

Reference: 08 005

10 September 2008

Silver Spirit Partners Level 25, Chifley Tower 2 Chifley Square Sydney NSW 2000 level 2/55 mountain st broadway nsw eustralia 2007 po box 697 broadway nsw 2007 t: (02) 9211 3352 f; (02) 9211 2740 e: enquirias@traffix.com.au director: graham pindar an: 0651 32961 abn: 660651 32961

Attention: David Goodrich

Re: Proposed Residential Development; Moruya East Village, Moruya, NSW

Dear David,

We refer to our correspondence regarding the subject development with regard to changes to the previously submitted development application. The changes generally involve removing the proposed site access to the Princes Highway to the south of the site in response to a lack of support for this access from Council and the RTA. In this regard, we have reviewed the subsequent impacts and performance of the surrounding roads and now advise as follows:

7 Trip Generation

The proposed changes do not result in any changes to the development yields previously assessed. An extract of the Traffic Impact Assessment (version 3 dated April 2008) is included within **attachment 1** which outlines the traffic generation associated with the various uses proposed by the development.

The removal of the southern access to the Princes Highway will result in the redistribution of these trips onto the surrounding road network, particularly South Head Road. The impact of this on the performance of surrounding critical intersections is discussed below.

Future Intersection Performance

The proposed changes result in the traffic previously allocated onto the Princes Highway access (which is no longer proposed) to be redistributed to the intersections to the north, particularly the intersection of South Head Road and the Princes Highway. The future performance of this intersection is summarised in **table 1** below for a future scenario which includes both growth over a 10 year period and seasonal (holiday) increase factors. The table includes results of the worst approach, however the results for individual movements are shown in the SIDRA outputs provided in **attachment 2**.



table 1. future intersection performance with seasonal increase factor (without development)

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
Princes Hwy / South Head Rd	Delade	АМ	2.170	855.9	F
	Priority	PM	1.509	362.1	F

It can be seen from Table 1 above that the future growth in the area will result in the unacceptable performance of the existing intersection between the Princes Highway and South Head Road. Alternative intersection arrangements should be provided at this intersection to accommodate the future growth in the area. It is important to note that this is due to 'background' traffic levels and is not a result of the proposed development.

The provision of a 'seagull' type intersection arrangement will allow vehicles to undertake a two-stage crossing and will improve the performance of this intersection, particularly for westbound traffic along South Head Road turning north onto the Princes Highway. This was the preferred arrangement as outlined in the previous traffic report. The performance of this intersection arrangement is summarised in **table 2** below with consideration to the redistribution of traffic as a result of the proposed changes.

table 2. future 'seagull' intersection performance with seasonal increase factor (without development)

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
Princes Hwy / South Head Rd	Priority	АМ	0.601	19.2	В
	'Seagull'	РМ	0.612	35.0	С

It can be seen from above this intersection will operate effectively in the future with a 'seagull' type arrangement. The performance of this (previously proposed) intersection with the additional traffic associated with the development is shown in **table 3** below.



table 3. future 'seagull' intersection performance with seasonal increase factor (with development)

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
Princes Hun / South Hood Pd	Priority	АМ	0.781	24.3	В
Princes Hwy / South Head Rd	'Seagull'	PM	1.198	172.0	F

It can be seen from above that this intersection configuration is not sufficient to accommodate the additional traffic volumes as a result of removing the previously proposed access to the Princes Highway. This is a result of inadequate gaps between the through traffic in the peak direction of flow which for the PM peak is southbound along the Princes Highway. Therefore, the development will require an alternate intersection configuration to those previously proposed.

The provision of roundabout controlled intersection was considered, however this arrangement was also found to be inadequate during the PM peak as shown in **table 4** below.

table 4. future 'roundabout' intersection performance with seasonal increase factor (with development)

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
Princes Hwy / South Head Rd	Roundabout	PM	1.064	71.2	F

Therefore, a signalised intersection is considered necessary to accommodate the proposed development with consideration to both future growth and seasonal increase factors. The layout and performance of this intersection is shown in the SIDRA outputs provided in **attachment 2** and are summarised in **table 5** below.



table 5. future 'signalised' intersection performance with seasonal increase factor (with development)

Intersection Description	Control	Time Period	Degree of Saturation	Intersection Delay (secs)	Level of Service
Princes Hwy / South Head Rd	Priority	АМ	0.854	20.2	В
	'Seagull'	PM	0.823	15.4	В

It can be seen from above and the SIDRA outputs provided in **attachment 2** that signalisation of the intersection between the Princes Highway and South Head Road will provide sufficient capacity to accommodate the additional demands associated with the proposed development taking into account the redistribution of traffic as a result of the proposed changes to the development. This will result in minimal delays to through traffic along the Princes Highway with acceptable delays for vehicles using South Head Road.

In summary, the removal of the previous proposed access to the Princes Highway will result in additional capacity being required at the intersection of the Princes Highway and South Head Road. Signalisation of this intersection will provide this additional capacity whilst minimising any potential delays to through traffic along the Princes Highway which is considered important with regard for its status an RTA major road. This assessment incorporates seasonal and annual growth over a 10 year period. It is important to note that this intersection will require additional works as a result of the future growth regardless of the proposed development. Therefore, it is considered appropriate that Council and the RTA should contribute to any upgrading works required to surrounding intersections.

Please contact the undersigned should you have any queries.

Yours faithfully,

TRAFFIX

Tim Lewis Associate

Encl: attachment 1 – Extract From Previous Traffic Report (Version 3 dated April 2008)

attachment 2 – SIDRA Outputs

Existing Intersection Arrangement

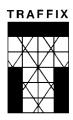
Previously Proposed 'Seagull' Arrangement Roundabout Controlled Intersection

Signalised Intersection Performance

traffic impact studies expert witness local govt. liason traffic calming development advice parking studies pedestrian studies traffic control plans traffic management studies intersection design traffic control plans traffic management studies.



attachment 1



5 TRAFFIC IMPACT ASSESSMENT

5.1 Full Development Traffic Generation

5.1.1 Non-Residential Use Traffic Generation

The development includes 1,650m² of various retail uses associated with the Village Square precinct. This would typically constitute a small neighbourhood shopping centre and would normally attract a maximum weekday peak traffic generation rate of 12.5 trips per 100m². As such this would result in a 206 trips per hour. However, the nature of the Village Square precinct is for the sole purpose of servicing the proposed development with little interaction anticipated with surrounding areas. As such these trips will be reduced and will not create external traffic impacts and therefore do not affect the external road network. Furthermore, a significant proportion of this demand would be associated with pedestrian movements given the relatively short distance to all residential areas; or as 'passing trade' (linked trips) so that the above RTA trip rate is of no relevance. This is discussed further in the context of sensitivity testing, but has not been included in the GTA assessment discussed in the following section.

5.1.2 Residential Traffic Generation

RTA Trip Rates

The RTA's Guide to Traffic Generating Developments specifies the following peak hour generation rate for the various uses contained within the development:

☐ Housing for aged or disabled persons
 ☐ Dwelling houses
 O.1-0.2 trips per dwelling; and
 O.85 trips per dwelling;

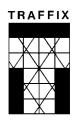
The entire planned development includes a total of 71 Torrens Title dwellings in addition to 495 Community Title (aged and disabled) dwellings. As such it is anticipated to generate in the order of 159 (32in, 127out) trips during the AM peak period with these flows reversed during the PM peak period.

GTA Report Traffic Generation

The GTA Report adopts a development traffic generation of up to 192 trips and 211 trips per hour during the AM and PM peak periods, respectively. This is based on the following surveyed peak hour generation rates:

AM peak hourPM peak hour0.41 trips per hour0.45 trips per hour

Surveys of similar existing developments are arguably the best assessment method and this approach is recommended in the RTA's Guide to Traffic Generating Developments. In this regard, Traffix has also undertaken surveys of privately funded aged care developments which demonstrated significantly reduced generation rates that are more similar to the RTA Guideline rates, resulting in a generation of about 170 trips per hour which is lower than that



stated in the GTA Report. However, for traffic impact assessment the GTA Report volumes can be considered to represent a 'worst case' scenario and the impacts of these volumes are discussed in Section 5.2.

Weekend Development Peaks

It is emphasised that weekend traffic conditions are less critical as there are lower overall 'background' traffic levels on the adjacent road system. This overall result is a direct consequence of the nature of trips associated with retirement developments, whereby trips are more spread throughout the day as a result of their 'discretionary' nature. Hence, traffic levels will be significantly lower overall than during peak periods (as discussed above), particularly as staff levels will also be reduced and will only occur at shift changeover times.

Visitation rates will also be moderate and distributed throughout the day, with only a few vehicle movements in any one hour.

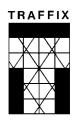
5.2 Traffic Impacts

5.2.1 Future Intersection Performances

Future Intersection Performance with 10 Year Growth Predictions with No Development
The performance of the surrounding road networks incorporating a factor for increased 10 year growth predictions, of 3.46% annual growth has previously been assessed in the GTA Report and the results are presented below.

Table 2. Future Intersection Performance with 10 Year Growth - No Development

Intersection Description	Peak	Approach	Degree of Saturation	Intersection Delay (secs)	Level of Service
		South	0.506	10.9	А
	АМ	East	2.170	855.9	F
Princes Highway &		North	0.295	1.5	А
South Head Road		South	0.476	39.7	С
	PM	East	1.509	362.1	F
		North	0.569	2.2	А
		South	0.047	10.1	А
	АМ	East	0.207	0.0	Α
South Head Road &		West	0.081	3.1	А
Maunsell Street		South	0.058	8.8	А
	PM	East	0.109	0.2	Α
		West	0.240	2.6	Α



In general the surrounding road network and intersections will continue to operate well into the future (ignoring site development) with the exception of the eastern approach of the intersection between the Princes Highway and South Head Road, which wilkl require improvement.

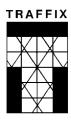
Future Intersection Performance with 10 Year Growth Predictions Plus Development

The impact of the development on the future intersection performance is also assessed in the GTA Report. The report assesses the performance of the proposed site access points based on predicted flow levels and distributions onto the road network, which are supported. However, the GTA assessment then assumes the continuation of the existing speed zonings in the vicinity of these accesses which is not considered to be an appropriate assumption. This has significant implications for the proposed site access arrangements are discussed in further detail in Section 5.3. Table 3, below, provides a summary of the intersection performance assessment previously documented in the GTA Report which incorporates both the 10 year growth as well as predicted development impacts.

Table 3. Future Intersection Performance with 10 Year Growth plus Development

Intersection Description	Peak	Approach	Degree of Saturation	Intersection Delay (secs)	Level of Service
		South	0.541	13.8	Α
	AM	East	3.241	1605.1	F
Princes Highway &		North	0.317	2.2	Α
South Head Road		South	0.608	67.8	Е
	РМ	East	2.794	1107.0	F
		North	0.591	2.5	Α
		South	0.102	10.5	Α
	AM	East	0.227	0.1	Α
South Head Road &		West	0.149	4.9	Α
Maunsell Street		South	0.111	9.1	Α
	PM	East	0.131	0.4	Α
		West	0.300	3.5	Α

It can be seen from Table 3 above that the development will result in further delays at the critical intersection of the Princes Highway and South Head Road. It should be noted that the poor future performance of this intersection is not solely the result of the proposed development and is more heavily influenced by the anticipated future growth in 'background' traffic volumes along the Highway.



5.2.2 Sensitivity Testing for Retail Traffic Generation

The above assessment makes no allowance for traffic generation associated with the non-residential uses as these are 'internal' trips. In this regard, further sensitivity testing has been undertaken to consider the implications of some external trips and to make some allowance for these non-residential uses, if appropriate.

Specifically, a worst case scenario would be if 30 percent of the 206 trips associated with the non residential use of the development (62 trips per hour) were assigned as external traffic. This is considered excessive having regard for the fact that the non-residential uses do not have any 'exposure' to the existing external road network are not therefore intended to attract external trips. In addition, the 206 'base' retail trips derived from the RTA's Guideline are very high and relate more to large shopping centre that to local retail facilities. Therefore, the 30% of 206 trips that have been tested would in effect be equivalent to about 50% of the more probable reduced external trips, again underscoring the fact that a worst case scenario has been adopted.

Nevertheless, if these external trips were to occur, the additional 62 veh/hr trips would be split 50:50 and this would equate to an additional 31 in and 31 out trips during the more critical evening peak periods. The AM peak period would relate principally to staff movements and these would be moderate. For assessment purposes, it has been assumed that this relates to an additional 20 veh/hr (in only).

These trips are distributed onto all available accesses. In this regard, 66% of trips are expected to use South Head Road; while the balance of 33% would use the new southern access onto the Highway, as assumed by GTA. The additional traffic through each intersection would therefore be as follows:

	13 veh/hr using South Head Road in the AM Peak;
	7 veh/hr using the New Access Road in the AM Peak;
	,
_	
Ц	40 veh/hr using the New Access Road in the PM Peak; and
	22 veh/hr using the New Access Road in the PM Peak;

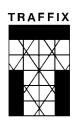
These increases are split onto all approaches and will not alter the results of the intersection performances as previously assessed, which are based on an improved intersection geometry as discussed below.

5.2.3 Proposed Upgrade to Intersection of Princes Highway/South Head Road

The proposed intersection upgrade recommended in the GTA Report for the intersection of the Princes Highway and South Head Road is supported. The proposed upgrade includes a 'seagull' type arrangement with the following components:

Provision of a 50 metre acceleration lane for vehicles turning north onto the Princes
Highway in order to allow a two-stage turn; and

Provision of a 50 metre right turn storage lane for vehicles turning east onto South
Head Road from the Princes Highway;



This arrangement was previously assessed in the GTA Report which concluded that this proposed intersection would operate with acceptable delays and queues in the short term but would require further assessment and possible upgrade in the medium to long term, to accommodate regional growth that is not related to the proposed development. These conclusions are also supported and the development impacts will be accommodated by the proposed intersection geometry.

In this regard, it is noted that the improvements will accommodate the development impacts as well as accommodating future growth and this arguably exceeds the obligations on an individual development, particularly as the majority of the traffic through the intersection relates to existing and future traffic requirements on a national highway.

5.3 Site Access Requirements

5.3.1 Policy Implications of a new Public Road Intersection with the Highway

The proposed intersection is supported on policy grounds for the following reasons:

- The site is within an area of land that lies generally on the northern side of the Highway east of the existing township and which is subject to future development in accordance with Council's strategic planning. With the exception of the TAFE college, there are currently no access opportunities to the Highway between Albert Street and Noads Road, which is a distance of about 2.3 kms. This is a substantial length of uninterrupted Highway frontage within an emerging urban environment that exceeds standard practice;
- It is the presence of intersections more than any other factor that triggers the perception by motorists that they are within an urban area, resulting in slower speeds as they need to negotiate through 'conflict' areas. Importantly, these speeds are more likely to be self-enforcing where intersections exist.
- The proposed intersection will act as a 'gateway' on approach to Moruya. It is considered that traffic flow efficiency is not unduly compromised by this intersection (or any other). Traffic flow efficiency on the Highway must be a secondary consideration within an urban area, where traffic speeds are lower to provide a safe environment for motorists and pedestrians;
- The provision of direct access to the Highway from a private development (such as the existing TAFE College) is not an uncommon practice and is not precluded by the RTA's Guideline. Specifically, the Guideline states that it is generally advisable to avoid direct access between developments and major roads (Section 1.3.2); but that where this is proposed, the obligation is to demonstrate that the resulting situation does not adversely affect safety. In the first instance, the proposed intersection is not expected to only serve the subject development but will result in a more permeable road network that will be of benefit to the overall community, fulfilling the role of a normal public road. Secondly, the intersection design is in accordance with the RTA's Road Design Guide (and can be conditioned as such) so that no safety issues arise; and
- There is a planning disbenefit in requiring all traffic associated with the site to access the Highway via South Head Road. It is good traffic planning practice to disperse traffic to several locations rather than to concentrate them at any one location. This



attachment 2



Princes Hwy / South Head Rd

AM Future + Seasonal Increase

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy Sout	p		2.4.m. 2.7.2.4.258000.400 pm 2000.700 cm 24.40000m	IN TO CHANCE IT STANDARD OF THE STANDARD OF TH	estamono, vancinuos un estimos e saveras vous estados vancis en verte verte.		anni faring a de mainte de la mai	Address of the second s	And agreement described that And Andrea and Anna
2	Т	943	2.1	0.506	10.8	LOS A	108	1.00	0.00	46.3
3	R	11	10.0	0.500	20.2	LOS B	108	1.00	1.20	40.2
Approach		953	2.2	0.506	10.9	LOS A	108	1.00	0.01	46.2
South Hea	ad Rd Ea	st				***************************************		And the Control of th	an and a fact and a definition of the and an and	Carlotter Annual Land Section Co.
4	L	95	6.4	0.316	14.9	LOS B	6	0.58	0.89	46.9
6	R	322	1.2	2.176	1101.5	LOS F	827	1.00	4.87	1.9
Approach		416	2.4	2.170	855.9	LOS F	827	0.90	3.97	2.4
Princes H	wy Nort	h				THE PERSON NAMED IN THE PE				Harangara Angusta ang Angu
7	L	111	5.5	0.062	9.2	LOS A	0	0.00	0.69	49.7
8	Т	576	6.1	0.307	0.0	LOS A	0	0.00	0.00	60.0
Approach		686	6.0	0.307	1.5	LOS A		0.00	0.11	58.0
All Vehicle	es	2055	3.5	2.176	178.8	Not Applicable	827	0.65	0.85	10.2

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: AM Future + Seasonal T:\2008\08005\SIDRA Files\Princes Hwy - South Head Rd.aap Processed Sep 10, 2008 11:45:33AM

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Princes Hwy / South Head Rd

PM Future + Seasonal Increase

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%H V	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy Sout	h			***************************************	and the second s	ing a second of the second			A CONTRACTOR OF THE PERSON OF
2	Т	523	3.4	0.476	39.1	LOS C	100	1.00	0.00	28.9
3	R	40	0.0	0.476	48.0	LOS D	100	1.00	1.16	26.8
Approach		563	3.2	0.476	39.7	LOS C	100	1.00	80.0	28.8
South He	ad Rd Ea	st								
4	L	77	1.3	0.538	36.0	LOS C	13	0.90	1.04	32.1
6	R	13 9	0.7	1.511	542.8	LOS F	258	1.00	2.66	3.8
Approach		216	0.9	1.509	362.1	LOS F	258	0.96	2.09	5.5
Princes H	wy Nortl	h						·		
7	L	354	1.1	0.192	9.0	LOS A	0	0.00	0.69	49.7
8	T	1109	1.5	0.575	0.0	LOS A	0	0.00	0.00	60.0
Approach		1463	1.4	0.575	2.2	LOS A		0.00	0.17	57.0
All Vehicl	es	2242	1.8	1.511	46.3	Not Applicable	258	0.34	0.33	26.7

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



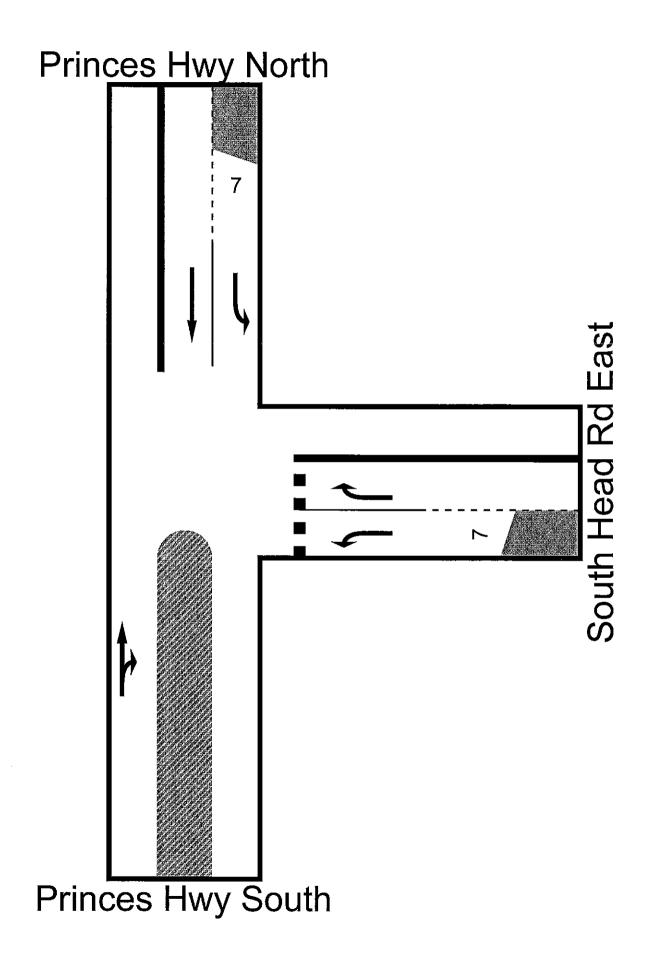
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Princes Hwy / South Head Rd

AM Future + Seasonal Increase + Development

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%H V	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
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2	Т	943	2.1	0.530	13.1	LOS A	108	1.00	0.00	44.1
3	R	23	4.3	0.535	22.3	LOS B	108	1.00	1.23	38.6
Approach		966	2.2	0.530	13.3	LOS A	108	1.00	0.03	43.9
South Hea	ad Rd Ea	st	and the same of th	all a Nach and Control of Nach and Assessment and A	***************************************	kalana marana na manaka makana kananaka na makama ka sa	***************************************		**************************************	
4	L	117	5.1	0.408	16.4	LOS B	9	0.63	0.94	45.3
6.	R	418	1.0	3.215	2050.9	LOS F	1351	1.00	5.36	1.0
Approach		535	1.9	3.224	1606.0	LOS F	1351	0.92	4.39	1.3
Princes H	wy Nort	h				and the second seco				
7	L	239	2.5	0.131	9.0	LOS A	0	0.00	0.69	49.7
8	Т	576	6.1	0.307	0.0	LOS A	0	0.00	0.00	60.0
Approach		815	5.0	0.307	2.6	LOS A		0.00	0.20	56.4
All Vehicl	es	2316	3.1	3.215	377.5	Not Applicable	1351	0.63	1.10	5.3

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: AM Future + Seasonal + Development T:\2008\08005\SIDRA Files\Princes Hwy - South Head Rd.aap Processed Sep 10, 2008 11:45:33AM

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Princes Hwy / South Head Rd

PM Future + Seasonal Increase + Development

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%H V	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy Sout	h						- diament the new Artifelius at New Market	A 10	
2	Т	523	3.4	0.626	68.8	LOS E	125	1.00	0.00	20.8
3	R	54	0.0	0.628	77.8	LOS F	125	1.00	1.22	19.9
Approach		577	3.1	0.626	69.7	LOS E	125	1.00	0.11	20.7
South He	ad Rd Ea	st	and confirment continuous designations.	a A A L. Inches and an annual network of the second of the	CONTRACTOR AND			***************************************		THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NAMED IN COL
4	L	116	0.9	0.892	38.2	LOS C	22	0.95	1.04	31.1
6	R	241	0.4	3.013	18 9 6.9	LOS F	776	1.00	3.75	1.1
Approach		357	0.6	3.026	1293.0	LOS F	776	0.98	2.87	1.6
Princes H	wy Nort	h								
7	L	477	0.8	0.258	9.0	LOS A	0	0.00	0.69	49.7
8	Т	1109	1.5	0.575	0.0	LOS A	0	0.00	0.00	60.0
Approach		1587	1.3	0.575	2.7	LOS A		0.00	0.21	56.4
All Vehicl	es	2521	1.6	3.013	200.7	Not Applicable	776	0.37	0.56	9.3

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Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

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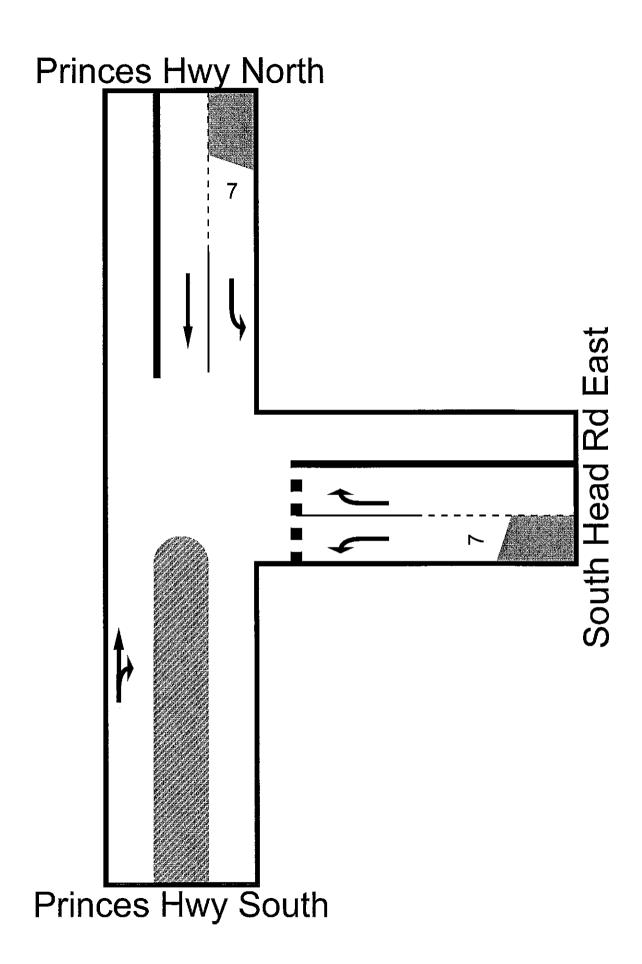
Following Queue

- Density for continuous movement



Site: PM Future + Seasonal + Development T:\2008\08005\SIDRA Files\Princes Hwy - South Head Rd.aap Processed Sep 10, 2008 11:45:34AM

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Princes Hwy / South Head Rd

AM Future + Seasonal Increase Seaguli

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%H V	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes Hw	y South							A STATE OF THE PARTY OF THE PAR		var i distribution variorità melesso
2	T	943	2.1	0.490	0.0	LOS A	0	0.00	0.00	60.0
3	R	11	10.0	0.016	13.4	LOS A	1	0.56	0.75	45.6
Approach		953	2.2	0.490	0.1	LOS A	1	0.01	0.01	59.8
South Head	l Rd Stag	je 2						deministrative Automotive & Land States and American	and a second control of the second	MATERIAL STATE OF THE STATE OF
23	R	322	1.2	0.602	19.2	LOS B	31	0.86	1.10	42.7
Approach		322	1.2	0.601	19.2	LOS B	31	0.86	1.10	42.7
South Head	i Rd Stag	je 1		THE THE THE PERSON OF THE PERS		CONTRACTOR	and the second s	***************************************		
4	L	95	6.4	0.316	14.9	LOS B	6	0.58	0.89	46.9
6	R	322	1.2	0.549	17.1	LOS B	30	0.70	1.04	44.6
Approach		416	2.4	0.549	16.6	LOS B	30	0.67	1.00	45.1
Princes Hw	y North								The state of the s	о одинаст тура и мине од е вада
7	L	111	5.5	0.062	9.2	LOS A	0	0.00	0.69	49.7
8	Т	576	6.1	0.307	0.0	LOS A	0	0.00	0.00	60.0
Approach		686	6.0	0.307	1.5	LOS A		0.00	0.11	58.0
All Vehicle	5	2377	3.2	0.602	6.0	Not Applicable	31	0.24	0.36	53.4

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: AM Future + Seasonal Seagull
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Princes Hwy / South Head Rd

PM Future + Seasonal Increase Seagull

Give-way

Vehicle Movements

Mov IĐ	Turn	Dem Flow (veh/h)	% HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes Hw	ry South				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	and the state of t				57.75.75.00.00.00.00.00.00.00.00.00.00.00.00.00
2	Т	523	3.4	0.274	0.0	LOS A	0	0.00	0.00	60.0
3	R	40	0.0	0.202	28.2	LOS B	6	0.89	0.98	35.0
Approach		563	3.2	0.274	2.0	LOS A	6	0.06	0.07	57.0
South Head	d Rd Stag	je 2		,		and the second s			- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	AND SERVICE SERVICES
23	R	139	0.7	0.132	10.0	LOS A	5	0.53	0.73	51.6
Approach		139	0.7	0.132	10.0	LOS A	5	0.53	0.73	51.6
South Head	d Rd Stag	ge 1	20002002020478804 179 804774	омер - 14 гуудоом четого оче оче оче оче оче оче оче оче оче оч	топост в постоя в постав подостав стоя	an en	anter en	TO SEE SEE SEE SEE SEE SEE SEE SEE SEE SE	***************************************	
4	L	77	1.3	0.538	36.0	LOS C	13	0.90	1.04	32.1
6	R	139	0.7	0.612	34.5	LOS C	24	0.92	1.10	32.8
Approach		216	0.9	0.612	35.0	LOS C	24	0.91	1.08	32.6
Princes Hw	y North	Andrews and the second							management of the second of th	and the second to the second second to the second
7	L	354	1.1	0.192	9.0	LOS A	0	0.00	0.69	49.7
8	Т	1109	1.5	0.575	0.0	LOS A	0	0.00	0.00	60.0
Approach		1463	1.4	0.575	2.2	LOS A		0.00	0.17	57.0
All Vehicle	5	2381	1.8	0.612	5.6	Not Applicable	24	0.13	0.26	53.1

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

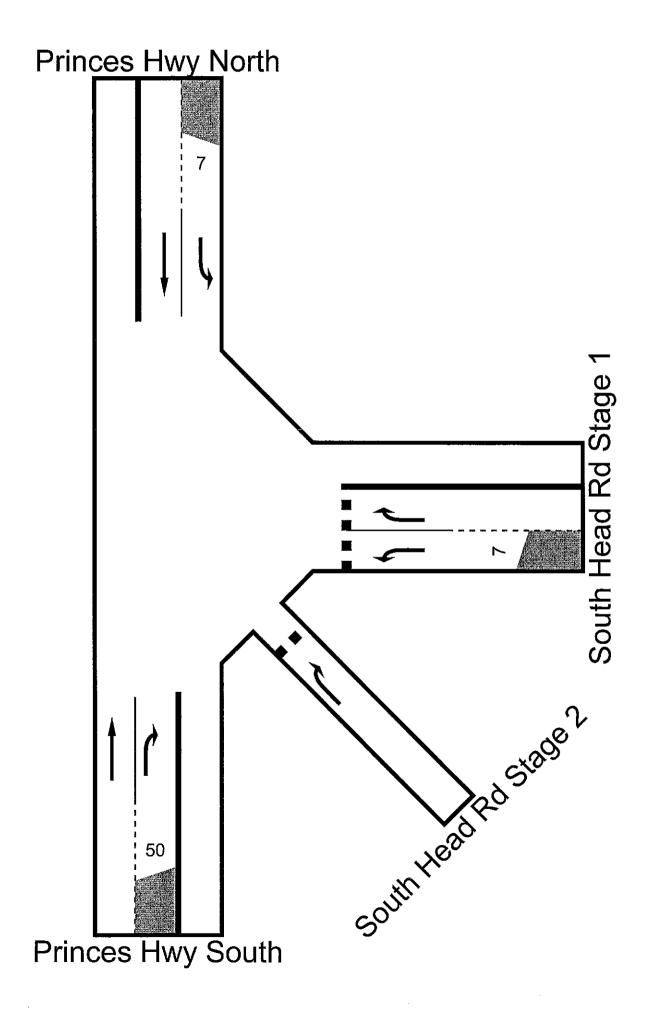
Following Queue

- Density for continuous movement



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Princes Hwy / South Head Rd

AM Future + Seasonal Increase + Development Seagull

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes Hw	y South	and the second to have been a the second to second the second the second to second the second to second the second to second the second the second to second the second th	1	THE REAL PROPERTY OF THE PROPE	one de la company de la compan	ACCOUNTS A STATE OF THE STATE O	The state of the s		AAAAA	***************************************
2	Т	943	2.1	0.490	0.0	LOS A	0	0.00	0.00	60.0
3	R	23	4.3	0.040	14.0	LOS A	1	0.61	0.83	44.9
Approach		966	2.2	0.490	0.3	LOS A	1	0.01	0.02	59.5
Sth Head R	ld Stage	2		and the state of t	and the second s	a como mela enconante concluente de professorio de constitución de constitució	And the second s	Montang of the August August 1, August 1		
23	R	418	1.0	0.781	24.3	LOS B	54	0.92	1.31	38.8
Approach		418	1.0	0.781	24.3	LOS B	54	0.92	1.31	38.8
South Head	d Rd Stag	ge 1			en communication and a					
4	L	117	5.1	0.408	16.4	LOS B	9	0.63	0.94	45.3
6	R	418	1.0	0.783	23.8	LOS B	62	0.85	1.30	39.2
Approach		535	1.9	0.782	22.2	LOS B	62	0.80	1.22	40.4
Princes Hw	y North		ann ann an Anna ann an Anna Anna Anna A	THE BUT OF THE STATE OF THE STA	**************************************	መን የያስትድ ያሳርር ለ ብዛኒሲሉ ተቀነ፡፡ መኔት ትርያዘመ ሉ የ ት ብ ብ ሊ ር ት ።	ener selekularia de de Artigologia (1905 Artigologia (1905) Artigologi		VA QUALITATION AND AND AND AND AND AND AND AND AND AN	
7	L	239	2.5	0.131	9.0	LOS A	0	0.00	0.69	49.7
8	Т	576	6.1	0.307	0.0	LOS A	0	0.00	0.00	60.0
Approach		815	5.0	0.307	2.6	LOS A		0.00	0.20	56.4
All Vehicle	s	2734	2.8	0.783	9.0	Not Applicable	62	0.30	0.51	50.0

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



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Princes Hwy / South Head Rd

PM Future + Seasonal Increase + Development Seagull

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%H V	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes Hw	y South	en mentalisti kan mengerakan mengelah mengentuk di sebagai mengentuk di sebagai mengentuk di sebagai mengentuk		a annound in a life of Liver Sim But But Site Street Site on Africa.	gold () () () () () () () () () () () () ()				-> None of the second s	CA CONTRACTOR AND THE CONTRACTOR OF THE CONTRACT
2	T	523	3.4	0.274	0.0	LOS A	0	0.00	0.00	60.0
3	R	54	0.0	0.353	38.0	LOS C	11	0.93	1.02	30,4
Approach		577	3.1	0.352	3,6	LOS A	11	0.09	0.10	54.8
South Head	i Rd Stag	je 2	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	An an ad Lanca (Mercania)	Matth.				And the second of the second o	eriga, yannga yanngagagagan okunikan kan oron gawa
23	R	241	0.4	0.230	10.2	LOS A	9	0.56	0.77	51.4
Approach		241	0.4	0.230	10.2	LOS A	9	0.56	0.77	51.4
South Head	d Rd Stag	je 1	OFETOWOTOFAT ATTEMPT AND ASSESSED		***************************************	чество столителниковорите ричковование	A TANK MANAGAMAN MAN	POLICE TO A STREET OF THE PROPERTY OF THE PROP	aregramma.voeue.com.vom.v.o.eue	
4	L	116	0.9	0.892	38.2	LOS C	22	0.95	1.04	31.1
6	Ř	241	0.4	1.199	236.4	LOS F	239	1.00	2.82	8.1
Approach		357	0.6	1.198	172.0	LOS F	239	0.98	2.24	10.7
Princes Hw	y North			**************************************	Adam de la constantina della c					Market and a come a debut of come of
7	_ L	477	0.8	0.258	9.0	LOS A	0	0.00	0.69	49.7
8	Т	1109	1.5	0.575	0.0	LOS A	0	0.00	0.00	60.0
Approach		1587	1.3	0.575	2.7	LOS A		0.00	0.21	56.4
All Vehicles	Ś	2762	1.5	1.199	25.4	Not Applicable	239	0.19	0.49	36.1

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow * x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

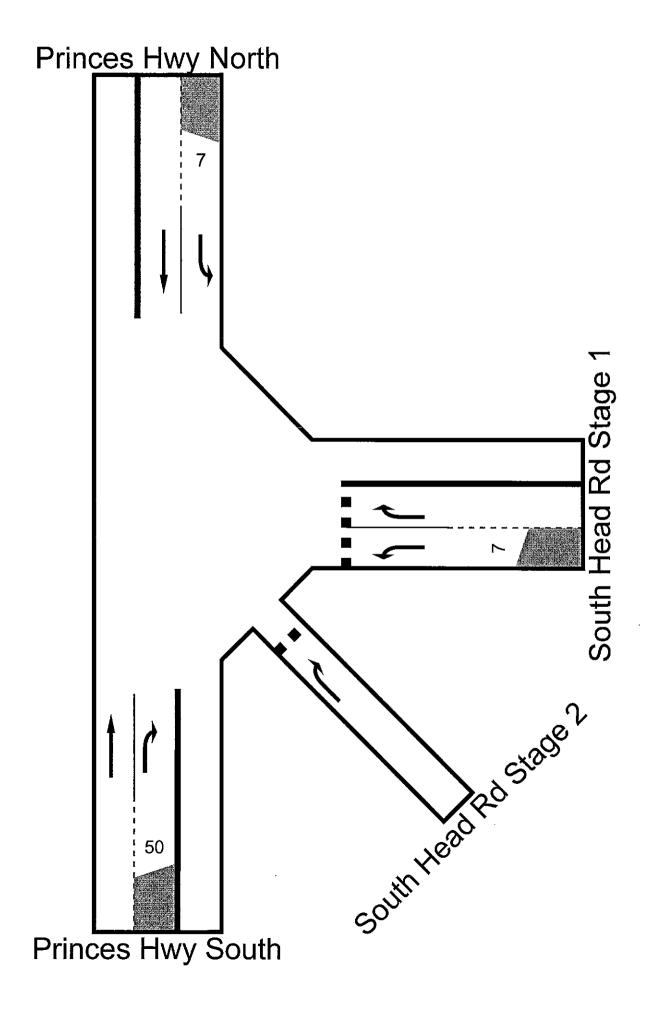
Following Queue

- Density for continuous movement



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Princes Hwy / South Head Rd

PM Future + Seasonal Increase + Development Roundabout

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy (sout	th)				: yes you go refer to a second go region was a con-	0.5200000000000000000000000000000000000			
2	Т	523	3.4	0.540	8.6	LOS A	45	0.68	0.65	47.0
3	R	54	0.0	0.540	13.6	LOS A	45	0.68	0.72	44.9
Approach		577	3.1	0.540	9.1	LOS A	45	0.68	0.66	46.8
South Hea	ad Rd (e	ast)						ngapa summing a mangan ng tao man y taong ng pagingan ng man	and the second seco	***************************************
4	L	116	0.9	1.160	209.4	LOS F	344	1.00	2.50	9.0
6	R	241	0.4	1.153	212.8	LOS F	344	1.00	2.50	9.1
Approach		357	0.6	1.155	211.7	LOS F	344	1.00	2.50	9.1
Princes H	wy (nort	th)								
7	L	477	0.8	1.065	72.2	LOS F	1065	1.00	1.18	20.9
8	Т	1109	1.5	1.064	70.7	LOS F	1065	1.00	1.18	20.3
Approach		1587	1.3	1.064	71.2	LOS F	1065	1.00	1.18	20.5
All Vehicle	es	2521	1.6	1.160	76.9	LOS F	1065	0.93	1.25	19.5

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



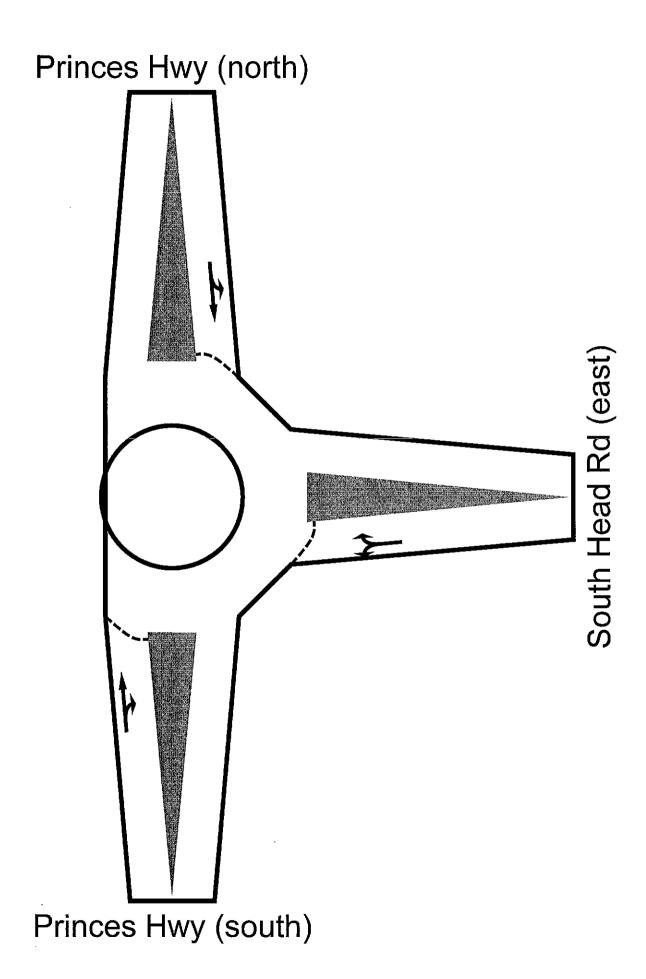
Site: PM Future + Seasonal + Development Roundabout T:\2008\08005\SIDRA Files\08 005 Moruya East Village_20080910.aap Processed Sep 10, 2008 02:38:44PM

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Princes Hwy / South Head Rd

AM Future + Seasonal Increase + Development Signals

Signalised - Fixed time

Cycle Time = 80 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy (sout	th)				2 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m			200 Carlotte (1975)	
2	Т	943	2.1	0.826	17.5	LOS B	228	0.87	0.85	40.5
3	R	23	4.3	0.128	25.0	LOS B	6	0.63	0.73	36.9
Approach		966	2.2	0.826	17.7	LOS B	228	0.86	0.85	40.4
South Hea	ad Rd (ea	ast)								
4	L	117	5.1	0.500	13.3	LOS A	17	0.43	0.75	48.4
6	R	418	1.0	0.854	47.5	LOS D	135	1.00	1.01	27.4
Approach		535	1.9	0.854	40.1	LOS C	135	0.87	0.95	30.3
Princes H	wy (nort	:h)								
7	L	239	2.5	0.286	9.6	LOS A	9	0.18	0.71	48.9
8	Т	576	6.1	0.515	10.5	LOS A	107	0.64	0.57	46.6
Approach		815	5.0	0.515	10.2	LOS A	107	0.50	0.61	47.3
All Vehicl	es	2316	3.1	0.854	20.2	LOS B	228	0.74	0.79	39.4

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	11	26.4	LOS C	0	0.81	0.81
Р3	11	9.5	LOS A	0	0.49	0.49
P5	11	26.4	LOS C	0	0.81	0.81
All Peds	33	20.8	LOS B	0	0.70	0.70

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS



Princes Hwy / South Head Rd

PM Future + Seasonal Increase + Development Signals

Signalised - Fixed time

Cycle Time = 80 seconds

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Princes H	wy (sout	th)	***************************************				and the second s	Andreas and the management of the state of t	MCCO. Marchell Co. V. Colonial Co. V. Marchell Co.	our souther the state of the st
2	Т	523	3.4	0.395	5.7	LOS A	74	0.46	0.41	51.9
3	R	54	0.0	0.399	36.2	LOS C	19	0.85	0.79	31.2
Approach	I	577	3.1	0.399	8.6	LOS A	74	0.50	0.45	48.7
South He	ad Rd (e:	ast)	and the second s	enterent a mentra par Marina (1995) andre entra a como entra en	artistani, etere artikanya maise) () () () () () () () () () (
4	L	116	0.9	0.693	36.4	LOS C	43	0.90	0.92	32.0
6	R	241	0.4	0.793	48.8	LOS D	82	1.00	0.93	27.0
Approach		357	0.6	0.793	44.8	LOS D	82	0.97	0.92	28.4
Princes H	wy (nort	th)		- 777						
7	L	477	8.0	0.569	10.2	LOS A	20	0.40	0.76	48.0
8	Т	1109	1.5	0.823	11.7	LOS A	232	0.78	0.76	45.4
Approach		1587	1.3	0.823	11.2	LOS A	232	0.67	0.76	46.2
All Vehicl	es	2521	1.6	0.823	15.4	LOS B	232	0.67	0.71	43.0

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P1	11	33.3	LOS D	0	0.91	0.91
Р3	11	6.0	LOS A	0	0.39	0.39
P 5	11	33.3	LOS D	0	0.91	0.91
All Peds	33	24.2	LOS B	0	0.74	0.74

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

