

**CONVERSION OF WEEKEND MARKETS to FACTORY
OUTLET CENTRE at MEGACENTA/MARKETS SITE
ORANGE GROVE ROAD, WARWICK FARM**

TRAFFIC AND PARKING ASSESSMENT REPORT

Report for Gazcorp Pty Ltd

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May 2011

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1. INTRODUCTION

This report has been prepared to accompany a rezoning and development application to Liverpool City Council for conversion of the existing Weekend Markets building at the Megacentra/Markets site on Orange Grove Road, Warwick Farm to a Factory Outlet Centre.

The location of the Megacentra/Markets site and the proposed Factory Outlet (FOC) at the existing Markets site thereupon are shown in Figure 1.

The report is based on information about the proposed conversion provided by the developer, a site inspection and relies on that information only. The report draws on previous Traffic and Parking Assessment Reports for this site specifically that for the Dan Murphy's development, by Dobinson & Associates Pty Ltd, November 2010.

The report:

- provides details of the proposed conversion;
- reports the nature of the road network adjacent to the site and traffic and parking controls on those roads;
- assesses the adequacy of the parking for the development; and
- provides an assessment of the traffic generation with the proposed converted development and its impact on the road network.

2. PROPOSED DEVELOPMENT

Site

The Megacentra/Markets site is located on the eastern side of Orange Grove Road (Cumberland Highway) straddling Viscount Place, Warwick Farm. The proposed Factory Outlet Centre conversion is to occupy the existing Weekend Markets building on the southern side of Viscount Place.

The Megacentra operates 7 days a week; the Markets only operate at weekends but on conversion the existing Markets building would operate 7 days a week.

Vehicular access to the Megacentra/Markets site is provided by existing traffic signals at the intersection of Orange Grove Road and Viscount Place. There is also an existing entry and exit from and to Orange Grove Road immediately south of Viscount Place. A second access is located at the rear of the site connecting Viscount Place to Homepride Avenue.

Proposed Development

The Weekend Markets building to be converted to the Factory Outlet Centre is a single storey building of 14,445 m² gross floor area (GFA) with a net leasable area (NLA) of 10,687 m². The building is to be converted into about 63 small to medium discount outlets, small clothing stores, electrical, homeware outlets and the like, generally as illustrated in Figure 2 below.

No change is proposed to existing on-site parking.

No change is proposed to existing access to the site from Orange Grove Road and Homepride Avenue.

The Factory Outlet Centre will operate during business hours for the Megacentra, generally 10 a.m. to 6.00 p.m. 7 days a week.

3. PARKING ASSESSMENT

Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions that apply adjacent to the site comprise:

- 'No Stopping' restriction on Orange Grove Road south of Viscount Place to the end of the deceleration lane at entry to the southeast corner; and
- A 'No Parking' restriction over the remainder of the frontage to the site; with a further
- 'No Stopping' restriction around the 'jug-handle' turning bay to the north of Viscount Place adjacent to the site; and
- 'No Stopping' restriction both sides of Viscount Place from Orange Grove Road to beyond the first entry off Viscount Place to on site facilities with no restrictions over the remainder of that road.

No restrictions apply to Homepride Avenue.

Council Car Parking Code

Liverpool City Council Development Control Plan 2008 (DCP 2008), Part 1.2, Section 2 Car Parking and Access¹ indicates parking requirements for various uses as set out below.

- Markets - 2.5 spaces per stall with occasional access for an articulated vehicle (to transport temporary structures) and loading facilities to be convenient to stalls;
- Bulky goods premises of > 3,000 m² LFA - 1 space per 150 m² LFA, with service facilities for an occasional articulated vehicle. (But it should be noted that surveys of existing bulky goods sites similar to that existing have indicated demand for 1 space per 100 m² GFA on weekdays and 1 space per 60 m² at weekends)
- Retail premises
 - < 12,000 m² - 1 space/20 m² LFA
 - 12,000 to 30,000 m² - 1 space/25 m²

LFA (Leasable Floor Area) means the sum of the areas of each floor of a building where the area of each floor is taken to be the area within the outer face of the external enclosing walls as measured at a height of 1400 millimetres above each floor level, excluding:

- columns, fin walls, sun control devices, awnings and any other elements, projections or works outside the general lines of the outer face of the external wall; and
- lift towers, cooling towers, machinery and plant rooms, ancillary storage space and air-conditioning ducts; and
- car parking needed to meet any requirements of the Council and any internal designated vehicular or pedestrian access thereto; and
- space for loading and unloading of goods; and
- internal public arcades and thoroughfares, terraces and balconies with outer walls less than 1400 millimetres high and the like.

Existing Parking

A parking and traffic survey was conducted at the Megacentra/Markets site on Thursday 28th and Saturday 30th April 2011 over the peak traffic periods. Earlier surveys were conducted over the weekend, Saturday 4th July 2009 and Sunday 5th July during market business hours shortly after the Weekend Markets were opened. Details of the April 2011 survey and an extract from the earlier 2009 surveys are provided in Appendix A.

¹ Liverpool Development Control Plan 2008 (DCP 2008) – Part 1.2 Additional General Controls for Development, Section 2 Car Parking and Access. Liverpool City Council, 2008

The survey of the site showed that there were 1,667 parking spaces available at the Megacentra/Weekend Markets site in 2011 which comprised:

- Megacentra at ground level – 355
- Megacentra basement – 548
- Along Viscount Place – 115
- Development at south east crn - 62
- Markets site – 215
- Eastern car park behind Megacentra – 372

About 30 are marked for disabled persons, 2 for the Fire Brigade and 2 for loading. There is also an unsealed area available for overflow parking to the east of the Markets site.

The proposed Pizza Cart will reduce parking available by 7 spaces while the proposed Dan Murphy's will increase on site parking by 13 spaces making overall parking available 1,673 spaces.

The April 2011 survey indicated that there was a maximum of 287 spaces occupied on Thursday afternoon and 759 on Saturday midday. The Saturday figure represents parking demand now the Weekend Markets have settled down to normal operation. Earlier counts in 2009 shortly after the Weekend Markets opened reflected higher demand due to the novelty aspect of the new Weekend Market, of 982 occupied spaces on the Saturday and 1,265 on the Sunday. The latest count indicates a fall in parking accumulation on site of 23 % once the site settled down to normal operation.

The earlier number of 1265 spaces occupied has been used as a worst possible case for assessment of parking availability on site. The proposed Pizza Cart will increase this by a further 12 spaces and the proposed Dan Murphy's by an additional 27 spaces increasing the peak of peak demands by 39 spaces to 1,304 spaces. This peak of peak demand for 1,304 spaces at weekends leaves a surplus of 369 spaces unoccupied.

Parking Required

Factory Outlet Centre

The proposed Factory Outlet Centre (FOC) will operate as a discount retail outlet of small to medium specialty shops of some 10,687 m² LFA but within the larger retail complex exceeding 20,000 m² LFA.

The Council Code for an outlet < 12,000 m² LFA indicates a requirement for -

- 10,687 m² LFA x 1/20 m² = 535 spaces; but within the wider context of the site of > 20,000 m² LFA retail -
- 10,687 m² LFA x 1/25 m² = 428 spaces.

This latter requirement of 428 spaces is considered the more applicable to this site.

Existing Markets

The Council Code for Markets of 2.5 spaces per stall accords with the assessment for the Weekend Markets when established which indicated a desirable requirement for 226 stalls x 2.5 spaces = 565 spaces. (*Proposed Weekend Markets, 12-16 Orange Grove Road, Warwick Farm. Traffic and Parking Assessment Report, October 2008*). In addition 23 spaces were required and allocated for stall holders vehicles servicing the stalls plus an additional 12 spaces alongside the access road to the loading dock.

Demand for parking spaces derived from the Council code and that from actual surveys of existing bulky goods developments yields a requirement for 1,398 spaces at weekends compared to the actual recorded peak of peaks of 1,265 spaces; this reflects the joint use of facilities by 10.5% of patrons on that busiest Sunday and even higher at 30 % for the recent 2011 normal peak weekend use

Assessment of Demand

The 428 spaces indicated by Council Code required for the FOC is less than the 565 spaces indicated for the Weekend Markets and hence the proposed FOC will reduce peak parking demand on site by about 137 spaces (by 123 spaces if the 10.5% joint use is taken into account). Even the higher figure above of 535 spaces for the FOC is 30 less than the requirement for the Weekend Markets.

This means that current parking on site will well exceed the assessed worst possible case demand by the proposed conversion of the Markets to a Factory Outlet Centre.

Parking demand during weekdays is even less. The assessed demand from the Council Code and recorded demand for bulky goods for the existing site facilities indicates a requirement for 492 spaces. However the April 2011 survey showed a peak demand for 287 spaces on Thursday 28th April 2011.

Adding the 428 spaces required by the Council DCP indicates total forecast demand of $428 + 287 = 715$ spaces (640 spaces if 10.5% joint use is applied) leaving a surplus of 958 spaces on site unoccupied (1,035 spaces unoccupied if 10.5% joint use is applied).

Hence there is more than sufficient parking provided on site to accommodate the conversion of the Weekend Markets building to a Factory Outlet Centre.

Provision is already made for heavy vehicles including semitrailers to service the loading docks at the site.

4. TRAFFIC ASSESSMENT

Road Network

The road network in the vicinity of the site is illustrated in Figure 1.

The Hume Highway is located to the south of the site and is classified as a State Road by the RTA; it provides the key east-west road link in the area. It typically comprises 6 traffic lanes (i.e. 3 lanes in each direction) with clearway restrictions operating during peak periods.

Cabramatta Road West is located to the north of the site and is classified by the RTA as a State Road and provides an east-west road link in the area from Orange Grove Road to the Hume Highway.

Orange Grove Road (Cumberland Highway) is classified as a State Road. It provides a major north-south road link within Sydney's road network, connecting the Hume Highway to the south at Liverpool to the M4 Freeway to the north at Wentworthville and Pennant Hills at Parramatta. It generally comprises 4 traffic lanes (i.e. 2 lanes in each direction) with a wide central median island separating opposing traffic flows in the vicinity of the site.

Viscount Place is a local road connecting Orange Grove Road at its western end to Homepride Avenue at its eastern end. It is a two-lane, two-way road but widened at its western end in approach to Orange Grove Road to 4 lanes two in each direction.

The intersection of Orange Grove Road and Viscount Place is signalized. Orange Grove Road at the intersection has a deceleration lane for entry by southbound traffic from Orange Grove Road and a two lane right turn bay for northbound traffic turning into the site. There are two entry lanes into Viscount Place and three exit lanes, 2 right turn and one left turn. There is a secondary entry to the site from Orange Grove Road south of the intersection with Viscount Place; the entry has a deceleration lane in approach.

Homepride Avenue is a two-lane, two way local road 6.8 metres wide between kerbs within a narrow 9.4 metres wide road reserve.

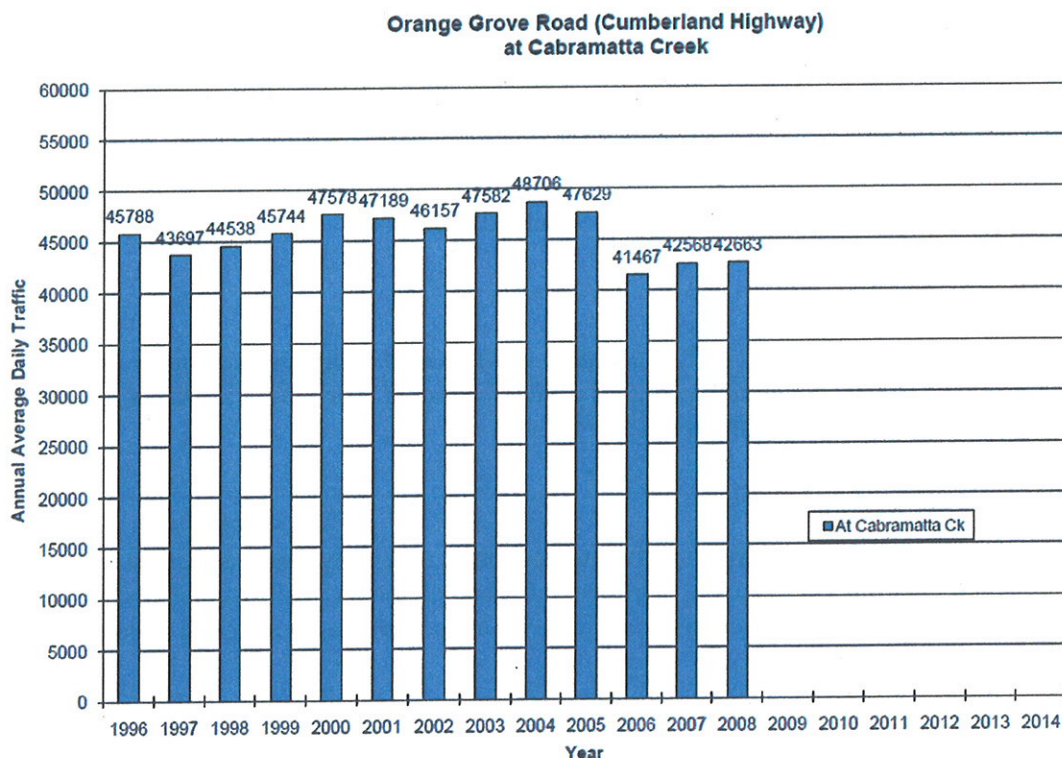
Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are:

- A 70 km/h Speed Limit on Orange Grove Road
- A 50 km/hr Speed Limit on Viscount Place and Homepride Avenue.
- A 5 km/hr Speed Limit on Viscount Place at pedestrian crossings
- Traffic Signals at the intersection of Orange Grove Road with Viscount Place
- Traffic Signals at the intersection of Orange Grove Road with O'Brien Parade
- A wide central median island in Orange Grove Road
- A U-Turn Bay facility in Orange Grove Road just north of its intersection with Viscount Place.
- A narrow central median island in Viscount Place in approach to Orange Grove Road.
- A 'Form One Lane' sign in Viscount Place at the reduction from 2 lanes to one lane eastbound.

Existing Traffic Conditions

Traffic on Orange Grove Road (Cumberland Highway) varied between 43,700 and 48,700 vehicles per day (vpd) between 1996 and 2005 with very slight growth; the volume dropped with opening of the M7 Motorway, to about 42,500 vpd. See graph below.



Traffic flow on the road network at the Megacentra/Weekend Markets site was provided by traffic count surveys on Thursday 28th and Saturday 30th April 2011 during the periods of combined peak flows on the road network and activity at the site.

The traffic surveys showed that peak hour flows were:

- Orange Grove Road in approach to Viscount Place -
 - 3,482 vehicles per hour (vph) at peak 4.45-5.45 p.m. on Thursday (1,790 northbound, 1,692 southbound);
 - 3,133 vph at peak 1.45-2.45 p.m on Saturday (1,507 northbound, 1,626 southbound); and
- Viscount Place
 - entry to 292 vph and exit to 316 vph at peak on Thursday;
 - entry to 659 vph and exit to 574 vph at peak on Saturday; and
- The Orange Grove Road/Viscount Place intersection throughput was -
 - 3,798 vph on Thursday;
 - 3,707 vph during the peak hour on Saturday; and
- The access to the development at the south eastern corner of Orange Grove Road and Viscount Place
 - entry to 4 vph and exit to 14 vph at peak on Thursday; and
 - entry to 12 vph and exit to 68 vph at peak on Saturday.
- Homepride Avenue
 - entry to 106 vph and exit to 72 vph at peak on Thursday; and
 - entry to 96 vph and exit to 151 vph at peak on Saturday.

Reference is also made below to the traffic count surveys on Saturday 4th July 2009 and on Sunday 5th July shortly after the Weekend Markets were opened; these surveys reflected higher demand due to the novelty aspect of the newly established Weekend Market; recent site generation is less now that the Markets usage has stabilised.

Access Arrangements

No change is proposed to access to the Megacentra/Weekend Markets site. However since the markets were opened consent has been granted to the access at Homepride Avenue for general use of the site.

Also to ensure uninterrupted entry to the site from Orange Grove Road, two lanes eastbound on Viscount Place will be maintained clear of parked traffic.

Traffic Generation

Generation Rates

The Roads & Traffic Authority (RTA) *Guide to Traffic Generating Developments* is usually the best guide to traffic generation potential of developments. The Guide indicates relevant traffic generation rates in peak hours as:

- Markets
 - 4 vehicle trips per stall.

The Factory Outlet Centre seems to align primarily with speciality shops as part of a shopping complex but has elements of bulky goods and elements of slow trade electrical and homewares and faster trade discount stores in shopping complexes; respective rates are:

- Bulky goods retail stores
 - 2.5 vehicle trips /100 m² GLFA on Thursdays, (within a range 0.1 to 6.4); and
 - 6.6 vehicle trips/100 m² GLFA on weekends, (within a range 0.7 to 16.9).

But it should be noted that surveys of existing bulky goods sites similar to that existing have indicated generation of 1.41 vehicle trips per 100 m² GFA on weekdays and 3.28 vehicle trips per 100 m² GFA at weekends.

- Retail, slow trade electrical stores
 - 20 vehicle trips/1000 m² GLFA on Thursdays;
 - 11 vehicle trips/1000 m² GLFA on Fridays; and
 - 38 vehicle trips/1000 m² GLFA on Saturdays.
- Retail, faster trade discount stores
 - 51 vehicle trips/1000 m² GLFA on Thursdays;
 - 23 vehicle trips/1000 m² GLFA on Fridays; and
 - 13 vehicle trips/1000 m² GLFA on Saturdays.
- Retail, specialty stores
 - 46 vehicle trips/1000 m² GLFA on Thursdays;
 - 56 vehicle trips/1000 m² GLFA on Fridays; and
 - 107 vehicle trips/1000 m² GLFA on Saturdays.

Existing Weekend Markets

The existing Weekend Markets generation was based on the RTA Guide of 4 trips per stall which indicated a peak hour generation of $226 \times 4 = 904$ vehicle trips per hour (vtp).h).

The total site generation at weekends derived from the RTA Guide and actual recorded data from bulky goods sites is 2,728 vtp).h. But the actual highest peak generation after opening the Weekend Markets was recorded on Sunday 5th July 2009 at 1,880 vtp).h which indicated a 30% joint patronage of facilities on site by patrons.

Proposed Factory Outlet Centre

With conversion of the Markets building to a Factory Outlet Centre, generation is assessed as best represented by 60% specialty shops, 10 % bulky goods, 10% slow trade electrical and 20% faster trade discount stores. This yields:

- Weekday (Thursday)
 - $10,687 \text{ m}^2 \text{ GLFA} \times 42.3/1000 \text{ m}^2 = 452 \text{ vtp).h}$ (226 entering, 226 departing);
- Weekends
 - $10,687 \text{ m}^2 \text{ GLFA} \times 77.2/1000 \text{ m}^2 = 825 \text{ vtp).h}$ (413 entering, 412 departing).

Traffic Impact on Road Network

Hence traffic generated by the site with the conversion to the proposed Factory Outlet Centre is assessed as:

Weekends

From the above calculations, traffic generation of the site at weekends is assessed to reduce from 904 vtp).h for the existing Weekend Markets to 825 vtp).h for the Factory Outlet Centre, a reduction of 79 vtp).h or allowing for the 30% joint patronage of facilities by 56 vtp).h, 28 entering and 28 departing.

Hence impact on the road network will be slightly less specifically at the intersection of Orange Grove Road and Viscount Place.

The proposed Dan Murphy's will increase site generation by an estimated 67 vtp).h but access to this site will be via the entry and exit south of Viscount Place and hence not impact on the Orange Grove Road/Viscount Place intersection.

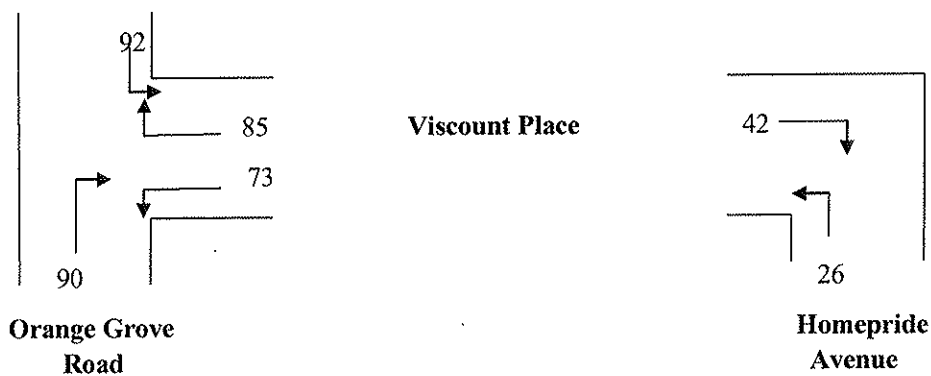
Weekdays (Thursday)

The existing site generation, derived from the RTA Guide and recorded data from bulky goods sites is 1,035 vtp. But actual peak generation recorded on Thursday 28th April 2011 was 804 vtp which represents a 24% joint patronage of existing facilities on site by patrons. From the above calculations, traffic generation of the site during the peak on Thursday will be increased by 452 vtp. From the data above it can reasonably be assumed that this total generation will be reduced by say 10% for joint use of facilities that is to 407 vtp.

The proposed Dan Murphy's will increase site generation by an estimated 95 vtp but access to this site will be via the entry and exit south of Viscount Place and hence not impact on the Orange Grove Road/Viscount Place intersection.

It is assumed that the additional traffic of 407 vtp will arrive and depart the site in similar proportion to that currently applying as shown by the traffic count on Saturday 30 May 2011 when the weekend markets were operating. The separate access from Orange Grove Road south of Viscount Place has been ignored for this purpose on the basis that this access is used for patrons of facilities at the south west corner of the site and by the future Dan Murphy's when established.

This yields additional flows on the road network from the conversion to the Factory Outlet Centre during the Thursday afternoon peak hour as:



The existing situation at the intersection of Orange Grove Road and Viscount Place on Thursday afternoon was then compared with that applying when the Factory Outlet Centre would operate, using the SIDRA analysis program. The results of the SIDRA analysis by Varga Traffic Planning are summarised in the table below and detailed in the full analysis set out below the Traffic Survey detail.

SIDRA Capacity Analysis
Intersection Orange Grove Road and Viscount Place

Measure	Existing	Proposed
Level of Service	B	B
Degree of Saturation	0.598	0.701
Average vehicle delay	14.7 secs	17.7 secs

This shows that the intersection of Orange Grove Road and Viscount Place with the Factory Outlet Centre operating will continue to operate at Level of Service B with no unacceptable traffic implications even though, as could be expected, the degree of saturation and average vehicle delay may slightly increase somewhat.

5. IN SUMMARY

Adequate parking is already provided at the Megacentra/ Markets site for the proposed conversion of the existing Weekend Markets building to a Factory Outlet Centre, with a slight increase in surplus parking on site.

Traffic generation by the proposed conversion of the Weekend Markets to a factory outlet Centre development will slightly reduce the impact on the road network at weekends.

On weekdays, specifically Thursdays, traffic generation of the site will increase by an estimated 407 vehicle trips per hour but the road network is well able to handle this increase without any unacceptable traffic operational implications, specifically at the intersection of Orange Grove Road and Viscount Place.

APPENDIX A **Parking and Traffic Survey** **Thursday 28th and Saturday 30th April 2011** **And extracts from Surveys** **Saturday and Sunday 4th & 5th July 2009**



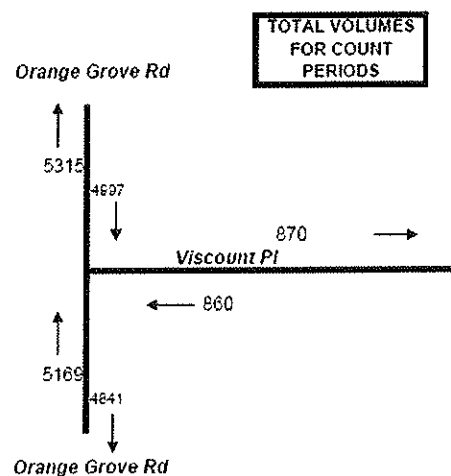
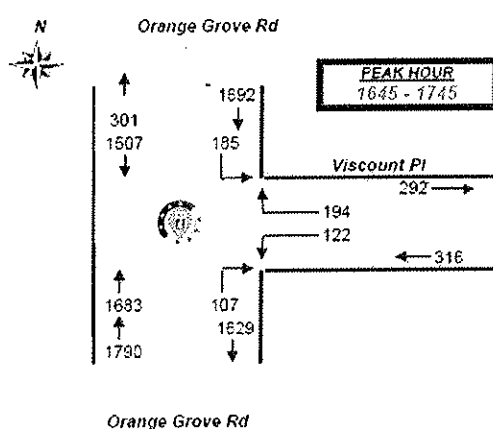
R.O.A.R. DATA
 Reliable, Original & Authentic Results
 Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
 Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
 Day/Date : Thursday 28th April 2011

All Vehicles	NORTH Orange Grove Rd		EAST Viscount Pl		SOUTH Orange Grove Rd		TOT
	T	L	R	L	R	T	
1500 - 1515	391	30	27	28	31	367	842
1515 - 1530	235	48	48	29	27	358	875
1530 - 1545	412	50	40	27	26	373	928
1545 - 1600	370	42	38	27	30	353	861
1600 - 1615	277	46	42	28	29	446	968
1615 - 1630	250	33	49	44	31	438	943
1630 - 1645	289	37	29	24	31	417	937
1645 - 1700	257	36	45	24	29	445	946
1700 - 1715	235	46	42	29	31	396	911
1715 - 1730	277	55	65	29	24	460	1040
1730 - 1745	408	46	42	30	23	352	901
1745 - 1800	274	50	27	29	35	358	874
Period End	4475	522	484	366	348	4821	11026

Peak Per	NORTH Orange Grove Rd		EAST Viscount Pl		SOUTH Orange Grove Rd		TOT
	T	L	R	L	R	T	
1500 - 1600	1478	171	153	102	114	1481	3506
1515 - 1615	1494	167	169	111	112	1503	3632
1530 - 1630	1509	172	169	126	116	1605	3700
1545 - 1645	1458	159	158	133	121	1652	3709
1600 - 1700	1473	152	165	140	120	1744	3794
1615 - 1715	1461	154	165	141	122	1684	3737
1630 - 1730	1438	176	181	126	115	1748	3834
1645 - 1745	1507	155	164	122	107	1683	3798
1700 - 1800	1524	199	176	117	114	1560	3726

PEAK HR	1507	185	184	122	107	1683	3798
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Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA

Reliable, Original & Authentic Results

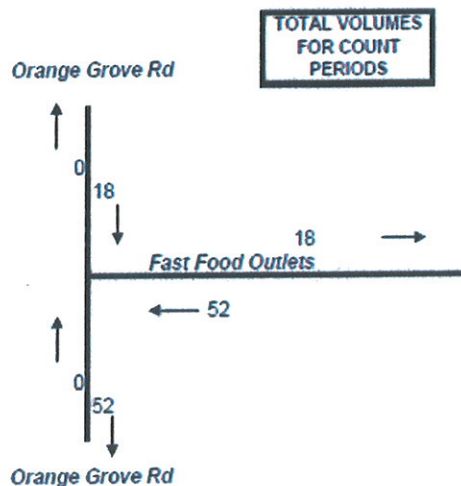
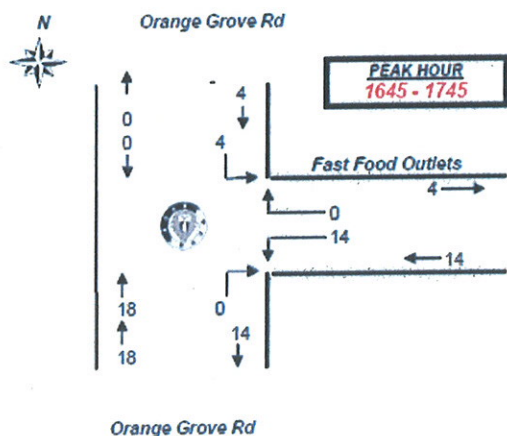
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Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Thursday 28th April 2011

Time Per	NORTH Orange Grove Rd		EAST Fast Food Outlets		SOUTH Orange Grove Rd		TOT
	I	L	R	L	R	I	
1500 - 1515		1	0	6	0		7
1515 - 1530		1	0	7	0		8
1530 - 1545		4	0	3	0		7
1545 - 1600		1	0	5	0		6
1600 - 1615		2	0	7	0		9
1615 - 1630		2	0	4	0		6
1630 - 1645		2	0	4	0		6
1645 - 1700		1	0	5	0		6
1700 - 1715		0	0	4	0		4
1715 - 1730		0	0	3	0		3
1730 - 1745		3	0	2	0		5
1745 - 1800		1	0	2	0		3
Period End	0	18	0	52	0	0	70

Peak Per	NORTH Orange Grove Rd		EAST Fast Food Outlets		SOUTH Orange Grove Rd		TOT
	I	L	R	L	R	I	
1500 - 1600	0	7	0	21	0	0	28
1615 - 1615	0	6	0	22	0	0	30
1530 - 1630	0	9	0	19	0	0	28
1545 - 1645	0	7	0	20	0	0	27
1600 - 1700	0	7	0	20	0	0	27
1615 - 1715	0	5	0	17	0	0	22
1630 - 1730	0	3	0	16	0	0	19
1645 - 1745	0	4	0	14	0	0	18
1700 - 1800	0	4	0	11	0	0	15

PEAK HR	4	0	14	0	18	
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R.O.A.R. DATA
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Client : Ken Dobinson & Associates
 Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
 Day/Date : Thursday 28th April 2011

All Vehicles

	SOUTH Homepride Ave		
Time Per	IN	OUT	TOT
1500 - 1515	19	11	30
1515 - 1530	19	12	31
1530 - 1545	13	14	27
1545 - 1600	18	15	33
1600 - 1615	35	17	52
1615 - 1630	32	16	48
1630 - 1645	21	13	34
1645 - 1700	24	17	41
1700 - 1715	31	19	50
1715 - 1730	22	22	44
1730 - 1745	29	14	43
1745 - 1800	16	11	27
Period End	279	181	460

	SOUTH Homepride Ave		
Peak Per	IN	OUT	TOT
1500 - 1600	69	52	121
1515 - 1615	85	58	143
1530 - 1630	98	62	160
1545 - 1645	106	61	167
1600 - 1700	112	63	175
1615 - 1715	108	65	173
1630 - 1730	98	71	169
1645 - 1745	106	72	178
1700 - 1800	98	66	164

PEAK HR	106	72	178
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TOTAL VOLUMES
 FOR COUNT
 PERIODS

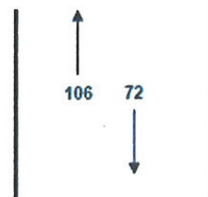
Markets



Homepride Ave

PEAK HOUR
 1645 - 1745

Markets



Homepride Ave





R.O.A.R. DATA

Reliable, Original & Authentic Results

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Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
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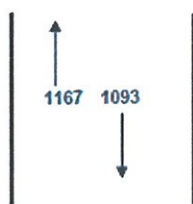
All Vehicles			
MARKETS			
Combined			
Time Per	IN	OUT	TOT
1500 - 1515	81	70	151
1515 - 1530	95	98	191
1530 - 1545	93	84	177
1545 - 1600	92	85	177
1600 - 1615	112	94	206
1615 - 1630	98	113	211
1630 - 1645	91	80	171
1645 - 1700	90	101	191
1700 - 1715	110	94	204
1715 - 1730	101	119	220
1730 - 1745	101	88	189
1745 - 1800	103	69	172
Period End	1167	1093	2260

MARKETS			
Combined			
Peak Per	IN	OUT	TOT
1500 - 1600	361	335	696
1515 - 1615	392	359	751
1530 - 1630	395	376	771
1545 - 1645	393	372	765
1600 - 1700	391	388	779
1615 - 1715	389	388	777
1630 - 1730	392	394	786
1645 - 1745	402	402	804
1700 - 1800	415	370	785

PEAK HR	402	402	804
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TOTAL VOLUMES FOR COUNT PERIODS

Markets



From Streets

PEAK HOUR 1645 - 1745

Markets



From Streets



Parking Accumulation

Total Vehicles at Start
213

Time Per
1500 - 1515
1515 - 1530
1530 - 1545
1545 - 1600
1600 - 1615
1615 - 1630
1630 - 1645
1645 - 1700
1700 - 1715
1715 - 1730
1730 - 1745
1745 - 1800

All Areas Parking
224
223
232
239
257
242
253
242
258
240
253
287
272

Total Vehicles at Finish

Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Thursday 28th April 2011



Zone	Location	Capacity	At Start 1500	At Finish 1800
A	MacDonald's / Krispy Kreme	172	27	35
B	Ground Level Parking Megacentre	183	114	175
C	Basement Car Park Megacentre	548	35	21
D	New Car Park East Megacentre	372	0	0
E	Northern Unsealed Car Park	?	0	0
F	Parking Viscount Place North	47	1	7
G	Parking Viscount Place South	68	3	12
H	Ground Level Parking Markets	215	21	8
I	Southern Unsealed Car Park	?	0	0
J	Fast Food Etc Parking	62	12	14
Total Vehicles Parked		1667	213	272
Number of Vacant spaces			1454	1395
% of Capacity used			12.8%	16.3%

Unsealed car parking areas not included in capacities or parking percentages



R.O.A.R. DATA

Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Thursday 28th April 2011

PEAK HOUR
1645 - 1745

Peds	NORTH		EAST		SOUTH		TOTAL
	Orange Grove	UNCLASSIFIED	Viscount Pl	UNCLASSIFIED	Orange Grove	UNCLASSIFIED	
Time Period							
1500 - 1515	0		0		0		0
1515 - 1530	0		0		0		0
1530 - 1545	0		1		0		1
1545 - 1600	0		0		0		0
1600 - 1615	0		2		6		8
1615 - 1630	0		0		0		0
1630 - 1645	0		3		0		3
1645 - 1700	0		0		0		0
1700 - 1715	0		0		0		0
1715 - 1730	0		1		0		1
1730 - 1745	0		0		0		0
1745 - 1800	0		0		0		0
Period End	0		7		6		13

Peds	NORTH		EAST		SOUTH		TOT
	Orange Grove	UNCLASSIFIED	Viscount Pl	UNCLASSIFIED	Orange Grove	UNCLASSIFIED	
Peak Period							
1500 - 1500	0		1		0		1
1515 - 1515	0		3		6		9
1530 - 1530	0		3		6		9
1545 - 1545	0		5		6		11
1600 - 1700	0		5		6		11
1615 - 1715	0		3		0		3
1630 - 1730	0		4		0		4
1645 - 1745	0		1		0		1
1700 - 1900	0		1		0		1

PEAK HR	0	1	0	1
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Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA

Reliable, Original & Authentic Results

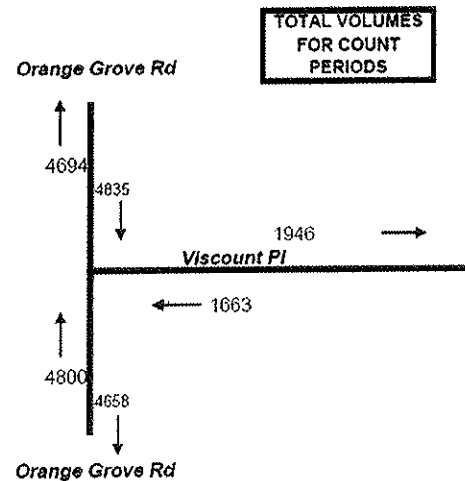
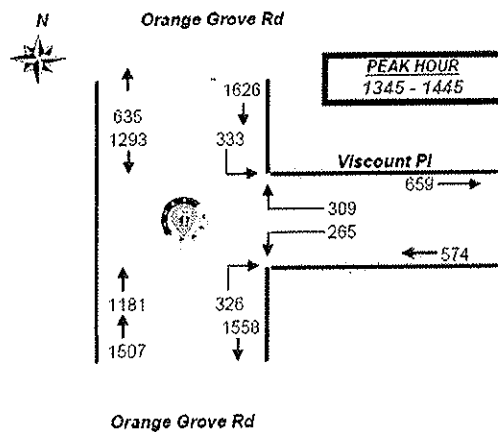
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Saturday 30th April 2011

All Vehicles	NORTH		EAST		SOUTH		TOT
	Orange Grove Rd		Viscount Pl		Orange Grove Rd		
	T	L	R	L	R	T	
1200 - 1215	301	78	60	72	103	341	955
1215 - 1230	317	88	89	64	66	363	987
1230 - 1245	312	79	63	72	83	380	999
1245 - 1300	304	83	81	65	89	304	927
1300 - 1315	343	82	59	79	94	343	1000
1315 - 1330	326	75	69	69	66	281	888
1330 - 1345	356	91	65	47	75	343	977
1345 - 1400	299	69	72	62	82	291	875
1400 - 1415	313	83	78	69	80	266	889
1415 - 1430	332	97	80	71	82	290	952
1430 - 1445	349	84	79	63	82	334	991
1445 - 1500	307	67	69	65	66	284	858
Period End	3859	976	864	799	970	3830	11298

	NORTH		EAST		SOUTH		
	Orange Grove Rd		Viscount Pl		Orange Grove Rd		
Peak Per	T	L	R	L	R	T	TOT
1200 - 1300	1234	328	293	274	341	1398	3868
1215 - 1315	1276	332	292	281	332	1400	3913
1230 - 1330	1285	319	272	286	334	1318	3814
1245 - 1345	1329	331	274	261	326	1271	3792
1300 - 1400	1324	317	265	257	319	1258	3740
1315 - 1415	1294	318	284	247	305	1181	3629
1330 - 1430	1300	340	295	249	319	1190	3693
1345 - 1445	1293	333	309	265	326	1181	3707
1400 - 1500	1301	331	306	268	310	1174	3690

PEAK HR	1293	333	309	265	326	1181	3707
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Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA
 Reliable, Original & Authentic Results
 Ph.88196847, Fax 88196849, Mob.0418-239019

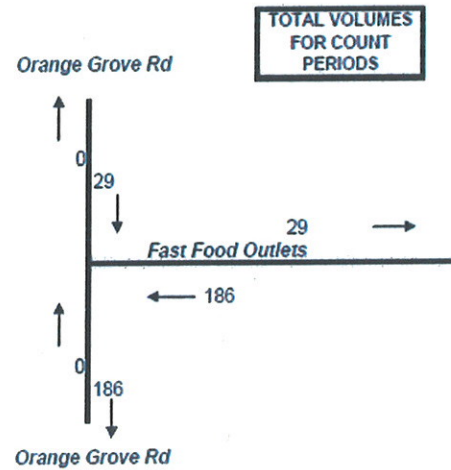
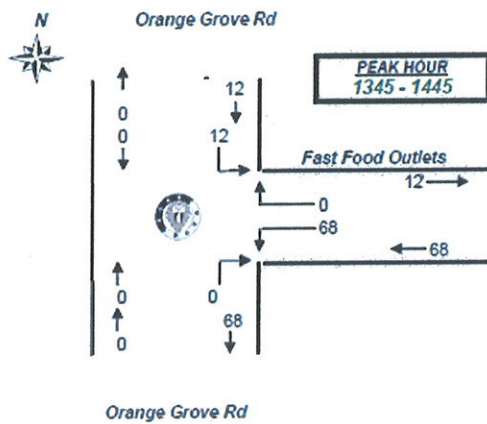
Client : Ken Dobinson & Associates
 Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
 Day/Date : Saturday 30th April 2011

All Vehicles

	NORTH Orange Grove Rd		EAST Fast Food Outlets		SOUTH Orange Grove Rd		
Time Per	T	L	R	L	R	T	TOT
1200 - 1215		2	0	13	0		15
1215 - 1230		3	0	23	0		26
1230 - 1245		2	0	9	0		11
1245 - 1300		2	0	15	0		17
1300 - 1315		4	0	17	0		21
1315 - 1330		2	0	15	0		17
1330 - 1345		2	0	12	0		14
1345 - 1400		7	0	18	0		25
1400 - 1415		2	0	25	0		27
1415 - 1430		2	0	15	0		17
1430 - 1445		1	0	10	0		11
1445 - 1500		0	0	14	0		14
Period End	0	29	0	186	0	0	215

	NORTH Orange Grove Rd		EAST Fast Food Outlets		SOUTH Orange Grove Rd		
Peak Per	T	L	R	L	R	T	TOT
1200 - 1300	0	9	0	80	0	0	69
1215 - 1315	0	11	0	64	0	0	75
1230 - 1330	0	10	0	56	0	0	66
1245 - 1345	0	10	0	59	0	0	69
1300 - 1400	0	15	0	62	0	0	77
1315 - 1415	0	13	0	70	0	0	83
1330 - 1430	0	13	0	70	0	0	83
1345 - 1445	0	12	0	68	0	0	80
1400 - 1500	0	5	0	64	0	0	69

PEAK HR	12	0	68	0	80
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Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA
 Reliable, Original & Authentic Results
 Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
 Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
 Day/Date : Saturday 30th April 2011

All Vehicles

	SOUTH Homepride Ave		
Time Per	IN	OUT	TOT
1200 - 1215	32	23	55
1215 - 1230	30	24	54
1230 - 1245	27	27	54
1245 - 1300	18	32	50
1300 - 1315	15	15	30
1315 - 1330	20	17	37
1330 - 1345	19	27	46
1345 - 1400	23	39	62
1400 - 1415	32	36	68
1415 - 1430	26	49	75
1430 - 1445	15	27	42
1445 - 1500	32	26	58
Period End	289	342	631

	SOUTH Homepride Ave		
Peak Per	IN	OUT	TOT
1200 - 1300	107	106	213
1215 - 1315	90	98	188
1230 - 1330	80	91	171
1245 - 1345	72	91	163
1300 - 1400	77	98	175
1315 - 1415	94	119	213
1330 - 1430	100	151	251
1345 - 1445	96	151	247
1400 - 1500	105	138	243

PEAK HR	96	151	247
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R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Saturday 30th April 2011

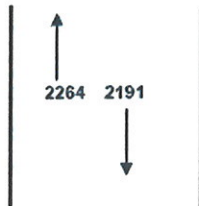
All Vehicles			
MARKETS			
Combined			
Time Per	IN	OUT	TOT
1200 - 1215	215	168	383
1215 - 1230	187	200	387
1230 - 1245	191	171	362
1245 - 1300	192	194	386
1300 - 1315	195	170	365
1315 - 1330	185	170	355
1330 - 1345	187	151	338
1345 - 1400	181	191	372
1400 - 1415	197	208	405
1415 - 1430	207	215	422
1430 - 1445	182	179	361
1445 - 1500	165	174	339
Period End	2264	2191	4455

MARKETS			
Combined			
Peak Per	IN	OUT	TOT
1200 - 1300	785	733	1518
1215 - 1315	785	735	1500
1230 - 1330	743	705	1448
1245 - 1345	739	685	1424
1300 - 1400	728	682	1410
1315 - 1415	730	720	1450
1330 - 1430	772	765	1537
1345 - 1445	767	793	1560
1400 - 1500	751	776	1527

PEAK HR	767	793	1560
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TOTAL VOLUMES FOR COUNT PERIODS

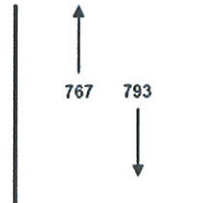
Markets



From Streets

PEAK HOUR 1345 - 1445

Markets



From Streets



Parking Accumulation

Total Vehicles at Start
651

Time Per
1200 - 1215
1215 - 1230
1230 - 1245
1245 - 1300
1300 - 1315
1315 - 1330
1330 - 1345
1345 - 1400
1400 - 1415
1415 - 1430
1430 - 1445
1445 - 1500

All Areas Parking
698
685
705
703
728
723
759
749
738
730
733
724
717

Total Vehicles at Finish

Factory Outlet Centre, Orange Grove Road, Warwick Farm



R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Saturday 30th April 2011



Zone	Location	Capacity	At Start 1500	At Finish 1800
A	MacDonald's / Krispy Kreme	172	120	119
B	Ground Level Parking Megacentre	183	168	180
C	Basement Car Park Megacentre	548	97	137
D	New Car Park East Megacentre	372	19	16
E	Northern Unsealed Car Park	?	0	0
F	Parking Viscount Place North	47	23	20
G	Parking Viscount Place South	68	41	46
H	Ground Level Parking Markets	215	161	165
I	Southern Unsealed Car Park	?	0	0
J	Fast Food Etc Parking	62	22	34
Total Vehicles Parked		1667	651	717
Number of Vacant spaces			1016	950
% of Capacity used			39.1%	43.0%

Unsealed car parking areas not included in capacities or parking percentages



R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Ken Dobinson & Associates
Job No/Name : 3572 LIVERPOOL Mega Centre & Markets
Day/Date : Saturday 30th April 2011

PEAK HOUR
1345 - 1445

Time Period	NORTH		EAST		SOUTH		TOTAL
	Orange Grove	UNCLASSIFIED	Viscount PI	UNCLASSIFIED	Orange Grove	UNCLASSIFIED	
1200 - 1215	0		1		0		1
1215 - 1230	0		0		0		0
1230 - 1245	0		0		0		0
1245 - 1300	0		8		0		8
1300 - 1315	0		0		0		0
1315 - 1330	0		0		0		0
1330 - 1345	2		1		0		3
1345 - 1400	2		5		0		7
1400 - 1415	0		0		0		0
1415 - 1430	0		1		0		1
1430 - 1445	0		2		0		2
1445 - 1500	0		1		0		1
Period End	4		19		0		23

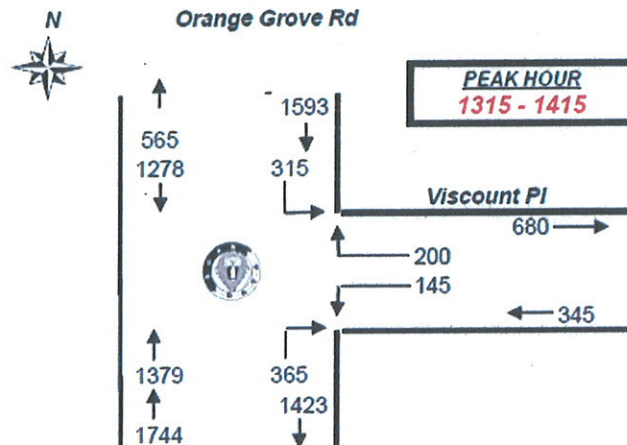
Peak Period	NORTH		EAST		SOUTH		TOT
	Orange Grove	UNCLASSIFIED	Viscount PI	UNCLASSIFIED	Orange Grove	UNCLASSIFIED	
1200 - 1300	0		9		0		9
1215 - 1315	0		8		0		8
1230 - 1330	0		8		0		8
1245 - 1345	2		9		0		11
1300 - 1400	4		6		0		10
1315 - 1415	4		6		0		10
1330 - 1430	4		7		0		11
1345 - 1445	2		8		0		10
1400 - 1500	0		4		0		4

PEAK HR	2	8	0	10
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Factory Outlet Centre, Orange Grove Road, Warwick Farm

Client : Ken Dobinson & Associates
 Job No/Name : 2743 LIVERPOOL Viscount PI 2
 Day/Date : Saturday 4th July 2009

	NORTH Orange Grove Rd		EAST Viscount PI		SOUTH Orange Grove Rd		
Peak Per	T	L	R	L	R	T	TOT
0830 - 0930	213	41	27	6	57	250	594
0845 - 0945	893	188	102	92	208	888	2371
0900 - 1000	930	204	108	114	214	901	2471
0915 - 1015	940	230	128	135	259	927	2619
0930 - 1030	997	232	142	148	280	965	2764
0945 - 1045	3664	221	152	166	293	1004	5500
1000 - 1100	3700	227	172	171	337	1043	5650
1015 - 1115	3759	236	178	180	325	1080	5758
1030 - 1130	3783	253	175	183	331	1064	5789
1045 - 1145	1164	284	181	188	366	1021	3204
1100 - 1200	1206	281	173	173	370	1034	3237
1115 - 1215	1171	255	175	146	365	1073	3185
1130 - 1230	1200	269	154	129	389	3845	5986
1145 - 1245	1254	286	154	103	372	3926	6095
1200 - 1300	1223	325	162	96	368	4026	6200
1215 - 1315	1282	361	157	100	374	4066	6340
1230 - 1330	1201	335	186	114	362	1349	3547
1245 - 1345	1175	329	168	109	364	1410	3555
1300 - 1400	1229	316	194	129	374	1374	3616
1315 - 1415	1278	315	200	145	365	1379	3682
1330 - 1430	1357	329	219	162	370	1395	3832
1345 - 1445	1453	325	231	183	369	1353	3914
1400 - 1500	1367	305	213	203	352	1369	3809
1415 - 1515	1287	276	212	204	345	1315	3639
1430 - 1530	1255	270	186	186	309	1310	3516
1445 - 1545	1208	256	204	182	280	1248	3378
1500 - 1600	1223	248	205	171	270	1233	3350
1515 - 1615	1226	244	212	166	249	1293	3390
1530 - 1630	1196	213	223	173	240	1290	3335
PEAK HR	1278	315	200	145	365	1379	3682



Factory Outlet Centre, Orange Grove Road, Warwick Farm

Client : Ken Dobinson & Associates
 Job No/Name : 2743 LIVERPOOL Viscount PI 2
 Day/Date : Saturday 4th July 2009

Parking Accumulation

MARKETS			
Combined			
Peak Per	IN	OUT	TOT
0830 - 0930	437	228	665
0845 - 0945	460	271	731
0900 - 1000	481	302	783
0915 - 1015	553	355	908
0930 - 1030	579	386	965
0945 - 1045	587	449	1036
1000 - 1100	636	501	1137
1015 - 1115	641	515	1156
1030 - 1130	672	542	1214
1045 - 1145	739	546	1285
1100 - 1200	750	550	1300
1115 - 1215	719	615	1334
1130 - 1230	765	649	1414
1145 - 1245	755	690	1445
1200 - 1300	793	751	1544
1215 - 1315	828	753	1581
1230 - 1330	781	827	1608
1245 - 1345	788	822	1610
1300 - 1400	778	856	1634
1315 - 1415	777	864	1641
1330 - 1430	795	825	1620
1345 - 1445	784	852	1636
1400 - 1500	739	840	1579
1415 - 1515	692	827	1519
1430 - 1530	644	807	1451
1445 - 1545	599	785	1384
1500 - 1600	587	751	1338
1515 - 1615	550	739	1289
1530 - 1630	510	735	1245

PEAK HR	777	864	1641
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Total Vehicles at Start
314

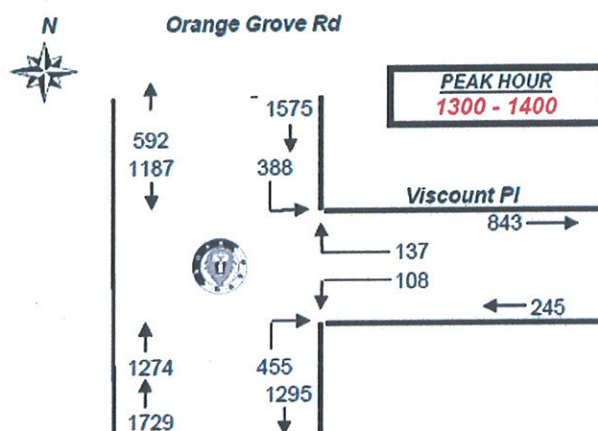
All Areas Parking
383
426
473
523
572
605
671
716
710
740
797
846
903
940
901
962
968
982
976
916
934
904
889
886
866
803
754
723
680
639
565
498
516

Total Vehicles at Finish

Factory Outlet Centre, Orange Grove Road, Warwick Farm

Client : Ken Dobinson & Associates
 Job No/Name : 2743 LIVERPOOL Viscount PI 2
 Day/Date : Sunday 5th July 2009

	NORTH Orange Grove Rd		EAST Viscount PI		SOUTH Orange Grove Rd		
Peak Per	T	L	R	L	R	T	TOT
0900 - 1000	147	42	26	15	51	127	408
0915 - 1015	896	229	85	62	240	808	2320
0930 - 1030	890	230	93	61	264	900	2438
0945 - 1045	953	275	88	65	296	959	2636
1000 - 1100	967	279	92	73	320	1014	2745
1015 - 1115	987	274	114	84	337	1094	2890
1030 - 1130	1082	310	118	82	344	1107	3043
1045 - 1145	1111	321	140	83	362	1146	3163
1100 - 1200	1219	348	147	74	383	1170	3341
1115 - 1215	1269	382	143	77	407	1169	3447
1130 - 1230	1282	376	155	79	444	1241	3577
1145 - 1245	1241	375	125	74	453	1221	3489
1200 - 1300	1165	370	135	87	450	1225	3432
1215 - 1315	1092	359	133	93	432	1261	3370
1230 - 1330	1131	372	130	99	414	1226	3372
1245 - 1345	1190	365	139	107	441	1264	3506
1300 - 1400	1187	388	137	108	455	1274	3549
1315 - 1415	1259	378	149	115	440	1230	3571
1330 - 1430	1161	357	168	107	429	1220	3442
1345 - 1445	1067	342	187	115	403	1271	3385
1400 - 1500	1043	292	204	120	385	1304	3348
1415 - 1515	1074	307	206	111	364	1335	3397
1430 - 1530	1075	297	204	144	361	1342	3423
1445 - 1545	1133	302	197	129	332	1336	3429
1500 - 1600	1129	312	187	126	321	1323	3398
1515 - 1615	1076	291	183	116	314	1314	3294
1530 - 1630	1171	291	201	105	300	1340	3408
1545 - 1645	1129	271	254	136	268	1303	3361
1600 - 1700	1125	236	303	180	233	1256	3333
1615 - 1715	1101	202	394	237	207	1257	3398
1630 - 1730	980	168	415	271	166	1239	3239
PEAK HR	1187	388	137	108	455	1274	3549



Factory Outlet Centre, Orange Grove Road, Warwick Farm

Client : Ken Dobinson & Associates
 Job No/Name : 2743 LIVERPOOL Viscount PI 2
 Day/Date : Saturday 4th July 2009

Parking Accumulation

Total Vehicles at Start
292

MARKETS			
Combined			
Peak Per	IN	OUT	TOT
0900 - 1000	440	228	668
0915 - 1015	518	247	765
0930 - 1030	555	276	831
0945 - 1045	624	326	950
1000 - 1100	663	380	1043
1015 - 1115	677	460	1137
1030 - 1130	728	516	1244
1045 - 1145	772	561	1333
1100 - 1200	821	581	1402
1115 - 1215	883	598	1481
1130 - 1230	922	644	1566
1145 - 1245	929	633	1562
1200 - 1300	915	685	1600
1215 - 1315	887	739	1626
1230 - 1330	869	793	1662
1245 - 1345	899	878	1777
1300 - 1400	944	936	1880
1315 - 1415	917	959	1876
1330 - 1430	886	963	1849
1345 - 1445	834	958	1792
1400 - 1500	762	929	1691
1415 - 1515	767	970	1737
1430 - 1530	766	987	1753
1445 - 1545	752	967	1719
1500 - 1600	742	965	1707
1515 - 1615	715	901	1616
1530 - 1630	691	835	1526
1545 - 1645	630	806	1436
1600 - 1700	562	824	1386
1615 - 1715	480	883	1363
1630 - 1730	387	900	1287

All Areas Parking
343
405
430
504
614
684
728
787
831
896
939
1027
1116
1174
1235
1257
1264
1250
1256
1265
1222
1173
1132
1098
1019
952
917
875
833
808
741
613
430
295

PEAK HR	944	936	1880
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Total Vehicles at Finish

VARGA TRAFFIC PLANNING Pty Ltd

Transport, Traffic and Parking Consultants



ACN 071 762 537 ABN 88 071 762 537

9 May 2011
Ref 11114

Dobinson & Associates
1 Brunel Close
CHERYBROOK NSW 2126

Attn: Mr Ken Dobinson
Kdob5500@bigpond.net.au

Dear Ken,

ORANGE GROVE ROAD & VISCOUNT PLACE, WARWICK FARM CAPACITY ANALYSIS

As requested, we have undertaken a capacity analysis of the subject intersection during the weekday afternoon peak period, based on the existing and projected future traffic volumes you have provided.

A copy of those existing traffic volumes as used in this analysis is attached. The projected additional traffic volumes comprised 182 vph IN and 158 vph OUT, or a total of an additional 340 vph.

The operational performance of the intersection was analysed using the SIDRA capacity analysis program. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

The results of the SIDRA analysis are also attached and are summarised in the table below.

RESULTS OF SIDRA CAPACITY ANALYSIS ORANGE GROVE ROAD & VISCOUNT PLACE		
	EXISTING	PROPOSED
LOS	B	B
D/S	0.598	0.701
AVD	14.7	17.7

LOS - Level of Service; D/S - Degree of Saturation; AVD
Average Vehicle Delays

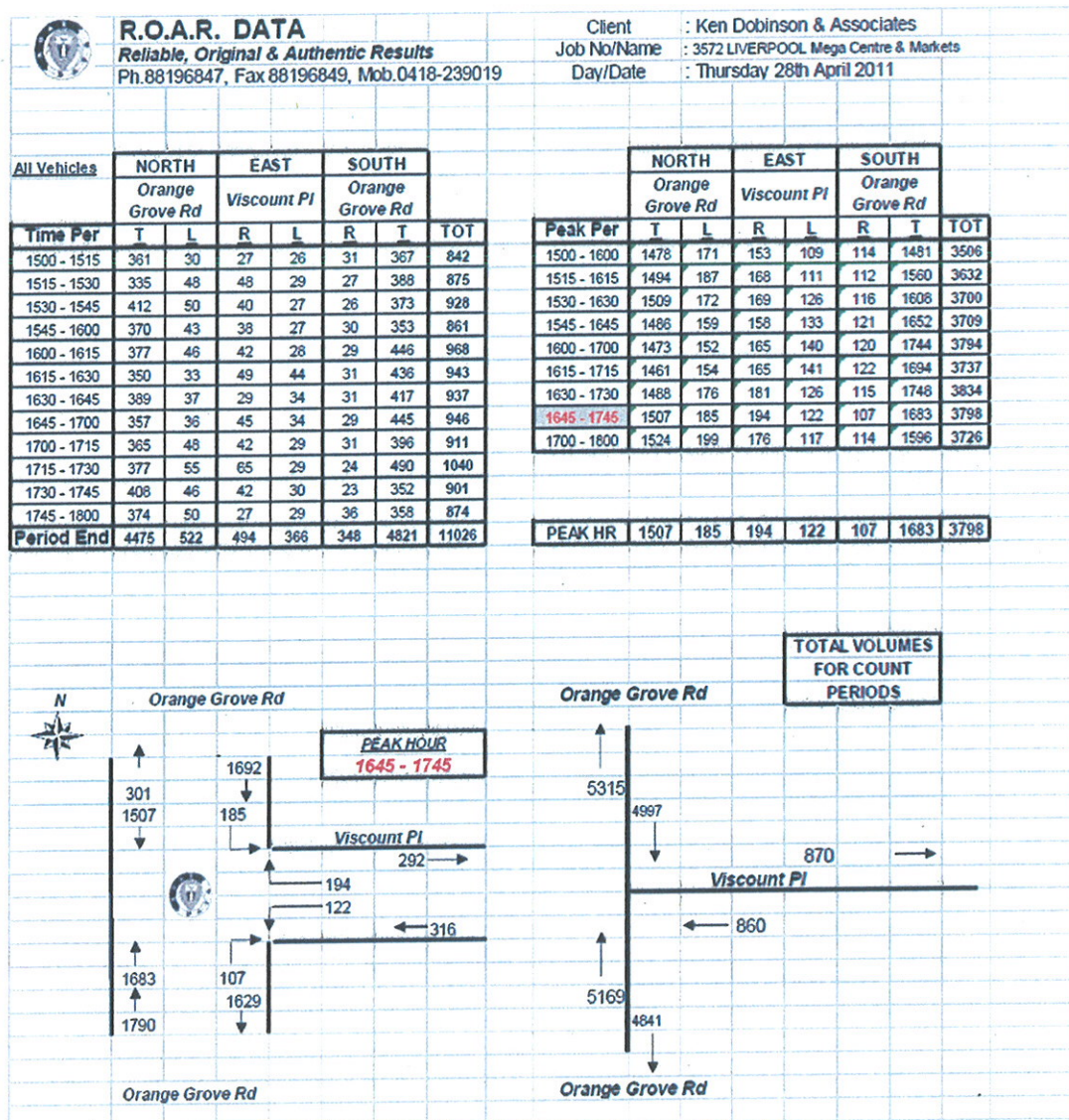
The results of the capacity analysis confirm that the projected additional traffic volumes will not have any unacceptable traffic implications in terms of road network capacity, and that no improvements will be required to the existing intersection configuration.

Please do not hesitate to contact me on telephone 9904 3224 should you have any enquiries.

Yours sincerely

Robert Varga
Director
Varga Traffic Planning Pty Ltd

Suite 6, 20 Young Street, Neutral Bay NSW 2089 - PO Box 1868, Neutral Bay NSW 2089
Ph: 9904 3224 Fax: 9904 3228, Email: varga@vtp.net.au



MOVEMENT SUMMARY

Site: Existing PM

Orange Grove Rd & Viscount PI

Signals - Fixed Time Cycle Time = 135 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orange Grove Rd (S)											
2	T	1683	3.0	0.588	8.0	LOS A	24.9	179.1	0.49	0.45	47.3
3	R	107	0.0	0.249	28.4	LOS B	3.1	21.9	0.65	0.76	32.2
Approach		1790	2.8	0.588	9.2	LOS A	24.9	179.1	0.50	0.47	46.2
East: Viscount PI (E)											
4	L	122	0.0	0.579	47.3	LOS D	8.1	56.7	0.84	0.75	18.9
6	R	194	0.0	0.321	58.1	LOS E	7.3	51.4	0.93	0.77	17.3
Approach		316	0.0	0.580	54.0	LOS D	8.1	56.7	0.89	0.76	17.9
North: Orange Grove Rd (N)											
7	L	185	0.0	0.179	9.2	LOS A	2.6	18.1	0.16	0.69	47.7
8	T	1507	3.0	0.598	13.6	LOS A	27.8	199.4	0.61	0.56	41.8
Approach		1692	2.7	0.598	13.1	LOS A	27.8	199.4	0.56	0.57	42.3
All Vehicles		3798	2.5	0.598	14.7	LOS B	27.8	199.4	0.56	0.54	39.4

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).

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

Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	20	61.6	LOS F	0.1	0.1	0.96	0.96
P3	Across E approach	20	12.9	LOS B	0.0	0.0	0.44	0.44
All Pedestrians		40	37.3				0.70	0.70

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).

Level of Service (Worst Movement): LOS F. LOS Method for individual pedestrian movements: Delay (HCM).

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 Project: C:\Users\Chris\Documents\SIDRA 5 Jobs\111114 Orange Grove\ORA_1\15X.sip
 8000110, VARGA TRAFFIC PLANNING, SINGLE

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MOVEMENT SUMMARY

Site: Proposed PM

Orange Grove Rd & Viscount PI
 Signals - Fixed Time Cycle Time = 105 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles										
Mov ID	Turn	Demand Flow veh/h	HV %	Seg Satn v/c	Average Delay sec	Level of Service	95% Back of Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh
South: Orange Grove Rd (S)										
2	T	1683	3.0	0.651	10.4	LOS A	25.2	180.6	0.63	0.58
3	R	197	0.0	0.448	37.8	LOS C	6.0	41.7	0.91	0.82
Approach		1880	2.7	0.651	13.3	LOS A	25.2	180.6	0.66	0.60
East: Viscount PI (E)										
4	L	199	0.0	0.698	35.1	LOS C	9.8	68.8	0.80	0.81
6	R	279	0.0	0.359	42.5	LOS D	7.9	55.1	0.90	0.78
Approach		478	0.0	0.699	39.4	LOS C	9.8	68.8	0.86	0.79
North: Orange Grove Rd (N)										
7	L	277	0.0	0.269	9.7	LOS A	4.0	27.7	0.22	0.70
8	T	1507	3.0	0.701	17.7	LOS B	28.1	201.5	0.78	0.71
Approach		1784	2.5	0.701	16.5	LOS B	28.1	201.5	0.69	0.71
All Vehicles		4142	2.3	0.701	17.7	LOS B	28.1	201.5	0.70	0.67

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	20	46.7	LOS E	0.1	0.1	0.94	0.94
P3	Across E approach	20	16.6	LOS B	0.0	0.0	0.56	0.56
All Pedestrians		40	31.6				0.75	0.75

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS E. LOS Method for individual pedestrian movements: Delay (HCM).

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 Project: C:\Users\Chris\Documents\SIDRA 5 Jobs\111114 Orange Grove\ORA_VISP.sip
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ILLUSTRATIONS

Figure 1 - Megacentra/Markets Site Location

Figure 2 - Factory Outlet Centre Building Layout

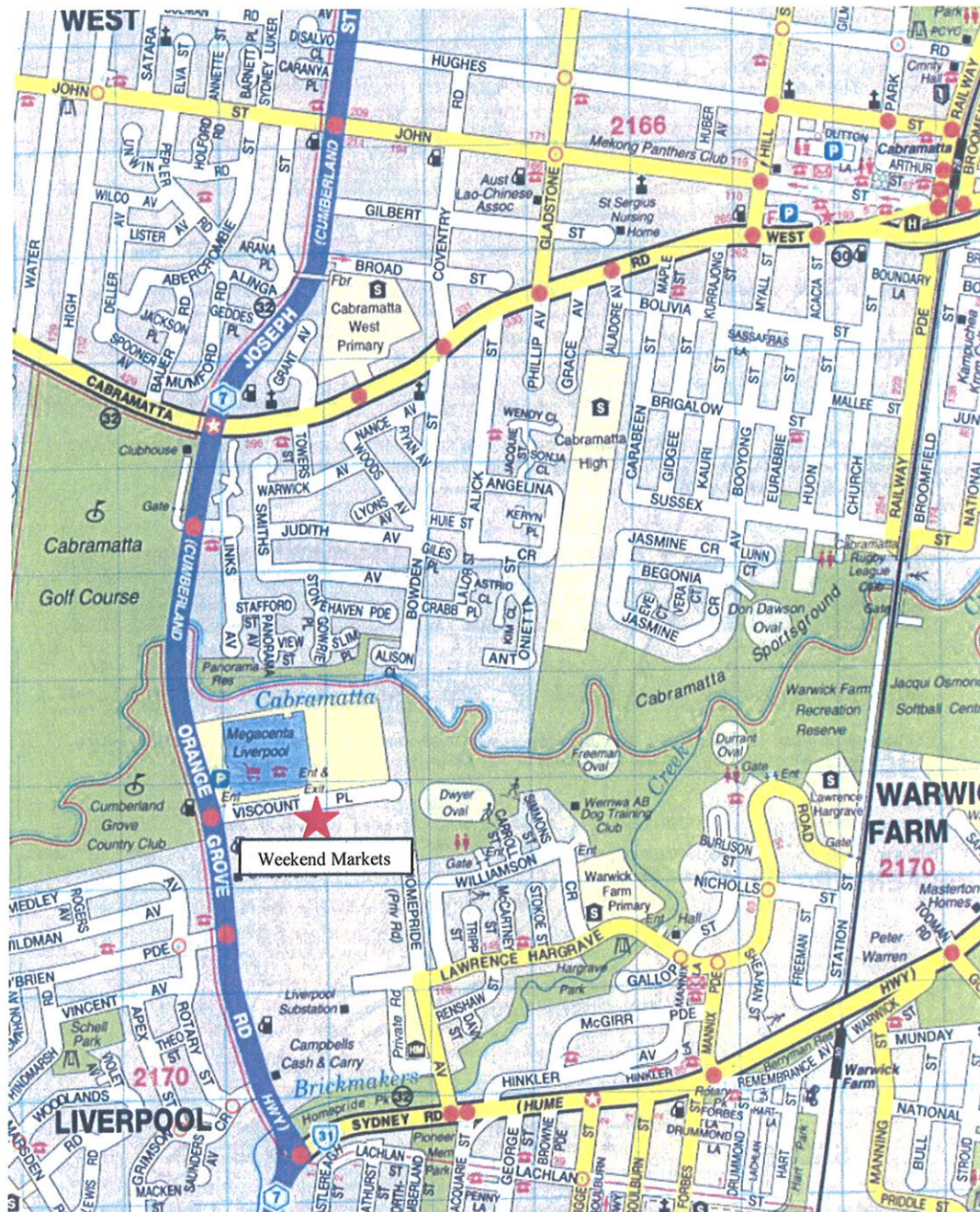


Figure 1
Megacentra/Markets Site Location



floor plan

