

Road Access to Bayswood Residential Development

4 May 2010

Prepared for
Stockland Corporation Limited

Road Access to Bayswood Residential Development

1. Introduction

The Bayswood residential development was approved as a component of the Vincentia Coastal Village for which Concept Approval was issued on 25 January 2007.

The overall Concept Approval also included a shopping centre/district centre with about 32,000m² of floor space to be constructed in stages, 604 residential lots and 136 adaptable dwellings.

At the same time Project Approval was issued for the Bayswood residential component. The approval allowed development of 604 residential lots.

The Concept Approval incorporated four points of access onto the overall site with these to be provided as follows and indicated on Figure 1:

Access A - Western Precinct access on Naval College Road to be formed as a one lane roundabout

Access B - Central Precinct access on Naval College Road to be formed as a “seagull” type priority intersection

Access C - eastern site access on Naval College Road at its intersection with Moona Creek Road to be formed as a two lane roundabout

Access D - access off The Wool Road via a signalised intersection

Accesses A and B would provide access to the Bayswood residential precinct exclusively. Access D would serve the shopping centre only. Access C would serve both, but principally the retail centre because it would connect only to the eastern edge of the residential area.

The Western Precinct was approved and is proposed to have about 326 residential lots and in due course would be most directly served by Access A on Naval College Road.

The Central Precinct is proposed to have about 323 dwellings (157 standard lots/166 retirement dwellings) and would be served most directly by Access B and in due course also by Access C. An internal road network would connect the Western and Central Precincts and the District Centre.

Central Precinct is currently being developed and Access B has been constructed to provide its access. 133 lots have been developed to date.

The Statement of Commitment incorporated in the Concept and Project Approval provides for Access A to be constructed prior to release of the subdivision certificate for Stage 9 in the Western Precinct. Under the approved staging plan, Stage 9 was the first stage of the Western Precinct.

Stockland wishes to defer the balance of the Central Precinct. Part of this area is being held back to possibly be developed as a future retirement village. It therefore wishes to commence construction at the northern end of the Western Precinct. Being the northern end of the Western Precinct, this initial development thus would be awkward to provide access via Access A initially.

In order to maintain the balance between access infrastructure costs and the roll out of lots, it is proposed by Stockland to defer construction of Access A in the initial stages of the development of Western Precinct with access to be provided via Access B through Central Precinct in the interim.

This report considers the traffic implications of this deferral.

2. Traffic Forecasts

The overall Vincentia Coastal Village including the Bayswood residential precincts and the District Centre was the subject of an exhaustive traffic forecasting process prior to the achievement of Concept Approval. Forecasts were developed for ultimate development.

Appendix A provides traffic forecasts proposed for the Concept Application. Table 1 provides results of the analysis of intersection operation relating to those forecasts as presented in the traffic report for the Concept Application.

Table 1 also shows forecast total intersection traffic flows during critical (i.e. most heavily trafficked) design traffic periods. Corresponding levels of service for the intersections are also indicated.

Table 1: Concept Application Analysis of Access Intersection Operation

	Access A		Access B		Access C	
	Traffic using Access	Intersection LOS	Traffic using Access	Intersection LOS	Traffic using Access	Intersection LOS
Summer Thursday Evening	192	A	130	B	636	B
Summer Saturday Morning	192	A	129	B	620	B

The table indicates that traffic use of Access A and B at ultimate development would be low and that intersection performance levels would be very good at Levels of Service A or B. In this regard it is noted that LOS A is excellent and LOS B good with considerable spare capacity. The performance levels are for the peak summer time of the year at which time LOS D would normally be the minimum desirable LOS. LOS F represents oversaturated conditions and is at the extreme low end of performance.

3. Effects of Higher Usage of Access B

To examine the effects of the early use of Access B for access to both Central and Western Precincts, the operation of Access B on Naval College Road was reanalysed on a likely highest case situation with:

- Background traffic flows increasing to forecast 2016 year flows with the shopping centre fully operational, and
- 400 lots from the Western and Central Precincts being developed being served exclusively by Access B.

This would obviously be an extreme case. The make up of traffic usage of the intersection is provided on Figure 2.

Analysis of the operation of the Access B intersection serving 400 lots as per this severe test indicates that it would operate as follows

Thursday Evening – LoS B (Average delay-20 seconds for worst movement)

Saturday Morning – LoS B (Average delay-19 seconds for worst movement)

Relevant analysis files from the SIDRA traffic model are provide in Appendix A.

The analysis indicates that Access B has considerable spare capacity and could reasonably be used to provide the only point of access to the Central and Western Precincts under the modelled scenario.

In practice it is expected that the first stage of the District Centre would be completed within about two years and Access C would provide a second point of access to the Central Precinct.

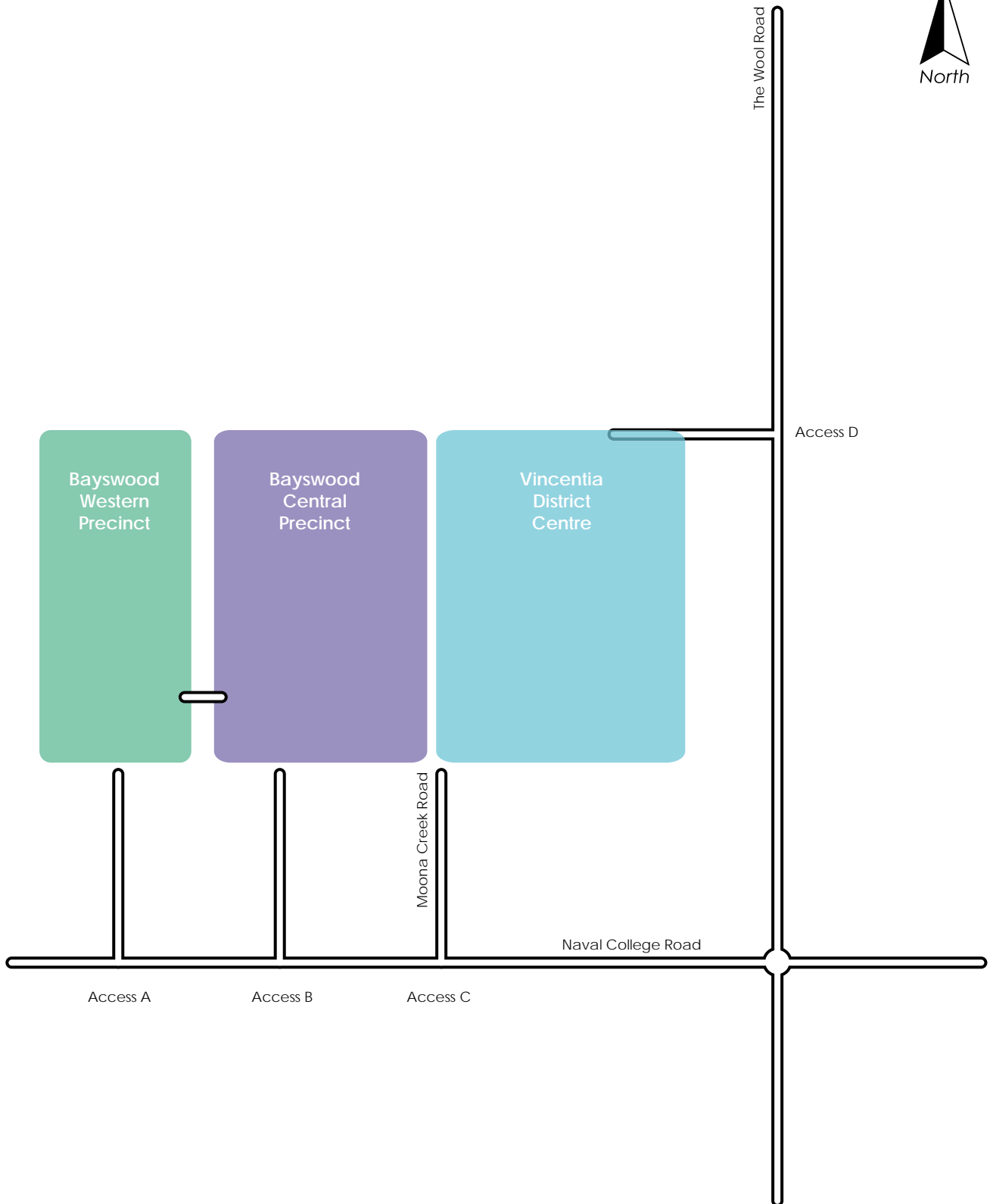
While Access B would then be able to accommodate the traffic related to further lots, it is noted that the roundabout to be provided at Access A was intended in part as a gateway point for the start of urban development along Naval College Road. From this perspective and to avoid excessive internal travel through Central Precinct it would be desirable that Access A be provided prior to the occupation of about two thirds of the proposed lots of Western and Central Precincts.

4. Conclusion

It is concluded that as designed, Access B to the Bayswood Central Precinct has considerable spare capacity and could reasonably serve up to 400 residential lots. Thereafter or earlier if appropriate Access A should be constructed.

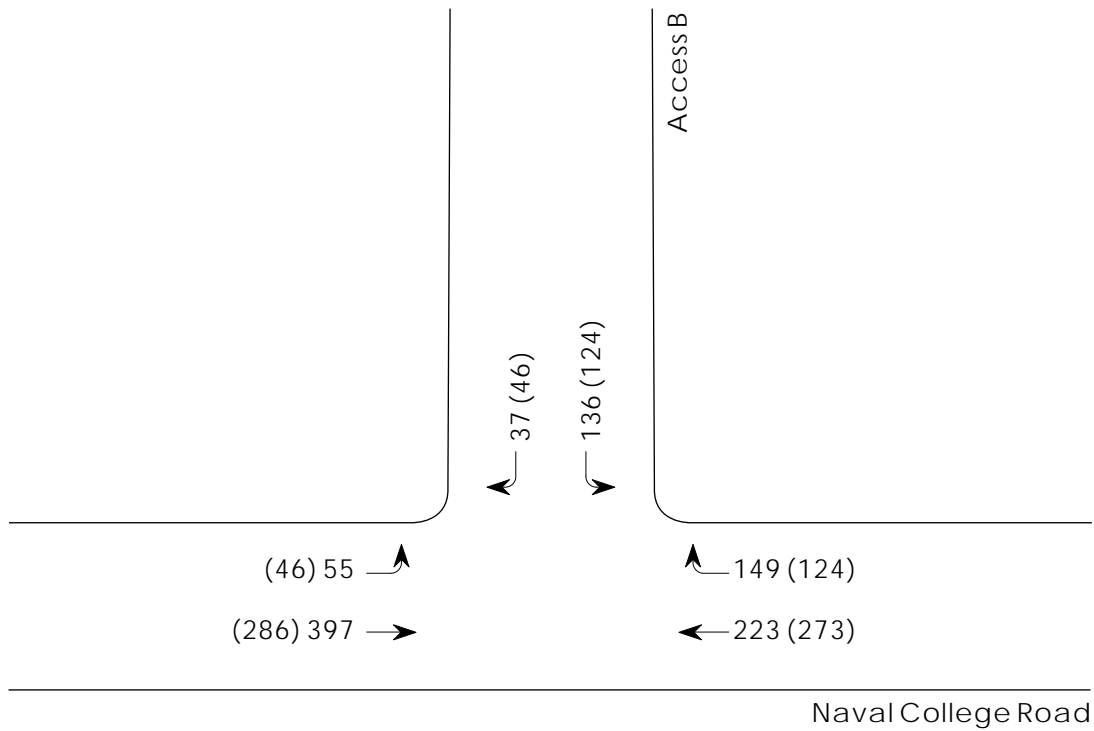
PROPOSAL ACCESS LOCATION

BAYSWOOD RESIDENTIAL DEVELOPMENT



2016 TRAFFIC FLOWS FOR 400 LOTS USING ACCESS B

BAYSWOOD RESIDENTIAL DEVELOPMENT



Key

5: Thursday PM Peak

(5): Saturday Midday Peak

Appendix A – Concept Application Traffic Forecasts

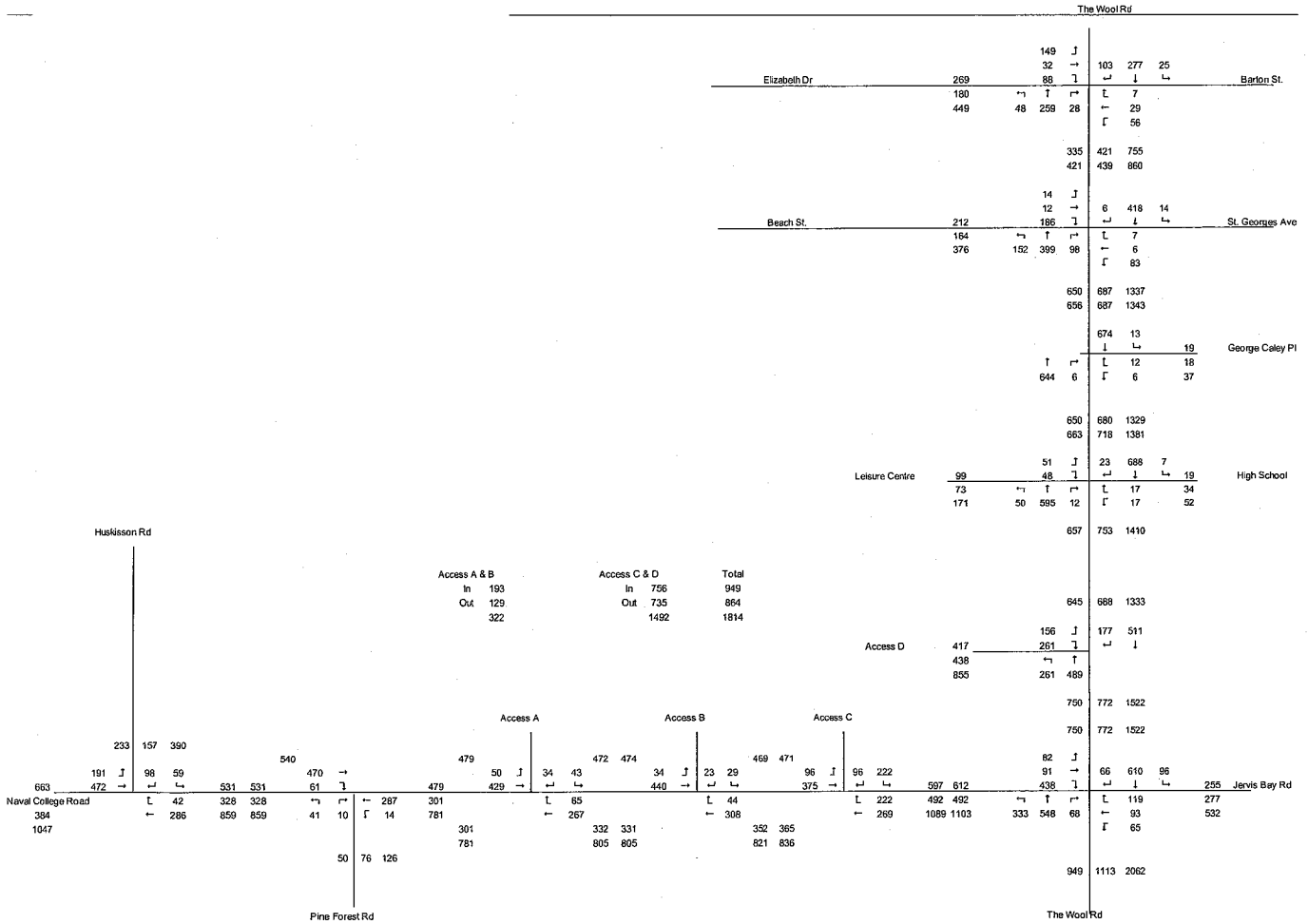
2016 Future Traffic with Developed Thursday PM Peak (Summer)

Naval College Rd/Huskisson Rd						Naval College Rd/Pine Forest Rd						Naval College Road/Access A																	
North		East		South		West		North		East		South		West		North		East		South		West							
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R						
59	0	98	0	286	42	0	0	0	191	472	0	0	0	0	0	0	0	43	0	34	0	267	65	0	0	0	50	429	0

Naval College Road/Access B						Naval College Road/Access C						Naval College Road/The Wool Road/Jervis Bay Rd																							
North		East		South		West		North		East		South		West		North		East		South		West													
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
29	0	23	0	308	44	0	0	0	34	440	0	222	0	96	0	269	222	0	0	0	86	375	0	96	610	66	65	93	119	333	548	68	82	91	438

The Wool Road/Access D						The Wool Road/Leisure Centre						The Wool Road/High School																							
North		East		South		West		North		East		South		West		North		East		South		West													
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
0	511	177	0	0	0	261	489	0	156	0	261	0	682	23	0	0	0	50	595	0	51	0	48	7	688	0	17	0	17	0	627	12	0	0	0

The Wool Road/George Caley Pl						The Wool Road/Beach St/St Georges Ave						The Wool Road/Elizabeth Dr/Barton St																							
North		East		South		West		North		East		South		West		North		East		South		West													
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
13	674	0	6	0	12	0	644	6	0	0	0	14	418	6	83	6	7	152	399	98	14	12	186	25	277	103	56	29	7	48	259	28	149	32	88



NOTES: Any number highlighted in red has a manual entry in the cell

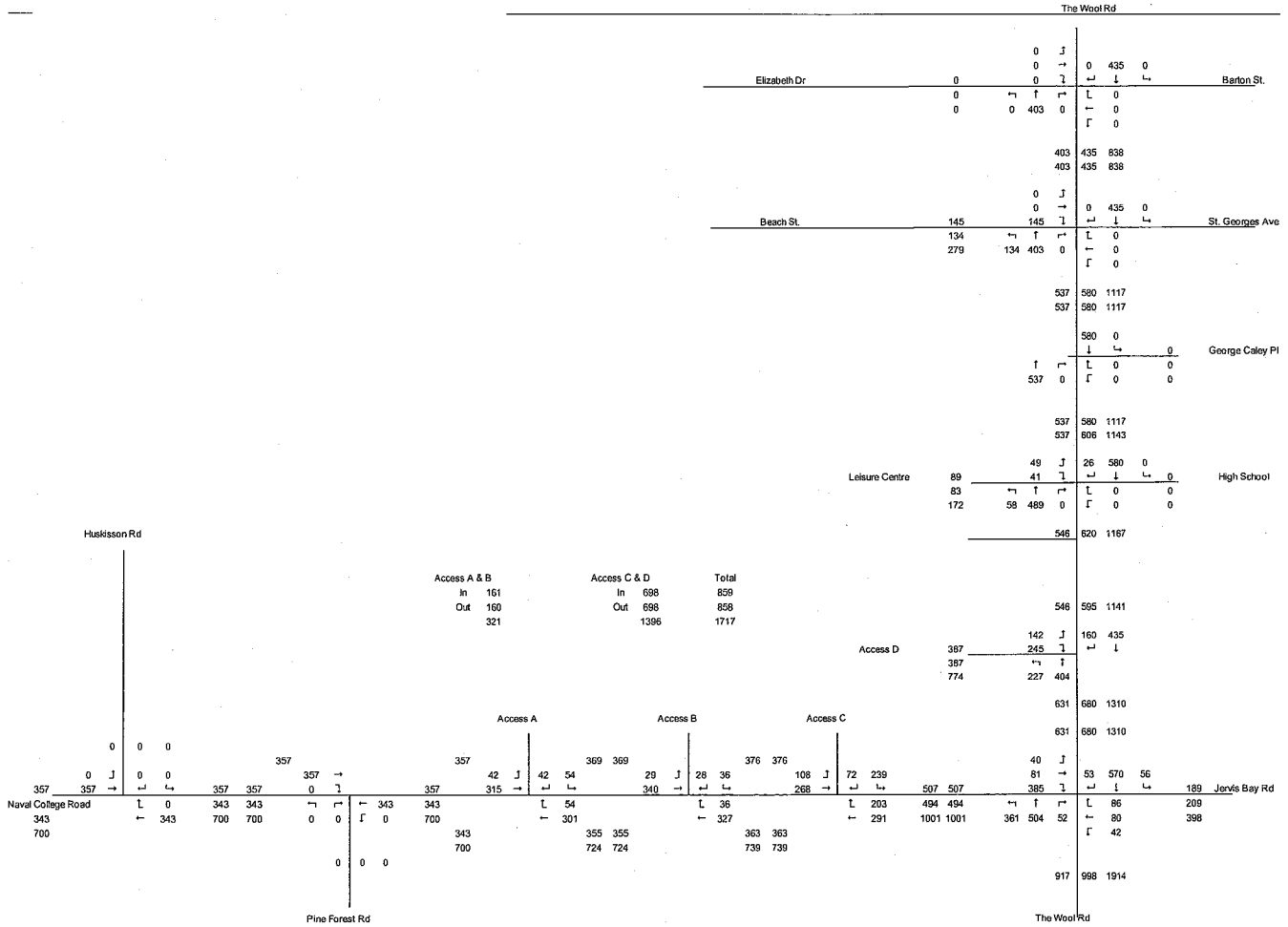
2016 Future Traffic with Development Saturday Peak (Summer)

Naval College Rd/Huskisson Rd						Naval College Rd/Pine Forest Rd						Naval College Road/Access A										
North		East		South		North		East		South		North		East		South		West				
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R		
0	0	0	0	343	0	0	0	0	343	0	0	54	0	42	0	301	54	0	0	42	315	0

Naval College Road/Access B						Naval College Road/Access C						Naval College Road/The Wool Road/Jervis Bay Rd																						
North		East		South		North		East		South		North		East		South		West																
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R														
36	0	28	0	327	36	0	0	0	29	340	0	239	0	72	0	291	203	0	0	108	268	0	56	570	53	42	80	86	351	504	52	40	81	385

The Wool Road/Access D						The Wool Road/Leisure Centre						The Wool Road/High School															
North		East		South		North		East		South		North		East		South		West									
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R							
0	435	160	0	0	0	0	554	26	0	0	0	0	580	0	0	0	0	0	537	0	0	0	0	0	0	0	0

The Wool Road/George Caley PI						The Wool Road/Beach St/St Georges Ave						The Wool Road/Elizabeth Dr/Barton St															
North		East		South		North		East		South		North		East		South		West									
L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R							
0	580	0	0	0	0	0	435	0	0	0	0	0	435	0	0	0	0	0	403	0	0	0	0	0	0	0	0



NOTES: Any number highlighted in red has a manual entry in the cell

Appendix B – SIDRA Analysis Files

MOVEMENT SUMMARY

Site: THU PM

CTLRJT Bayswood
 Naval College Rd-Access B (Seagull)
 Thursday PM
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued sec	Effective Stop Rate per veh	Average Speed km/h	
East: Naval College Road (E)												
5	T	235	0.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
6	R	157	0.0	0.136	10.1	LOS A	0.8	5.4	0.50	0.73	46.8	
Approach		392	0.0	0.136	4.1	LOS A	0.8	5.4	0.20	0.29	53.9	
North: Access B (N)												
7	L	143	0.0	0.131	9.9	LOS A	0.7	4.7	0.46	0.72	47.0	
9	R	39	0.0	0.069	12.9	LOS A	0.3	2.3	0.57	0.81	44.2	
Approach		182	0.0	0.131	10.5	LOS A	0.7	4.7	0.48	0.74	46.4	
West: Naval College Road (W)												
10	L	58	0.0	0.031	8.2	LOS A	0.0	0.0	0.00	0.67	49.0	
11	T	418	0.0	0.214	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		476	0.0	0.214	1.0	LOS A	0.0	0.0	0.00	0.08	58.4	
All Vehicles		1049	0.0	0.214	3.8	NA	0.8	5.4	0.16	0.27	54.3	

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

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

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

MOVEMENT SUMMARY

Site: THU PM-merge

CTLRJT Bayswood
 Naval College Rd-Access B (Seagull merge)
 Thursday PM
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued sec	Effective Stop Rate per veh	Average Speed km/h	
East: Naval College Road (E)												
5	T	235	0.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		235	0.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
North East: Merge												
26	R	39	0.0	0.025	7.3	LOS A	0.1	0.7	0.23	0.57	49.1	
Approach		39	0.0	0.025	7.3	LOS A	0.1	0.7	0.23	0.57	49.1	
All Vehicles		274	0.0	0.120	1.0	NA	0.1	0.7	0.03	0.08	58.2	

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

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

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

MOVEMENT SUMMARY

Site: SAT Midday

CTLRJT Bayswood
 Naval College Rd-Access B (Seagull)
 Saturday Midday
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued sec	Effective Stop Rate per veh	Average Speed km/h	
East: Naval College Road (E)												
5	T	287	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
6	R	131	0.0	0.099	9.5	LOS A	0.6	4.0	0.42	0.68	47.1	
Approach		418	0.0	0.147	3.0	LOS A	0.6	4.0	0.13	0.21	55.3	
North: Access B (N)												
7	L	131	0.0	0.106	9.3	LOS A	0.5	3.8	0.38	0.67	47.3	
9	R	48	0.0	0.070	11.5	LOS A	0.3	2.4	0.51	0.75	45.6	
Approach		179	0.0	0.106	9.9	LOS A	0.5	3.8	0.42	0.69	46.8	
West: Naval College Road (W)												
10	L	48	0.0	0.026	8.2	LOS A	0.0	0.0	0.00	0.67	49.0	
11	T	301	0.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		349	0.0	0.154	1.1	LOS A	0.0	0.0	0.00	0.09	58.2	
All Vehicles		946	0.0	0.154	3.6	NA	0.6	4.0	0.14	0.26	54.4	

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

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

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

MOVEMENT SUMMARY

Site: SAT Midday-merge

CTLRJT Bayswood
 Naval College Rd-Access B (Seagull merge)
 Saturday Midday
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued sec	Effective Stop Rate per veh	Average Speed km/h
East: Naval College Road (E)											
5	T	287	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		287	0.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
North East: Merge											
26	R	48	0.0	0.032	7.4	LOS A	0.1	0.8	0.26	0.59	49.0
Approach		48	0.0	0.032	7.4	LOS A	0.1	0.8	0.26	0.59	49.0
All Vehicles		336	0.0	0.147	1.1	NA	0.1	0.8	0.04	0.08	58.1

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

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

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