uneven surfaces and are in poor condition.

The overall streetscape in the retail precinct of Cox's Road is inconsistent with no particular character or style. Existing buildings have varying setbacks, heights and differing treatment to the public domain.

There are a number of traffic issues that Cox's Road currently faces such as the traffic congestion particularly during peak hours, pedestrian crossing and the on-street parking.

Currently within Cox's Road and the immediate vicinity, there are a number of significant issues such as the public domain, built form, traffic and parking that require substantial improvement in order to fulfil needs of the current and future residents, visitors and community.

Image 1. The North Ryde Library and Community Centre.

Image 2. Retail strip south of Cox's Road with shop top housing.

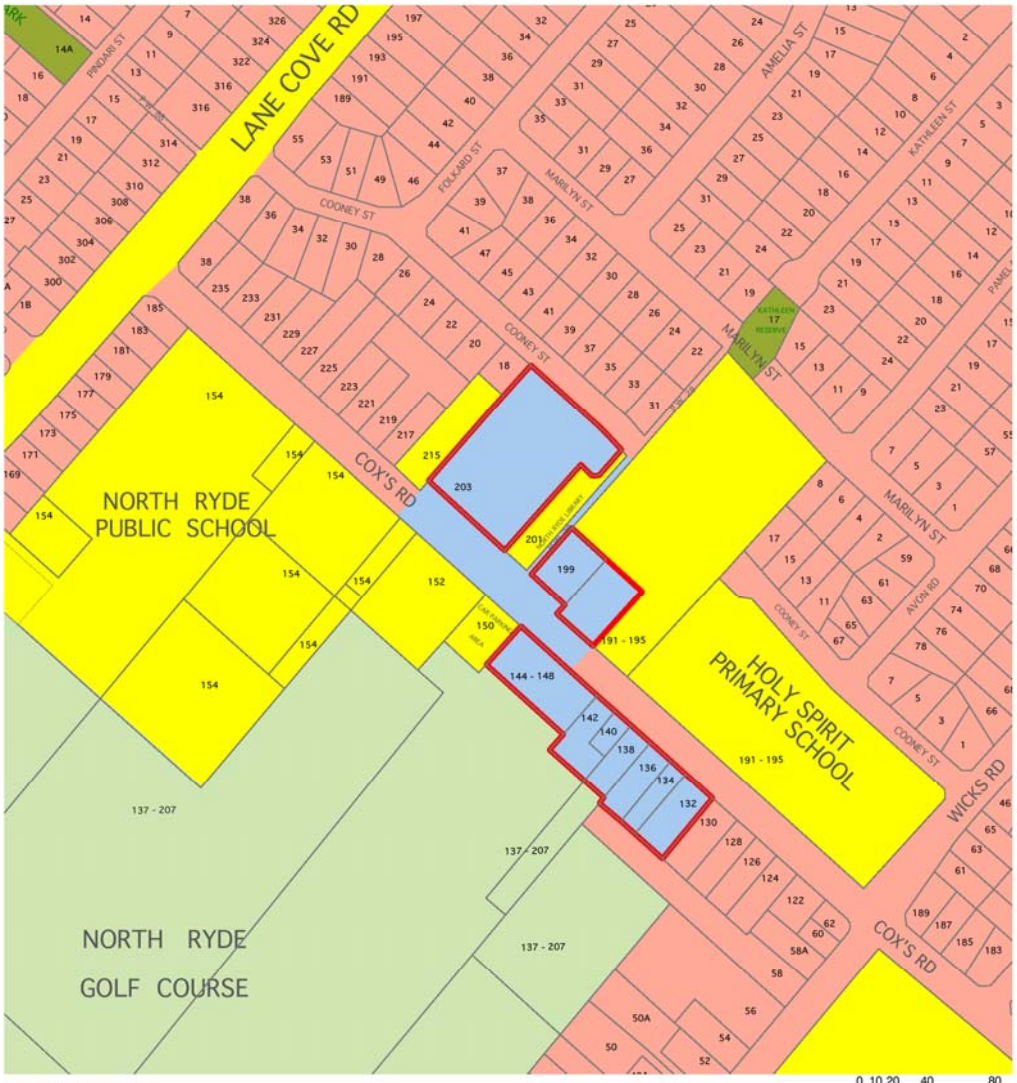
Image 3. St Vincent de Paul Centre with the Holy Spirit Primary School located rear of the centre.

Image 4. The predominant residential character of the area with 1 - 2 storeys.

ITEM 6 (continued) **ATTACHMENT 5**

City of Ryde
Small Centres Master Plan Study DRAFT Master Plan Report

COX'S ROAD - ANALYSIS



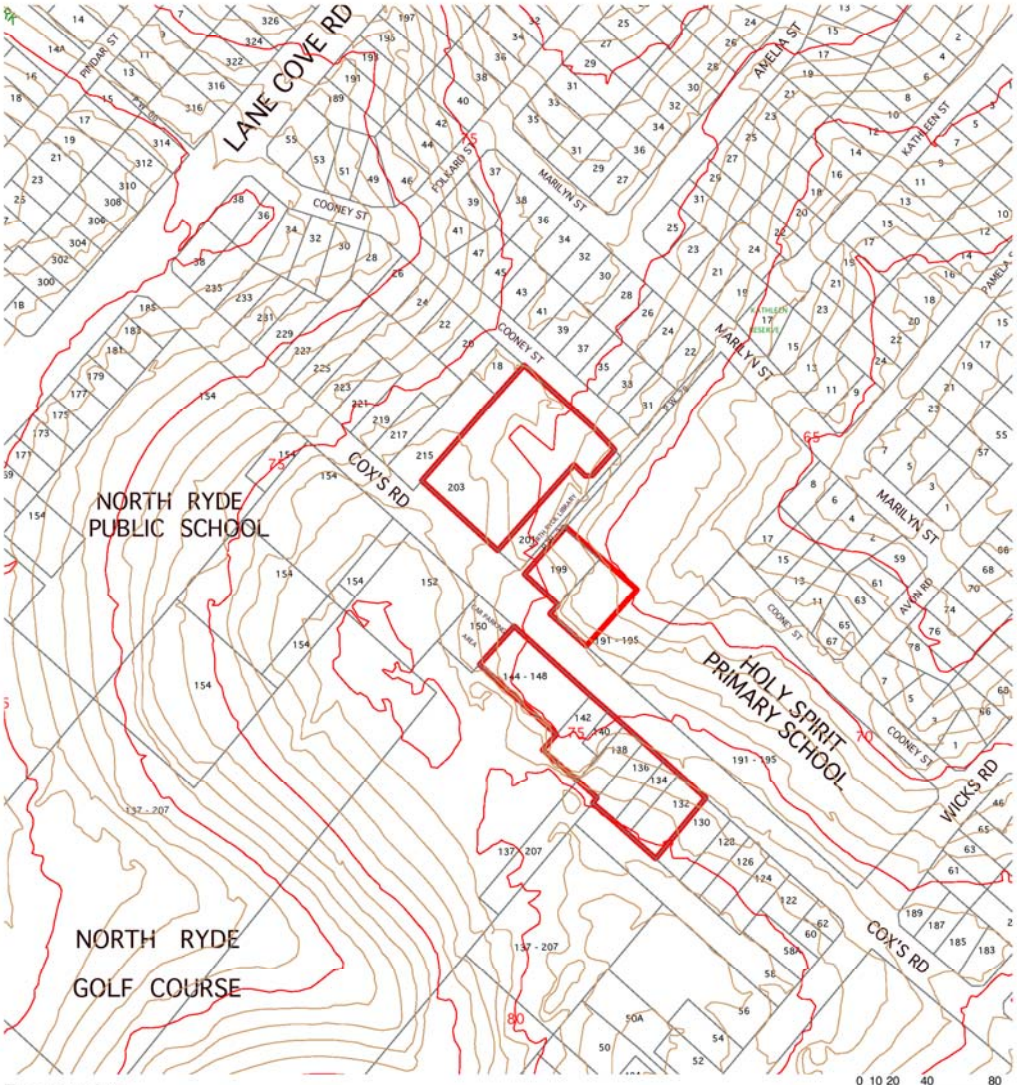
Existing zoning

0 10 20 40 80

- small centre boundary from brief
- R2 Low Density Residential
- B1 Neighbourhood Centre
- B4 Mixed Use
- SP1 Special Activities
- SP2 Infrastructure
- RE1 Public Recreation
- RE2 Private Recreation

ITEM 6 (continued) **ATTACHMENT 5**

COX'S ROAD - ANALYSIS



Topography

small centre boundary from brief

1m contours

5m contours

ITEM 6 (continued) **ATTACHMENT 5**

City of Ryde
Small Centres Master Plan Study DRAFT Master Plan Report

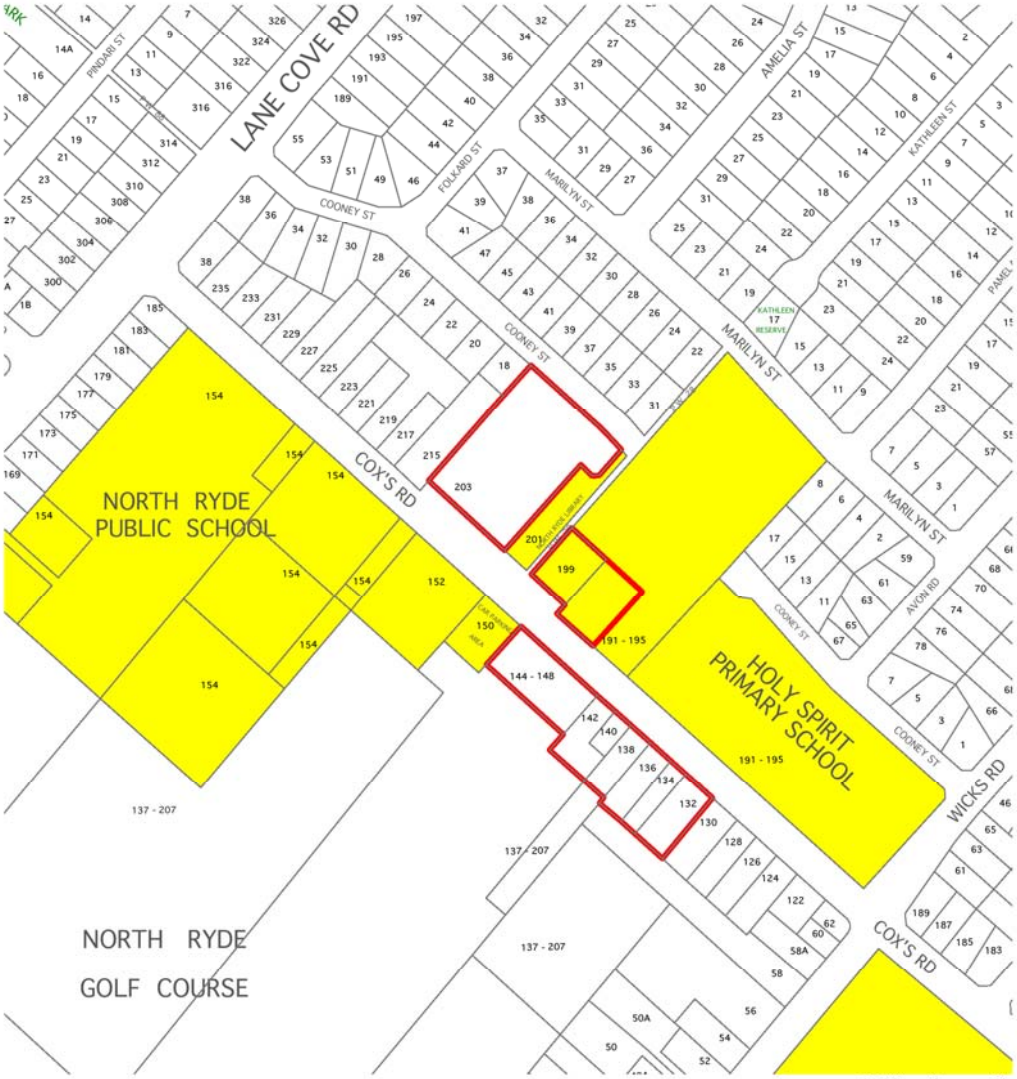
COX'S ROAD - ANALYSIS

Street hierarchy

- small centre boundary from brief
- main road
- secondary road
- major local road
- local road
- pedestrian way

ITEM 6 (continued) **ATTACHMENT 5**

COX'S ROAD - ANALYSIS



Schools, churches, car parks & community

0 10 20 40 80

small centre boundary from brief

schools, churches, car parks & community

ITEM 6 (continued) **ATTACHMENT 5**

City of Ryde
Small Centres Master Plan Study DRAFT Master Plan Report

COX'S ROAD - ANALYSIS

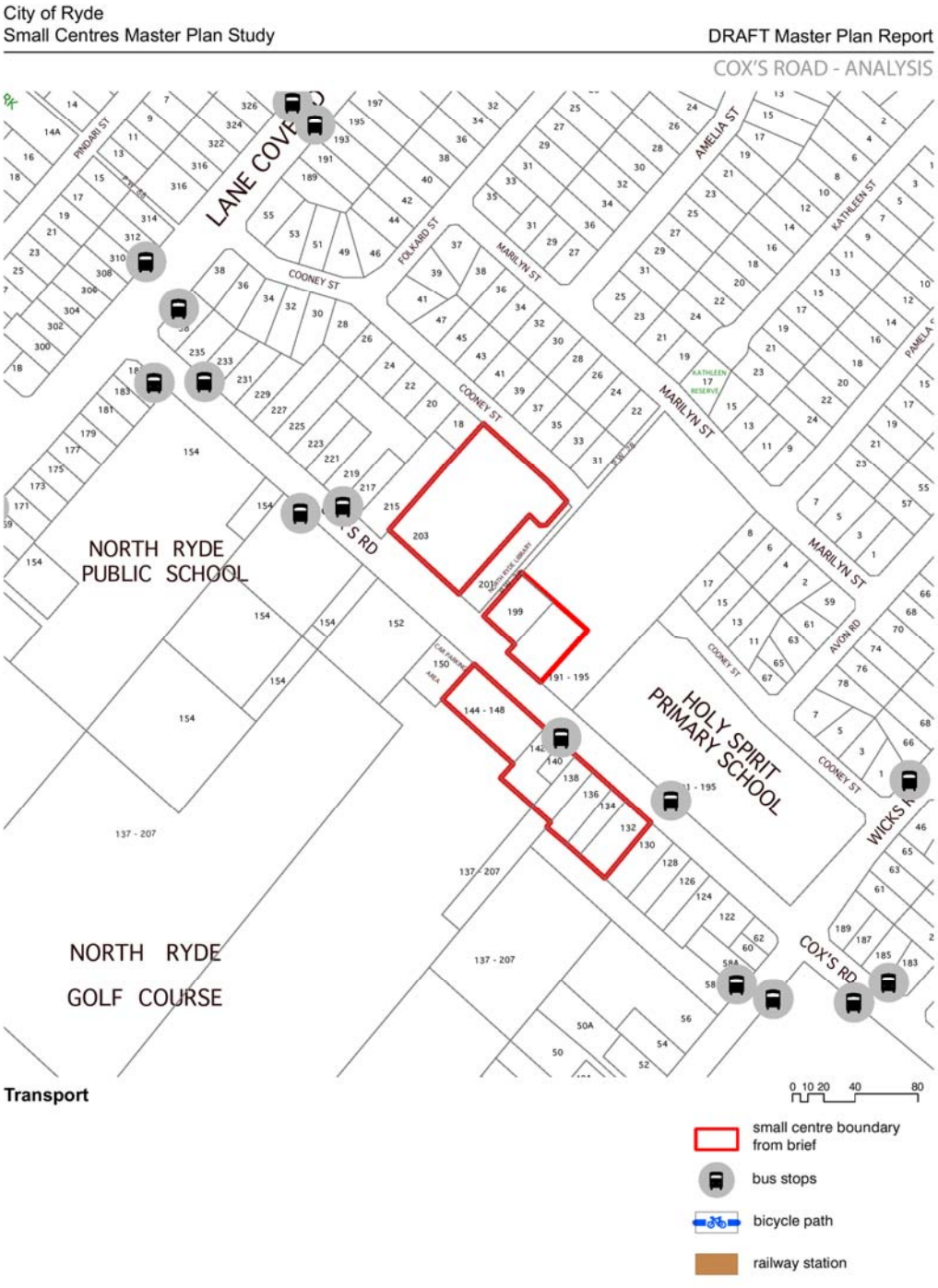
Open space

small centre boundary from brief

public recreational

private recreational

ITEM 6 (continued) **ATTACHMENT 5**



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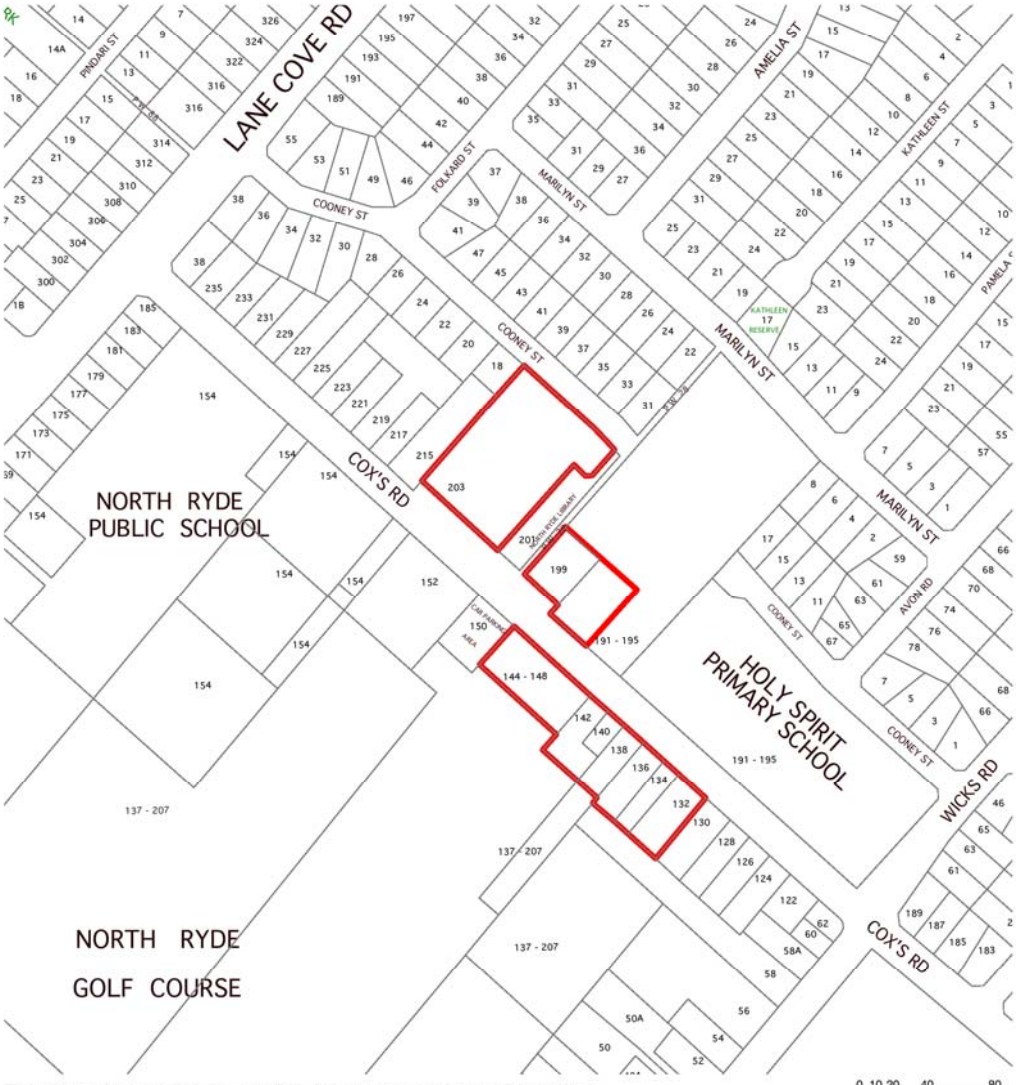
ITEM 6 (continued) **ATTACHMENT 5**

COX'S ROAD - ANALYSIS



Existing commercial uses adjoining centre and transition sites

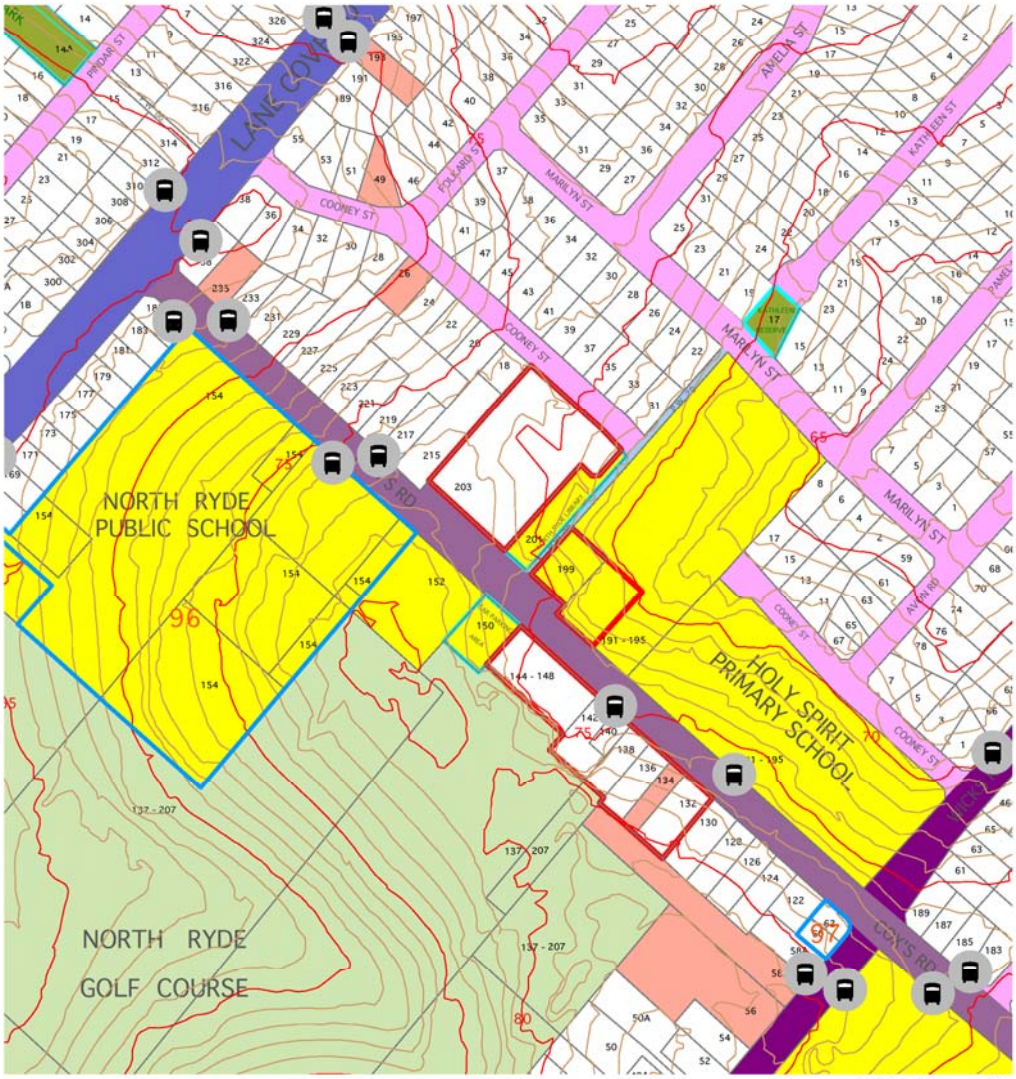
0 10 20 40 80

small centre boundary from brief

existing commercial uses adjoining centre and transition sites

ITEM 6 (continued) **ATTACHMENT 5**

ITEM 6 (continued) **ATTACHMENT 5**



Overall analysis

ITEM 6 (continued) **ATTACHMENT 5**

COX'S ROAD - MASTER PLAN

Desired Future Character

The Master Plan offers the opportunity to reinforce the significance of Cox's Road as a major local centre. Mixed uses, including retail, commercial and residential will provide a range of services and accommodation for residents and visitors. The streetscape is to be generally consistent in its built form and with increased pedestrian amenity.

New development should be built to a consistent alignment along the length of Cox's Road. Building envelopes along Cox's Road are typically four to five storeys in height with the top storey setback to reduce the impact on the streetscape. Two of the sites adjoining the North Ryde Golf Course are 6 storeys in height as the ground floor is partially submerged in ground and the 6 storey envelopes are located to the rear of the sites. Three storey townhouses to the Cooney Street frontage will provide a transition in scale and height from the five storeys.

The existing retail shops will be improved and the supermarket expanded with residential apartments above to create mixed use developments.

New development to the northern side of Cox's Road, along the frontage of Holy Spirit Primary School, should be setback from the boundary to maintain a consistent building alignment and provide for footpath widening and 90° angle parking rear to kerb. Building envelopes and proposed lot boundaries allow for connection through to the school and church.

The proposed built form is to create a diversity of spaces that will accommodate different uses with flexibility over time. The improvement of the public domain will provide a greater level of amenity to the active ground level to support retail and commercial uses.

New development is to provide basement parking. In particular, carspaces provided in the existing council carpark will be provided within the basement of the proposed council facility, freeing the Council site for appropriate development.

Public Domain Benefits

Public Squares
Two new public spaces are proposed, including a new public square on the southern side of Cox's Road, opposite to the public space adjacent to the school. These two spaces will be linked by a relocated pedestrian crossing to improve access.

Both spaces will be supported by activities and a variety


Image 1. A landscaped square surrounded by retail and over-looked by residential above.


Image 2. A mixed-use development with a top floor setback.


Image 3. A public square with various amenity and paving finishes defined by a 4 storey building with a top floor setback.


Image 4. The use of street trees and awnings along the streetscape improves & enhances the public domain.

ITEM 6 (continued) **ATTACHMENT 5**

of uses on the ground floor of adjacent buildings. The public squares will cater for the needs of the increased population and for visitors.

Streetscape
New buildings proposed will primarily be aligned and address the public domain to create good spatial definition of streets and public squares. This will provide the opportunity for continuous awnings, wide footpaths, surveillance of the public domain by residents above, street trees and continuous street frontages at ground level to enhance pedestrian interest and amenity.

The planned relocation of pedestrian crossings to the north, central and southern part of Cox's Road allows greater access for pedestrians to the various uses and safe access to both sides of Cox's Road for all pedestrians.

The inclusion of street furniture, lighting, signage, bicycle racks and paving will enhance and contribute to the overall streetscape.

Street trees
Street trees contribute to the quality of the street and public domain. Trees can significantly improve the street character, influence mirco climatic conditions and reduce the urban heat island effect.

Placement and selection of trees contribute to the quality of the public domain for residents and visitors by affecting views, light, shadow, wind sound, temperature and colour. The use of street trees will reduce the effect of hard landscaping and provide visual interest.

Cycle lane
A cycle lane is proposed to the north west of Cox's Road on the site of the potential future expansion of the supermarket. This will provide an opportunity for the cyclists to connect with Cooney and Marilyn Streets to the north.

Parking
There is an existing pattern of angle parking to the northern street edge and parallel parking to the south. All the angle parking existing and new to become rear to kerb.

There is the opportunity to formalise this parking with street tree planting, increasing the supply of car parking and providing a buffer to the widened footpath. Road widening is proposed to improve traffic flow.

The urban design of Cox's Road is a balanced outcome of public domain, built form, transport and economical development. The design of the built form creates a well defined street and the public squares, street trees and wide footpaths provide a sense of balance within the urban fabric.

Image 5. A wide footpath with an active retail ground floor use and residential above with a top floor setback.


Image 6. Outdoor dining, awnings, street trees and built form contribute to the public domain and streetscape. (source: DEM)

ITEM 6 (continued) **ATTACHMENT 5**

APPENDIX

ITEM 10 **ATTACHMENT 1**

City of Ryde

Lifestyle and opportunity @ your doorstep

COR-EOI-03/11

TO ESTABLISH A PREFERRED PANEL OF LEGAL SERVICE PROVIDERS TO THE CITY OF RYDE

SUBMISSIONS CLOSE

2pm TUESDAY 18 OCTOBER 2011

ITEM 10 **ATTACHMENT 1**

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Annexures

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- Schedule 1 - Expression of Interest Form – Professional consultants
- Schedule 2 - Consultancy Categories
- Schedule 3 - Form Of Offer
- Schedule 4 - Nominated departures from EOI documents
- Schedule 5 – Schedule of fees
- Schedule 6 – Capacity of the respondent
- Schedule 7 - Previous Experience
- Schedule 8 - Referees
- Schedule 9 - Insurances
- Schedule 10 - Occupational Health Safety & Rehabilitation
- Schedule 11 – Providers sustainability assessment questionairre

1. Introduction

1.1 Background

The City of Ryde at times requires the provision of legal services to supplement the service provided by the in-house General Counsel. Generally, such services are required in the following circumstances:

1. The matter involves a substantial workload
2. Land and Environment Court prosecutions and certain other prosecutions
3. The matter requires highly specialised legal expertise outside the normal scope of local government law
4. Due to conflict of interest on the part of the General Counsel
5. Politically sensitive matters where the advice requires a high level of independence

The experience since November 2006 (being the date of commencement of the General Counsel) is that such services are not often required so that the $150,000 tender limit in the *Local Government Act 1993* is not reached. However, for the sake of transparency and in order to obtain value for money, it would be preferable for the Council to procure a preferred panel of legal service providers

1.2 Purpose

The purpose of this Expression of Interest is to

- Request information from appropriately qualified and experienced practitioners who are interested in being considered to be on the panel of preferred legal providers to the City Of Ryde (COR)

- Define what information is required

- Define the format that information should be provided in

- Provide information to potential respondents to assist them in preparing their response. Expressions of interest are sought in accordance with the terms and conditions set out below.

The intention, subject to the terms of this Expressions of Interest ("**EOI**"), is to form a panel of preferred suppliers selected from Respondents to this EOI. It is Council's intention to then call on these suppliers to provide quotations based on the set rates (as provided in this EOI) or at a lump sum in the second procurement phase as and when these tasks are identified by Council as required.

1.3 Scope of Preferred Suppliers list

The term of any contract will be limited to 30 June 2013 (with an option of a further year at Councils discretion).

Respondents will be required to acknowledge that, as a preferred supplier, the Council:

1. does not guarantee any level of work to any supplier either in terms of quantity and/or type; and

2. is at liberty to procure work from suppliers not on the list.

Respondents must also identify which one or more of the following categories of legal services they have the necessary expertise to provide:

1. Land and Environment Court planning and valuation appeals
2. Land and Environment Court criminal matters
3. Local Court prosecutions (including Court elections)
4. General planning law (mainly *Environmental Planning and Assessment Act 1979* and cognate legislation)
5. General local government law (mainly *Local Government Act 1993* and cognate legislation)
6. Probity/Governance in a Local Government context
7. Environmental law (mainly *Protection of the Environment Operations Act 1997*)
8. Commercial transactions (including construction and other commercial contracts but excluding property transactions)
9. Property transactions (including sales, leasing and licensing)
10. Employment and Industrial matters
11. Worker's Compensation and Occupational Health and Safety
12. Intellectual Property
13. Negligence, Trespass and related common law matters
14. Litigation not addressed in the above categories
15. Competition and Trade Practices

1.4 Contract

The Contract of engagement will involve a simple letter of appointment from Council to the preferred suppliers which shall act as a head retainer. The letter shall identify:

1. The term (ie. until 30 June 2013)
2. The categories of legal services for which the preferred supplier has been selected (list in 1.3 above)
3. The agreed fee structure
4. The additional services to be supplied

The letter shall also attach or reference the EOI and the EOI response to form part of the contract.

2. Administration

2.1 Responding to this Request

2.1.1 Responses must include the information sought in this EOI, including all material included in the **returnable schedules**

2.2 Anticipated timetable

It is anticipated that the panel of preferred providers will be in place by the end of November 2011. It is envisaged that this will run for a period up to 30 June 2013 with an option to extend (at Council's discretion) for a further 1 year period.

2.3 Lodgement and Closing Date

Council will be utilising the e-tendering portal provided through Tenderlink for this Expression of Interest (EOI).

EOI documents can be obtained by registering on the e-tendering portal at www.tenderlink.com/ryde

If you experience difficulties accessing this website please contact the Tenderlink helpdesk on 1800 233 533.

Enquiries should be directed to Bruce McCann (General Counsel) via the online forum accessed on the portal. Requests for additional information may be made via the online forum at www.tenderlink.com/ryde

Completed submissions should be lodged in the Electronic Tender Box at www.tenderlink.com/ryde (preferred) by the time and date nominated using the attached word version of the returnable Schedules. Respondents will receive a Successful Submission Receipt timed and dated upon completion. Should assistance be required please use the online manual on the portal under Support/Online Manuals/Making a Submission or contact Tenderlink Customer Support on 1800 233 533 or email support@tenderlink.com.

Alternatively, responses can be submitted in a sealed envelope and endorsed with the EOI title; number and closing date, and placed in the Tender Box located at the following address by the nominated time.

The Tender Box
Ground Floor, Civic Centre
1 Devlin Street
Ryde NSW 2112

It shall be posted in sufficient time to be received before the closing date and time.

The nominated closing time and date is 2pm, Tuesday 18 October 2011

Respondents should be aware that Tenderlink advises that the submission of responses should be commenced at least one hour before the advised closing time

A Tender received by any other means will not be accepted. Failure to comply with these conditions may lead to the Tender not being considered

2.4 Number Of Copies (Hard copy submissions)

If submitting a hard copy into the tender box, respondents must submit an original along with one copy of the Tender submission **(total 2 copies to be submitted)**. They must be marked "original" and "copy" respectively. The contractor must ensure that the copy is a true copy in all respects. In the event of any discrepancy, the original will prevail.

2.5 Time and Date for Lodgement of Submissions

Tenders must be received by the Council by 2:00pm on Tuesday 18 October, 2011.

2.6 Late Tenders

A Tender lodged after the stipulated closing time shall be deemed late. A late Tender shall be excluded from consideration unless it can be clearly established to the satisfaction of City of Ryde that it was dispatched in sufficient time to be lodged in the Tender Box before the time and date named in the advertisement or other invitation for submission of Tenders. Late Tenders will generally not be considered for acceptance if they are:

a) Hand delivered, including courier delivered; or
b) Received through Australia Post unless the envelope is clearly postmarked or stamped prior to the time and date of Tender closing.

2.7 Tender Box Lodgement by Facsimile or Email

Lodgement of Tenders by facsimile or email are **NOT** acceptable and will be rejected.

2.8 Opening of Submissions

Council will only open the submissions after the closing time. The submissions will be opened by a minimum of two designated Council Officers. Any member of the public may attend this opening.

2.9 Acceptance, Clarification and Evaluation of Submissions

Once submitted, a submission may not be varied. However further information may be allowed by way of explanation or clarification or to correct a mistake or anomaly. Such variations shall not alter the original Tender.

The Council, at its own discretion, may or may not accept submissions that do not conform strictly to all requirements of the EOI documents.

The Council shall not be bound to accept the lowest or any Tender nor shall the Council be responsible for the time or expense involved in the preparation of any Tender.

2.10 Enquiries

2.10.1 Enquiries by prospective Respondents must only be directed to:

Bruce McCann
General Counsel
Telephone: 02 9952 8080
Email:bmccann@ryde.nsw.gov.au

2.10.2 The preferred method of enquiry is via the tender forum on tenderlink.

2.10.3 City of Ryde reserves the right to forward the details of any response by City of Ryde to requests from a Respondent to all Respondents without identifying the Respondent who requested the clarification.

3. Assessment of responses – information to be submitted

3.1 Assessment criteria

3.1.1 EOI's will be evaluated on the basis of the criteria specified below. Respondents should not place any significance on the order in which the criteria are listed nor should it be assumed the criteria have equal weight or significance.

The Council may treat any required detail in the EOI that is left out, illegible or unintelligible as failing to fulfil the relevant requirement.

Council is not bound to accept the lowest EOI or any EOI submitted. Council, in its discretion, will accept the EOI or EOI's for short-listing that it determines provides the most advantageous result. Tenders will be assessed on "conformity to the documentation" and "value for money" (the most cost effective offer determined by considering all price and non-price factors relevant to the proposed contract) and the following assessment criteria:

- ***Their expertise in relation to the identified categories including experience of key staff***
- ***Proposed fee and disbursement structure (including standard retainer terms) and whether the structure is fixed for the life of the contract***
- ***Their level of insurance and any material exclusions from the relevant policy***
- ***What additional services respondents can provide the Council throughout the contract period and fees (if any) for such services***
- ***The respondent's capacity to deliver the proposed service including staffing levels, response times etc.***

3.2 Information required in responses

3.2.1 All returnable schedules must be completed and returned for the submission to be considered conforming and to allow for an evaluation of each response.

4 Conditions

4.1 Corrections and Additions

If a Respondent becomes aware of any discrepancy, error or omission in its Response and wishes to lodge a correction or additional information, that material is to be in writing and lodged in accordance with this EOI prior to the Response Closing Time. Corrections or additional information will only be accepted after that time at the sole discretion of the Council. City of Ryde is not required to give reasons for admitting or excluding the correcting or additional information.

4.2 Alterations, Erasures or Illegibility

4.2.1 Responses containing alterations or erasures, and information that is not clearly and legibly stated, may be excluded from consideration. The Respondent must initial any alteration made to a Response.

4.3 False and Misleading Claims

If a Respondent is found to have made false or misleading claims or statements, City of Ryde reserves the right to reject at any time, any Response lodged by or on behalf of that Respondent.

4.4 Collusive Tendering

4.4.1 Respondents, their consortium members and their respective officers, employees, agents and advisors must not engage in any collusive tendering, anti-competitive conduct or any other similar conduct with any other Respondent or any other person in relation to the preparation or lodgement of a Response.

4.4.2 In addition to any other remedies available under any law or any contract, City of Ryde reserves the right, in its absolute discretion, immediately to reject any Response lodged by a Respondent that engaged in any collusive tendering, anti-competitive conduct or any other similar conduct with any other Respondent or any other person in relation to the preparation or lodgement of Responses.

4.5 Unlawful Inducements

Respondents and their respective officers, employees, agents or advisors must not have violated and must not violate any applicable laws or City of Ryde policies regarding the offering of inducements in connection with the preparation of their Responses.

4.6 Improper Assistance

4.6.1 Respondents must not communicate with nor solicit information relating to this EOI from employees of the City of Ryde, except for contact through the contact officer specified in **clause 2.7**

4.6.2 Responses that, in the opinion of the City of Ryde, have been compiled with the improper assistance of employees or, ex-employees of the City of Ryde, or with the utilisation of information unlawfully obtained from the City of Ryde, may be excluded from further consideration. The Form of Offer requires each

Respondent to certify that it has not sought in any way to obtain a special advantage from City of Ryde in connection with the preparation of its Response.

4.7 Conflict of interest

4.7.1 Respondents must identify any conflict of interest, or potential conflict of interest, that may apply to their responding to this EOI or meeting the City of Ryde Specification of Requirements.

4.7.2 Respondents must describe the procedures they intend to implement for dealing with any known or potential conflicts of interest that may arise in the conduct of the proposed services described in this EOI. Respondents must include details of any known circumstances that may give rise to either an actual conflict or a perception of conflict of interest with the City of Ryde, and the proposed method of managing each issue.

4.8 Ownership of Response documents

4.8.1 Response documents become the property of City of Ryde on submission.

4.8.2 Such intellectual property rights as may exist in information contained in the EOI will remain the property of the City of Ryde.

4.8.3 Such intellectual property rights as may exist in the information contained in the Response documents will remain the property of the Respondent.

4.8.4 The Respondent licenses the City of Ryde, its officers, employees, agents and advisers to copy, adapt, modify, disclose or do anything else necessary, in the City of Ryde opinion, to all material (including that which contains intellectual property rights of the Respondent or other parties) contained in Response for the purpose of:

(a) evaluation of Responses;

(b) any subsequent procurement process, including a restricted tender process;

(a) negotiation of any contract following an EOI, Request for Tender or otherwise;

(b) management of any such contract; and

(c) other related matters, including audit, governmental reporting and requirements and provision.

4.9 Reserved Rights

4.9.1 Without limiting its rights at law or otherwise, City of Ryde reserves the right in its absolute discretion at any time to:

(a) evaluate Responses as City of Ryde sees appropriate in the context of its requirements including determining, at its sole discretion, the weighting or significance to be attached to selection criteria;

(b) consider Late Responses where Council considers that the transparency of the procurement process has not been compromised;

(c) require additional information or clarification from any Respondent or anyone else or provide additional information or clarification;

(d) change the structure or timing of the EOI process;

(e) cease to proceed with the EOI process or any subsequent process;

(d) suspend or vary the process or any part of it, including deciding not to conduct a further stage of the procurement process or deciding to conduct a further unrestricted tender process;

(e) vary the information, or any time requirements, set out in the EOI;

(f) call for new Responses

(g) Negotiate a contract with any Respondent and/or waive, vary or negotiate any obligation of any Respondent under any consequent contract;

(h) add to, alter or delete any services specified within the Specification of Requirements;

4.9.2 City of Ryde reserves the right to consider any existing contractual arrangements that are relevant to its requirements, as well as looking at all other options for the Core Information systems. Existing contractors may respond to this EOI. Any existing contractors that respond to this EOI must do so on the basis of the EOI.

4.9.3 City of Ryde also reserves the right to compare any Response with existing internal arrangements and/or existing systems available to it.

4.9.4 The establishment of any time or date in this EOI does not create an obligation on the part of City of Ryde to take any action, nor does it create any right in any Respondent that any action will be taken on the date established. City of Ryde may notify affected Respondents if it does any of the above but is not obliged to provide any reasons for its actions.

4.9.5 City of Ryde accepts no liability in negligence or otherwise for any loss or liability suffered by a Respondent as a result of reliance on information provided by City of Ryde to the Respondent in connection with this EOI.

4.10 Respondent to be informed

Respondents acknowledge that in lodging their Response they have:

(a) examined the EOI and any other information made available by or on behalf of City of Ryde to Respondents for the purpose of the EOI process;

(b) sought and examined all information relevant to the risks, contingencies, and other circumstances having an effect on their Response and which is obtainable by the making of reasonable enquiries;

(c) satisfied themselves as to the correctness and sufficiency of their Responses;

(f) in lodging a Response, not relied on any express or implied statement, warranty or representation, whether oral, written or otherwise made by or on

behalf of City of Ryde other than any statement, warranty or representation contained in the EOI; and

(g) agreed to comply with the Respondent's obligations under the EOI.

4.11 Costs and expenses

4.11.1 Respondents must bear all costs associated with the preparation and lodgement of a Response, answering any queries and providing any additional information to the City of

4.11.2 City of Ryde is not liable to any Respondent on the basis of any contractual, quasi-contractual, equitable or restitutionary grounds whatsoever or in negligence as a consequence of any matter or thing relating or incidental to a Respondent's participation in this process, including without limitation instances where:

(a) a Respondent is not engaged to participate in a further process or to provide the System;

(b) City of Ryde varies or terminates this process or any negotiations with a Respondent;

(c) City of Ryde decides not to proceed with this process; or

(d) City of Ryde exercises or fails to exercise any of its rights under or in relation to the EOI.

4.12 Other Requirements

4.12.1 In accordance with the provisions of the Local Government Act and Freedom of Information Act, the City of Ryde seeks to facilitate public access to its information in an open and transparent manner. However the City of Ryde does recognise the need to maintain the confidentiality of certain commercial information. All Tender and Expression of Interest submissions received by the City of Ryde will be maintained as "Confidential" until such time as a formal determination is made regarding the particular Tender or Expression of interest.

Following this determination, however, the City of Ryde may be required to facilitate public access to information that has been submitted to it. To assist in the provision of this information you are requested to clearly label or mark the information that you regard as being of a commercially confidential nature as "**Commercial in Confidence**". Any information not marked as such shall be regarded as being information where you have no objection to public disclosure. In the event that a request is made to obtain information marked as "Commercial in Confidence", the City of Ryde reserves the right to review whether this information should be provided or whether it is in fact commercially confidential information. The City of Ryde will consult with the respondent as part of this review process prior to the release of such information.

4.12.2 With regard to matters concerning this Expression of Interest, there shall be no vendor initiated contact with Council after the Expression of Interest has closed and prior to the announcement of short-listed respondents. The only communication shall be at the initiation of Council for the purposes of

clarification. The only exception to this is where the respondent contacts Council (and with Councils consent) provides further clarifying information or corrects a mistake or anomaly. Any respondent not complying with this clause will have their submission rejected.

4.12.3 Respondents are invited to nominate (in order of relevant clauses) any nominated departures from the Expression of Interest document on Returnable Schedule 4. The departure should be nominated in sufficient detail to enable a full evaluation of the nominated departure. If it has a financial impact the value of the financial impact should also be nominated to allow for evaluation.

If there are no departures from the Expression of Interest documents, this schedule should state: "There are no departures"

4.13 Changes to Corporate Structure Ownership and Support

Each Respondent must confirm that it will promptly notify City of Ryde of any change, after submission of its Expression of Interest, to:

(a) its corporate structure;

(b) its ownership structure; or

(c) the basis upon which it will have access to the necessary skills, resources, or corporate or financial backing to provide the Services.

4.14 Assessment of Responses

4.14.1 Following Closing Time, an evaluation process will take place. Evaluation of Responses will be based on the selection criteria in Clause 3.1. Evaluation may, at the absolute discretion of the City of Ryde involve presentations by some or all Respondents, visits to Respondents' sites, discussions with Respondents and requests to Respondents to provide written clarification of their Responses. Discussions may be held with some or all Respondents to seek further clarification of their Responses.

4.14.2 City of Ryde reserves the right to evaluate the responses against the selection criteria in Clause 3.1 as it sees appropriate. The criteria in Clause 3.1 are not listed in any order of priority.

4.14.3 It is intended that Responses be assessed using the selection criteria in Clause 3.1, principally to:

(a) select a panel of qualified and experienced legal providers to provide a range of advice to the City of Ryde as required. City of Ryde reserves the right not to select a shortlist of pre-qualified tenderers and to conduct a further procurement process, if any, that is not restricted.

4.15 Language of Response

The Response, including all attachments and supporting material, must be written in English. Unless otherwise specified, measurements must be specified in Australian legal units of measurement.

4.16 Defined Terms

4.16.1 In this document, the following terms have the meanings specified below:

ABN	means "Australian Business Number" - issued by the Registrar of the Australian Business Register under the *A New Tax System (Australian Business Number) Act* 1999 (Cth).
ACN	means "Australian Company Number" issued by the Australian Securities and Investments Commission.
Closing Time	means the date and time specified in **clause 2.3 and 2.5**
CoR	City of Ryde
Form of Offer	means the respondents submission including returnable schedules as outlined in Annexure A
Late Response	means a Response described in **clause 2.6**
EOI	means Expression of Interest
EOI or Expressions of Interest	means this document.
Response	means any response to this document.
Respondent	means a person or organisation who submits a Response.

ITEM 10 **ATTACHMENT 1**

ANNEXURE A - Returnable Schedules

INDEX

To submit a conforming Expression of Interest, the respondent must complete all the Schedules nominated above. If there is insufficient space for any response, please prepare an attachment to the relevant Schedule.

Failure to complete this section may result in rejection of the respondents submission.

Company Name:……

Date:…… *Respondent's signature:*……

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 1: EXPRESSION OF INTEREST FORM – PANEL OF PREFERRED PROVIDERS OF LEGAL SERVICES

Name of Firm:

Contact Person:

Address:

Postal Address:

Contact Info: Phone: ..... Fax No. .....

Mobile: ..... E-mail. .....

Legal Status of entity: (Company, partnership, sole trader etc) .....

CONFLICTS OF INTEREST

The Contractor shall confirm whether there exists any interests, relationships (including those of family members and employees) or clients that may or do give rise to a conflict of interest: ***Yes ✓*** ☐ ***No x*** ☐

If "*Yes*", as an attachment to this declaration, the Contractor shall detail the area in which that conflict or potential conflict does or may arise and provide details of strategies for preventing conflicts of interest.

Executed by Authorised Officer of Contractor who has delegated authority to enter into a contract:
Contractors Signature:
.....

(Print Name & Title): _____

Date of declaration: _____

Signature of witness: _____

(Print Name & Title): _____

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 2: CATEGORIES

Please tick below the areas for which you wish to be considered for:-

Category No	Category	Selection
1	Land and Environment Court planning and valuation appeals	
2	Land and Environment Court criminal matters	
3	Local Court prosecutions (including Court elections)	
4	General planning law (mainly *Environmental Planning and Assessment Act 1979* and cognate legislation)	
5	General local government law (mainly *Local Government Act 1993* and cognate legislation)	
6	Probity/Governance in a Local Government context	
7	Environmental law (mainly *Protection of the Environment Operations Act 1997*)	
8	Commercial transactions (including construction and other commercial contracts but excluding property transactions)	
9	Property transactions (including sales, leasing and licensing)	
10	Employment and Industrial matters	
11	Worker's Compensation and Occupational Health and Safety	
12	Intellectual Property	
13	Negligence, Trespass and related common law matters	
14	Litigation not addressed in the above categories	
15	Competition and Trade Practices	

SCHEDULE - 3: FORM OF OFFER

Respondent's Statutory Declaration

I, ... ***[insert name]***

of..... ***[address]***

a director/authorised officer of ..... ***[company name]***

(ACN.....) (ABN.....) ("**Respondent**")

do solemnly and sincerely declare as follows:-

that I am authorised by the Respondent to make this declaration:

and I hereby declare that:

1. The Respondent wishes to provide a service on the basis of the Response annexed to this Statutory Declaration and submitted in accordance with the Request for Expressions of Interest ("**EOI**").

2. The Response to which this statutory declaration is appended has not been prepared with the benefit of:

   (a) information obtained from a current or former officer or employee of the City of Ryde

   (b) information otherwise improperly obtained from City of Ryde or any department or agency of the State

3. The Respondent is aware that giving false or misleading information is a serious offence

4. The Respondent through its officers, employees or agents, has/have not attempted and will not attempt, to influence improperly any officer or employee of City of Ryde in connection with the EOI process.

5. The Respondent understands and agrees to all conditions including without limitation obligations and acknowledgments included in the EOI.

6. The Respondent hereby:

   (a) consents to and authorises the City of Ryde, its officers , employees, agents or advisers to seek any information, including financial information, required for the purpose of the EOI; and

   (b) agrees to provide at the Respondent's expense reasonable assistance to City of Ryde to assist it in any checking it wishes to have undertaken under or in respect of the EOI.

I make this solemn declaration by virtue of the *Statutory Declarations Act* 1959 and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true in every particular.

..... (1)

Declared at ..... the ..... day of 2011,

before me

..... (2)

Notes: (1) Signature of the person making the declaration.

(2) Signature and title of the person before whom the declaration is made.

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 4: NOMINATED DEPARTURES FROM EOI DOCUMENTS

Vendors are invited to nominate (in order of relevant clauses) departures from the Expression of Interest document on the schedule set out below. The departure should be nominated in sufficient detail to enable a full evaluation of the nominated departure. If it has a financial impact the value of the financial impact should also be nominated to allow for evaluation.

If there are no departures from the Expression of Interest document, the respondent must state: "There are no departures"

Document	Clause/reference	Details of departure	Value

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 5 SCHEDULE OF FEES AND DISBURSEMENT STRUCTURE

Applicants must outline their proposed fee and disbursement structure (including standard retainer terms).

They must also nominate whether this structure is fixed for the life of the contract and if not the basis on which this will be varied

Nominated rates should include profit, overheads and travel costs to anywhere within 50kms of Council's office and exclude GST.

POSITION OF NOMINATED STAFF	DAILY RATE Excluding GST	HOURLY RATE Excluding GST

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 6 CAPACITY OF THE RESPONDENT

Respondents must provide the following information:

A description of the Respondent's organisation in terms of its;

- size
- financial turnover
- years in operation
- management structure
- key personnel and positions of staff likely to be involved in the provision of the nominated services to Council including brief career summaries of the key nominated Personnel demonstrating the ability to provide these services
- technical capacity and capability
- quality systems
- location of key employees.

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 7: PREVIOUS EXPERIENCE

Describe the organisation's experience in the provision of legal services referred to in the document of a similar nature during the last 5 years:

Note: Council reserves the right to make its own independent enquiries.

Professional Service _____

Client: _____

Contact: _____ **Telephone:** _____

Contract Value: $_____ **Duration:** _____

Description of the contract or task: _____

_____

Professional Service _____

Client: _____

Contact: _____ **Telephone:** _____

Contract Value: $_____ **Duration:** _____

Description of the contract or task: _____

_____

_____

Professional Service _____

Client: _____

Contact: _____ **Telephone:** _____

Contract Value: $_____ **Duration:** _____

Description of the contract or task: _____

_____

_____

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 8: REFEREES

Provide details of organisations, especially local government organisations for which you have successfully completed works of a similar nature to those being nominated for. The following information should be included:

Provide at least two referees who can attest to the your capabilities in undertaking the works

Note: Council reserves the right to make its own independent enquiries.

FIRST REFEREE:

Organisation name (if applicable) _____

the type and value of work carried out _____

Address: _____

Contact Person: _____

Telephone: _____ **Facsimile:** _____

SECOND REFEREE:

Organisation name (if applicable) _____

the type and value of work carried out _____

Address: _____

Contact Person: _____

Telephone: _____ **Facsimile:** _____

THIRD REFEREE:

Organisation name (if applicable) _____

the type and value of work carried out _____

Address: _____

Contact Person: _____

Telephone: _____ **Facsimile:** _____

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 9: INSURANCES

The following insurances will be required and shall state details of current policies for these insurances.

WORKERS COMPENSATION OR PERSONAL ACCIDENT AND ILLNESS INSURANCE:

Insurance against any death of or injury to persons employed by the Service Provider as required by the Workers Compensation Act 1987.

ALTERNATIVELY: Where the Service Provider has **no employees** and in lieu of Workers Compensation Insurance, insurance for personal accident and illness under a policy.

Insurance Required

Insurance Company: **Amount of coverage:** *As detailed above* | |

Policy Number: _____ **Expiry Date:** _____

PUBLIC LIABILITY INSURANCE

Insurance against the death or injury to any third party or parties or loss of or damage to any property including loss of use of property whether it is damaged or not whatsoever caused during the course of the contract. The policy shall have a limit of indemnity of not less than the amount indicated for any one occurrence, but shall be unlimited in the aggregate.

Insurance Required

Insurance Company: **Amount of coverage:** _____ | |

Policy Number: _____ **Expiry Date:** _____

PROFESSIONAL INDEMNITY INSURANCE

Professional Indemnity insurance in an amount to be identified below. The respondent must agree to at all times maintain no less than the level of cover specified below for whatever period it remains in practice.

Insurance Required

Insurance Company: **Amount of coverage:** _____ | |

Policy Number: _____ **Expiry Date:** _____

ITEM 10 **ATTACHMENT 1**

SCHEDULE – 10: OCCUPATIONAL HEALTH SAFETY & REHABILITATION

Demonstrate commitment to OHS&R and understanding and acceptance of the principles of OHS&R.

Note: Further information may be required to be submitted as substantiation.

	SUBJECT	YES	NO
1.	**Does the organisation have an OHS&R Management Plan as part of its overall management system?** (If yes give details)		
	Is the OHS&R Management Plan accredited by a NSW Government agency or an accredited third party? (If yes give details)		
2.	**Has WorkCover NSW issued the organisation with any Prohibition Notices, Improvement Notices or fines in the past 12 months?** (If yes give details)		
3.	**Is the organisation able to provide documented evidence that within its organisation, there are people or resources nominated to:** • Define OHS&R management policies and objectives, priorities and targets;		
	• Define the responsibilities of personnel for OHS&R matters;		
	• Identify system verification requirements and allocating human, technical and financial resources adequate to meet those requirements;		
	• Ensure compliance with OHS&R legislation and regulations;		
	• Keep abreast of changes in legislation and regulations;		
	• Acquire and disseminate OHS&R management information;		
	• Plan and conduct training in OHS&R management, including inducting new employees;		
	• Oversee the development and implementation of OHS&R procedures;		
	• Assess subcontractors' and suppliers' abilities to comply with OHS&R requirements;		
	• Ensure compliance with safe work practices and procedures.		

SCHEDULE – 11: PROVIDERS SUSTAINABILITY ASSESSMENT QUESTIONNAIRE

At City of Ryde, we are committed to Environmental protection and Ecologically Sustainable Development. As a potential supplier, your environmental performance could have an influence on our impact on the environment. Therefore, we have included this specific questionnaire in order to assess your performance in terms of environmental sustainability and biodiversity protection.

The Environmental Sustainability Assessment Questionnaire will form part of the evaluation process. It is composed of two parts:

Part A – Organisation's Environmental Management
Part B – Operational Information

All information is confidential and will only be used by City of Ryde for evaluating its suppliers.

PART A
Potential Supplier/provider Questionnaire - General Environmental Management Considerations

No.	Question	Yes	No
1	Does your organisation have access to and an understanding of all environmental legislation relevant to your organisation's operations?		
2	Does your organisation have, or is in the process of implementing, an Environmental Management system?		
3	If Yes, Is it implemented and certified?		
	If yes please specify certification body		
4	Does your organisation have or regularly carry out any of the followings:		
4 (a)	Environmental policy		
4 (b)	Specific Revegetation policies		
4 (c)	Environmental risk management plan		
4 (d)	Environmental correction actions		
5	Does your organisation undertake monitoring programs to minimise environmental impacts?		
6	Does your organisation conduct waste audits, environmental audits or monitoring programs to minimise environmental impacts? If yes please specify:		
7	Does your organisation evaluate its supplier's or sub-contractors environmental performance?		

8	Does your organisation have a clean record with the EPA and other regulators - that is, no convictions or violations of EPA or other environmental regulations or licensing conditions during the past 3 years? (If No, please provide explanation on the answer sheet at the end of the questionnaire.)		

PART B – Sample Specific Supplier Questionnaire – Supply of Services

Service Provider:

Nature of Services to be provided:

No.	Question	Yes	No
	General		
1	Does your company have current and documented procedures to be followed in the event of an environmental accident/incident? If yes, please provide details of these procedures		
2	Are all staff trained in the application of the environmental management plan and environmental accident/incident procedures? If yes, please provide dates of the most recent training sessions and the frequency of training		

"I declare that all information submitted on this form is true and correct"

Signed: _____ Dated:_____