SHAOLIN TEMPLE FOUNDATION (AUSTRALIA) LTD

APPENDICES

(BOUND SEPARATELY)

**TRAFFIC IMPACT ASSESSMENT
FOR
PROPOSED SHAOLIN TOURIST
RESIDENTIAL DEVELOPMENT
AT
COMBERTON GRANGE,
SOUTH NOWRA, NSW**

Prepared by:

**Lyle Marshall & Associates Pty Ltd
Consulting Engineers,
Transportation and Environmental Planners**

**Suite 8, 871 Pacific Highway
CHATSWOOD NSW 2067**

**Phone: (02) 9419-8191
Fax: (02) 9419-8107**

**Job No.: 3005
Report No.: 07/12**

MARCH, 2012

APPENDICES: (Bound separately)

1. **Compound Annual Growth Factors in AADT for SH1, Forest Road and MR312.**

2. **Automatic Tube Counts in Princes Highway and Forest Road, South Nowra.**

3. **Table 1 - 2008 2-Way Hourly Volumes by Hour of Day in Forest Road 500 metres East of SH1.**

   Tables 2A & 2B - 2008 2-Way Hourly Traffic Volumes in Huskisson Road MR312.

   Table 3 - 2007-2008 2-Way Hourly Traffic Volumes by Hour of Day in Princes highway North of MR312.

   Table 4 - 2007-2008 2-Way Hourly Traffic Volumes in Princes Highway Ranked in Order of Magnitude Showing 120th H.H.

4. **Hourly Trip Distribution Residential Village.**

5. **Enlargements of Masterplan Facilities Shown on DWG. No. 07062 SK080226-01 prepared by Conybeare Morrison.**

6.1 **Attendance Survey and Parking Accumulation at Nan Tien Water and Dharma Festival on Saturday 10/10/2009. Memo 13/10/2009.**

6.2 **Memo dated 27th July 2010. Traffic Volumes Surveys Nan Tien Temple 12/2/10 to 28/2/10 before, during and after the Chinese New Year Celebrations.**

APPENDICES

APPENDIX 1

Lyle Marshall & Associates Pty Ltd

CONSULTING ENGINEERS, TRANSPORTATION AND ENVIRONMENTAL PLANNERS
ABN 39 001 200 620

MEMORANDUM

To:	**John Britton / Scott Wells**	**From:**	**Lyle Marshall**
		Phone:	**02) 9419-8191**
E-mail:	**britton@shoalhaven.nsw.gov.au**	**Fax:**	**02) 9419-8107**
Date:	**5th March 2012**	**Job No.**	**3005**

Subject: **Compound Annual Growth Factors in AADT for SH1, MR312 and Forest Road.**

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1. The AADT for the years 2000 to 2006 for SH1 and MR312 published by the RTA for the Southern West Region, the 2008 AADT for MR312 and Forest Road provided by Brett Williams and 2008 AADT for SH1 at Station 7.053 provided by Bradley Collins RTA Wollongong have been used together with our traffic counts in October 2011 to estimate growth rates in AADT to the year 2011. We propose to factor the 2011 design volumes by the growth rate for 10 years and check the capacity of the major SH1 intersections to carry these traffic volumes with the added development traffic for Stage 1. The RTA has advised that the Princes Highway upgrading will be completed in 2013 and the capacity calculations will be based upon 2 traffic lanes in each direction.

2. Growth Factors to 2011

   (i) Princes Highway STN 7.053 and North of BTU
   From count 22/10/11 to 28/10/11
   ADT North of BTU = 21650
   Estimated ADT North of MR312 = 20892
   Relative increase North of BTU = 21692/20892 = +3.63%

   From RTA data 23/10/08 to 29/10/08
   ADT North of MR312 = 18358
   Estimated ADT North of MR312 in 2011 = 20892
   Relative increase + 13.8%
   AADT in 2008 = 18689
   Estimated AADT in 2011 North of MR312 = 1.138 x 18689 = 21268 *
   Estimated AADT in 2011 North of BTU = 21268 x 1.0363 = 22040 *

Year	**2000**	**2006**	**2008**	**2011**
AADT	16664	18744	18797	21268

   Compound annual growth $(1 + r)^6$ from 2000 to 2006 = 2%
   Compound annual growth from 2000 to 2008 = 1.53%
   Compound annual growth from 2000 to 2011 = 2.24%

   (ii) Growth Factors Forest Road to 2011 and Beyond
   From count 22/10/11 to 28/10/11 500 metres east of SH1 ADT 2597
   From Council Data Base 18/10/2008 to 24/10/2008
   Estimated ADT = 2127
   ∴ Growth factor 2008 to 2011 = $^{2597}/_{2127}$ = 1.2210

SUITE 8, 871 PACIFIC HIGHWAY CHATSWOOD NSW 2067
TELEPHONE: 9419 8191 FACSIMILE: 9419 8107
EMAIL: lylemarshall@ozemail.com.au
ABN 39 001 200 620

(ii) (Cont.)

From Council Data Base AADT in 2008 = 2131

∴ Estimated AADT in 2011 = $\frac{2131}{2127} \times 2597 = 2602$

Average annual compound growth rate from 2008 to 2011 = $1 + r)^3 = 1.2210 = 7\%$

Council Data Base ADT Forest Road August 2007 = 1882

Spike in traffic growth 2007 to 2011 due to upgrading of Forest Road in 2008.

Proposed

Adopt average annual growth rate of 2.5% from 2011 to 2021 similar to MR312.

(iii) Growth Factors Huskisson Road MR312

Count Friday 28/10/2011

8.00-10.00am	1107
11.00-1.00pm	1162
3.00-5.00pm	1398
Total	3667

Council Data Base Friday 31/10/2008

8.00-10.00am	847	ADT 7276
11.00-1.00pm	1067	AADT 6381
3.00-5.00pm	1122	
Total	3036	

Estimated ADT 28/10/2011 = $\frac{3667}{3030} \times 7276 = 8788$ (Compound Annual Growth 6.6% pa 2008-2011)

Estimated AADT 2011 = $\frac{8788}{7276} \times 6381 = 7707$

(iv) BTU Road

(Council Data Base)

Year	**2003**	**2007**	**2011**
ADT	1469 (Mar)	1469 (Feb)	1733 (Mar)

Annual Average Growth 2007 to 2011 = $\frac{1733}{1469} = 1.1797 = (1+r)^4$ r = 4.2% pa

Annual Average Growth 2003 to 2011 = $\frac{1733}{1469} = 1.1797 = (1+r)^8$ r = 2.1% pa *

Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2008**	**2011**
AADT	6392	6572	6891	6965	6492	6260	6116	6318	7707est

Source RTA

Annual Average Growth 2000 to 2003 $\frac{6965}{6392} = 1.0896$

$(1 + r^3 = 1.0896$ r = 2.9% pa

Annual Average Growth 2000 to 2011 $(1+r)^{11} = \frac{7707}{6392} = 1.2057$ r = 1.7%pa

Annual Average Growth 2004 to 2011 $\frac{7707}{6492} = 1.18175 = (1+r)^7$ r = 2.5% *

Summary Proposed Annual Average Growth Rates Compound
From 2011 to 2021

Forest Road	+ 2.5%
MR312	+ 2.5%
Princes Highway	+ 2.24%
BTU Road	+ 2.1%

Please advise your agreement or any adjustments.

Regards,

Lyle Marshall
LYLE MARSHALL & ASSOCIATES PTY LTD

APPENDIX 2

CFE Information Technologies

Traffic Count 8044

Lyle Marshall & Associates

PRINCES HIGHWAY, FALLS CREEK

SECTION SURVEYED

ULLADULLA

TO

NOWRA

Southbound, about 1.2 Kms north BTU Road, on 100 KPH Sign

Lat/Long : S 34 55'51.72 / E 150 36'11.24

Date of Survey

Friday, October 21 2011 **to** Friday, October 28 2011

CFE Traffic Surveys : 350 King Georges Road, Beverly Hills NSW 2209
Phone: 9740 8600, Fax: 9740 9600, email: bob.white@cfeit.com

Traffic Count Summary Report

Count Number	8044	Ref : LYLM	Lat/Long : S 34 55'51.72 / E 150 36'11.24	GOOGLE
Street	PRINCES HIGHWAY, FALLS CREEK : From ULLADULLA to NOWRA : SOUTH BOUND			
Location	Southbound, about 1.2 Kms north BTU Road, on 100 KPH Sign			*Carriageway*

TOTAL COUNT MATRIX

Start Date	21-OCT-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	81
Weekly 85th Percentile Speed	90
Five Day AADT	11677
Seven Day AADT	10917

	MON *24TH*	TUE *25TH*	WED *26TH*	THU *27TH*	FRI *21ST / 28TH*	SAT *22ND*	SUN *23RD*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	27	38	29	42	42	87	69	178	36	334	48
1am – 2am	31	21	18	16	28	50	40	114	23	204	29
2am – 3am	17	10	18	13	23	26	29	81	16	136	19
3am – 4am	10	19	21	20	23	16	12	93	19	121	17
4am – 5am	31	28	25	27	25	45	28	136	27	209	30
5am – 6am	90	81	74	98	99	110	36	442	88	588	84
6am – 7am	329	326	291	317	318	179	74	1581	316	1834	262
7am – 8am	467	414	435	457	474	277	144	2247	449	2668	381
8am – 9am	513	476	477	499	497	465	312	2462	492	3239	463
9am – 10am	546	537	506	517	670	616	413	2776	555	3805	544
10am – 11am	703	633	569	587	704	887	675	3196	639	4758	680
11am – Midday	684	648	653	707	855	1022	778	3547	709	5347	764
Midday – 1pm	764	716	683	780	804	970	774	3747	749	5491	784
1pm – 2pm	789	772	711	874	1138	912	754	4284	857	5950	850
2pm – 3pm	858	881	868	986	1166	820	731	4759	952	6310	901
3pm – 4pm	1074	1041	1155	1169	1245	829	727	5684	1137	7240	1034
4pm – 5pm	1282	1228	1298	1355	1446	706	696	6609	1322	8011	1144
5pm – 6pm	1204	1219	1255	1269	1394	558	613	6341	1268	7512	1073
6pm – 7pm	566	528	659	712	976	410	407	3441	688	4258	608
7pm – 8pm	299	310	411	499	698	256	287	2217	443	2760	394
8pm – 9pm	203	227	336	383	592	213	210	1741	348	2164	309
9pm – 10pm	195	195	219	304	495	173	174	1408	282	1755	251
10pm – 11pm	95	126	132	147	311	152	88	811	162	1051	150
11pm – Midnight	76	54	76	125	160	130	53	491	98	674	96
Total	10853	10528	10919	11903	14183	9909	8124	58386	11677	76419	10917

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CFE Information Technologies

Traffic Count 8043

Lyle Marshall & Associates

PRINCES HIGHWAY, FALLS CREEK

SECTION SURVEYED

ULLADULLA

TO

NOWRA

Northbound, about 1.4 KM north BTU Road, on Warra Warra Rd Sign

Lat/Long : S 34 55'51.72 / E 150 36'11.24

Date of Survey

Friday, October 21 2011 **to** Friday, October 28 2011

CFE Traffic Surveys : 350 King Georges Road, Beverly Hills NSW 2209
Phone: 9740 8600, Fax: 9740 9600, email: bob.white@cfeit.com

Traffic Count Summary Report

Count Number	8043	Ref : LYLM	Lat/Long : S 34 55'51.72 / E 150 36'11.24 GOOGLE
Street	PRINCES HIGHWAY, FALLS CREEK : From ULLADULLA to NOWRA : NORTH BOUND		
Location	Northbound, about 1.4 KM north BTU Road, on Warra Warra Rd Sign		*Carriageway*

Start Date	21-OCT-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	80
Weekly 85th Percentile Speed	89
Five Day AADT	10978
Seven Day AADT	10733

TOTAL COUNT MATRIX

	MON *24TH*	TUE *25TH*	WED *26TH*	THU *27TH*	FRI *21ST / 28TH*	SAT *22ND*	SUN *23RD*	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	15	14	17	17	25	35	30	88	18	153	22
1am – 2am	14	13	12	12	18	21	33	69	14	123	18
2am – 3am	23	12	14	20	10	21	16	79	16	116	17
3am – 4am	55	36	44	40	45	22	27	220	44	269	38
4am – 5am	141	112	103	95	80	54	30	531	106	615	88
5am – 6am	314	274	267	273	254	129	80	1382	276	1591	227
6am – 7am	767	735	737	744	684	253	188	3667	733	4108	587
7am – 8am	1073	995	1068	1077	989	451	262	5202	1040	5915	845
8am – 9am	1385	1254	1326	1359	1333	697	414	6657	1331	7768	1110
9am – 10am	941	1077	960	1070	1025	861	782	5073	1015	6716	959
10am – 11am	882	825	841	908	902	930	1091	4358	872	6379	911
11am – Midday	704	788	828	766	858	784	1168	3944	789	5896	842
Midday – 1pm	673	676	657	703	817	642	1037	3526	705	5205	744
1pm – 2pm	660	660	638	636	782	657	937	3376	675	4970	710
2pm – 3pm	718	616	644	692	841	605	1093	3511	702	5209	744
3pm – 4pm	646	648	692	750	776	643	1190	3512	702	5345	764
4pm – 5pm	658	542	655	697	632	559	979	3184	637	4722	675
5pm – 6pm	393	359	481	530	497	468	734	2260	452	3462	495
6pm – 7pm	286	233	321	358	370	343	467	1568	314	2378	340
7pm – 8pm	213	135	160	223	291	256	292	1022	204	1570	224
8pm – 9pm	118	84	107	155	182	181	209	646	129	1036	148
9pm – 10pm	81	89	75	102	129	171	124	476	95	771	110
10pm – 11pm	52	73	74	64	102	113	68	365	73	546	78
11pm – Midnight	37	30	19	38	49	60	36	173	35	269	38
Total	10849	10280	10740	11329	11691	8956	11287	54889	10977	75132	10733

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CFE Information Technologies

Traffic Count 8042

Lyle Marshall & Associates

FOREST ROAD, SOUTH NOWRA

SECTION SURVEYED

PRINCES HIGHWAY

TO

CALLALA BAY ROAD

About 500 Mtrs east of Princes Highway, on Tree

Lat/Long : S 34 56'49.31 / E150 36'26.91

Date of Survey

Friday, October 21 2011 **to** Friday, October 28 2011

CFE Traffic Surveys : 350 King Georges Road, Beverly Hills NSW 2209
Phone: 9740 8600, Fax: 9740 9600, email: bob.white@cfeit.com

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

Traffic Count Summary Report

Count Number	8042	Ref : LYLM	Lat/Long : S 34 56'49.31 / E150 36'26.91 GOOGLE
Street	FOREST ROAD, SOUTH NOWRA : From CALLALA BAY ROAD to PRINCES HIGHWAY : WEST BOUND		
Location	About 500 Mtrs east of Princes Highway, on Tree		Carriageway

Start Date	21-OCT-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	77
Weekly 85th Percentile Speed	87
Five Day AADT	1266
Seven Day AADT	1246

TOTAL COUNT MATRIX

	MON 24TH	TUE 25TH	WED 26TH	THU 27TH	FRI 21ST/28TH	SAT 22ND	SUN 23RD	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	1	3	5	2	0	4	4	11	2	19	3
1am – 2am	2	3	1	2	3	1	2	11	2	14	2
2am – 3am	5	1	1	1	1	3	3	9	2	15	2
3am – 4am	3	3	3	3	1	0	2	13	3	15	2
4am – 5am	20	13	8	10	10	5	1	61	12	67	10
5am – 6am	39	52	36	39	42	14	10	208	42	232	33
6am – 7am	122	135	120	127	130	38	24	634	127	696	99
7am – 8am	154	141	173	153	151	58	31	772	154	861	123
8am – 9am	116	140	127	144	136	90	38	663	133	791	113
9am – 10am	126	107	107	105	112	84	75	557	111	716	102
10am – 11am	84	79	86	70	89	116	99	408	82	623	89
11am – Midday	74	63	78	74	90	99	120	379	76	598	85
Midday – 1pm	81	62	64	70	77	97	98	354	71	549	78
1pm – 2pm	98	68	57	59	94	111	82	376	75	569	81
2pm – 3pm	100	57	73	83	75	119	105	388	78	612	87
3pm – 4pm	93	51	83	94	94	91	129	415	83	635	91
4pm – 5pm	67	60	92	54	76	89	102	349	70	540	77
5pm – 6pm	50	35	44	59	54	78	89	242	48	409	58
6pm – 7pm	26	27	30	53	25	40	50	161	32	251	36
7pm – 8pm	31	16	18	25	35	29	29	125	25	183	26
8pm – 9pm	11	20	8	19	25	34	32	83	17	149	21
9pm – 10pm	8	5	10	19	14	26	9	56	11	91	13
10pm – 11pm	4	6	13	8	9	14	6	40	8	60	9
11pm – Midnight	2	2	4	1	6	8	2	15	3	25	4
Total	1317	1149	1241	1274	1349	1248	1142	6330	1266	8720	1245

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

Traffic Count Summary Report

Count Number	8042	Ref : LYLM	Lat/Long : S 34 56'49.31 / E150 36'26.91 GOOGLE
Street	FOREST ROAD, SOUTH NOWRA : Between PRINCES HIGHWAY & CALLALA BAY ROAD (bidirectional) :		
Location	About 500 Mtrs east of Princes Highway, on Tree		Carriageway

TOTAL COUNT MATRIX

Start Date	21-OCT-11
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	77
Weekly 85th Percentile Speed	87
Five Day AADT	2683
Seven Day AADT	2598

	MON 24TH	TUE 25TH	WED 26TH	THU 27TH	FRI 21ST / 28TH	SAT 22ND	SUN 23RD	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	3	5	8	7	4	11	8	27	5	46	7
1am – 2am	2	5	3	2	5	5	5	17	3	27	4
2am – 3am	7	1	2	1	3	7	6	14	3	27	4
3am – 4am	4	3	3	3	3	5	4	16	3	25	4
4am – 5am	22	16	9	13	10	11	10	70	14	91	13
5am – 6am	46	56	38	41	48	22	16	229	46	267	38
6am – 7am	166	174	147	155	173	62	41	815	163	918	131
7am – 8am	238	193	242	209	215	99	50	1097	219	1246	178
8am – 9am	204	210	185	223	213	159	83	1035	207	1277	182
9am – 10am	196	172	164	166	189	163	151	887	177	1201	172
10am – 11am	157	162	151	144	167	261	176	781	156	1218	174
11am – Midday	171	133	158	158	177	226	218	797	159	1241	177
Midday – 1pm	170	150	129	173	186	232	199	808	162	1239	177
1pm – 2pm	184	154	149	159	220	230	198	866	173	1294	185
2pm – 3pm	205	149	167	183	209	217	185	913	183	1315	188
3pm – 4pm	240	178	212	210	231	199	213	1071	214	1483	212
4pm – 5pm	253	216	261	234	234	197	181	1198	240	1576	225
5pm – 6pm	211	196	216	215	195	165	164	1033	207	1362	195
6pm – 7pm	100	111	138	146	129	106	98	624	125	828	118
7pm – 8pm	80	49	70	108	109	65	58	416	83	539	77
8pm – 9pm	31	53	47	66	75	55	58	272	54	385	55
9pm – 10pm	32	29	46	60	69	44	24	236	47	304	43
10pm – 11pm	12	18	31	27	44	31	15	132	26	178	25
11pm – Midnight	9	10	7	12	25	25	8	63	13	96	14
Total	2743	2443	2583	2715	2933	2597	2169	13417	2683	18183	2597

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APPENDIX 3

Table 1 Forest Road 2008 Two Way Hourly Volumes

10-11am	11-12	12-1pm	1-2pm	2-3pm	3-4pm	4-5pm	Date	7-8am	Date	8-9am	Date	9-10am	Date	5-6pm
31/12 305	30/12 314	3/1 292	23/3 309	31/12 280	28/12 266	30/12 285	6/5	206	12/5	215	29/12	235	24/1	258
27/12 305	22/3 306	4/1 282	30/12 254	30/12 276	22/3 264	29/12 266	7/2	205	14/2	213	2/1	235	11/1	256
29/12 311	28/12 295	31/12/ 274	25/1 247	27/12 262	30/12 262	2/1 266	24/9	205	24/1	211	3/1	225		
2/1 311	4/1 292	22/3 269	31/12 244	25/1 258	24/1 257	23/1 257	3/4	196	11/2	208	27/12	224		
3/1 272	31/12 292	30/12 260	28/12 239	27/1 257	8/1 255	14/1 254	29/4	196	3/3	206	4/1	220		
28/12 265	27/12 266	27/1 256	4/1 237	29/12 251	31/12 255	22/1 254	25/9	193	25/3	206	30/12	210		
4/1 263	2/1 261	25/1/ 245	18/1 235	2/1 251	11/1 251	22/12 254	5/12	193	21/5	205	31/12	209		
30/12 259	29/12 261	26/1 238	5/10 234	3/1 249	9/1 249	7/1 253	1/7	191	25/1	204	20/9	208		
26/4 258	26/4 260	29/12 237	27/1 230	10/2 238	16/1 249	28/12 250	3/7	190	13/2	198	24/12	201		
22/3 255	9/1 259	2/1/ 237	5/1 225	4/1/ 237	7/10 247	31/1 246	25/2	189	26/5	198	12/1	199		
24/12 247	26/1 254	26/4 236	8/1 224	7/1 234	23/1 246	27/12 245	11/9	189	15/8	197	26/1	196		
8/1 241	5/1 249	2/2 234	2/1 223	22/3 232	8/2 245	5/2 243	29/1	188	29/1	196	28/12	193		
26/1 239	7/1 248	30/11 233	29/12 223	7/10 227	26/1 239	21/2 240	30/4	187	13/8	196	25/1	188		
7/1 238	1/1 247	11/1 233	17/1 221	4/10 224	10/2 236	31/12 238	22/9	187	2/10	196	9/2	188		
9/2 236	3/1 247	19/1 229	26/1 217	26/1 224	14/1 235	29/9 237	19/5	186	23/1	194	6/1	186		
5/10 235	27/1 247	9/2 229	22/12 216	10/1 222	22/12 235	8/1 237	10/6	186	15/5	194	7/10	183		
4/10 227	5/10 246	23/3 226	14/1 216	9/10 220	30/1 234	12/2 234	26/3	185	22/9	194	10/2	182		
19/10 225	25/1 243	8/1 225	3/1 215	5/1 217	22/1 233	30/1 234	26/5	185	26/9	193	18/2	182		
5/1 225	28/1 239	4/10 225	8/2 213	8/1 216	11/11 233	18/1 232	20/5	184	6/2	192	26/4	181		
27/1 222	17/1 237	16/2 224	10/10 212	15/1 213	17/1 233	3/1 232	14/2	183	24/7	192	15/2	180		
18/1 221	23/3 235	12/1 222	7/1 211	23/12 213	27/1 230	29/4 232	7/5	183	15/2	191	23/2	180		
25/1 221	14/1 233	24/1 222	4/10 208	19/1 212	4/2 228	6/2 231	14/5	183	2/5	191	4/10	180		
10/2 219	22/12 233	3/2 221	11/1 205	23/1 212	18/2 228	10/1 230	20/2	182	13/3	191	28/1	179		
24/1 218	6/1 230	5/10 221	9/2 205	11/1 211	23/3 228	27/1 230	18/6	182			29/1	179		
11/1 217	12/1 228	10/2 220	10/2 205	22/1 211	2/1 226	4/1 244					11/10	178		
10/1 215	8/1 227	1/1 218	16/1 204	14/2 209	3/4 226						11/2	177		
7/10 215	26/7 226	14/1 214	17/10 203	15/2 208	29/12 226						10/1	176		

120th highest hour: 232

Tuesday 29/4/08 4-5pm
Friday 18/1/08 4-5pm
Thursday 3/1/08 4-5pm

Table 2A MR 312 Huskisson Road 2008 Two Way Hourly Volumes

Date	11-12	Date	12-1	Date	1-2	Date	2-3	Date	3-4	Date	4-5	Date	10-11am	Date	5-6pm
30/12	1082	30/12	986	30/12	980	30/12	968	30/12	953	30/12	875	30/12	945	30/12	858
28/12	892	28/12	869	29/12	836	8/1	843	29/12	857	14/4	817	5/1	838	4/1	767
29/12	885	31/12	834	31/12	819	5/1	829	8/1	841	2/1	805	12/1	838	11/1	767
8/1	859	8/1	818	22/3	818	12/1	829	7/1	821	9/1	805	28/12	836	29/12	719
3/1	856	3/1	800	28/12	816	7/1	818	3/1	819	14/1	796	24/3	824		
10/1	856	10/1	800	7/1	810	3/1	817	10/1	819	3/1	795	8/1	810		
5/1	830	13/1	797	2/4	802	10/1	817	15/1	807	10/1	795	29/12	806		
12/1	830	4/1	794	5/1	766	13/1	813	2/1	786	13/1	795	31/12	803		
22/3	826	11/1	794	12/1	766	28/12	800	4/1	786	8/1	788	13/1	794		
31/12	820	22/3	790	27/12	762	2/1	799	9/1	786	12/12	758	4/1	775		
13/1	817	5/1	782	25/1	756	9/1	799	11/1	786	4/1	749	11/1	775		
2/1	811	12/1	782	3/1	745	31/12	795	13/1	761	11/1	749	3/1	774		
9/1	811	27/12	779	10/1	745	29/12	792	28/12	755	15/1	747	10/1	774		
28/1	789	29/12	778	4/1	743	4/1	788	5/12	754	27/12	747	28/1	762		
7/1	786	2/1	756	11/1	743	11/1	788	6/1	753	4/12	744	7/1	761		
6/1	784	9/1	756	24/2	743	6/1	768	31/12	746	7/1	739	27/12	755		
27/12	771	27/1	751	2/1	734	1/1	724	18/1	725	29/12	733	2/1	747		
4/1	755	7/1	723	9/1	734	27/1	720	14/1	720	27/11	729	9/1	747		
11/1	755			18/1	727	28/11	720			27/1	724	19/1	723		
27/1	740			27/1	719										
26/12	733														

120th highest hour: 743 24/2/08 Sunday 1-2pm

Table 2B MR 312 Huskisson Road 2008 Two Way Hourly Volumes					
Date	9-10am	Date	7-8am	Date	8-9am
5/1/08	640	20/11	629	11/12	689
12/1	640	4/12	628	8/12	684
30/12	635	13/11	617	4/12	662
29/12	625	11/11	613	18/12	661
6/10	625	9/12	605	2/12	647
31/12	609	10/12	604	15/12	645
7/1	607	17/11	601	27/12	635
23/12	606	19/11	594	13/3	632
22/12	595	30/10	591	10/4	628
24/12	594	26/11	591	16/12	624
8/1	585	25/11	588	17/12	624
2/1	581	18/11	588	13/2	622
9/1	581	3/4	585	22/12	621
15/11	577	3/12	584	21/2	620
3/1	561	11/12	583	20/2	619
10/1	561	16/12	577	19/3	614
17/12	560	5/3	574	10/12	613
13/1	559	29/10	574	12/3	609
4/1	555	8/12	574	5/12	609
17/1	555	12/11	571	1/12	609
7/10	555				
11/1	555				

Date	8-9am	Date	9-10am	Date	10-11am	Date	11-12am	Date	12-1pm	Date	1-2pm	Date	2-3pm	Date	3-4pm	Date	4-5pm	Date	5-6pm
20/03/2008	1926	2/01/2008	1863	29/12/2007	2540	27/12/2007	2599	2/01/2008	2486	29/12/2007	2349	28/12/2007	2357	28/12/2007	2364	2/01/2008	2277	4/01/2008	2250
13/03/2008	1844	29/12/2007	1833	27/12/2007	2428	3/01/2008	2501	27/12/2007	2373	27/12/2007	2345	29/12/2007	2347	14/01/2008	2302	28/12/2007	2169	2/01/2008	2234
21/02/2008	1820	3/01/2008	1808	2/01/2008	2385	2/01/2008	2480	30/12/2007	2293	28/12/2007	2252	27/12/2007	2268	2/01/2008	2290	26/12/2007	2126	25/01/2008	2100
22/01/2008	1812	28/12/2007	1699	28/12/2007	2348	29/12/2007	2413	4/01/2008	2291	4/01/2008	2250	30/12/2007	2157	29/12/2007	2285	27/12/2007	2110	12/01/2008	2045
13/02/2008	1811	4/01/2008	1674	5/01/2008	2230	30/12/2007	2366	3/01/2008	2289	2/01/2008	2234	26/12/2007	2033	3/01/2008	2253	3/01/2008	2075	22/03/2008	1939
25/03/2008	1810	4/10/2007	1597	12/01/2008	2208	5/01/2008	2349	12/01/2008	2287	30/12/2007	2160	31/12/2007	1947	27/12/2007	2200	4/01/2008	2064	18/01/2008	1927
13/12/2007	1791	5/01/2008	1590	3/01/2008	2207	28/12/2007	2301	29/12/2007	2273	25/01/2008	2100	1/10/2007	1899	25/01/2008	2188	30/12/2007	2064	31/12/2007	1920
10/04/2008	1786	25/03/2008	1589	4/01/2008	2192	12/01/2008	2289	28/12/2007	2207	12/01/2008	2045	21/12/2007	1811	29/01/2008	2168	24/01/2008	2053	28/12/2007	1906
20/11/2007	1773	31/12/2007	1569	31/12/2007	2162	31/12/2007	2286	26/12/2007	2117	31/12/2007	1960			30/12/2007	2168	29/12/2007	2052	5/01/2008	1895
15/11/2007	1771	12/01/2008	1566	30/12/2007	2121	4/01/2008	2281	31/12/2007	2087	1/10/2007	1892			7/01/2008	2128	22/02/2008	2006	18/04/2008	1889
1/11/2007	1770	7/01/2008	1564	26/12/2007	2100	26/12/2007	2222	19/01/2008	2085	26/12/2007	1885			4/01/2008	2125	24/04/2008	2001	11/01/2008	1861
18/10/2007	1769		1557	24/12/2007	1991	11/01/2008	2029	11/01/2008	2001					5/01/2008	2098	25/01/2008	2000	7/01/2008	1858
25/10/2007	1767	24/12/2007	1551	11/01/2008	1990	26/01/2008	2014	1/10/2007	1958					21/01/2008	2066	11/01/2008	1996	19/01/2008	1830
13/11/2007	1764	10/01/2008	1549	9/01/2008	1913	1/10/2007	1986	22/12/2007	1929					25/02/2008	2064	14/01/2008	1975	24/02/2008	1829
29/11/2007	1762	24/01/2008	1547	6/10/2007	1884	9/01/2008	1986							11/06/2008	2059	16/11/2007	1953	20/03/2008	1823
6/12/2007	1762	21/12/2007	1540	7/01/2008	1866	6/01/2008	1980							26/12/2007	2059	23/01/2008	1948	1/01/2008	1815
11/12/2007	1758	16/01/2008	1533	19/01/2008	1848	24/12/2007	1976							2/11/2007	2050	18/01/2008	1940	14/01/2008	1811
26/07/2007	1754	19/03/2008	1528	10/01/2008	1847	22/03/2008	1971							18/01/2008	2025	10/01/2008	1932	6/01/2008	1808
8/11/2007	1756	17/01/2008	1519	29/09/2007	1844	22/12/2007	1970							5/10/2007	2015	15/02/2008	1922		
19/12/2007	1753	11/01/2008	1519	28/01/2008	1841	19/01/2008	1967							29/04/2008	2006	15/01/2008	1920		
20/12/2007	1753	13/12/2007	1513	22/12/2007	1815	6/10/2007	1960							24/04/2008	2005	29/09/2007	1918		
22/10/2007	1751	25/01/2008	1512	25/01/2008	1788	10/01/2008	1953							20/03/2008	1989	6/06/2008	1916		
17/12/2007	1747	20/12/2007	1511	26/01/2008	1784	7/01/2008	1950							18/02/2008	1982	29/02/2008	1915		
27/02/2008	1742	12/10/2007	1509	18/01/2008	1780	14/01/2008	1913							17/03/2008	1968	30/11/2007	1908		
10/03/2008	1741	8/10/2007	1508	17/01/2008	1762	18/01/2008	1909							7/12/2008	1965	23/04/2008	1901		
17/10/2007	1737	11/10/2007	1507	6/01/2008	1758	13/01/2008	1906							11/01/2008	1949	21/02/2008	1900		
6/03/2008	1736	18/01/2008	1502	8/01/2008	1753	28/01/2008	1894							17/01/2008	1945	17/01/2008	1899		
														9/01/2008	1935	10/10/2007	1898		
														30/11/2007	1931	13/03/2008	1896		

TABLE 4
PRINCES HIGHWAY HOURLY TRAFFIC VOLUMES 2007 - 2008
RANKED IN ORDER OF MAGNITUDE

Date	Day	Rank	Hour	Vol
27/12/2007		1	11	2599
29/12/2007		2	10	2540
3/01/2008		3	11	2501
2/01/2008		4	12	2486
2/01/2008		5	11	2480
27/12/2007		6	10	2428
29/12/2007		7	11	2413
2/01/2008		8	10	2385
27/12/2007		9	12	2373
30/12/2007		10	11	2366
28/12/2007		11	15	2364
238/12/07		12	14	2357
5/01/2008		13	11	2349
29/12/2007		14	13	2349
28/12/2007		15	10	2348
29/12/2007		16	14	2347
27/12/2007		17	13	2345
14/01/2008		18	15	2302
28/12/2007		19	11	2301
30/12/2007		20	12	2293
4/01/2008		21	12	2291
2/01/2008		22	15	2290
12/01/2008		23	11	2289
3/01/2008		24	12	2289
12/01/2008		25	12	2287
31/12/2008		26	11	2286
29/12/2007		27	15	2285
4/01/2008		28	11	2281
2/01/2008		29	16	2277
29/12/2007		30	12	2273
27/12/2007		31	14	2268
3/01/2008		32	15	2253
28/12/2007		33	13	2252
4/01/2008		34	13	2250
4/01/2008		35	17	2250
2/01/2008		36	13	2234
2/01/2008		37	17	2234
5/01/2008		38	10	2230
26/12/2007		39	11	2222
12/01/2008		40	10	2208
3/01/2008		41	10	2207
28/12/2007		42	12	2207
27/12/2007		43	15	2200
4/01/2008		44	10	2192
25/01/2008		45	15	2188
28/12/2007		46	16	2169
30/12/2007		47	15	2168
29/01/2008		48	15	2168
31/12/2007		49	10	2162
30/12/2007		50	13	2160
30/12/2007		51	14	2157
7/01/2008		52	15	2128
26/12/2007		53	16	2126
4/01/2008		54	15	2125
30/12/2007		55	10	2121
26/12/2007		56	12	2117
27/12/2007		57	16	2110
25/01/2008		58	13	2100
26/12/2007		59	11	2100
26/12/2007		60	10	2100
5/01/2008		61	15	2098
31/12/2007		62	12	2087
19/01/2008		63	12	2085
3/01/2008		64	16	2075
21/01/2008		65	15	2066

PRINCES HIGHWAY HOURLY TRAFFIC VOLUMES 2007 - 2008
RANKED IN ORDER OF MAGNITUDE (Cont)

Table 4

Date	Day	Rank	Hour	Vol
4/01/2008		66	16	2064
25/02/2008		67	15	2064
30/12/2007		68	16	2064
11/06/2008		69	15	2059
26/12/2007		70	15	2057
24/01/2008		71	16	2053
29/12/2007		72	16	2052
2/11/2007		73	15	2050
12/01/2008		74	13	2045
12/01/2008		75	17	2045
26/12/2007		76	14	2033
11/01/2008		77	11	2029
18/01/2008		78	15	2025
5/10/2007		79	15	2015
26/01/2008		80	11	2014
22/02/2008		81	16	2006
29/04/2008		82	15	2006
24/04/2008		83	15	2005
24/04/2008		84	16	2001
11/01/2008		85	12	2001
25/01/2008		86	16	2000
11/01/2008		87	16	1996
24/12/2007		88	10	1991
11/01/2008		89	10	1990
29/03/2008		90	15	1989
1/10/2007		91	11	1986
9/01/2008		92	11	1986
18/02/2008		93	15	1982
6/01/2008		94	11	1980
24/12/2007		95	11	1976
14/01/2008		96	16	1975
22/03/2008		97	11	1971
22/12/2007		98	11	1970
17/03/2008		99	15	1968
19/01/2008		100	11	1967
7/12/2007		101	15	1965
6/10/2007		102	11	1960
31/12/2007		103	11	1960
1/10/2007		104	12	1958
1/10/2007		105	12	1953
16/11/2007		106	16	1953
7/01/2008		107	11	1950
11/01/2008		108	15	1949
23/01/2008		109	16	1948
31/12/2007		110	14	1947
17/01/2008		111	15	1945
18/01/2008		112	16	1940
22/03/2008		113	17	1939
9/01/2008		114	15	1935
10/01/2008		115	16	1932
30/11/2007		116	15	1931
22/12/2007		117	12	1929
18/01/2008		118	17	1927
20/03/2008		119	8	1926
15/02/2008		120	16	1922

APPENDIX 4

HOURLY TRIP DISTRIBUTION RESIDENTIAL VILLAGE ASSUMED SIMILAR TO FOREST ROAD OCTOBER 2011

Weekdays	Inbound trips	(52.81%) 24 hour total
	Outbound trips	(47.19%) 24 hour total
	12 Hour trips 7:00am – 7:00pm	
	Inbound	85.39% of 24 hour total
	Outbound	80.0 % of 24 hour total
Saturdays	Inbound Trips	51.94% of 24 hour total
	Outbound Trips	48.06% of 24 hour total
	12 Hour trips 7:00am – 7:00pm	
	Inbound	87.6% of 24 hour total
	Outbound	85.9% of 24 hour total
Sundays	Inbound Trips	47.35% of 24 hour total
	Outbound Trips	52.65% of 24 hour total
	12 Hour trips 7:00am – 7:00pm	
	Inbound Trips	87.44% of 24 hour total
	Outbound Trips	89.14% of 24 hour total

Residential Detached Dwellings	**Stage 1**	**100**
	Ultimate	**300**

OWNERSHIP PROFILE	**Chinese Nationals**	**75%**
	Australian Citizens	**25%**

2006 CENSUS SHOALHAVEN LGA
CAR / TRUCK DRIVER 64.7% JTW

TRIP PURPOSE - 2007 TRANSPORT INDICATORS HOME LGA

Commuter	**11%**	**Personal Business**	**10%**
Work Related	**8%**	**Social Recreation**	**24%**
Childcare/Education	**5%**	**Serve Passenger**	**15%**
Shopping	**25%**	**Other**	**2%**

Assume 25% of work related / education trips made on weekdays
25% x 24 = 6%

Base RTA Trip Generation RE = 9 trips / dwelling
Daily 24 hr trips = 9 x .82 x 300 = 2214
Assume Local Trips (Internal) 10% 221
External trips Nowra. Bomaderry 90% 1993

	12 Hour trips 7:00am – 7:00pm .8286 x 1993	=	1651
	Inbound (East) .5281 x 1651	=	872
	Outbound (West) .4719 x 1651	=	779
Saturdays	No work/education Trips		24%
	Daily 24Hr trips = 9 x300 x .76	=	2052
	Local Trips 10%	:	205
	External Trips	:	1847
	24 Hr East (In) 1847 x 51.94%	=	959
	West (Out) 1847 x 48.06%	=	888
	12 Hr Trips 7:00am to 7:00pm		
	Inbound (East) 87.6% x 959	=	840
	Outbound (West) 85.9% x 888	=	763

Sundays	No work / education trips				24%
	Daily 24Hr trips			:	2052
	Local			:	205
	External			:	1847
	24 Hr trips	Inbound	: 1847 x 47.35%	=	875
		Outbound	: 1847 x 52.65%	=	972
	12 Hr trips	Inbound	: 875 x 87.44%	=	765
		Outbound	: 972 x 89.14%	=	866

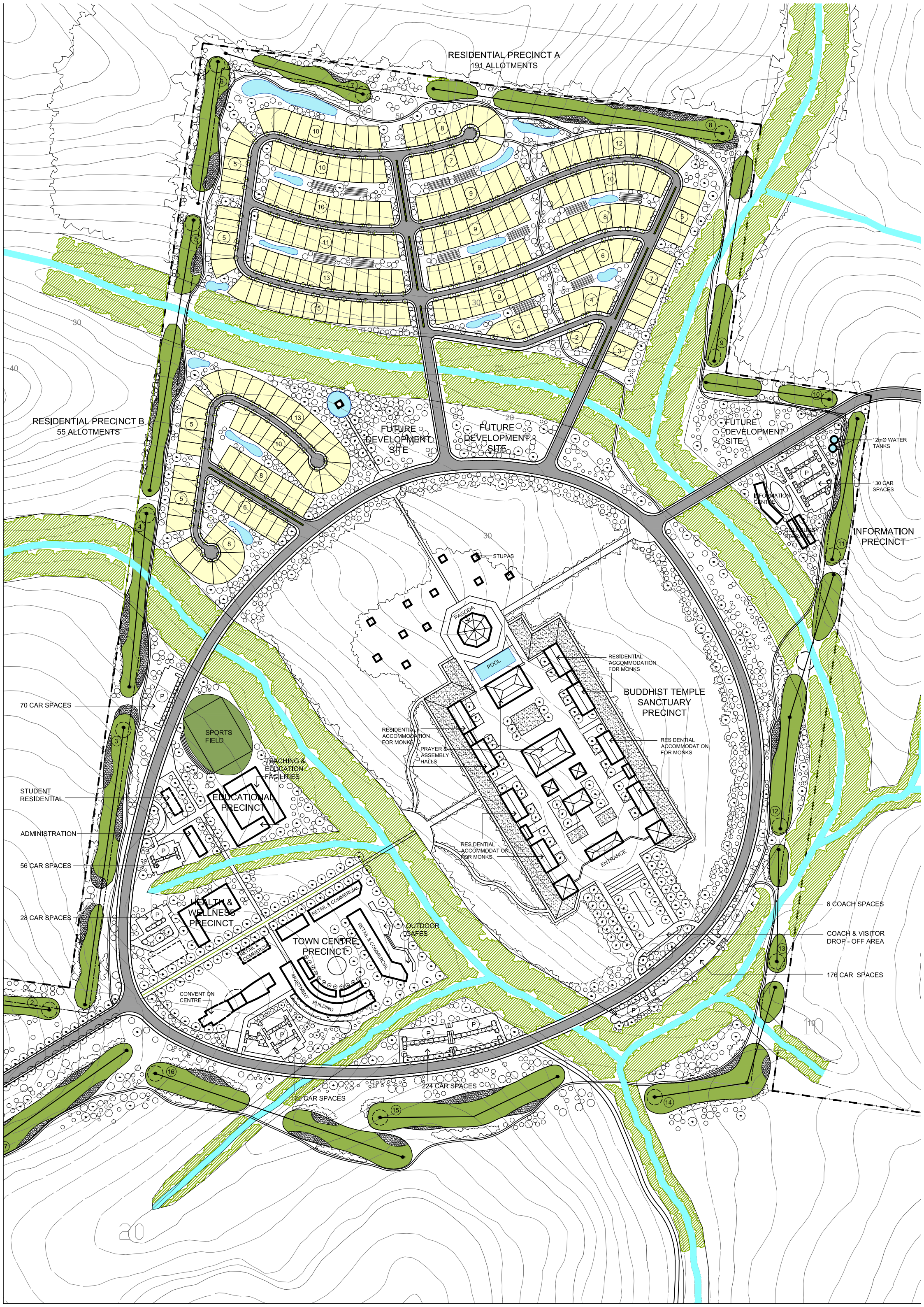
HOURLY TRIP DISTRIBUTION IN FOREST ROAD OCTOBER 2011

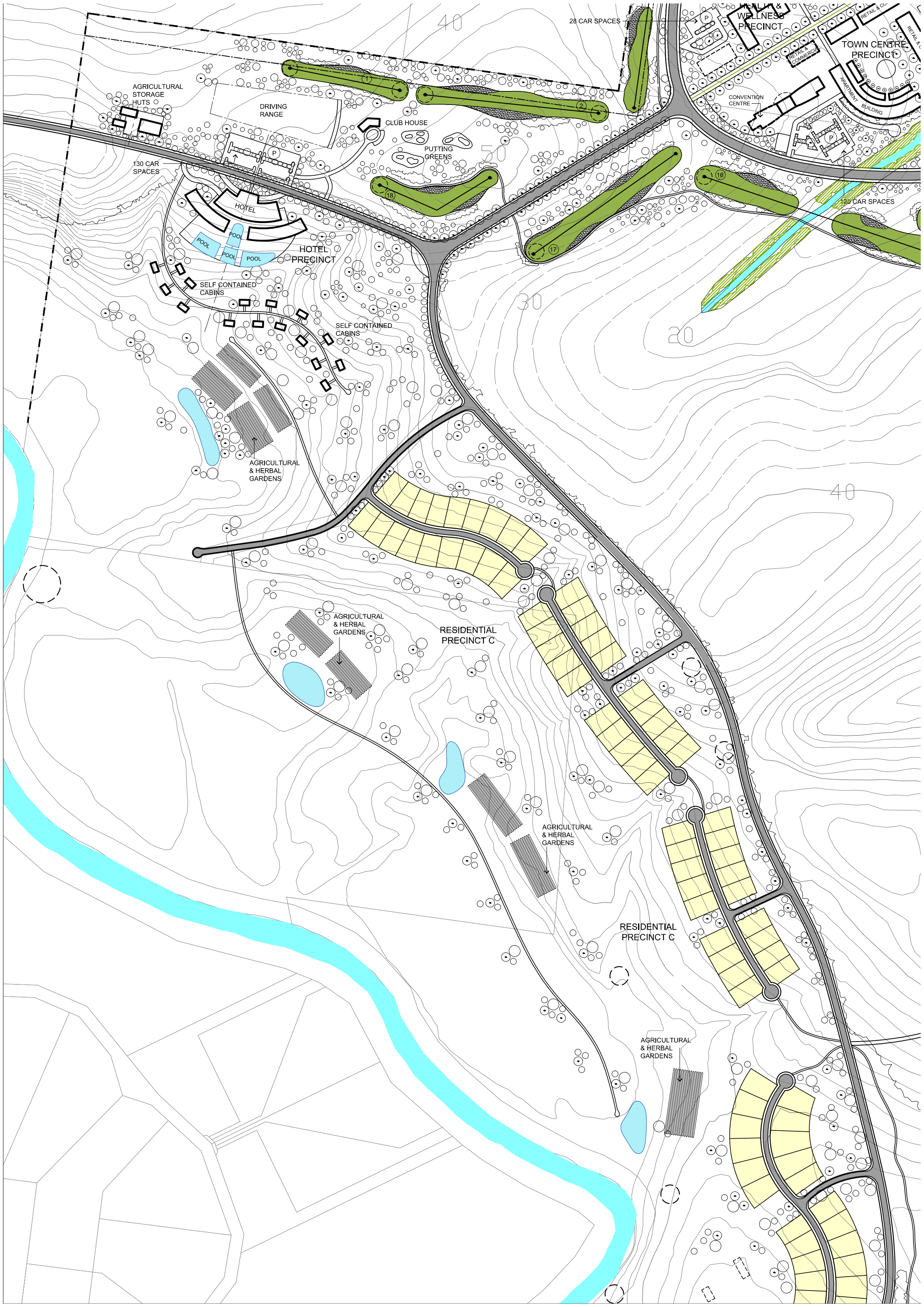
Hour	Weekday				Weekends							
	5 Day Average Weekday				Saturday				Sunday			
	East		West		East		West		East		West	
	%	Vol	%	Vol	%	Vol	%	Vol	%	Vol	%	Vol
7-8am	5.37	65	15-20	154	3.47	41	5.41	58	2.12	19	3.05	31
8-9am	6.11	74	13.13	133	5.84	69	8.40	90	5.01	45	3.73	38
9-10am	5.45	66	10.96	111	6.68	79	7.84	84	8.46	76	7.37	75
10-11am	6.20	75	8.09	82	12.27	145	10.82	116	8.57	77	9.73	99
11-12noon	6.94	84	7.50	76	10.74	127	9.24	99	10.91	98	11.79	120
12-1pm	7.52	91	7.01	71	11.42	135	9.05	97	11.25	101	9.63	98
1-2pm	8.10	98	7.40	75	10.07	119	10.35	111	12.92	116	8.06	82
2-3pm	8.68	105	7.70	78	8.29	98	11.10	119	8.91	80	10.31	105
3-4pm	10.83	131	8.19	83	9.14	108	8.49	91	9.35	84	12.67	129
4-5pm	14.05	170	6.91	70	9.14	108	8.30	89	8.80	79	10.02	102
5-6pm	13.06	158	4.74	48	7.36	87	7.28	78	8.35	75	8.74	89
6-7pm	7.69	93	3.16	32	5.58	66	3.73	40	5.35	48	4.91	50
Total	**85.39**	**1210**	**80.01**	**1013**	**87.6**	**1182**	**85.9**	**1072**	**87.44**	**898**	**89.14**	**1018**
24 Hour	100	1417	100.00	1266	100	1349	100	1248	100	1027	100	1142
	52.81		47.19		51.94		48.06		47.35		52.65	

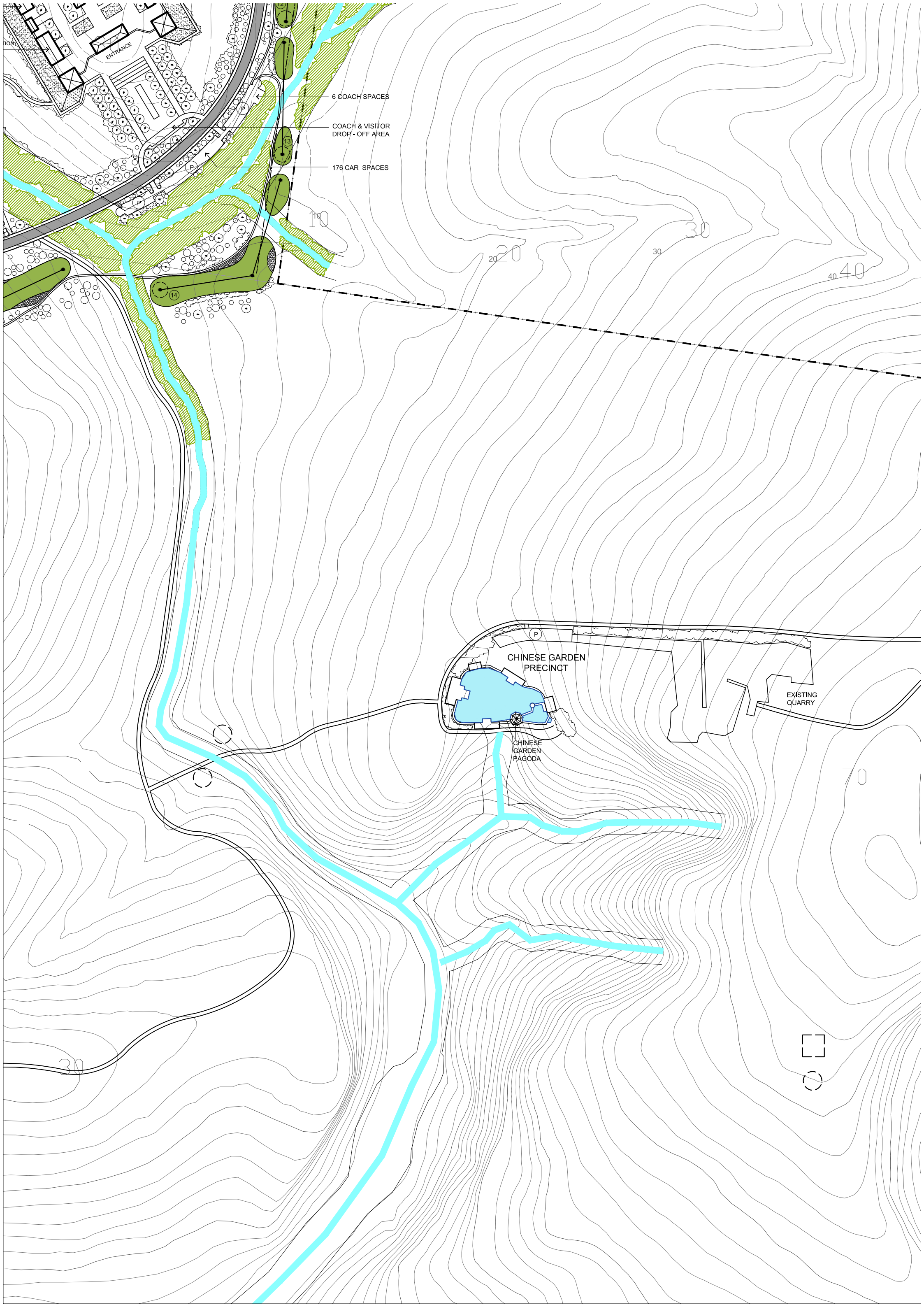
ESTIMATED HOURLY RESIDENTIAL TRIP GENERATION 300 DWELLINGS

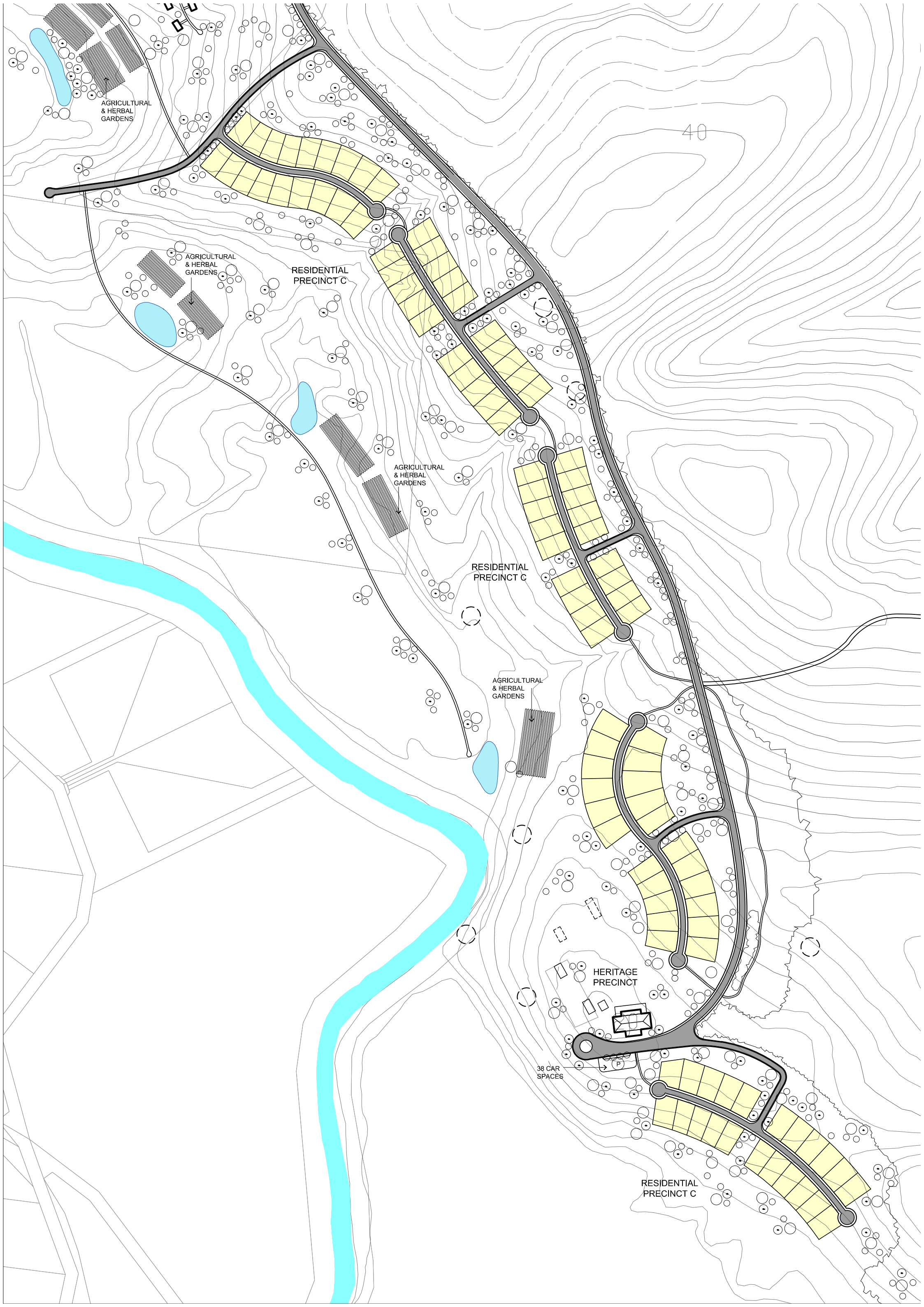
Hour	Weekday				Weekends							
	5 Weekday Average				Saturday				Sunday			
	East		West		East		West		East		West	
	%	Vol	%	Vol	%	Vol	%	Vol	%	Vol	%	Vol
7-8am	5.37	47	15.20	118	3.47	29	5.41	41	2.12	16	3.05	26
8-9am	6.11	53	13.13	102	5.84	49	8.40	64	5.01	38	3.73	32
9-10am	5.45	48	10.96	85	6.68	56	7.84	60	8.46	65	7.37	64
10-11am	6.20	54	8.09	63	12.27	103	10.82	83	8.57	66	9.73	84
11-12noon	6.94	61	7.50	58	10.74	90	9.24	71	10.91	83	11.79	102
12-1pm	7.52	66	7.01	55	11.42	96	9.05	69	11.25	86	9.63	83
1-2pm	8.10	71	7.40	58	10.07	85	10.35	79	12.92	99	8.06	70
2-3pm	8.68	76	7.70	60	8.29	70	11.10	85	8.91	68	10.31	89
3-4pm	10.83	94	8.19	64	9.14	77	8.49	65	9.35	72	12.67	110
4-5pm	14.05	123	6.91	54	9.14	77	8.30	63	8.80	67	10.02	87
5-6pm	13.06	114	4.74	37	7.36	62	7.28	56	8.35	64	8.74	76
6-7pm	7.69	67	3.16	25	5.58	47	3.73	28	5.35	41	4.91	43
Total 12 Hr		**872**		**779**		**840**		**763**		**765**		**866**
Total 24 Hr		**1053**		**940**		**959**		**888**		**875**		**972**

APPENDIX 5


RESIDENTIAL PRECINCT A
191 ALLOTMENTS
RESIDENTIAL PRECINCT B
55 ALLOTMENTS
FUTURE DEVELOPMENT SITE
FUTURE DEVELOPMENT SITE
FUTURE DEVELOPMENT SITE
12mØ WATER TANKS
130 CAR SPACES
INFORMATION CENTRE
GOLF BUGGY STORAGE
INFORMATION PRECINCT
STUPAS
PAGODA
POOL
RESIDENTIAL ACCOMMODATION FOR MONKS
BUDDHIST TEMPLE SANCTUARY PRECINCT
RESIDENTIAL ACCOMMODATION FOR MONKS
PRAYER & ASSEMBLY HALLS
RESIDENTIAL ACCOMMODATION FOR MONKS
RESIDENTIAL ACCOMMODATION FOR MONKS
ENTRANCE
70 CAR SPACES
SPORTS FIELD
TEACHING & EDUCATION FACILITIES
STUDENT RESIDENTIAL
EDUCATIONAL PRECINCT
ADMINISTRATION
56 CAR SPACES
28 CAR SPACES
HEALTH & WELLNESS PRECINCT
RETAIL & COMMERCIAL
RETAIL & COMMERCIAL
RETAIL & COMMERCIAL
TOWN CENTRE PRECINCT
OUTDOOR CAFES
APARTMENT BUILDING
CONVENTION CENTRE
120 CAR SPACES
224 CAR SPACES
6 COACH SPACES
COACH & VISITOR DROP - OFF AREA
176 CAR SPACES


28 CAR SPACES
HEALTH & WELLNESS PRECINCT
TOWN CENTRE PRECINCT
RETAIL & COMMERCIAL
CONVENTION CENTRE
APARTMENT BUILDING
AGRICULTURAL STORAGE HUTS
DRIVING RANGE
CLUB HOUSE
PUTTING GREENS
130 CAR SPACES
120 CAR SPACES
HOTEL
POOL
HOTEL PRECINCT
SELF CONTAINED CABINS
AGRICULTURAL & HERBAL GARDENS
RESIDENTIAL PRECINCT C
40
50
30
20


ENTRANCE
6 COACH SPACES
COACH & VISITOR
DROP - OFF AREA
176 CAR SPACES
CHINESE GARDEN
PRECINCT
CHINESE
GARDEN
PAGODA
EXISTING
QUARRY


AGRICULTURAL
& HERBAL
GARDENS
40
AGRICULTURAL
& HERBAL
GARDENS
RESIDENTIAL
PRECINCT C
AGRICULTURAL
& HERBAL
GARDENS
RESIDENTIAL
PRECINCT C
AGRICULTURAL
& HERBAL
GARDENS
HERITAGE
PRECINCT
38 CAR
SPACES
P
RESIDENTIAL
PRECINCT C

Lyle Marshall & Associates Pty Ltd

Consulting Engineers, Transportation and Environmental Planners,Hydrology & Hydraulics & Architects
ABN 39 001 200 620

MEMORANDUM

To:	**Audrey Thomas**	**From:**	**Lyle Marshall**
Phone:	**8244 8888**	**Phone:**	**02) 9419-8191**
Email:	***athomas@cmplus.com.au***	**Fax:**	**02) 9419-8107**
		Email:	lylemarshall@ozemail.com.au
Date:	**13th October, 2009**	**Job No. 3005**	

Subject: Attendance at Nan Tien Water and Dharma Festival Saturday 10/10/09

---

1. I made a visit to Nan Tien on Friday 9/10/09 and inspected the main buildings and made an inventory of parking spaces in the Pagoda Car Park, Main Temple Car Park and the Pilgrims Lodge Car Park.

Lodge Car Park	-		
Pagoda Car Park	-	56 spaces	
Main Temple Car Park	-	154 spaces	
Pilgrims Lodge	-	16 (visitor)	
Pilgrims Staff	-	13 marked	
		3 beyond marked spaces	
		3 west of Pilgrims Lodge	
Grass Parking		29 Visitor	**Overflow**
		17 (contrary to signs)	**Illegal**
Teahouse Staff		4	
Bus		Drop Off Pick Up Zone	Roadway north of Main Shrine Complex

Total Visitor Parking	-	226	Marked spaces
	-	29	Overflow on grass
	-	17	Illegal
Staff	-	17	Marked
Staff	-	6	Unmarked.
	TOTAL	295	

2. Seating **Dew Drop Inn (Tea House).**

	122 seats (bench & plastic chairs inside).
	25 (outside).
Front Shrine	90 kneeler pads.
Dining Hall	253 seats (bench style)

3. SAT Estimated Peak Attendance at **2:00pm** – *1331 persons*

Car Parking	-	3 large buses (50 seat).
Peak at 1pm	-	234 cars legal (staff + visitors)
	-	52 cars illegal and on grass.
	-	2/21 Seater buses.
	-	11 cars outside main gate.
Travel mode	-	car 918
	-	Bus / coach / taxi 413

4. Traffic Generation / Car Occupancy.

Count at Front Entrance Gate: Sat. 10/10/09.

11:00am – 12:00noon	**IN**	**OUT**
	1 bus (50 pass.)	33 cars
	2 taxis (8 pass.)	2 taxis (driver)
	65 cars	1 bus (empty)

Car Occupancy = $\frac{139}{65}$ = 2.14

	No. of Passengers	**%**
Bus/Taxi	58	29.5
Car	139	70.5
Total	**197**	**100**

5. I have telephoned Nan Tien today with a request for *additional information* to confirm our *attendance count*, as my survey people could not enter the Main Shrine.

Regards

Lyle Marshall

Lyle Marshall
LYLE MARSHALL & ASSOCIATES PTY LTD

Facilities: - ***See Brochure***

APPENDIX 6.2

APPENDIX 6.2

Lyle Marshall & Associates Pty Ltd

CONSULTING ENGINEERS, TRANSPORTATION AND ENVIRONMENTAL PLANNERS
ABN 39 001 200 620

MEMORANDUM

To:	**Audrey Thomas** Conybeare Morrison	**From:**	**Lyle Marshall**
Email:	***athomas@cmplus.com.au***	**Phone:** **Fax:**	**02) 9419-8191** **02) 9419-8107**
Date:	**27 July, 2010**	**Job No. 3005**	

Subject: Shaolin Tourist and Residential Development Comberton Grange.

1. TRAFFIC VOLUME SURVEYS NAN TIEN TEMPLE 12/2/10 TO 25/2/10

(i). The hourly traffic volumes by direction recorded by the automatic tube counters in the access road to Nan Tien and in Berkeley Road north of the roundabout are attached (8 pages all page 1).

(ii) The hourly traffic volumes by direction in the access road and Berkeley Road on Saturday **13/2** and Sunday **14/2** are shown on Sheet marked **A**. The hourly volumes by direction at the same locations on Saturday **20/2** and Sunday **21/2** are shown on Sheet marked **B**.

(iii) Between **9:00am** and **5:00pm** on Sunday **14** (Chinese New Year) **28** buses entered the temple and **25** exited from the temple grounds.

(iv) The hourly traffic volumes to and from Nan Tien Temple have been averaged for the 5 weekdays Monday **15/2** to Friday **19/2** and are included in **Table 1.** Saturday **20/2** and Sunday **21/2** are considered to be typical weekend days. The hourly volumes on these days are also included in Table 1, together with Sunday **14/2** which is probably the busiest Sunday of the year.

CONCLUSIONS:

(i) On the busiest day of the year the Nan Tien Temple generates **2549** movements in and out from **9:00am** to **5:00**pm.

(ii) The busiest hours on weekdays and weekend days are between **11:00am** and **4:00pm**. This period does not coincide with the commuter peak hours.

(iii) On an average weekday the Nan Tien Temple generates **506** vehicle movements in and out from **9:00am** to **5:00**pm. On a typical Saturday and Sunday the vehicle movements are 1**054** and **1369** respectively.

SUITE 8, 871 PACIFIC HIGHWAY, CHATSWOOD NSW 2067
TELEPHONE: 9419-8191, FACSIMILE: 9419-8107
ACN: 39 001 200 620

(iv) The *24 hour traffic volumes* in the north and south direction in Berkeley Road on Sunday 14/2/10 were very similar to the weekday traffic volumes. On typical Saturdays and Sundays the 24 hour volumes are significantly *lower* than *weekdays*.

(v) The peak hours on weekdays in Berkeley Road are **8:00 – 9:00am** and **4:00 – 5:00pm**. The peak direction of flow is *northbound in the morning* and southbound in the afternoon. The directional distribution is **64:40** north/south **am** and **40:60** *north/south* in the **pm**.

(vi) The peak direction of flow in the Princes Highway on weekdays north of **MR312** Huskisson Road is north and the **am** peak is **8:00 – 9:00am**.

The *afternoon peak* hour is **4:00 – 5:00pm** and the peak direction of flow is *south*. The flows generated by the Shaolin Tourist Centre will be *opposite* to the peak directions in the Princes Highway.

(vii) On weekends, the peak period in the Princes Highway is **10:00am** to **3:00pm**. The peak direction of flow until **1:00pm** is *southbound* and after **1:00pm** the peak direction is *northbound.* This coincides with the Shaolin Tourist Village traffic generation. On weekends the peak hourly two-way flow between **12:00 – 1:00pm** is **1671**. This is almost identical to the two-way peak hour flow of **1675** from **4:00 – 5:00pm** on weekdays.

(viii) The traffic pattern in Forest Road is expected to be similar to Huskisson Road, **MR312** where the peak direction of flow is westbound (towards Nowra) in the am peak and eastbound in the pm peak. The peak direction of flow generated by the Shaolin Tourist Centre will be eastbound in the am period to **1:00pm** and then westbound from **1:00 to 5:00pm**. This will help mitigate the capacity constraint with the right turn at Forest Road into the Princes Highway.

(ix) On weekends, the peak period in **MR312** is from **1:00 – 2:00pm** when the two-way volumes are **581**. The directional distribution is **50:50**. The **8:00 – 9:00am** (**586**) and **4:00 – 5:00pm** (**627**) peak hour flows on weekdays are similar to the **1:00 – 2:00pm** on weekends.

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

Traffic Count Summary Report

Count Number	5416	Ref : LYLE	UBDW 40 P-4
Street	NAN TIEN ACCESS ROAD, UNANDERRA : From NAN TIEN TEMPLE to BERKELEY ROAD : EAST BOUND OUT		
Location	Week 2 On the access road, west of the roundabout		Carriageway

Start Date	19-FEB-10
Start Time	100
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	44
Weekly 85th Percentile Speed	54
Five Day AADT	229
Seven Day AADT	376

TOTAL COUNT MATRIX

	MON 22ND	TUE 23RD	WED 24TH	THU 25TH	FRI 19TH	SAT 20TH	SUN 21ST	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	0	0	1	1	1	0	6	3	1	9	1
1am – 2am	1	2	0	0	0	0	4	3	1	7	1
2am – 3am	0	0	0	0	0	0	25	0	0	25	4
3am – 4am	0	0	0	0	0	0	34	0	0	34	5
4am – 5am	1	1	1	2	1	1	11	6	1	18	3
5am – 6am	0	0	0	0	0	0	3	0	0	3	0
6am – 7am	3	1	1	0	0	1	2	5	1	8	1
7am – 8am	0	1	5	0	2	3	4	8	2	15	2
8am – 9am	7	8	3	4	4	5	18	26	5	49	7
9am – 10am	19	9	12	6	9	12	30	55	11	97	14
10am – 11am	9	11	15	6	13	19	36	54	11	109	16
11am – Midday	32	28	25	14	13	28	48	112	22	188	27
Midday – 1pm	18	28	44	27	31	75	131	148	30	354	51
1pm – 2pm	18	34	38	34	46	92	152	170	34	414	59
2pm – 3pm	18	40	45	27	40	89	124	170	34	383	55
3pm – 4pm	10	27	28	31	22	102	112	118	24	332	47
4pm – 5pm	8	26	21	31	35	81	81	121	24	283	40
5pm – 6pm	11	11	17	16	23	49	36	78	16	163	23
6pm – 7pm	3	8	2	4	13	21	14	30	6	65	9
7pm – 8pm	2	0	1	6	3	5	6	12	2	23	3
8pm – 9pm	2	1	4	1	3	4	3	11	2	18	3
9pm – 10pm	4	2	1	2	2	9	2	11	2	22	3
10pm – 11pm	0	0	0	0	1	4	1	1	0	6	1
11pm – Midnight	0	0	0	1	1	6	0	2	0	8	1
Total	166	238	264	213	263	606	883	1144	228	2633	376

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Traffic Count Summary Report

Count Number	5416	Ref : LYLE	UBDW 40 P-4
Street	NAN TIEN ACCESS ROAD, UNANDERRA : From BERKELEY ROAD to NAN TIEN TEMPLE : WEST BOUND		IN
Location	Week 2 On the access road, west of the roundabout		Carriageway

Start Date	19-FEB-10
Start Time	100
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	37
Weekly 85th Percentile Speed	47
Five Day AADT	185
Seven Day AADT	335

TOTAL COUNT MATRIX

	MON 22ND	TUE 23RD	WED 24TH	THU 25TH	FRI 19TH	SAT 20TH	SUN 21ST	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	0	1	3	0	1	1	3	5	1	9	1
1am – 2am	1	1	0	0	0	0	0	2	0	2	0
2am – 3am	0	0	0	0	0	0	2	0	0	2	0
3am – 4am	0	0	0	1	0	1	1	1	0	3	0
4am – 5am	1	1	1	1	1	0	3	5	1	8	1
5am – 6am	0	0	0	0	0	0	0	0	0	0	0
6am – 7am	3	0	1	0	0	1	0	4	1	5	1
7am – 8am	0	2	6	2	1	1	0	11	2	12	2
8am – 9am	5	13	14	6	9	17	12	47	9	76	11
9am – 10am	4	15	14	14	21	27	47	68	14	142	20
10am – 11am	10	21	24	9	18	53	90	82	16	225	32
11am – Midday	25	28	41	29	27	84	149	150	30	383	55
Midday – 1pm	12	37	32	29	37	110	121	147	29	378	54
1pm – 2pm	18	17	28	21	33	91	93	117	23	301	43
2pm – 3pm	9	30	17	16	18	72	82	90	18	244	35
3pm – 4pm	5	13	10	25	21	73	44	74	15	191	27
4pm – 5pm	3	9	8	12	19	46	29	51	10	126	18
5pm – 6pm	4	5	5	6	7	39	9	27	5	75	11
6pm – 7pm	1	4	0	1	4	23	6	10	2	39	6
7pm – 8pm	2	0	0	3	3	25	1	8	2	34	5
8pm – 9pm	1	0	4	2	4	19	2	11	2	32	5
9pm – 10pm	4	2	0	1	2	20	1	9	2	30	4
10pm – 11pm	0	0	0	0	2	15	1	2	0	18	3
11pm – Midnight	0	0	1		1	8	1	2	0	11	2
Total	108	199	209	178	229	~~726~~	~~697~~	923	184	2346	335

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Traffic Count Summary Report

Count Number	5415	Ref : LYLE	Lat/Long : S34 27 51.5 / E150 51 10.4	UBDW 40 P-4
Street	NAN TIEN ACCESS ROAD, UNANDERRA : From BERKELEY ROAD to NAN TIEN TEMPLE : WEST BOUND			IN
Location	Week 1 On the access road, west of the roundabout			Carriageway

Start Date	12-FEB-10
Start Time	100
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	35
Weekly 85th Percentile Speed	46
Five Day AADT	258
Seven Day AADT	480

TOTAL COUNT MATRIX

	MON 15TH	TUE 16TH	WED 17TH	THU 18TH	FRI 12TH	SAT 13TH	SUN 14TH	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	0	1	0	1	1	2	33	3	1	38	5
1am – 2am	1	1	2	1	0	0	3	5	1	8	1
2am – 3am	0	1	0	1	0	0	1	2	0	3	0
3am – 4am	1	2	1	0	1	1	1	5	1	7	1
4am – 5am	2	0	0	2	0	1	1	4	1	6	1
5am – 6am	0	0	0	1	0	0	0	1	0	1	0
6am – 7am	0	0	1	2	1	0	6	4	1	10	1
7am – 8am	1	1	1	0	1	0	14	4	1	18	3
8am – 9am	9	13	12	18	10	18	69	62	12	149	21
9am – 10am	19	20	17	22	19	27	196	97	19	320	46
10am – 11am	23	42	32	33	26	44	287	156	31	487	70
11am – Midday	48	43	42	47	32	48	97	212	42	357	51
Midday – 1pm	48	53	51	60	40	62	105	252	50	419	60
1pm – 2pm	42	22	33	36	21	47	100	154	31	301	43
2pm – 3pm	37	24	29	19	16	62	137	125	25	324	46
3pm – 4pm	15	18	19	15	11	50	139	78	16	267	38
4pm – 5pm	14	11	11	11	7	42	56	54	11	152	22
5pm – 6pm	2	5	3	9	7	23	14	26	5	63	9
6pm – 7pm	4	1	2	1	9	22	6	17	3	45	6
7pm – 8pm	3	0	2	0	2	29	5	7	1	41	6
8pm – 9pm	1	0	1	1	3	23	1	6	1	30	4
9pm – 10pm	0	1	1	3	1	71	2	6	1	79	11
10pm – 11pm	2	2	2	1	2	78	4	9	2	91	13
11pm – Midnight	0	0	0	0	1	140	0	1	0	141	20
Total	272	261	262	284	211	790	1277	1290	258	3357	479

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Traffic Count Summary Report

Count Number	5415	Ref : LYLE	Lat/Long : S34 27 51.5 / E150 51 10.4	UBDW 40 P-4
Street	NAN TIEN ACCESS ROAD, UNANDERRA : From NAN TIEN TEMPLE to BERKELEY ROAD : EAST BOUND			OUT
Location	Week 1 On the access road, west of the roundabout			Carriageway

Start Date	12-FEB-10
Start Time	100
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	38
Weekly 85th Percentile Speed	49
Five Day AADT	318
Seven Day AADT	569

TOTAL COUNT MATRIX

	MON 15TH	TUE 16TH	WED 17TH	THU 18TH	FRI 12TH	SAT 13TH	SUN 14TH	5 Day Total	5 Day Average	7 Day Total	7 Day Average
Midnight – 1am	0	1	0	1	1	0	175	3	1	178	25
1am – 2am	1	1	1	1	0	2	86	4	1	92	13
2am – 3am	0	1	0	1	0	0	3	2	0	5	1
3am – 4am	1	1	0	0	1	1	1	3	1	5	1
4am – 5am	2	1	1	2	1	1	1	7	1	9	1
5am – 6am	0	0	0	1	0	0	1	1	0	2	0
6am – 7am	0	0	1	1	1	0	1	3	1	4	1
7am – 8am	0	0	0	2	0	0	5	2	0	7	1
8am – 9am	5	7	4	10	4	4	22	30	6	56	8
9am – 10am	7	5	8	6	10	11	46	36	7	93	13
10am – 11am	16	21	17	24	14	18	134	92	18	244	35
11am – Midday	26	85	60	28	17	27	199	216	43	442	63
Midday – 1pm	37	45	56	53	45	42	190	236	47	468	67
1pm – 2pm	61	55	47	51	38	52	212	252	50	516	74
2pm – 3pm	51	39	41	54	30	53	174	215	43	442	63
3pm – 4pm	43	44	40	29	22	61	269	178	36	508	73
4pm – 5pm	31	29	29	35	25	58	208	149	30	415	59
5pm – 6pm	22	20	14	16	15	45	84	87	17	216	31
6pm – 7pm	5	3	7	12	3	20	27	30	6	77	11
7pm – 8pm	3	3	8	1	10	15	8	25	5	48	7
8pm – 9pm	1	1	0	0	2	19	5	4	1	28	4
9pm – 10pm	1	2	1	2	2	17	6	8	2	31	4
10pm – 11pm	1	1	2	1	2	20	3	7	1	30	4
11pm – Midnight	1	0	0	0	1	66	1	2	0	69	10
Total	315	365	337	331	244	532	1861	1592	318	3985	569

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APPENDIX A

TRAFFIC GENERATION DURING CHINESE NEW YEAR FESTIVAL AT NAN TIEN TEMPLE 12/02/10 TO 25/02/10.

TABLE 1 HOURLY TRAFFIC VOLUMES GENERATED BY NAN TIEN TEMPLE

TIME INTERVAL	Peak Sunday 14/2/10		Sunday 21/2/10		Saturday 20/2/10	
	Traffic Movements		Traffic Movements		Traffic Movements	
	IN	OUT	IN	OUT	IN	OUT
7:00 – 8:00am	14	5	0	4	1	3
8:00 – 9:00am	69	22	12	18	17	5
9:00 – 10:00am	196	46	47	30	27	12
10:00 – 11:00am	287	134	90	36	53	19
11:00 – 12:00pm	97	199	149	48	84	28
12:00 – 1:00pm	105	190	121	131	110	75
1:00 – 2:00pm	100	212	93	152	91	92
2:00 – 3:00pm	137	174	82	124	72	89
3:00 – 4:00pm	139	269	44	112	73	102
4:00 – 5:00pm	56	208	29	81	46	81
5:00 – 6:00pm	14	84	9	36	39	49
6:00 – 7:00pm	6	27	6	14	23	21
12 Hour Total	**1220**	**1570**	**682**	**786**	**636**	**576**
24 Hour Total	**1277**	**1861**	**697**	**883**	**726**	**606**

TIME INTERVAL	Tuesday 16/2/10 Busiest Weekday Mon to Friday		12/2/10 to 25/2/10 Average Weekday	
	Traffic Movements		Traffic Movements	
	IN	OUT	IN	OUT
7:00 – 8:00am	1	0	1.5	1.0
8:00 – 9:00am	13	7	10.9	5.6
9:00 – 10:00am	20	5	16.5	9.1
10:00 – 11:00am	42	21	23.8	14.6
11:00 – 12:00pm	43	85	36.2	32.8
12:00 – 1:00pm	53	45	39.9	38.4
1:00 – 2:00pm	22	55	27.1	42.2
2:00 – 3:00pm	24	39	21.5	38.5
3:00 – 4:00pm	18	44	15.2	29.6
4:00 – 5:00pm	11	29	10.5	27.0
5:00 – 6:00pm	5	20	5.3	16.5
6:00 – 7:00pm	1	3	2.7	6.0
12 hour Total	**253**	**353**	**211.1**	**261.3**
24 hour Total	**261**	**365**	**221.3**	**273.6**