

Planning Proposal for a Mixed-Use Development

**14-20 Parkes Street,  
Parramatta**

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**TRAFFIC AND PARKING ASSESSMENT REPORT**

27 July 2015

Ref 14872

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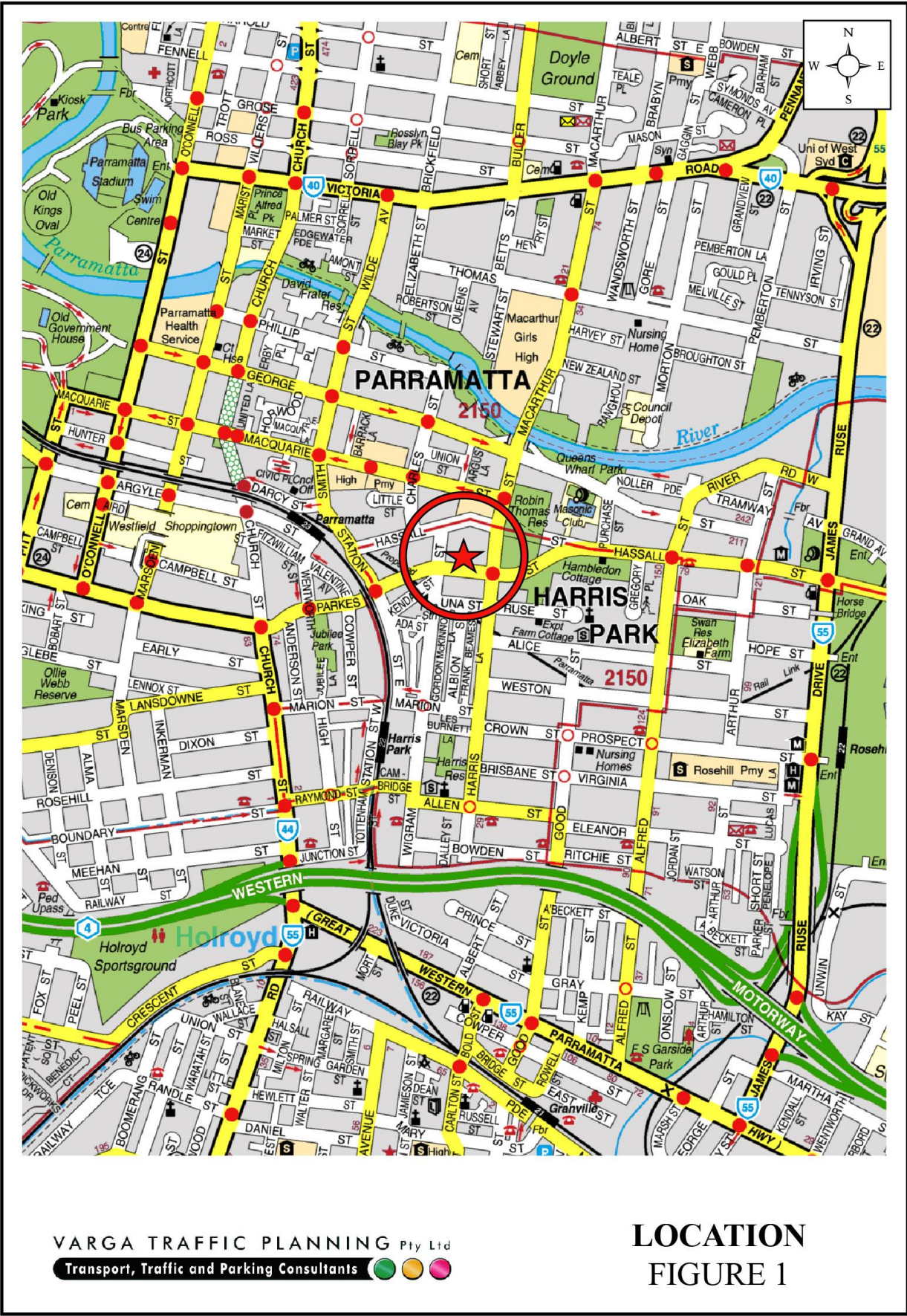
## **1. INTRODUCTION**

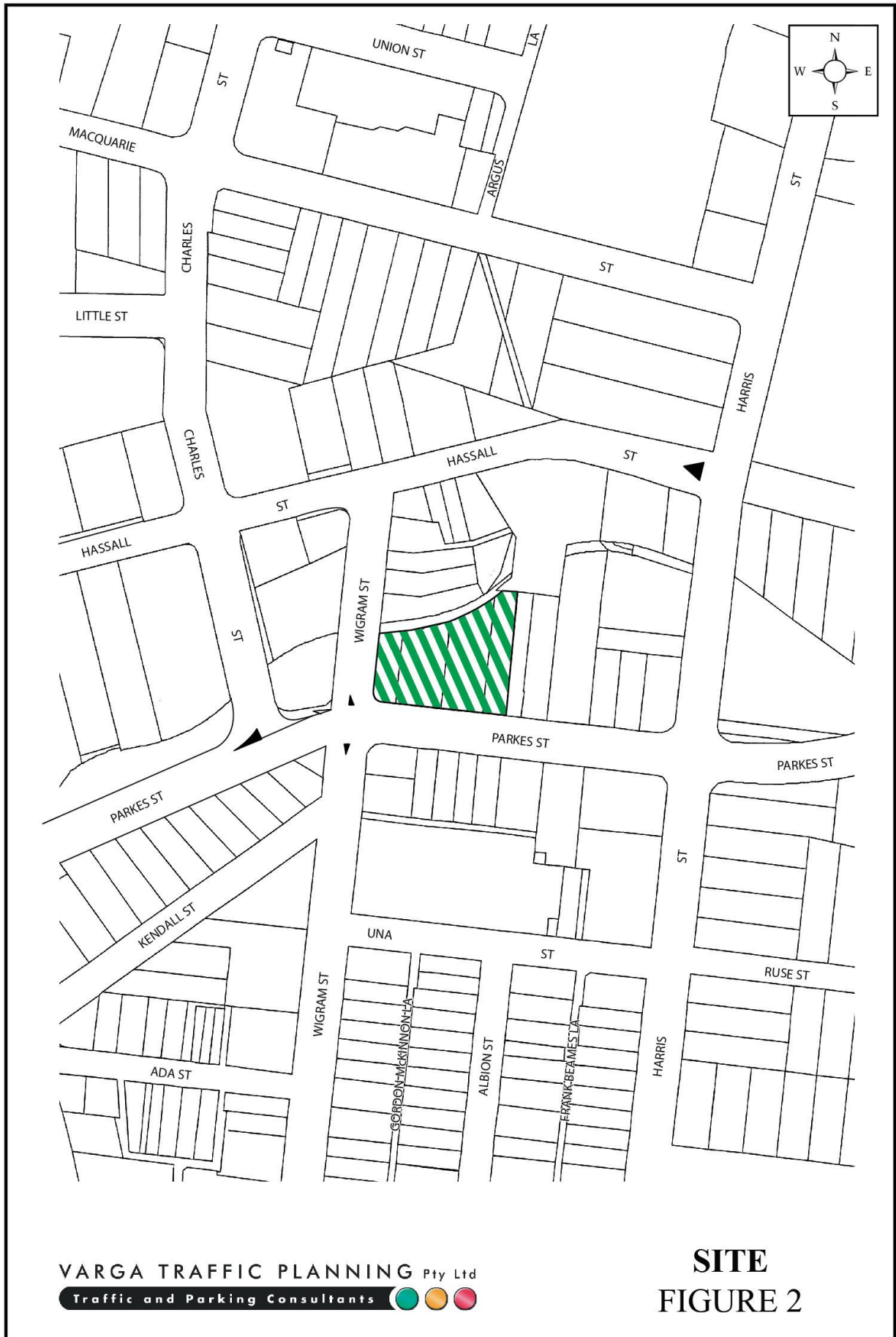
This report has been prepared to accompany a planning proposal to Parramatta City Council for a proposed mixed-use high rise mixed-use residential apartment building to be located at 14-20 Parkes Street, Parramatta (Figures 1 and 2).

The planning proposal will involve the demolition of the existing commercial buildings on the site to facilitate the construction of a new mixed-use residential apartment building with a ground floor retail component. Off-street car parking is to be accommodated in a multi-level above ground car park which will ultimately comply with Council's Parking Code requirements.

The purpose of this report is to assess the traffic and parking implications of the planning proposal and to that end this report:

- describes the site and provides details of the planning proposal
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network
- estimates the traffic generation potential of the planning proposal, and assigns that traffic generation to the road network serving the site
- assesses the traffic implications of the planning proposal in terms of road network capacity
- reviews the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards
- assesses the adequacy and suitability of the quantum of off-street car parking provided on the site.





## 2. PROPOSED DEVELOPMENT

### Site

The subject site is located at the north-eastern corner of the Parkes Street and Wigram Street intersection. The site has a street frontage of approximately 60 metres in length to Parkes Street, and approximately 28 metres in length to Wigram Street. The site occupies an area of approximately 2,830m<sup>2</sup>.

The subject site is currently occupied by three separate commercial buildings, each with respective vehicular access driveways to Parkes Street. The commercial buildings comprise a mix of two and five-storey buildings, and have a cumulative floor area of approximately 5,900m<sup>2</sup>.

### Proposed Development

The planning proposal will involve the demolition of the existing buildings on the site to facilitate the construction of a new mixed-use residential apartment building.

The following schemes have been investigated as part of the planning proposal, with varying building heights and unit mix as follows:

| Apartment Type | Scheme 1<br>(15 Storeys) | Scheme 2<br>(25 Storeys) | Scheme 3<br>(32 Storeys) | Scheme 4<br>(39 Storeys) | Scheme 5<br>(44 Storeys) |
|----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 bedroom      | 31                       | 52                       | 73                       | 97                       | 112                      |
| 2 bedrooms     | 83                       | 121                      | 158                      | 193                      | 218                      |
| 3 bedrooms     | 9                        | 16                       | 24                       | 31                       | 36                       |
| <b>TOTAL</b>   | <b>123</b>               | <b>189</b>               | <b>255</b>               | <b>321</b>               | <b>366</b>               |

Scheme 1 represents the existing development potential of the site under the current planning controls, whilst Scheme 5 represents the maximum development potential being considered as part of the planning proposal.

A retail component common to all schemes is proposed at Ground Level, with a cumulative floor area of 600m<sup>2</sup>.

Off-street car parking is proposed in an above ground multi-level car parking area, and the number of parking spaces to be provided will ultimately comply with Council's requirements. Vehicular access to the car parking facilities is to be provided via an entry/exit driveway located at the northern end of the Wigram Street site frontage.

Loading and servicing for planning proposed is expected to be undertaken by a variety of light commercial vehicles such as white vans, utilities and the like, which are capable of fitting into a conventional parking space. Garbage collection is expected to be undertaken by Council's waste contractor. These arrangements are to be reviewed in detail during the DA stage of the project.

### 3. TRAFFIC ASSESSMENT

#### Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by the Roads and Maritime Services is illustrated on Figure 3.

The M4 Motorway is classified by the RMS as a *State Road* and provides the key east-west road link in the area, linking Concord to Emu Plains. It typically carries three traffic lanes in each direction in the vicinity of the site, with opposing traffic flows separated by a central median island. All intersections with the M4 Motorway are grade-separated.

James Ruse Drive is also classified by the RMS as a *State Road* and provides the key north-south road link in the area, linking the Great Western Highway to Windsor Road. It typically carries three traffic lanes in each direction with turning bays provided at key locations.

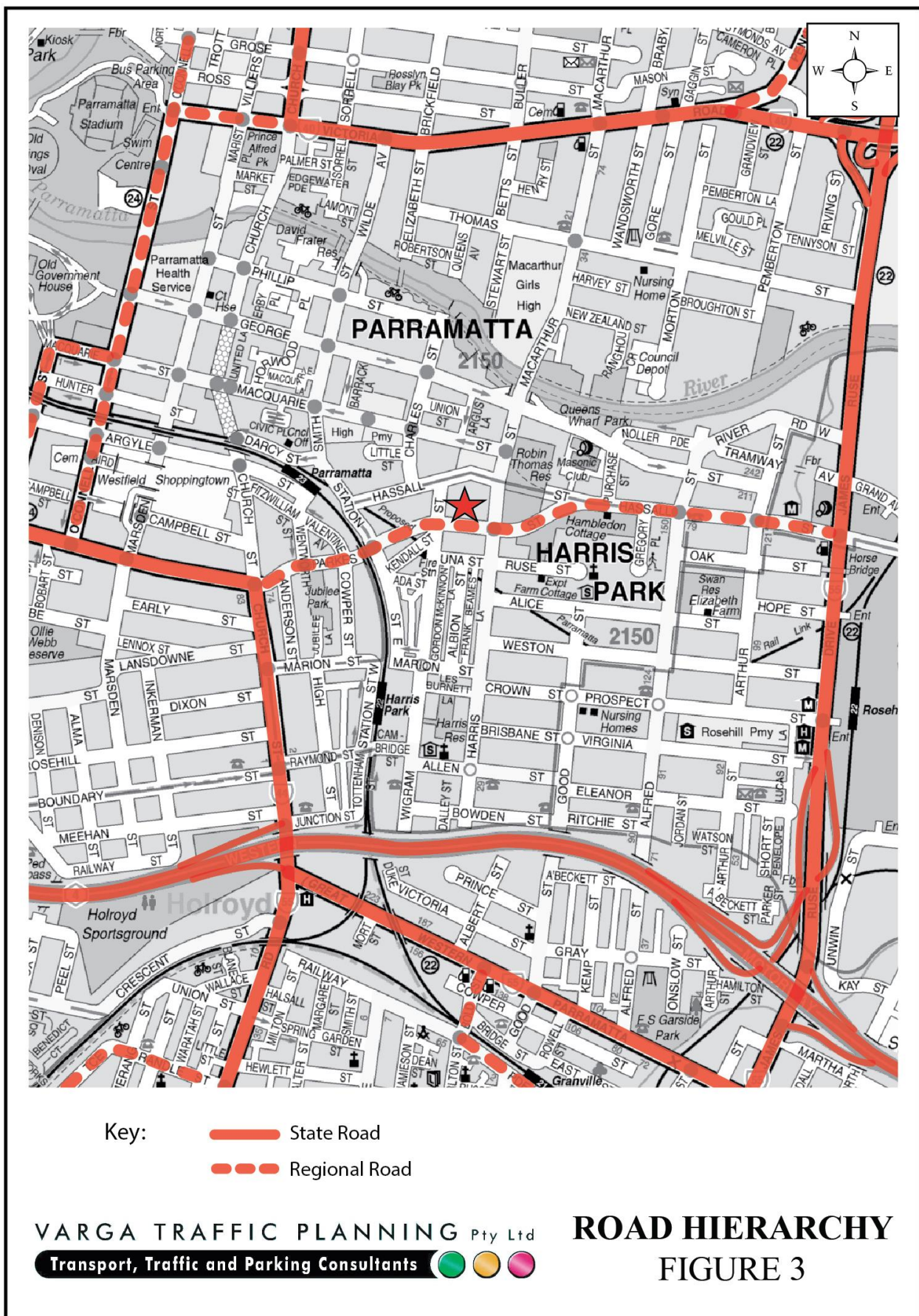
Parkes Street and Hassall Street (east of Parkes Street) are classified by the RMS as a *Regional Road* which provides the key east-west *collector route* through the area. It typically carries two traffic lanes in each direction in the vicinity of the site, with kerbside parking permitted at selected locations only, outside commuter peak periods.

Wigram Street is a local, unclassified road which is primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted along both sides of the road.

#### Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to the Parkes Street and Harris Street (north of Parkes Street)
- a 50 km/h SPEED LIMIT which applies to all other local roads in the area





- TRAFFIC SIGNALS in Parkes Street where it intersects with Wigram Street and also Harris Street
- a NO RIGHT-TURN restriction westbound in Parkes Street into Wigram Street
- a NO RIGHT-TURN restriction eastbound in Parkes Street onto Harris Street.

### **Sustainable Transport Options**

The proposed mixed-use building is located within the boundaries of the Parramatta City Centre where there is an extensive variety of sustainable transport options available such as train, bus, ferry, cycling and walking, as detailed below.

Parramatta Railway Station is located between Station Street and Argyle Street, approximately 400m west from the proposed development (approx. a 5 min walk). The Railway Station is a major railway interchange which services three train lines – The Blue Mountains Line, the Western Line and the Cumberland Line.

The Cumberland Line operates Monday to Friday only and offers two morning services and three afternoon services between Campbelltown and Blacktown. The Blue Mountains Line operates 7 days per week between Lithgow and Central, with generally one service per hour during off-peak periods, increasing to one service every 20-30min during peak periods. The Western Line operates 7 days per week between Emu Plains/Richmond and North Sydney/North Shore, with generally one service approximately every 15min during off-peak periods, increasing to one service approximately every 5-10min during peak periods.

A major bus interchange is also located at Parramatta Railway Station which, as previously mentioned, is approximately 400m west from the proposed mixed-use development (approx.. a 5 min walk).

In addition to the extensive range of train and bus services available in the Parramatta area, the Parramatta Rivercat Ferry service provides *express-only* services every hour between Circular Quay and Parramatta, 7 days a week. The Parramatta wharf is located at the northern

end of Charles Street, approximately 700m north of the proposed mixed-use building (approx. an 8 min walk).

### **Existing Traffic Conditions**

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken as part of this traffic study. The traffic surveys were undertaken in Wigram Street where it intersects with Parkes Street and also with Hassall Street. The results of the traffic surveys are reproduced in full in Appendix A and reveal that:

- two-way traffic flows in Parkes Street are typically in the order of 1,500 vph during peak periods
- two-way traffic flows in Wigram Street in front of the site are typically in the order of 350 vehicles per hour (vph) during peak periods
- two-way traffic flows in Hassall Street is typically less than 400 vph during peak periods.

### **Projected Traffic Generation**

An indication of the traffic generation potential of the planning proposal is provided by reference to the Roads and Maritime Services publication *Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation (October 2002)*.

The RMS *Guidelines* are based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the planning proposal:

#### **High Density Residential Flat Buildings in Metropolitan Regional Centres**

0.24 peak hour vehicle trips/dwelling

The RMS *Guidelines* also make the following observation in respect of high density residential flat buildings:

#### Definition

A *high density residential flat building* refers to a building containing 20 or more dwellings. This does not include aged or disabled persons housing. *High density residential flat buildings* are usually more than 5 levels, have basement level car parking and are located in close proximity to public transport services. The building may contain a component of commercial use.

#### Factors

The above rates include visitors, staff, service/delivery and on-street movements such as taxis and pick-up/set-down activities.

The RMS *Guidelines* do not nominate a traffic generation rate for small, local shops, referring only to major regional shopping centres incorporating supermarkets and department stores. For the purpose of this assessment therefore, the traffic generation rate of 2.0 peak hour vehicle trips per 100m<sup>2</sup> GFA nominated in the RMS *Guidelines* for *commercial premises* has been adopted in respect of the retail component of the planning proposal.

Application of the above traffic generation rates to the residential and retail components of each scheme is summarised in the table below, revealing that:

- under Scheme 1 which represents the existing development potential of the site under current planning controls yields a traffic generation potential of 42 vph
- under Scheme 5 which represents the maximum development potential of the site under the planning proposal yields a traffic generation potential of 100 vph
- the *nett* difference between Scheme 1 and Scheme 5 is 58 vph.

**Projected Future Traffic Generation Potential**

| Landuse      | Scheme 1<br>(15 Storeys) | Scheme 2<br>(25 Storeys) | Scheme 3<br>(32 Storeys) | Scheme 4<br>(39 Storeys) | Scheme 5<br>(44 Storeys) |
|--------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Residential  | 29.5 vph                 | 45.4 vph                 | 61.2 vph                 | 77.0 vph                 | 87.8 vph                 |
| Retail       | 12.0 vph                 | 12.0 vph                 | 12.0 vph                 | 12.0 vph                 | 12.0 vph                 |
| <b>TOTAL</b> | <b>41.5 vph</b>          | <b>57.4 vph</b>          | <b>73.2 vph</b>          | <b>89.0 vph</b>          | <b>99.8 vph</b>          |

The projected future traffic generation potential of the site should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to be generated by the existing commercial uses of the site, in order to determine the *nett increase (or decrease)* in traffic generation potential of the site expected to occur as a consequence of the planning proposal when compared with the previously approved development on the site.

Application of the *commercial premises* traffic generation rate nominated in the RMS *Guidelines* to the existing commercial buildings on the site which have a floor area of approximately 5,900m<sup>2</sup> yields a traffic generation potential of approximately 118 peak hour vehicle trips.

Accordingly, it is clear that *all* of the schemes being considered as part of this planning proposal would result in a *nett reduction* in the traffic generation potential of the site. In particular, it is noted that *Scheme 4* would result in a *nett reduction* in the traffic generation potential of the site of 18 vph as set out in the table below:

**Projected Nett Change in Peak Hour Traffic Generation Potential  
of the Site as a Consequence of the Planning Proposal**

|                                                                                        |                            |
|----------------------------------------------------------------------------------------|----------------------------|
| Projected Future Traffic Generation Potential (Scheme 4):                              | 99.8 vehicle trips         |
| Less Existing Commercial Buildings Traffic Generation Potential (5900m <sup>2</sup> ): | -118.0 vehicle trips       |
| <b>NETT CHANGE IN TRAFFIC GENERATION POTENTIAL:</b>                                    | <b>-18.2 vehicle trips</b> |

For the purposes of this assessment however, it has been assumed that the existing commercial buildings on the site are currently *vacant* and that *all* of the projected future traffic flows of up to 99.8 peak hour vehicle trips will be new or *additional* to the existing traffic flows currently using the adjacent road network.

### **Traffic Implications - Road Network Capacity**

The traffic implications of planning proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA program which is widely used by the RMS and many LGA's for this purpose. Criteria for evaluating the results of SIDRA analysis are reproduced in the following pages.

For the purposes of this assessment, the maximum traffic generation potential of the site under Scheme 4 has been adopted as it represents the maximum development potential of the site being considered as part of this planning proposal.

The detailed SIDRA *movement summaries* results pages are reproduced in full in Appendix B. The results of the SIDRA analysis are summarised in Table 3.1 and 3.2 below, revealing that:

#### Wigram Street & Parkes Street Intersection

- the intersection currently operates at *Level of Service “B”* under the existing traffic demands with total average vehicle delays in the order of 23.5 seconds/vehicle
- under the projected future Scheme 4 traffic demands expected to be generated by the planning proposal, the intersection will continue to operate at *Level of Service “B”*, with increases in average vehicle delays of ***less than*** 3 seconds/vehicle.

#### Wigram Street & Hassall Street Intersection

- the intersection currently operates at *Level of Service “A”* under the existing traffic demands with total average vehicle delays in the order of 4.6 seconds/vehicle
- under the projected future Scheme 4 traffic demands expected to be generated by the planning proposal, the intersection will continue to operate at *Level of Service “A”*, with increases in average vehicle delays of ***less than*** 1 second/vehicle.

In summary, it is clear that the planning proposal will not have any unacceptable traffic implications in terms of road network capacity.

| <b>TABLE 3.1 - RESULTS OF SIDRA ANALYSIS OF<br/>WIGRAM STREET &amp; PARKES STREET INTERSECTION</b> |                                    |             |                                                              |             |
|----------------------------------------------------------------------------------------------------|------------------------------------|-------------|--------------------------------------------------------------|-------------|
| <b>Key Indicators</b>                                                                              | <b>Existing<br/>Traffic Demand</b> |             | <b>Scheme 4<br/>Projected Development<br/>Traffic Demand</b> |             |
|                                                                                                    | <b>AM</b>                          | <b>PM</b>   | <b>AM</b>                                                    | <b>PM</b>   |
| <b>Level of Service</b>                                                                            | B                                  | B           | B                                                            | B           |
| <b>Degree of Saturation</b>                                                                        | 0.464                              | 0.397       | 0.490                                                        | 0.421       |
| <b>Average Vehicle Delay (secs/veh)</b>                                                            |                                    |             |                                                              |             |
| Wigram Street (south)                                                                              |                                    |             |                                                              |             |
| L                                                                                                  | 37.2                               | 33.9        | 35.0                                                         | 33.9        |
| T                                                                                                  | 38.1                               | 43.3        | 38.8                                                         | 43.7        |
| R                                                                                                  | 44.3                               | 49.6        | 47.0                                                         | 50.6        |
| Parkes Street (east)                                                                               |                                    |             |                                                              |             |
| L                                                                                                  | 30.6                               | 25.9        | 32.9                                                         | 27.3        |
| T                                                                                                  | 25.0                               | 20.3        | 27.3                                                         | 21.7        |
| Wigram Street (north)                                                                              |                                    |             |                                                              |             |
| L                                                                                                  | 38.7                               | 42.6        | 36.6                                                         | 41.0        |
| T                                                                                                  | 39.7                               | 43.8        | 44.3                                                         | 45.0        |
| R                                                                                                  | 44.3                               | 48.4        | 48.9                                                         | 49.5        |
| Parkes Street (west)                                                                               |                                    |             |                                                              |             |
| L                                                                                                  | 18.6                               | 15.5        | 20.4                                                         | 16.6        |
| T                                                                                                  | 13.3                               | 10.2        | 15.1                                                         | 11.3        |
| R                                                                                                  | 19.5                               | 16.3        | 21.1                                                         | 17.3        |
| <b>TOTAL AVERAGE VEHICLE DELAY</b>                                                                 | <b>23.5</b>                        | <b>21.1</b> | <b>25.6</b>                                                  | <b>22.3</b> |

WIG\_PARX

WIG\_PARP

| <b>TABLE 3.2 - RESULTS OF SIDRA ANALYSIS OF<br/>WIGRAM STREET &amp; HASSALL STREET INTERSECTION</b> |                                    |            |                                                              |            |
|-----------------------------------------------------------------------------------------------------|------------------------------------|------------|--------------------------------------------------------------|------------|
| <b>Key Indicators</b>                                                                               | <b>Existing<br/>Traffic Demand</b> |            | <b>Scheme 4<br/>Projected Development<br/>Traffic Demand</b> |            |
|                                                                                                     | <b>AM</b>                          | <b>PM</b>  | <b>AM</b>                                                    | <b>PM</b>  |
| <b>Level of Service</b>                                                                             | A                                  | A          | A                                                            | A          |
| <b>Degree of Saturation</b>                                                                         | 0.127                              | 0.120      | 0.153                                                        | 0.130      |
| <b>Average Vehicle Delay (secs/veh)</b>                                                             |                                    |            |                                                              |            |
| Wigram Street (south) L                                                                             | 7.8                                | 7.6        | 7.8                                                          | 7.6        |
| R                                                                                                   | 7.5                                | 7.5        | 7.5                                                          | 7.5        |
| Hassall Street (east) L                                                                             | 4.6                                | 4.6        | 4.6                                                          | 4.6        |
| T                                                                                                   | 0.0                                | 0.0        | 0.0                                                          | 0.0        |
| Hassall Street (west) T                                                                             | 0.2                                | 0.1        | 0.3                                                          | 0.2        |
| R                                                                                                   | 4.8                                | 4.7        | 4.9                                                          | 4.8        |
| <b>TOTAL AVERAGE VEHICLE DELAY</b>                                                                  | <b>4.4</b>                         | <b>4.6</b> | <b>4.7</b>                                                   | <b>4.7</b> |

WIG\_HASX

WIG\_HASP

## Criteria for Interpreting Results of Sidra Analysis

### 1. Level of Service (LOS)

| LOS | Traffic Signals and Roundabouts                                                                        | Give Way and Stop Signs                         |
|-----|--------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 'A' | Good operation.                                                                                        | Good operation.                                 |
| 'B' | Good with acceptable delays and spare capacity.                                                        | Acceptable delays and spare capacity.           |
| 'C' | Satisfactory.                                                                                          | Satisfactory but accident study required.       |
| 'D' | Operating near capacity.                                                                               | Near capacity and accident study required.      |
| 'E' | At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode. | At capacity and requires other control mode.    |
| 'F' | Unsatisfactory and requires additional capacity.                                                       | Unsatisfactory and requires other control mode. |

### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

| Level of Service | Average Delay per Vehicle (secs/veh) | Traffic Signals, Roundabout                                                                            | Give Way and Stop Signs                      |
|------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------|
| A                | less than 14                         | Good operation.                                                                                        | Good operation.                              |
| B                | 15 to 28                             | Good with acceptable delays and spare capacity.                                                        | Acceptable delays and spare capacity.        |
| C                | 29 to 42                             | Satisfactory.                                                                                          | Satisfactory but accident study required.    |
| D                | 43 to 56                             | Operating near capacity.                                                                               | Near capacity and accident study required.   |
| E                | 57 to 70                             | At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode. | At capacity and requires other control mode. |

### 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

<sup>1</sup> The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

## 4. PARKING IMPLICATIONS

### Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 5 and comprise:

- NO STOPPING/NO PARKING restrictions along both sides of Parkes Street, including along the site frontage
- NO STOPPING restrictions along both sides of Hassall Street
- 4 HOUR PARKING restrictions along both sides of Wigram Street, and various sections along Hassall Street
- BUS ZONES at regular intervals along Parkes Street.

### Off-Street Parking Provisions

The *maximum* number of off-street parking spaces which may be provided on the site are specified in *Parramatta City Centre Local Environmental Plan 2007, Section 22C – Car Parking* document in the following terms:

#### **Multi Dwelling Housing (1, 2 and 3 bedrooms)**

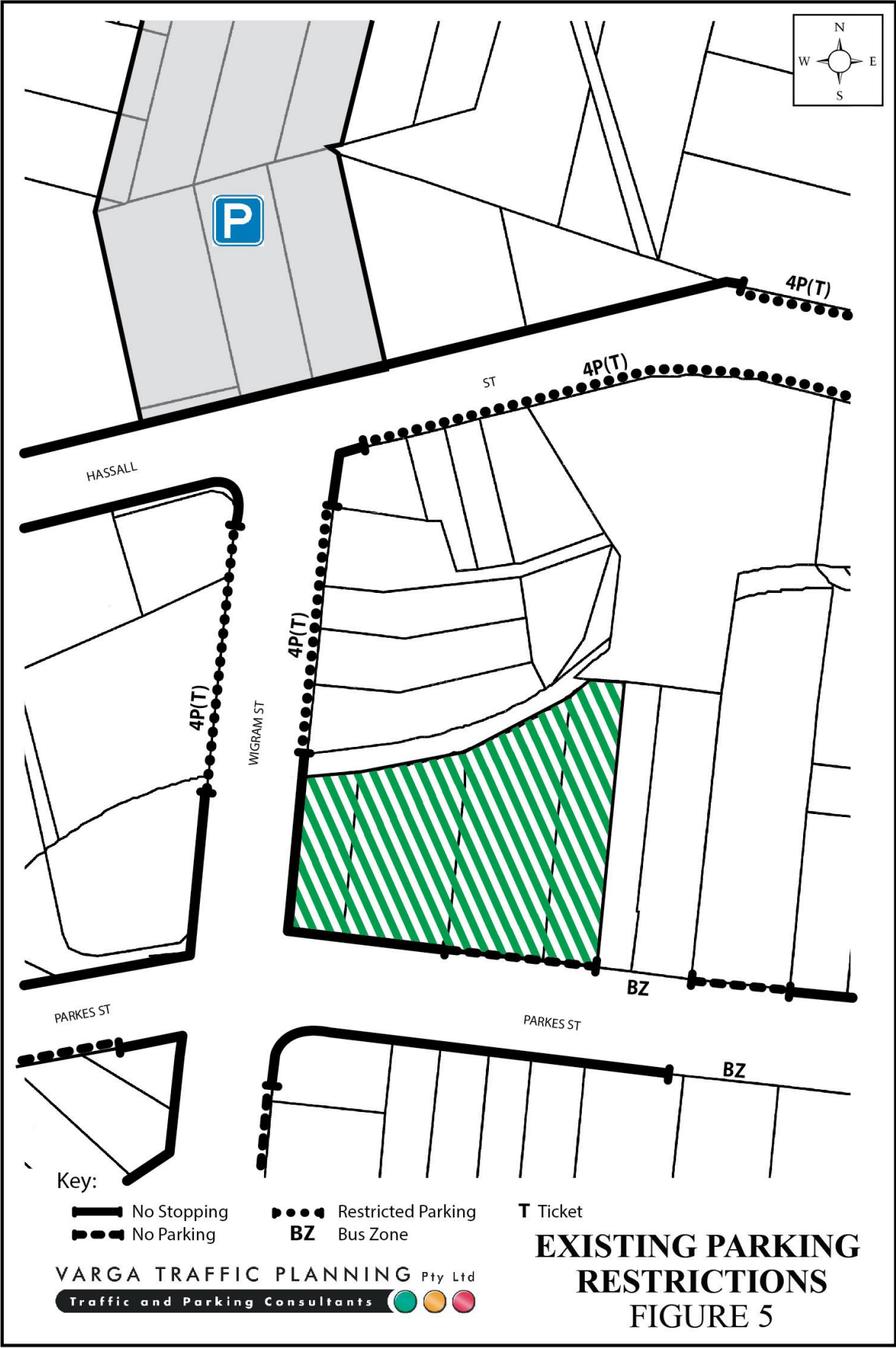
Residents: 1 space per dwelling

Visitors: 1 space per 5 dwellings

#### **Shops**

1 space per 30m<sup>2</sup> of gross floor area

Application of the above parking requirements to each of the schemes outlined in the development proposal yields a *maximum* off-street parking provision between 168 and 459 parking spaces as set out below:



**Maximum Parking Provisions Permitted  
On the Site by Parramatta City Centre LEP 2007**

| <b>Apartment Size</b> | <b>Scheme 1<br/>(15 Storeys)</b> | <b>Scheme 2<br/>(25 Storeys)</b> | <b>Scheme 3<br/>(32 Storeys)</b> | <b>Scheme 4<br/>(39 Storeys)</b> | <b>Scheme 5<br/>(44 Storeys)</b> |
|-----------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>Residents</b>      | 123.0 spaces                     | 189.0 spaces                     | 255.0 spaces                     | 321.0 spaces                     | 366.0 spaces                     |
| <b>Visitors</b>       | 24.6 spaces                      | 37.8 spaces                      | 51.0 spaces                      | 64.2 spaces                      | 73.2 spaces                      |
| <b>Retail</b>         | 20.0 spaces                      | 20.0 spaces                      | 20.0 spaces                      | 20.0 spaces                      | 20.0 spaces                      |
| <b>TOTAL</b>          | <b>167.6 spaces</b>              | <b>246.8 spaces</b>              | <b>326 spaces</b>                | <b>405.2 spaces</b>              | <b>459.2 spaces</b>              |

It is envisaged that the amount of car parking to be provided on the site will comply with Council's Parking Code requirements, noting that the Parramatta City Centre LEP 2007 specifies a *maximum* rather than a *minimum* parking requirement.

The geometric design layout of the proposed car parking facilities will be designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1* in respect of parking bay dimensions, ramp gradients and aisle widths.

In summary, the proposed parking facilities are capable of complying with the relevant requirements specified in both Council's Parking Code as well as the Australian Standards and it is therefore concluded that the proposed development could not be expected to have any unacceptable parking implications.

## **APPENDIX A**

### **TRAFFIC SURVEY DATA**



# R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

| Lights      | WEST       |     | SOUTH     |     | EAST       |     |     |
|-------------|------------|-----|-----------|-----|------------|-----|-----|
|             | Hassall St |     | Wigram St |     | Hassall St |     |     |
| Time Per    | T          | R   | L         | R   | L          | T   | TOT |
| 0700 - 0715 | 18         | 9   | 15        | 7   | 4          | 18  | 71  |
| 0715 - 0730 | 27         | 12  | 14        | 15  | 5          | 14  | 87  |
| 0730 - 0745 | 17         | 17  | 20        | 11  | 5          | 22  | 92  |
| 0745 - 0800 | 14         | 18  | 23        | 19  | 2          | 12  | 88  |
| 0800 - 0815 | 11         | 42  | 30        | 13  | 5          | 17  | 118 |
| 0815 - 0830 | 14         | 23  | 26        | 12  | 4          | 19  | 98  |
| 0830 - 0845 | 22         | 41  | 33        | 14  | 6          | 25  | 141 |
| 0845 - 0900 | 19         | 48  | 31        | 17  | 6          | 17  | 138 |
| Per End     | 142        | 210 | 192       | 108 | 37         | 144 | 833 |

| Heavies     | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Time Per    | T          | R | L         | R | L          | T | TOT |
| 0700 - 0715 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 0715 - 0730 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 0730 - 0745 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 0745 - 0800 | 0          | 0 | 0         | 0 | 0          | 1 | 1   |
| 0800 - 0815 | 0          | 0 | 0         | 0 | 0          | 1 | 1   |
| 0815 - 0830 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 0830 - 0845 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 0845 - 0900 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| Per End     | 0          | 0 | 0         | 0 | 0          | 2 | 2   |

| Combined    | WEST       |     | SOUTH     |     | EAST       |     |     |
|-------------|------------|-----|-----------|-----|------------|-----|-----|
|             | Hassall St |     | Wigram St |     | Hassall St |     |     |
| Time Per    | T          | R   | L         | R   | L          | T   | TOT |
| 0700 - 0715 | 18         | 9   | 15        | 7   | 4          | 18  | 71  |
| 0715 - 0730 | 27         | 12  | 14        | 15  | 5          | 14  | 87  |
| 0730 - 0745 | 17         | 17  | 20        | 11  | 5          | 22  | 92  |
| 0745 - 0800 | 14         | 18  | 23        | 19  | 2          | 13  | 89  |
| 0800 - 0815 | 11         | 42  | 30        | 13  | 5          | 18  | 119 |
| 0815 - 0830 | 14         | 23  | 26        | 12  | 4          | 19  | 98  |
| 0830 - 0845 | 22         | 41  | 33        | 14  | 6          | 25  | 141 |
| 0845 - 0900 | 19         | 48  | 31        | 17  | 6          | 17  | 138 |
| Per End     | 142        | 210 | 192       | 108 | 37         | 146 | 835 |

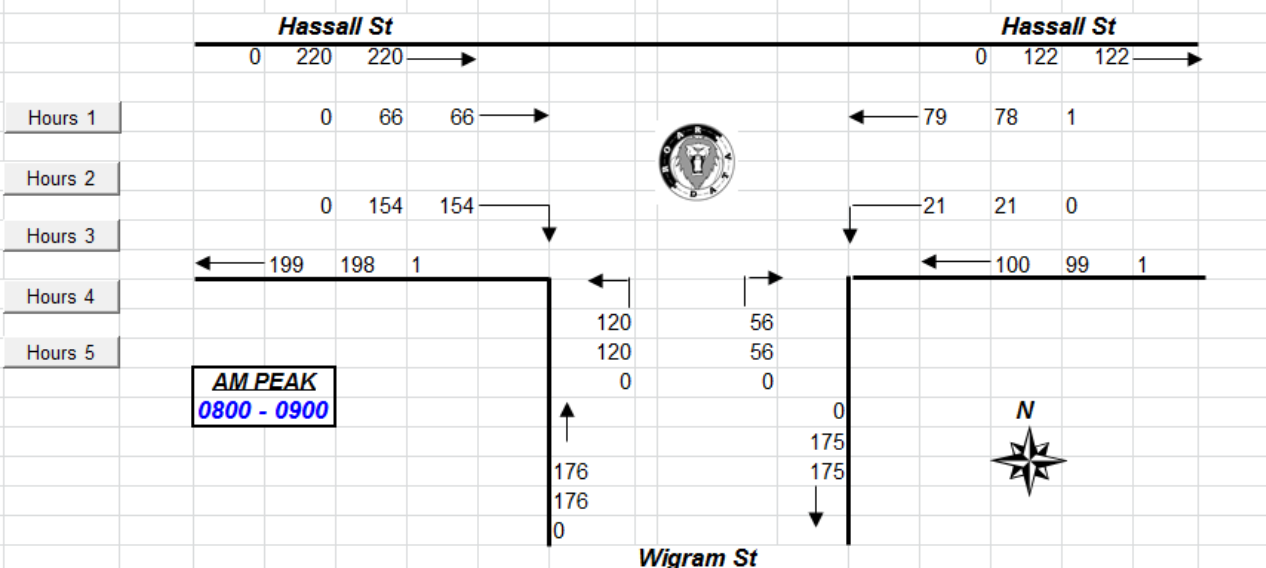
| Lights      | WEST       |     | SOUTH     |    | EAST       |    |     |
|-------------|------------|-----|-----------|----|------------|----|-----|
|             | Hassall St |     | Wigram St |    | Hassall St |    |     |
| Peak Per    | T          | R   | L         | R  | L          | T  | TOT |
| 0700 - 0800 | 76         | 56  | 72        | 52 | 16         | 66 | 338 |
| 0715 - 0815 | 69         | 89  | 87        | 58 | 17         | 65 | 385 |
| 0730 - 0830 | 56         | 100 | 99        | 55 | 16         | 70 | 396 |
| 0745 - 0845 | 61         | 124 | 112       | 58 | 17         | 73 | 445 |
| 0800 - 0900 | 66         | 154 | 120       | 56 | 21         | 78 | 495 |
| PEAK HR     | 66         | 154 | 120       | 56 | 21         | 78 | 495 |

| Heavies     | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Peak Per    | T          | R | L         | R | L          | T | TOT |
| 0700 - 0800 | 0          | 0 | 0         | 0 | 0          | 1 | 1   |
| 0715 - 0815 | 0          | 0 | 0         | 0 | 0          | 2 | 2   |
| 0730 - 0830 | 0          | 0 | 0         | 0 | 0          | 2 | 2   |
| 0745 - 0845 | 0          | 0 | 0         | 0 | 0          | 2 | 2   |
| 0800 - 0900 | 0          | 0 | 0         | 0 | 0          | 1 | 1   |
| PEAK HR     | 0          | 0 | 0         | 0 | 0          | 1 | 1   |

| Combined    | WEST       |     | SOUTH     |    | EAST       |    |     |
|-------------|------------|-----|-----------|----|------------|----|-----|
|             | Hassall St |     | Wigram St |    | Hassall St |    |     |
| Peak Per    | T          | R   | L         | R  | L          | T  | TOT |
| 0700 - 0800 | 76         | 56  | 72        | 52 | 16         | 67 | 339 |
| 0715 - 0815 | 69         | 89  | 87        | 58 | 17         | 67 | 387 |
| 0730 - 0830 | 56         | 100 | 99        | 55 | 16         | 72 | 398 |
| 0745 - 0845 | 61         | 124 | 112       | 58 | 17         | 75 | 447 |
| 0800 - 0900 | 66         | 154 | 120       | 56 | 21         | 79 | 496 |
| PEAK HR     | 66         | 154 | 120       | 56 | 21         | 79 | 496 |

| Peds        | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Time Per    | T          | R | L         | R | L          | T | TOT |
| 0700 - 0715 | 5          |   | 8         |   | 18         |   | 31  |
| 0715 - 0730 | 7          |   | 14        |   | 39         |   | 60  |
| 0730 - 0745 | 4          |   | 13        |   | 28         |   | 45  |
| 0745 - 0800 | 9          |   | 11        |   | 38         |   | 58  |
| 0800 - 0815 | 13         |   | 21        |   | 45         |   | 79  |
| 0815 - 0830 | 18         |   | 18        |   | 31         |   | 67  |
| 0830 - 0845 | 26         |   | 21        |   | 44         |   | 91  |
| 0845 - 0900 | 21         |   | 15        |   | 45         |   | 81  |
| Per End     | 103        |   | 121       |   | 288        |   | 512 |

|             | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Peak Per    | T          | R | L         | R | L          | T | TOT |
| 0700 - 0800 | 25         |   | 46        |   | 123        |   | 194 |
| 0715 - 0815 | 33         |   | 59        |   | 150        |   | 242 |
| 0730 - 0830 | 44         |   | 63        |   | 142        |   | 249 |
| 0745 - 0845 | 66         |   | 71        |   | 158        |   | 295 |
| 0800 - 0900 | 78         |   | 75        |   | 165        |   | 318 |
| PEAK HR     | 78         |   | 75        |   | 165        |   | 318 |





# R.O.A.R DATA

Reliable, Original & Authentic Results

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

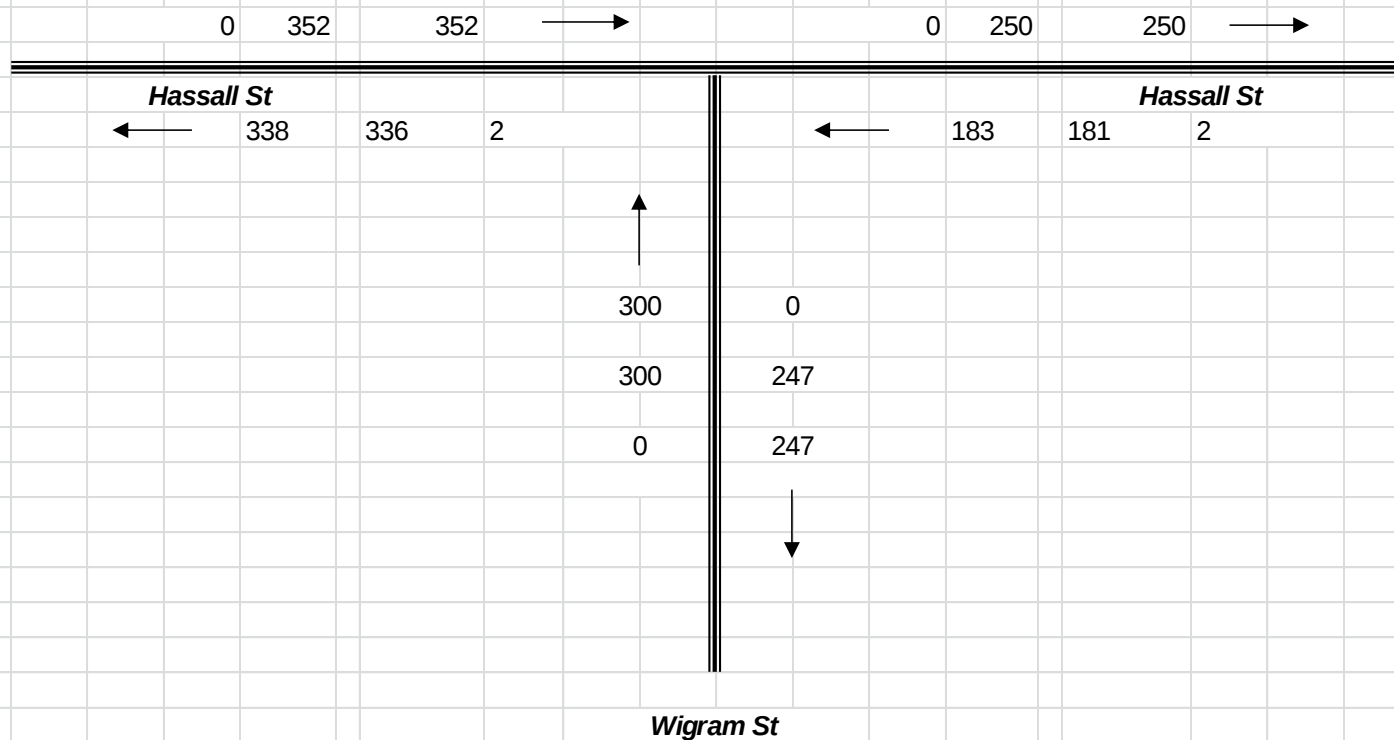
Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

TOTAL VOLUMES  
FOR COUNT  
PERIOD

AM





## R.O.A.R DATA

Reliable, Original & Authentic Results

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

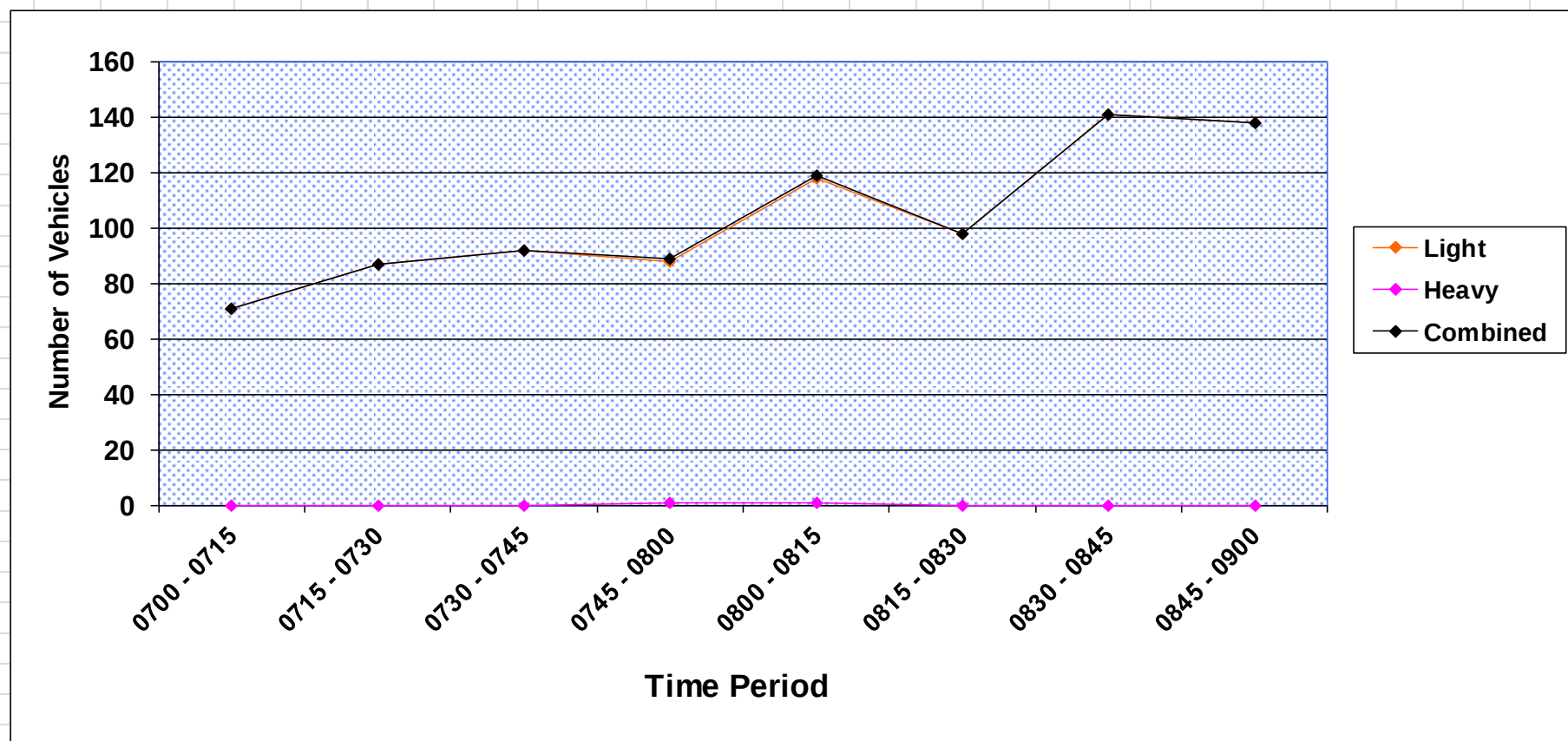
Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

AM

Hassall St & Wigram St





## R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

| Lights      | WEST       |     | SOUTH     |     | EAST       |    |     |
|-------------|------------|-----|-----------|-----|------------|----|-----|
|             | Hassall St |     | Wigram St |     | Hassall St |    |     |
| Time Per    | T          | R   | L         | R   | L          | T  | TOT |
| 1600 - 1615 | 20         | 52  | 17        | 16  | 2          | 9  | 116 |
| 1615 - 1630 | 12         | 35  | 12        | 15  | 3          | 10 | 87  |
| 1630 - 1645 | 14         | 57  | 11        | 29  | 7          | 6  | 124 |
| 1645 - 1700 | 18         | 38  | 17        | 22  | 3          | 8  | 106 |
| 1700 - 1715 | 18         | 63  | 11        | 14  | 6          | 9  | 121 |
| 1715 - 1730 | 14         | 40  | 13        | 23  | 3          | 12 | 105 |
| 1730 - 1745 | 20         | 36  | 7         | 18  | 7          | 14 | 102 |
| 1745 - 1800 | 9          | 30  | 19        | 14  | 8          | 10 | 90  |
| Per End     | 125        | 351 | 107       | 151 | 39         | 78 | 851 |

| Lights      | WEST       |     | SOUTH     |    | EAST       |    |     |
|-------------|------------|-----|-----------|----|------------|----|-----|
|             | Hassall St |     | Wigram St |    | Hassall St |    |     |
| Peak Per    | T          | R   | L         | R  | L          | T  | TOT |
| 1600 - 1700 | 64         | 182 | 57        | 82 | 15         | 33 | 433 |
| 1615 - 1715 | 62         | 193 | 51        | 80 | 19         | 33 | 438 |
| 1630 - 1730 | 64         | 198 | 52        | 88 | 19         | 35 | 456 |
| 1645 - 1745 | 70         | 177 | 48        | 77 | 19         | 43 | 434 |
| 1700 - 1800 | 61         | 169 | 50        | 69 | 24         | 45 | 418 |

|         |    |     |    |    |    |    |     |
|---------|----|-----|----|----|----|----|-----|
| PEAK HR | 64 | 198 | 52 | 88 | 19 | 35 | 456 |
|---------|----|-----|----|----|----|----|-----|

| Peds        | WEST       |  | SOUTH     |  | EAST       |  |     |
|-------------|------------|--|-----------|--|------------|--|-----|
|             | Hassall St |  | Wigram St |  | Hassall St |  |     |
| Time Per    | Hassall St |  | Wigram St |  | Hassall St |  | TOT |
| 1600 - 1615 | 24         |  | 11        |  | 9          |  | 44  |
| 1615 - 1630 | 34         |  | 6         |  | 4          |  | 44  |
| 1630 - 1645 | 42         |  | 9         |  | 19         |  | 70  |
| 1645 - 1700 | 27         |  | 11        |  | 9          |  | 47  |
| 1700 - 1715 | 27         |  | 18        |  | 8          |  | 53  |
| 1715 - 1730 | 31         |  | 13        |  | 10         |  | 54  |
| 1730 - 1745 | 69         |  | 13        |  | 8          |  | 90  |
| 1745 - 1800 | 35         |  | 6         |  | 11         |  | 52  |
| Per End     | 289        |  | 87        |  | 78         |  | 454 |

|             | WEST       |  | SOUTH     |  | EAST       |  |     |
|-------------|------------|--|-----------|--|------------|--|-----|
|             | Hassall St |  | Wigram St |  | Hassall St |  |     |
| Peak Per    | Hassall St |  | Wigram St |  | Hassall St |  | TOT |
| 1600 - 1700 | 127        |  | 37        |  | 41         |  | 205 |
| 1615 - 1715 | 130        |  | 44        |  | 40         |  | 214 |
| 1630 - 1730 | 127        |  | 51        |  | 46         |  | 224 |
| 1645 - 1745 | 154        |  | 55        |  | 35         |  | 244 |
| 1700 - 1800 | 162        |  | 50        |  | 37         |  | 249 |

|         |     |    |    |     |
|---------|-----|----|----|-----|
| PEAK HR | 127 | 51 | 46 | 224 |
|---------|-----|----|----|-----|

| Heavies     | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Time Per    | T          | R | L         | R | L          | T | TOT |
| 1600 - 1615 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1615 - 1630 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1630 - 1645 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1645 - 1700 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1700 - 1715 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1715 - 1730 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1730 - 1745 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1745 - 1800 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| Per End     | 0          | 0 | 0         | 0 | 0          | 0 | 0   |

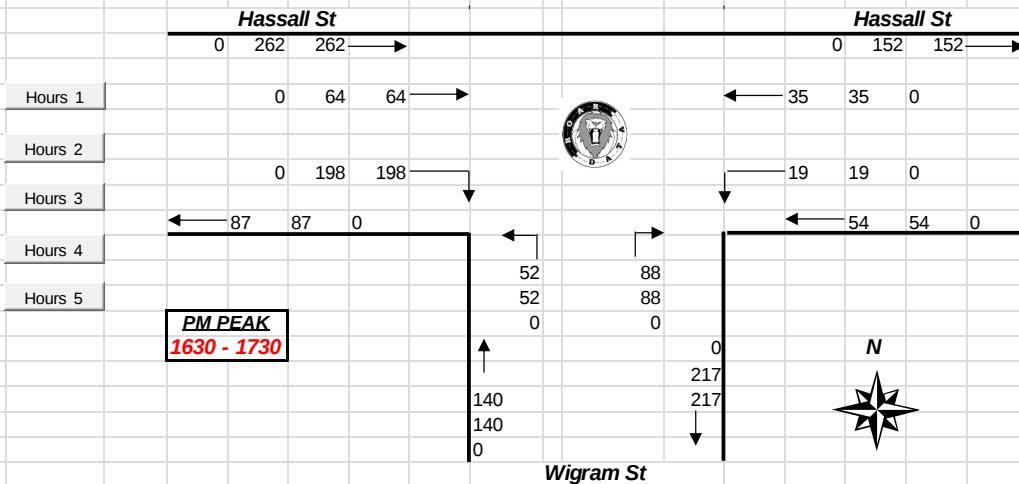
| Heavies     | WEST       |   | SOUTH     |   | EAST       |   |     |
|-------------|------------|---|-----------|---|------------|---|-----|
|             | Hassall St |   | Wigram St |   | Hassall St |   |     |
| Peak Per    | T          | R | L         | R | L          | T | TOT |
| 1600 - 1700 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1615 - 1715 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1630 - 1730 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1645 - 1745 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |
| 1700 - 1800 | 0          | 0 | 0         | 0 | 0          | 0 | 0   |

|         |   |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|---|
| PEAK HR | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---------|---|---|---|---|---|---|---|

| Combined    | WEST       |     | SOUTH     |     | EAST       |    |     |
|-------------|------------|-----|-----------|-----|------------|----|-----|
|             | Hassall St |     | Wigram St |     | Hassall St |    |     |
| Time Per    | T          | R   | L         | R   | L          | T  | TOT |
| 1600 - 1615 | 20         | 52  | 17        | 16  | 2          | 9  | 116 |
| 1615 - 1630 | 12         | 35  | 12        | 15  | 3          | 10 | 87  |
| 1630 - 1645 | 14         | 57  | 11        | 29  | 7          | 6  | 124 |
| 1645 - 1700 | 18         | 38  | 17        | 22  | 3          | 8  | 106 |
| 1700 - 1715 | 18         | 63  | 11        | 14  | 6          | 9  | 121 |
| 1715 - 1730 | 14         | 40  | 13        | 23  | 3          | 12 | 105 |
| 1730 - 1745 | 20         | 36  | 7         | 18  | 7          | 14 | 102 |
| 1745 - 1800 | 9          | 30  | 19        | 14  | 8          | 10 | 90  |
| Per End     | 125        | 351 | 107       | 151 | 39         | 78 | 851 |

| Combined    | WEST       |     | SOUTH     |    | EAST       |    |     |
|-------------|------------|-----|-----------|----|------------|----|-----|
|             | Hassall St |     | Wigram St |    | Hassall St |    |     |
| Peak Per    | T          | R   | L         | R  | L          | T  | TOT |
| 1600 - 1700 | 64         | 182 | 57        | 82 | 15         | 33 | 433 |
| 1615 - 1715 | 62         | 193 | 51        | 80 | 19         | 33 | 438 |
| 1630 - 1730 | 64         | 198 | 52        | 88 | 19         | 35 | 456 |
| 1645 - 1745 | 70         | 177 | 48        | 77 | 19         | 43 | 434 |
| 1700 - 1800 | 61         | 169 | 50        | 69 | 24         | 45 | 418 |

|         |    |     |    |    |    |    |     |
|---------|----|-----|----|----|----|----|-----|
| PEAK HR | 64 | 198 | 52 | 88 | 19 | 35 | 456 |
|---------|----|-----|----|----|----|----|-----|





## R.O.A.R DATA

*Reliable, Original & Authentic Results*

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

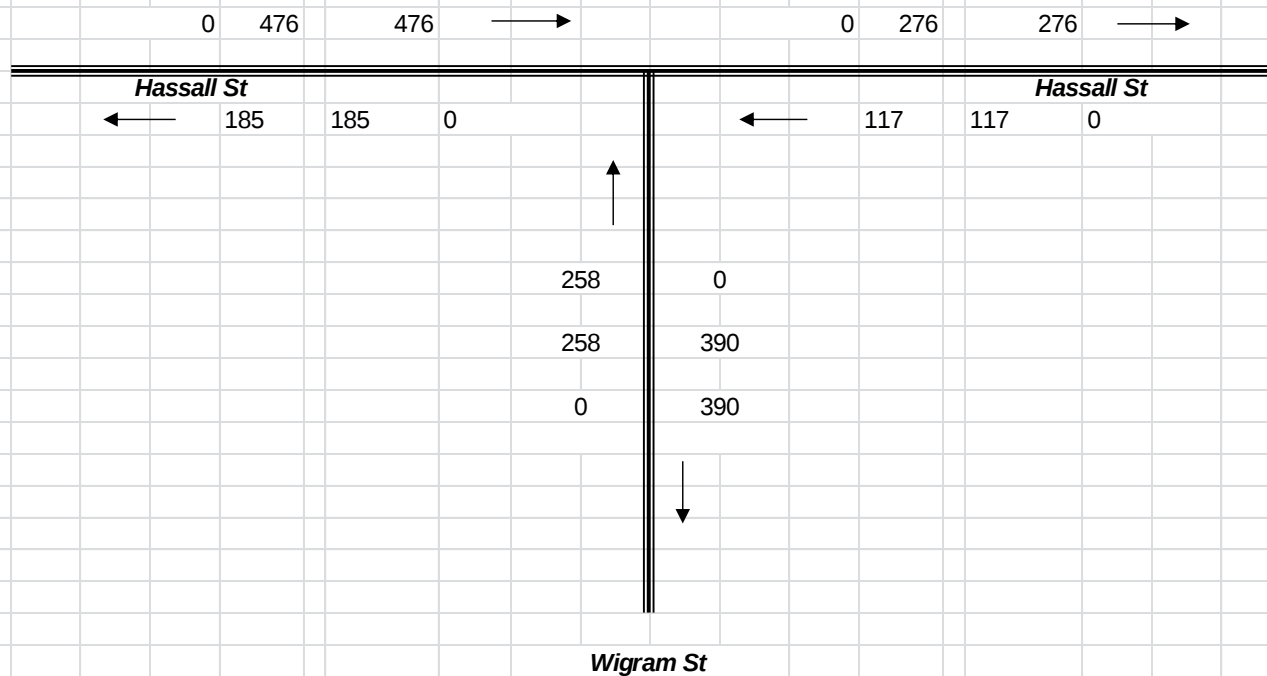
Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

PM

TOTAL VOLUMES  
FOR COUNT  
PERIOD





## R.O.A.R DATA

Reliable, Original & Authentic Results

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

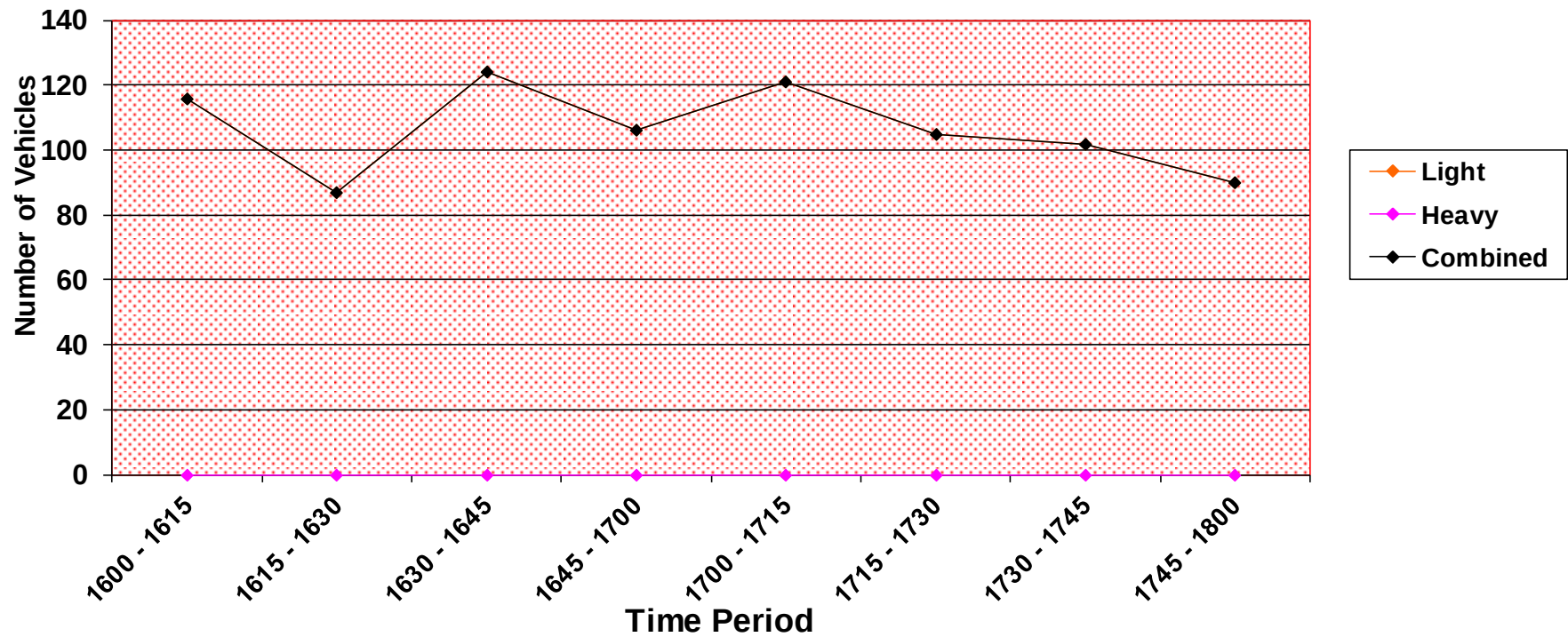
Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

**PM**

**Hassall St & Wigram St**





## R.O.A.R. DATA

**Reliable, Original & Authentic Results**

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

Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

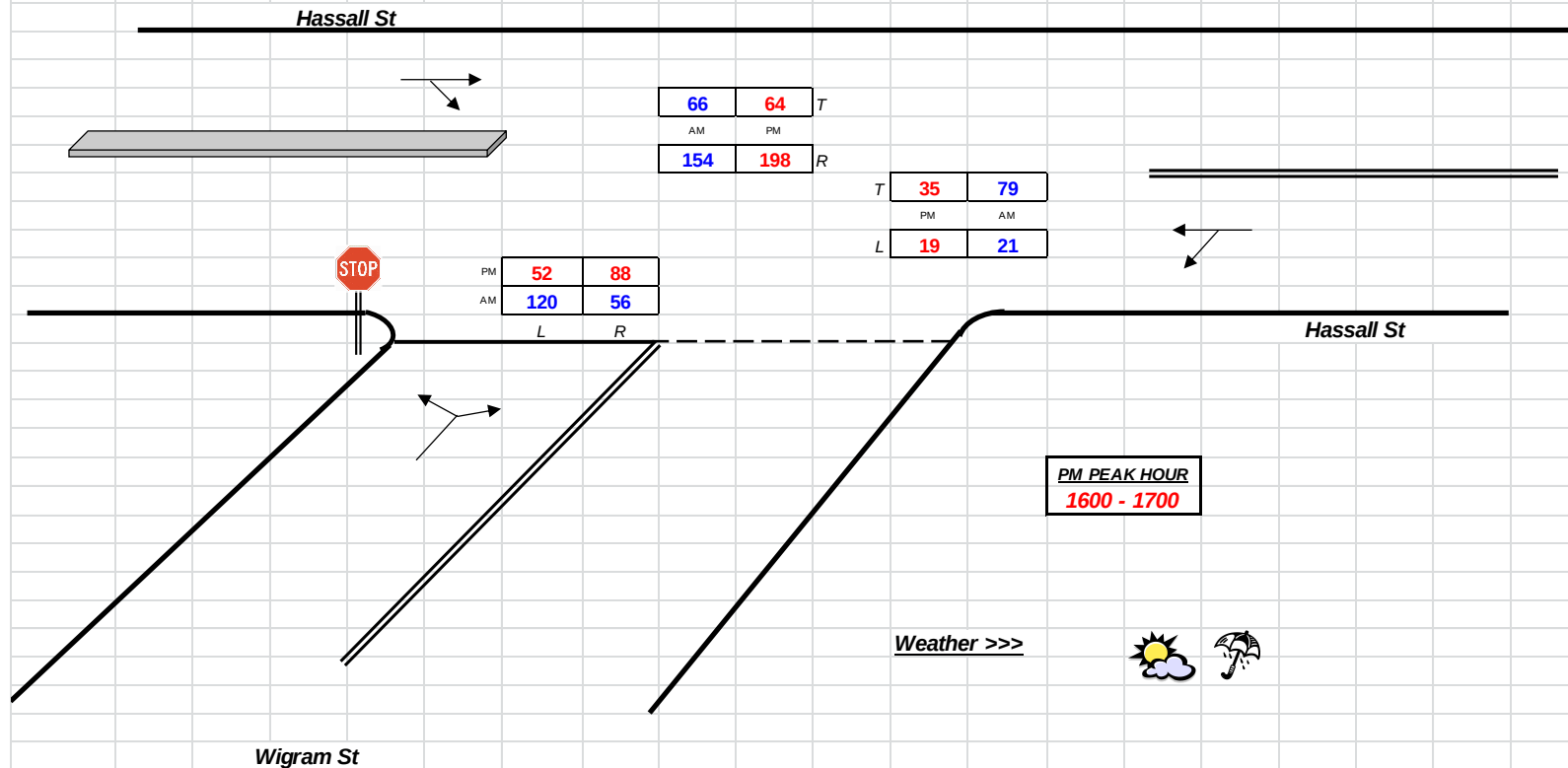
### Intersection Details

Obtained via satellite

May be incorrect

**AM PEAK HOUR**  
**0800 - 0900**

Combined Figures only





# R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob. 0418 239019

| Lights      | NORTH     |     |    | WEST      |      |     | SOUTH     |     |    | EAST      |      |   |      |
|-------------|-----------|-----|----|-----------|------|-----|-----------|-----|----|-----------|------|---|------|
|             | Wigram St |     |    | Parkes St |      |     | Wigram St |     |    | Parkes St |      |   |      |
| Time Per    | L         | I   | R  | L         | I    | R   | L         | I   | R  | L         | I    | R | TOT  |
| 0700 - 0715 | 4         | 5   | 2  | 3         | 201  | 16  | 1         | 14  | 6  | 6         | 111  | 0 | 369  |
| 0715 - 0730 | 7         | 4   | 4  | 11        | 189  | 13  | 4         | 18  | 4  | 8         | 112  | 0 | 374  |
| 0730 - 0745 | 6         | 9   | 3  | 15        | 179  | 17  | 3         | 16  | 2  | 4         | 140  | 0 | 394  |
| 0745 - 0800 | 11        | 16  | 4  | 13        | 195  | 29  | 6         | 47  | 10 | 10        | 150  | 0 | 491  |
| 0800 - 0815 | 16        | 14  | 6  | 9         | 181  | 21  | 3         | 31  | 10 | 7         | 176  | 0 | 474  |
| 0815 - 0830 | 14        | 26  | 12 | 12        | 148  | 22  | 9         | 56  | 17 | 10        | 176  | 0 | 502  |
| 0830 - 0845 | 24        | 15  | 4  | 8         | 154  | 32  | 7         | 38  | 3  | 7         | 194  | 0 | 486  |
| 0845 - 0900 | 26        | 22  | 10 | 13        | 136  | 26  | 5         | 34  | 7  | 11        | 188  | 0 | 478  |
| Period End  | 108       | 111 | 45 | 84        | 1383 | 176 | 38        | 254 | 59 | 63        | 1247 | 0 | 3568 |

| Lights      | NORTH     |    |    | WEST      |     |     | SOUTH     |     |    | EAST      |     |   |      |
|-------------|-----------|----|----|-----------|-----|-----|-----------|-----|----|-----------|-----|---|------|
|             | Wigram St |    |    | Parkes St |     |     | Wigram St |     |    | Parkes St |     |   |      |
| Peak Time   | L         | I  | R  | L         | I   | R   | L         | I   | R  | L         | I   | R | TOT  |
| 0700 - 0800 | 28        | 34 | 13 | 42        | 764 | 75  | 14        | 95  | 22 | 28        | 513 | 0 | 1628 |
| 0715 - 0815 | 40        | 43 | 17 | 48        | 744 | 80  | 16        | 112 | 26 | 29        | 578 | 0 | 1733 |
| 0730 - 0830 | 47        | 65 | 25 | 49        | 703 | 89  | 21        | 150 | 39 | 31        | 642 | 0 | 1861 |
| 0745 - 0845 | 65        | 71 | 26 | 42        | 678 | 104 | 25        | 172 | 40 | 34        | 696 | 0 | 1953 |
| 0800 - 0900 | 80        | 77 | 32 | 42        | 619 | 101 | 24        | 159 | 37 | 35        | 734 | 0 | 1940 |

|           |    |    |    |    |     |     |    |     |    |    |     |   |      |
|-----------|----|----|----|----|-----|-----|----|-----|----|----|-----|---|------|
| PEAK HOUR | 65 | 71 | 26 | 42 | 678 | 104 | 25 | 172 | 40 | 34 | 696 | 0 | 1953 |
|-----------|----|----|----|----|-----|-----|----|-----|----|----|-----|---|------|

| Combined    | NORTH     |     |    | WEST      |      |     | SOUTH     |     |    | EAST      |      |   |      |
|-------------|-----------|-----|----|-----------|------|-----|-----------|-----|----|-----------|------|---|------|
|             | Wigram St |     |    | Parkes St |      |     | Wigram St |     |    | Parkes St |      |   |      |
| Time Per    | L         | I   | R  | L         | I    | R   | L         | I   | R  | L         | I    | R | TOT  |
| 0700 - 0715 | 4         | 5   | 2  | 3         | 206  | 17  | 1         | 14  | 6  | 7         | 117  | 0 | 382  |
| 0715 - 0730 | 7         | 4   | 4  | 11        | 194  | 13  | 4         | 18  | 4  | 8         | 120  | 0 | 387  |
| 0730 - 0745 | 6         | 9   | 3  | 15        | 184  | 17  | 4         | 16  | 2  | 4         | 144  | 0 | 404  |
| 0745 - 0800 | 11        | 16  | 4  | 13        | 202  | 29  | 6         | 47  | 10 | 10        | 160  | 0 | 508  |
| 0800 - 0815 | 16        | 14  | 7  | 9         | 188  | 22  | 4         | 31  | 10 | 8         | 183  | 0 | 492  |
| 0815 - 0830 | 14        | 26  | 12 | 12        | 153  | 22  | 9         | 56  | 17 | 10        | 186  | 0 | 517  |
| 0830 - 0845 | 24        | 15  | 4  | 8         | 161  | 33  | 8         | 38  | 3  | 8         | 201  | 0 | 503  |
| 0845 - 0900 | 26        | 22  | 10 | 13        | 139  | 27  | 5         | 34  | 7  | 12        | 199  | 0 | 494  |
| Period End  | 108       | 111 | 46 | 84        | 1427 | 180 | 41        | 254 | 59 | 67        | 1310 | 0 | 3687 |

| Combined    | NORTH     |    |    | WEST      |     |     | SOUTH     |     |    | EAST      |     |   |      |
|-------------|-----------|----|----|-----------|-----|-----|-----------|-----|----|-----------|-----|---|------|
|             | Wigram St |    |    | Parkes St |     |     | Wigram St |     |    | Parkes St |     |   |      |
| Peak Time   | L         | I  | R  | L         | I   | R   | L         | I   | R  | L         | I   | R | TOT  |
| 0700 - 0800 | 28        | 34 | 13 | 42        | 786 | 76  | 15        | 95  | 22 | 29        | 541 | 0 | 1681 |
| 0715 - 0815 | 40        | 43 | 18 | 48        | 768 | 81  | 18        | 112 | 26 | 30        | 607 | 0 | 1791 |
| 0730 - 0830 | 47        | 65 | 26 | 49        | 727 | 90  | 23        | 150 | 39 | 32        | 673 | 0 | 1921 |
| 0745 - 0845 | 65        | 71 | 27 | 42        | 704 | 106 | 27        | 172 | 40 | 36        | 730 | 0 | 2020 |
| 0800 - 0900 | 80        | 77 | 33 | 42        | 641 | 104 | 26        | 159 | 37 | 38        | 769 | 0 | 2006 |

|           |    |    |    |    |     |     |    |     |    |    |     |   |      |
|-----------|----|----|----|----|-----|-----|----|-----|----|----|-----|---|------|
| PEAK HOUR | 65 | 71 | 27 | 42 | 704 | 106 | 27 | 172 | 40 | 36 | 730 | 0 | 2020 |
|-----------|----|----|----|----|-----|-----|----|-----|----|----|-----|---|------|

Client : Varga Traffic Planning  
 Job No/Name : 5450 PARRAMATTA Wigram St Counts  
 Day/Date : Wednesday 10th December 2014

| Heavies     | NORTH     |   |   | WEST      |    |   | SOUTH     |   |   | EAST      |    |   |     |
|-------------|-----------|---|---|-----------|----|---|-----------|---|---|-----------|----|---|-----|
|             | Wigram St |   |   | Parkes St |    |   | Wigram St |   |   | Parkes St |    |   |     |
| Time Per    | L         | I | R | L         | I  | R | L         | I | R | L         | I  | R | TOT |
| 0700 - 0715 | 0         | 0 | 0 | 0         | 5  | 1 | 0         | 0 | 0 | 1         | 6  | 0 | 13  |
| 0715 - 0730 | 0         | 0 | 0 | 0         | 5  | 0 | 0         | 0 | 0 | 0         | 8  | 0 | 13  |
| 0730 - 0745 | 0         | 0 | 0 | 0         | 5  | 0 | 1         | 0 | 0 | 0         | 4  | 0 | 10  |
| 0745 - 0800 | 0         | 0 | 0 | 0         | 7  | 0 | 0         | 0 | 0 | 0         | 10 | 0 | 17  |
| 0800 - 0815 | 0         | 0 | 1 | 0         | 7  | 1 | 1         | 0 | 0 | 1         | 7  | 0 | 18  |
| 0815 - 0830 | 0         | 0 | 0 | 0         | 5  | 0 | 0         | 0 | 0 | 0         | 10 | 0 | 15  |
| 0830 - 0845 | 0         | 0 | 0 | 0         | 7  | 1 | 1         | 0 | 0 | 1         | 7  | 0 | 17  |
| 0845 - 0900 | 0         | 0 | 0 | 0         | 3  | 1 | 0         | 0 | 0 | 1         | 11 | 0 | 16  |
| Period End  | 0         | 0 | 1 | 0         | 44 | 4 | 3         | 0 | 0 | 4         | 63 | 0 | 119 |

| Heavies     | NORTH     |   |   | WEST      |    |   | SOUTH     |   |   | EAST      |    |   |     |
|-------------|-----------|---|---|-----------|----|---|-----------|---|---|-----------|----|---|-----|
|             | Wigram St |   |   | Parkes St |    |   | Wigram St |   |   | Parkes St |    |   |     |
| Peak Time   | L         | I | R | L         | I  | R | L         | I | R | L         | I  | R | TOT |
| 0700 - 0800 | 0         | 0 | 0 | 0         | 22 | 1 | 1         | 0 | 0 | 1         | 28 | 0 | 53  |
| 0715 - 0815 | 0         | 0 | 1 | 0         | 24 | 1 | 2         | 0 | 0 | 1         | 29 | 0 | 58  |
| 0730 - 0830 | 0         | 0 | 1 | 0         | 24 | 1 | 2         | 0 | 0 | 1         | 31 | 0 | 60  |
| 0745 - 0845 | 0         | 0 | 1 | 0         | 26 | 2 | 2         | 0 | 0 | 2         | 34 | 0 | 67  |
| 0800 - 0900 | 0         | 0 | 1 | 0         | 22 | 3 | 2         | 0 | 0 | 3         | 35 | 0 | 66  |

|           |   |   |   |   |    |   |   |   |   |   |    |   |    |
|-----------|---|---|---|---|----|---|---|---|---|---|----|---|----|
| PEAK HOUR | 0 | 0 | 1 | 0 | 26 | 2 | 2 | 0 | 0 | 2 | 34 | 0 | 67 |
|-----------|---|---|---|---|----|---|---|---|---|---|----|---|----|

| Peds        | NORTH        |  |  | WEST         |  |  | SOUTH        |  |  | EAST         |  |  |     |
|-------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|-----|
|             | Wigram St    |  |  | Parkes St    |  |  | Wigram St    |  |  | Parkes St    |  |  |     |
| Time Per    | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | TOT |
| 0700 - 0715 | 1            |  |  | 1            |  |  | 2            |  |  | 7            |  |  | 11  |
| 0715 - 0730 | 1            |  |  | 1            |  |  | 4            |  |  | 5            |  |  | 11  |
| 0730 - 0745 | 2            |  |  | 8            |  |  | 4            |  |  | 7            |  |  | 21  |
| 0745 - 0800 | 3            |  |  | 13           |  |  | 0            |  |  | 10           |  |  | 26  |
| 0800 - 0815 | 1            |  |  | 1            |  |  | 1            |  |  | 12           |  |  | 15  |
| 0815 - 0830 | 8            |  |  | 18           |  |  | 0            |  |  | 9            |  |  | 35  |
| 0830 - 0845 | 4            |  |  | 23           |  |  | 2            |  |  | 12           |  |  | 41  |
| 0845 - 0900 | 8            |  |  | 14           |  |  | 6            |  |  | 10           |  |  | 38  |
| Period End  | 28           |  |  | 16           |  |  | 19           |  |  | 72           |  |  | 198 |

| Peds        | NORTH        |  |  | WEST         |  |  | SOUTH        |  |  | EAST         |  |  |     |
|-------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|-----|
|             | Wigram St    |  |  | Parkes St    |  |  | Wigram St    |  |  | Parkes St    |  |  |     |
| Peak Per    | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | TOT |
| 0700 - 0800 | 7            |  |  | 23           |  |  | 10           |  |  | 29           |  |  | 69  |
| 0715 - 0815 | 7            |  |  | 23           |  |  | 9            |  |  | 34           |  |  | 73  |
| 0730 - 0830 | 14           |  |  | 40           |  |  | 5            |  |  | 38           |  |  | 97  |
| 0745 - 0845 | 16           |  |  | 55           |  |  | 3            |  |  | 43           |  |  | 117 |
| 0800 - 0900 | 21           |  |  | 56           |  |  | 9            |  |  | 43           |  |  | 129 |

|         |    |  |  |    |  |  |   |  |  |    |  |  |     |
|---------|----|--|--|----|--|--|---|--|--|----|--|--|-----|
| PEAK HR | 16 |  |  | 55 |  |  | 3 |  |  | 43 |  |  | 117 |
|---------|----|--|--|----|--|--|---|--|--|----|--|--|-----|



# R.O.A.R DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob. 0418 239019

Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

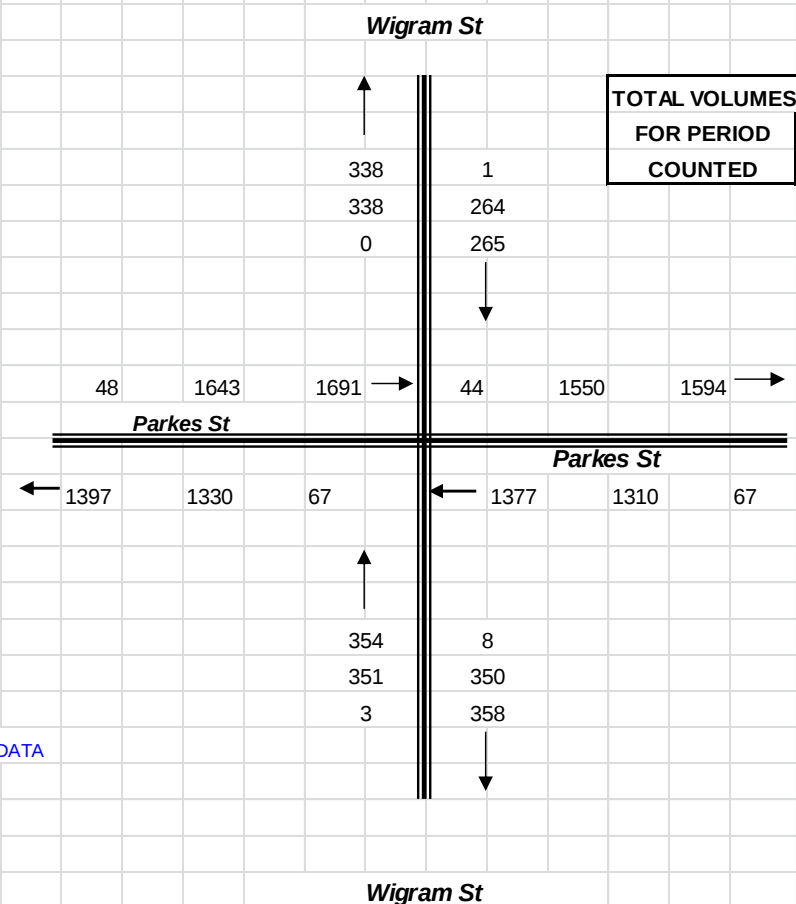
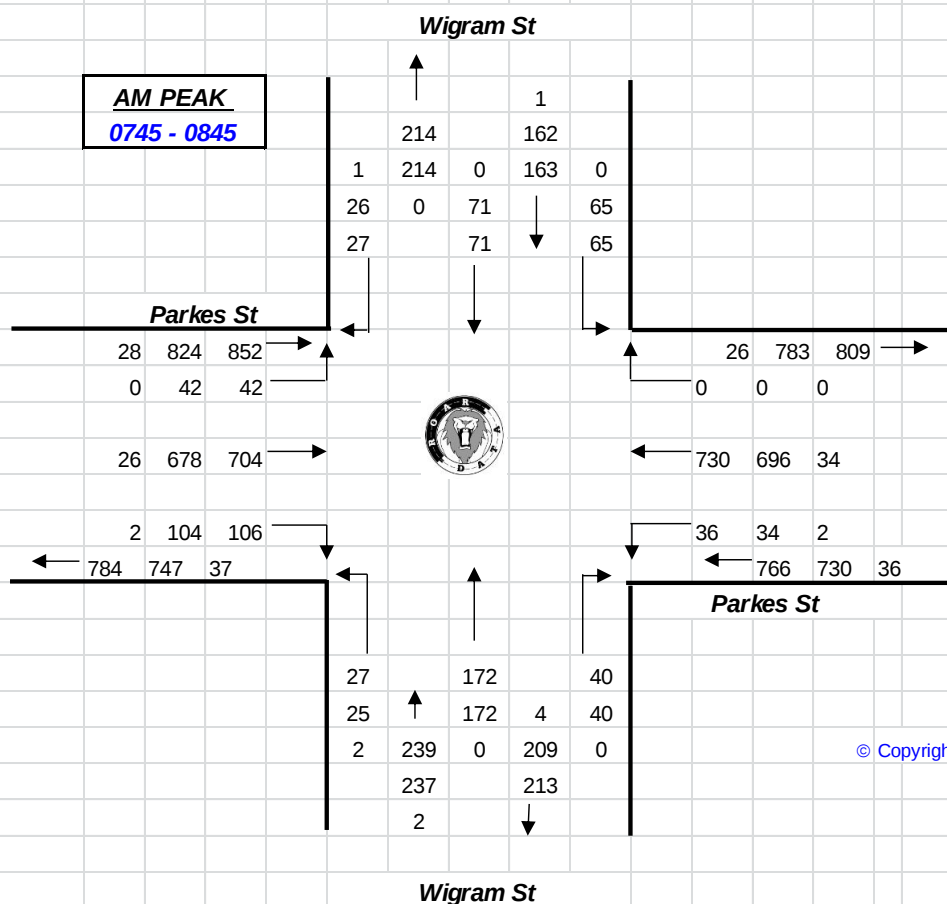
Hours 1

Hours 2

Hours 3

Hours 4

Hours 5





# R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob. 0418 239019

Client : Varga Traffic Planning  
Job No/Name : 5450 PARRAMATTA Wigram St Counts  
Day/Date : Wednesday 10th December 2014

| Lights      | NORTH     |     |    | WEST      |      |     | SOUTH     |     |    | EAST      |      |   |      |
|-------------|-----------|-----|----|-----------|------|-----|-----------|-----|----|-----------|------|---|------|
|             | Wigram St |     |    | Parkes St |      |     | Wigram St |     |    | Parkes St |      |   |      |
| Time Per    | L         | I   | R  | L         | I    | R   | L         | I   | R  | L         | I    | R | TOT  |
| 1600 - 1615 | 15        | 34  | 12 | 15        | 137  | 24  | 13        | 19  | 16 | 17        | 166  | 0 | 468  |
| 1615 - 1630 | 6         | 26  | 7  | 13        | 153  | 24  | 10        | 11  | 11 | 21        | 176  | 0 | 458  |
| 1630 - 1645 | 18        | 28  | 6  | 15        | 164  | 26  | 16        | 14  | 10 | 10        | 160  | 0 | 467  |
| 1645 - 1700 | 12        | 21  | 10 | 15        | 158  | 29  | 9         | 21  | 7  | 10        | 162  | 0 | 454  |
| 1700 - 1715 | 16        | 35  | 14 | 7         | 152  | 27  | 13        | 26  | 6  | 6         | 170  | 0 | 472  |
| 1715 - 1730 | 8         | 31  | 10 | 16        | 143  | 26  | 13        | 20  | 12 | 14        | 167  | 0 | 460  |
| 1730 - 1745 | 10        | 22  | 7  | 9         | 159  | 32  | 14        | 21  | 8  | 13        | 169  | 0 | 464  |
| 1745 - 1800 | 12        | 9   | 5  | 10        | 162  | 37  | 18        | 21  | 10 | 11        | 163  | 0 | 458  |
| Period End  | 97        | 206 | 71 | 100       | 1228 | 225 | 106       | 153 | 80 | 102       | 1333 | 0 | 3701 |

| Lights      | NORTH     |     |    | WEST      |     |     | SOUTH     |    |    | EAST      |     |   |      |
|-------------|-----------|-----|----|-----------|-----|-----|-----------|----|----|-----------|-----|---|------|
|             | Wigram St |     |    | Parkes St |     |     | Wigram St |    |    | Parkes St |     |   |      |
| Peak Time   | L         | I   | R  | L         | I   | R   | L         | I  | R  | L         | I   | R | TOT  |
| 1600 - 1700 | 51        | 109 | 35 | 58        | 612 | 103 | 48        | 65 | 44 | 58        | 664 | 0 | 1847 |
| 1615 - 1715 | 52        | 110 | 37 | 50        | 627 | 106 | 48        | 72 | 34 | 47        | 668 | 0 | 1851 |
| 1630 - 1730 | 54        | 115 | 40 | 53        | 617 | 108 | 51        | 81 | 35 | 40        | 659 | 0 | 1853 |
| 1645 - 1745 | 46        | 109 | 41 | 47        | 612 | 114 | 49        | 88 | 33 | 43        | 668 | 0 | 1850 |
| 1700 - 1800 | 46        | 97  | 36 | 42        | 616 | 122 | 58        | 88 | 36 | 44        | 669 | 0 | 1854 |

|           |    |     |    |    |     |     |    |    |    |    |     |   |      |
|-----------|----|-----|----|----|-----|-----|----|----|----|----|-----|---|------|
| PEAK HOUR | 51 | 109 | 35 | 58 | 612 | 103 | 48 | 65 | 44 | 58 | 664 | 0 | 1847 |
|-----------|----|-----|----|----|-----|-----|----|----|----|----|-----|---|------|

| Combined    | NORTH     |     |    | WEST      |      |     | SOUTH     |     |    | EAST      |      |   |      |
|-------------|-----------|-----|----|-----------|------|-----|-----------|-----|----|-----------|------|---|------|
|             | Wigram St |     |    | Parkes St |      |     | Wigram St |     |    | Parkes St |      |   |      |
| Time Per    | L         | I   | R  | L         | I    | R   | L         | I   | R  | L         | I    | R | TOT  |
| 1600 - 1615 | 15        | 34  | 12 | 15        | 140  | 24  | 14        | 19  | 17 | 17        | 172  | 0 | 479  |
| 1615 - 1630 | 6         | 26  | 7  | 13        | 158  | 25  | 10        | 11  | 11 | 21        | 180  | 0 | 468  |
| 1630 - 1645 | 18        | 28  | 6  | 15        | 168  | 26  | 17        | 14  | 10 | 10        | 162  | 0 | 474  |
| 1645 - 1700 | 12        | 21  | 10 | 15        | 162  | 30  | 9         | 21  | 7  | 10        | 164  | 0 | 461  |
| 1700 - 1715 | 16        | 35  | 14 | 7         | 153  | 27  | 13        | 26  | 6  | 6         | 171  | 0 | 474  |
| 1715 - 1730 | 8         | 31  | 10 | 16        | 147  | 27  | 14        | 20  | 12 | 14        | 169  | 0 | 468  |
| 1730 - 1745 | 10        | 22  | 7  | 9         | 160  | 32  | 14        | 21  | 8  | 13        | 170  | 0 | 466  |
| 1745 - 1800 | 12        | 9   | 5  | 10        | 164  | 38  | 19        | 21  | 10 | 11        | 164  | 0 | 463  |
| Period End  | 97        | 206 | 71 | 100       | 1252 | 229 | 110       | 153 | 81 | 102       | 1352 | 0 | 3753 |

| Combined    | NORTH     |     |    | WEST      |     |     | SOUTH     |    |    | EAST      |     |   |      |
|-------------|-----------|-----|----|-----------|-----|-----|-----------|----|----|-----------|-----|---|------|
|             | Wigram St |     |    | Parkes St |     |     | Wigram St |    |    | Parkes St |     |   |      |
| Peak Time   | L         | I   | R  | L         | I   | R   | L         | I  | R  | L         | I   | R | TOT  |
| 1600 - 1700 | 51        | 109 | 35 | 58        | 628 | 105 | 50        | 65 | 45 | 58        | 678 | 0 | 1882 |
| 1615 - 1715 | 52        | 110 | 37 | 50        | 641 | 108 | 49        | 72 | 34 | 47        | 677 | 0 | 1877 |
| 1630 - 1730 | 54        | 115 | 40 | 53        | 630 | 110 | 53        | 81 | 35 | 40        | 666 | 0 | 1877 |
| 1645 - 1745 | 46        | 109 | 41 | 47        | 622 | 116 | 50        | 88 | 33 | 43        | 674 | 0 | 1869 |
| 1700 - 1800 | 46        | 97  | 36 | 42        | 624 | 124 | 60        | 88 | 36 | 44        | 674 | 0 | 1871 |

|           |    |     |    |    |     |     |    |    |    |    |     |   |      |
|-----------|----|-----|----|----|-----|-----|----|----|----|----|-----|---|------|
| PEAK HOUR | 51 | 109 | 35 | 58 | 628 | 105 | 50 | 65 | 45 | 58 | 678 | 0 | 1882 |
|-----------|----|-----|----|----|-----|-----|----|----|----|----|-----|---|------|

| Heavies     | NORTH     |   |   | WEST      |    |   | SOUTH     |   |   | EAST      |    |   |     |
|-------------|-----------|---|---|-----------|----|---|-----------|---|---|-----------|----|---|-----|
|             | Wigram St |   |   | Parkes St |    |   | Wigram St |   |   | Parkes St |    |   |     |
| Time Per    | L         | I | R | L         | I  | R | L         | I | R | L         | I  | R | TOT |
| 1600 - 1615 | 0         | 0 | 0 | 0         | 3  | 0 | 1         | 0 | 1 | 0         | 6  | 0 | 11  |
| 1615 - 1630 | 0         | 0 | 0 | 0         | 5  | 1 | 0         | 0 | 0 | 0         | 4  | 0 | 10  |
| 1630 - 1645 | 0         | 0 | 0 | 0         | 4  | 0 | 1         | 0 | 0 | 0         | 2  | 0 | 7   |
| 1645 - 1700 | 0         | 0 | 0 | 0         | 4  | 1 | 0         | 0 | 0 | 0         | 2  | 0 | 7   |
| 1700 - 1715 | 0         | 0 | 0 | 0         | 1  | 0 | 0         | 0 | 0 | 0         | 1  | 0 | 2   |
| 1715 - 1730 | 0         | 0 | 0 | 0         | 4  | 1 | 1         | 0 | 0 | 0         | 2  | 0 | 8   |
| 1730 - 1745 | 0         | 0 | 0 | 0         | 1  | 0 | 0         | 0 | 0 | 0         | 1  | 0 | 2   |
| 1745 - 1800 | 0         | 0 | 0 | 0         | 2  | 1 | 1         | 0 | 0 | 0         | 1  | 0 | 5   |
| Period End  | 0         | 0 | 0 | 0         | 24 | 4 | 4         | 0 | 1 | 0         | 19 | 0 | 52  |

| Heavies     | NORTH     |   |   | WEST      |    |   | SOUTH     |   |   | EAST      |    |   |     |
|-------------|-----------|---|---|-----------|----|---|-----------|---|---|-----------|----|---|-----|
|             | Wigram St |   |   | Parkes St |    |   | Wigram St |   |   | Parkes St |    |   |     |
| Peak Time   | L         | I | R | L         | I  | R | L         | I | R | L         | I  | R | TOT |
| 1600 - 1700 | 0         | 0 | 0 | 0         | 16 | 2 | 2         | 0 | 1 | 0         | 14 | 0 | 35  |
| 1615 - 1715 | 0         | 0 | 0 | 0         | 14 | 2 | 1         | 0 | 0 | 0         | 9  | 0 | 26  |
| 1630 - 1730 | 0         | 0 | 0 | 0         | 13 | 2 | 2         | 0 | 0 | 0         | 7  | 0 | 24  |
| 1645 - 1745 | 0         | 0 | 0 | 0         | 10 | 2 | 1         | 0 | 0 | 0         | 6  | 0 | 19  |
| 1700 - 1800 | 0         | 0 | 0 | 0         | 8  | 2 | 2         | 0 | 0 | 0         | 5  | 0 | 17  |

|           |   |   |   |   |    |   |   |   |   |   |    |   |    |
|-----------|---|---|---|---|----|---|---|---|---|---|----|---|----|
| PEAK HOUR | 0 | 0 | 0 | 0 | 16 | 2 | 2 | 0 | 1 | 0 | 14 | 0 | 35 |
|-----------|---|---|---|---|----|---|---|---|---|---|----|---|----|

| Peds        | NORTH        |  |  | WEST         |  |  | SOUTH        |  |  | EAST         |  |  |     |
|-------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|-----|
|             | Wigram St    |  |  | Parkes St    |  |  | Wigram St    |  |  | Parkes St    |  |  |     |
| Time Per    | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | TOT |
| 1600 - 1615 | 5            |  |  | 8            |  |  | 1            |  |  | 4            |  |  | 18  |
| 1615 - 1630 | 3            |  |  | 18           |  |  | 3            |  |  | 9            |  |  | 33  |
| 1630 - 1645 | 3            |  |  | 10           |  |  | 2            |  |  | 8            |  |  | 23  |
| 1645 - 1700 | 5            |  |  | 11           |  |  | 6            |  |  | 6            |  |  | 28  |
| 1700 - 1715 | 6            |  |  | 9            |  |  | 1            |  |  | 11           |  |  | 27  |
| 1715 - 1730 | 4            |  |  | 6            |  |  | 1            |  |  | 5            |  |  | 16  |
| 1730 - 1745 | 3            |  |  | 4            |  |  | 4            |  |  | 3            |  |  | 14  |
| 1745 - 1800 | 1            |  |  | 3            |  |  | 2            |  |  | 0            |  |  | 6   |
| Period End  | 30           |  |  | 69           |  |  | 20           |  |  | 46           |  |  | 165 |

| Peds        | NORTH        |  |  | WEST         |  |  | SOUTH        |  |  | EAST         |  |  |     |
|-------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|-----|
|             | Wigram St    |  |  | Parkes St    |  |  | Wigram St    |  |  | Parkes St    |  |  |     |
| Peak Per    | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | UNCLASSIFIED |  |  | TOT |
| 1600 - 1700 | 16           |  |  | 47           |  |  | 12           |  |  | 27           |  |  | 102 |
| 1615 - 1715 | 17           |  |  | 48           |  |  | 12           |  |  | 34           |  |  | 111 |
| 1630 - 1730 | 18           |  |  | 36           |  |  | 10           |  |  | 30           |  |  | 94  |
| 1645 - 1745 | 18           |  |  | 30           |  |  | 12           |  |  | 25           |  |  | 85  |
| 1700 - 1800 | 14           |  |  | 22           |  |  | 8            |  |  | 19           |  |  | 63  |

|         |    |  |  |    |  |  |    |  |  |    |  |  |     |
|---------|----|--|--|----|--|--|----|--|--|----|--|--|-----|
| PEAK HR | 16 |  |  | 47 |  |  | 12 |  |  | 27 |  |  | 102 |
|---------|----|--|--|----|--|--|----|--|--|----|--|--|-----|



## ROAR DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob. 0418 239019

Client : Varga Traffic Planning

Job No/Name : 5450 PARRAMATTA Wigram St Counts

Day/Date : Wednesday 10th December 2014

Hours 1

Hours 2

Hours 3

Hours 4

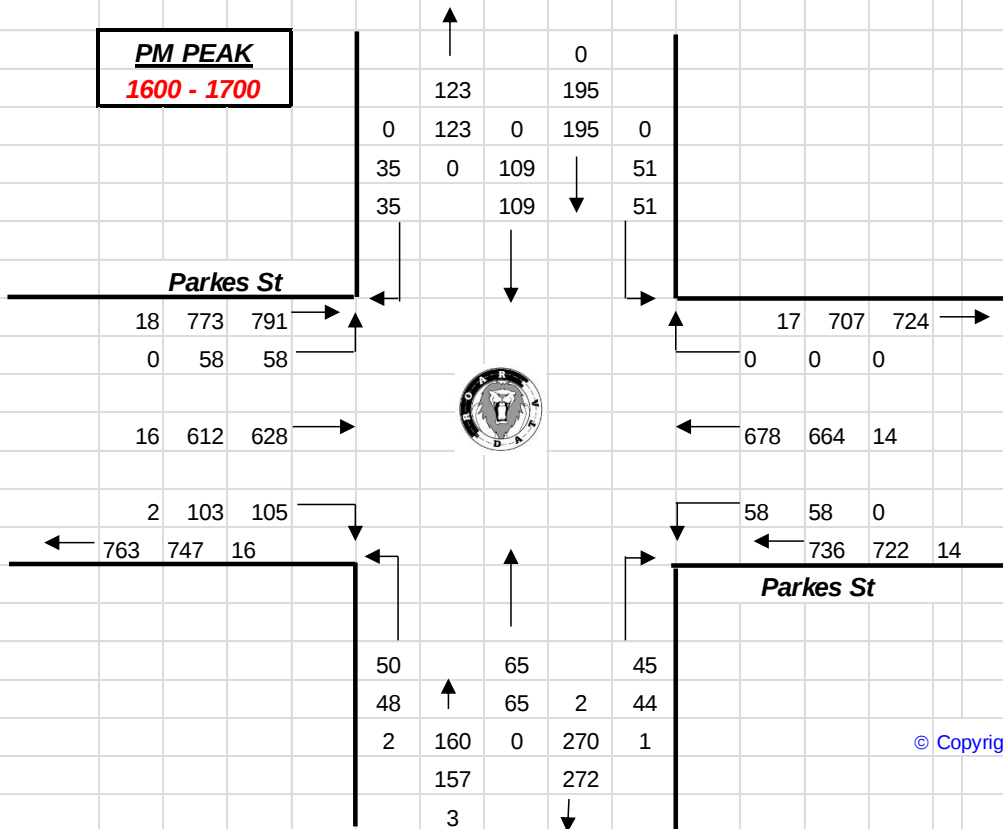
Hours 5



Wigram St

**PM PEAK**

**1600 - 1700**

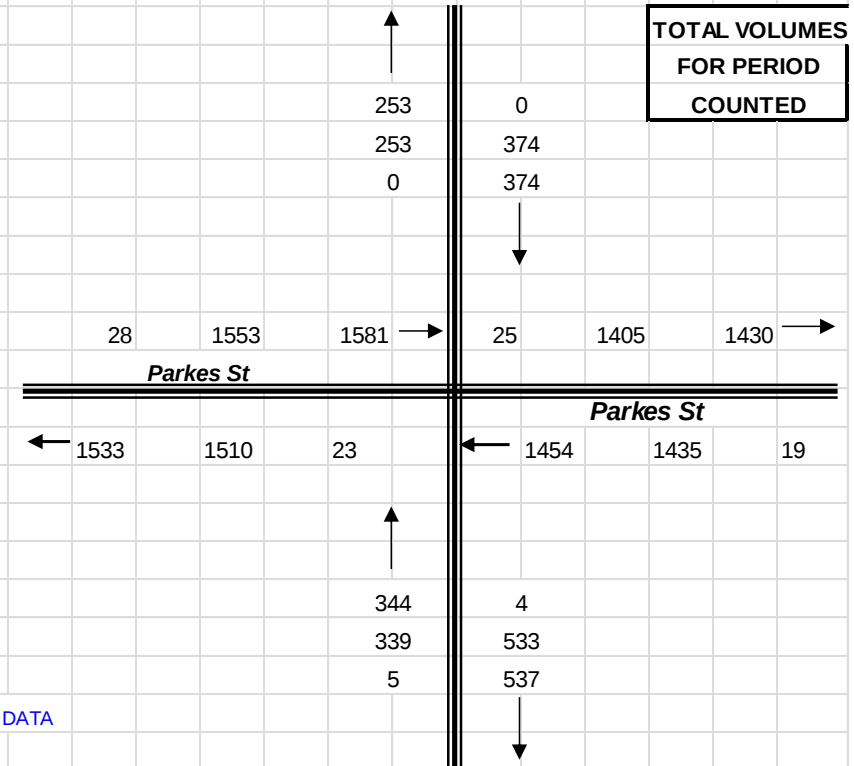


Wigram St

**TOTAL VOLUMES**

**FOR PERIOD**

**COUNTED**



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Wigram St

Wigram St



## R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : Varga Traffic Planning  
Job No/Name : 5450 PARRAMATTA Wigram St Counts  
Day/Date : Wednesday 10th December 2014

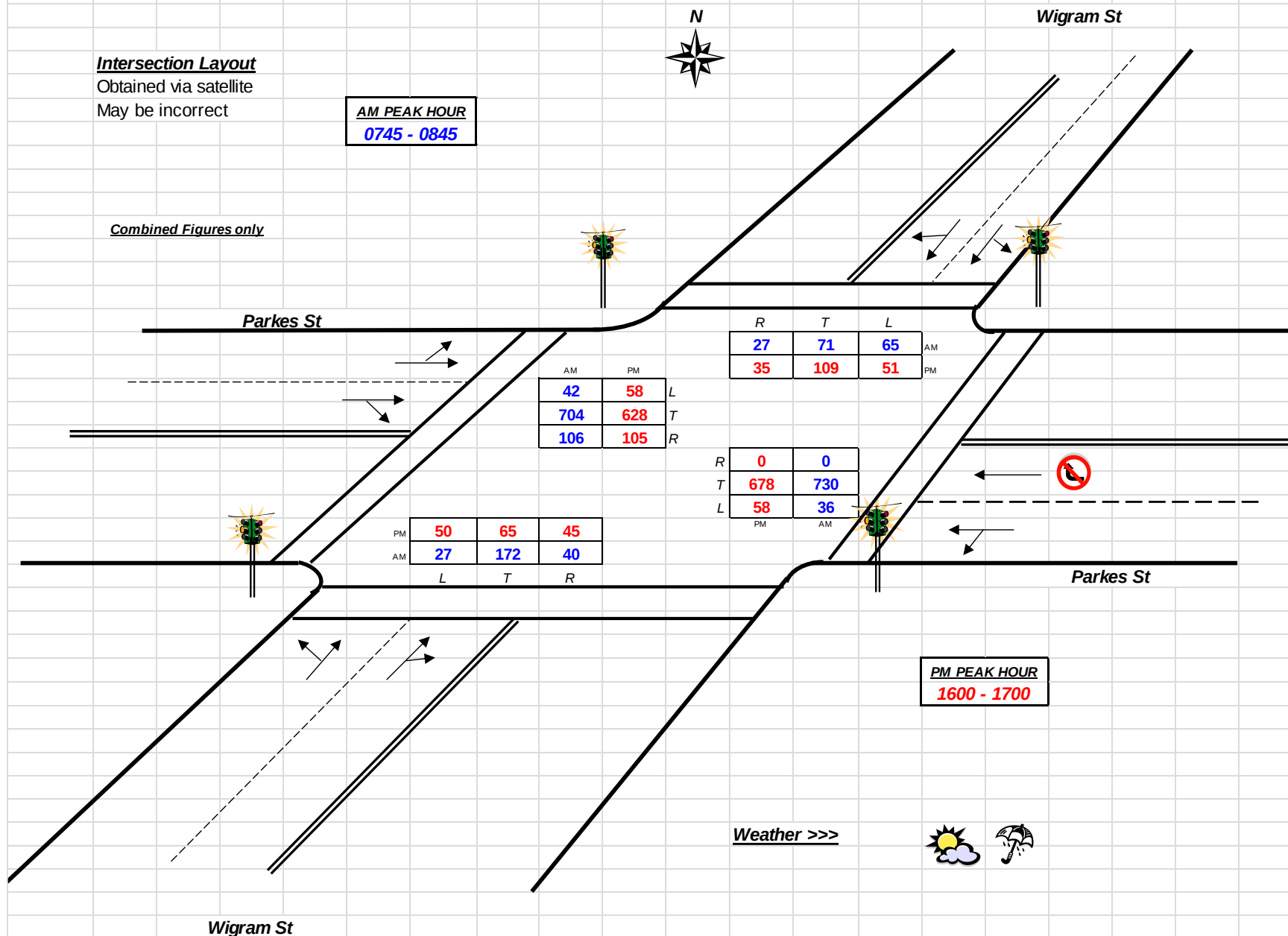
### Intersection Layout

Obtained via satellite

May be incorrect

**AM PEAK HOUR**  
**0745 - 0845**

Combined Figures only



## **APPENDIX B**

### **SIDRA RESULTS**

## MOVEMENT SUMMARY



Site: Existing AM

Wigram Street & Hassall Street Intersection  
Stop (Two-Way)

| Movement Performance - Vehicles |        |                                |         |                  |                         |                     |                                      |                        |                 |                                   |                          |
|---------------------------------|--------|--------------------------------|---------|------------------|-------------------------|---------------------|--------------------------------------|------------------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                          | OD Mov | Demand Flows<br>Total<br>veh/h | HV<br>% | Deg. Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of Queue<br>Vehicles<br>veh | Queue<br>Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| South: Wigram Street (south)    |        |                                |         |                  |                         |                     |                                      |                        |                 |                                   |                          |
| 1                               | L2     | 120                            | 0.0     | 0.127            | 7.8                     | LOS A               | 0.5                                  | 3.2                    | 0.14            | 0.92                              | 45.0                     |
| 3                               | R2     | 56                             | 0.0     | 0.127            | 7.5                     | LOS A               | 0.5                                  | 3.2                    | 0.14            | 0.92                              | 44.6                     |
| Approach                        |        | 176                            | 0.0     | 0.127            | 7.7                     | LOS A               | 0.5                                  | 3.2                    | 0.14            | 0.92                              | 44.9                     |
| East: Hassall Street (east)     |        |                                |         |                  |                         |                     |                                      |                        |                 |                                   |                          |
| 4                               | L2     | 21                             | 0.0     | 0.052            | 4.6                     | LOS A               | 0.0                                  | 0.0                    | 0.00            | 0.11                              | 48.9                     |
| 5                               | T1     | 79                             | 1.3     | 0.052            | 0.0                     | LOS A               | 0.0                                  | 0.0                    | 0.00            | 0.11                              | 49.3                     |
| Approach                        |        | 100                            | 1.0     | 0.052            | 1.0                     | NA                  | 0.0                                  | 0.0                    | 0.00            | 0.11                              | 49.2                     |
| West: Hassall Street (west)     |        |                                |         |                  |                         |                     |                                      |                        |                 |                                   |                          |
| 11                              | T1     | 66                             | 0.0     | 0.104            | 0.2                     | LOS A               | 0.5                                  | 3.7                    | 0.16            | 0.37                              | 47.5                     |
| 12                              | R2     | 154                            | 0.0     | 0.104            | 4.8                     | LOS A               | 0.5                                  | 3.7                    | 0.16            | 0.37                              | 46.6                     |
| Approach                        |        | 220                            | 0.0     | 0.104            | 3.4                     | NA                  | 0.5                                  | 3.7                    | 0.16            | 0.37                              | 46.9                     |
| All Vehicles                    |        | 496                            | 0.2     | 0.127            | 4.4                     | NA                  | 0.5                                  | 3.7                    | 0.12            | 0.52                              | 46.6                     |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## MOVEMENT SUMMARY



**Site: Existing PM**

Wigram Street & Hassall Street Intersection  
Stop (Two-Way)

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Wigram Street (south)    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 1                               | L2     | 52                 | 0.0        | 0.097         | 7.6               | LOS A            | 0.3                            | 2.2        | 0.08         | 0.95                        | 45.0               |
| 3                               | R2     | 88                 | 0.0        | 0.097         | 7.5               | LOS A            | 0.3                            | 2.2        | 0.08         | 0.95                        | 44.6               |
| Approach                        |        | 140                | 0.0        | 0.097         | 7.5               | LOS A            | 0.3                            | 2.2        | 0.08         | 0.95                        | 44.8               |
| East: Hassall Street (east)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4                               | L2     | 19                 | 0.0        | 0.028         | 4.6               | LOS A            | 0.0                            | 0.0        | 0.00         | 0.19                        | 48.5               |
| 5                               | T1     | 35                 | 0.0        | 0.028         | 0.0               | LOS A            | 0.0                            | 0.0        | 0.00         | 0.19                        | 48.9               |
| Approach                        |        | 54                 | 0.0        | 0.028         | 1.6               | NA               | 0.0                            | 0.0        | 0.00         | 0.19                        | 48.8               |
| West: Hassall Street (west)     |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 11                              | T1     | 64                 | 0.0        | 0.120         | 0.1               | LOS A            | 0.6                            | 4.5        | 0.11         | 0.40                        | 47.5               |
| 12                              | R2     | 198                | 0.0        | 0.120         | 4.7               | LOS A            | 0.6                            | 4.5        | 0.11         | 0.40                        | 46.6               |
| Approach                        |        | 262                | 0.0        | 0.120         | 3.6               | NA               | 0.6                            | 4.5        | 0.11         | 0.40                        | 46.8               |
| All Vehicles                    |        | 456                | 0.0        | 0.120         | 4.6               | NA               | 0.6                            | 4.5        | 0.09         | 0.55                        | 46.4               |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 **Site: Proposed AM**

Wigram Street & Hassall Street Intersection  
Stop (Two-Way)

| Movement Performance - Vehicles |        |                                |         |                  |                         |                     |                                      |               |                 |                                   |                          |
|---------------------------------|--------|--------------------------------|---------|------------------|-------------------------|---------------------|--------------------------------------|---------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                          | OD Mov | Demand Flows<br>Total<br>veh/h | HV<br>% | Deg. Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| South: Wigram Street (south)    |        |                                |         |                  |                         |                     |                                      |               |                 |                                   |                          |
| 1                               | L2     | 138                            | 0.0     | 0.153            | 7.8                     | LOS A               | 0.6                                  | 3.9           | 0.14            | 0.93                              | 45.0                     |
| 3                               | R2     | 74                             | 0.0     | 0.153            | 7.5                     | LOS A               | 0.6                                  | 3.9           | 0.14            | 0.93                              | 44.6                     |
| Approach                        |        | 212                            | 0.0     | 0.153            | 7.7                     | LOS A               | 0.6                                  | 3.9           | 0.14            | 0.93                              | 44.9                     |
| East: Hassall Street (east)     |        |                                |         |                  |                         |                     |                                      |               |                 |                                   |                          |
| 4                               | L2     | 35                             | 0.0     | 0.060            | 4.6                     | LOS A               | 0.0                                  | 0.0           | 0.00            | 0.17                              | 48.6                     |
| 5                               | T1     | 79                             | 1.3     | 0.060            | 0.0                     | LOS A               | 0.0                                  | 0.0           | 0.00            | 0.17                              | 49.0                     |
| Approach                        |        | 114                            | 0.9     | 0.060            | 1.4                     | NA                  | 0.0                                  | 0.0           | 0.00            | 0.17                              | 48.9                     |
| West: Hassall Street (west)     |        |                                |         |                  |                         |                     |                                      |               |                 |                                   |                          |
| 11                              | T1     | 66                             | 0.0     | 0.108            | 0.3                     | LOS A               | 0.6                                  | 3.9           | 0.17            | 0.38                              | 47.5                     |
| 12                              | R2     | 160                            | 0.0     | 0.108            | 4.9                     | LOS A               | 0.6                                  | 3.9           | 0.17            | 0.38                              | 46.6                     |
| Approach                        |        | 226                            | 0.0     | 0.108            | 3.5                     | NA                  | 0.6                                  | 3.9           | 0.17            | 0.38                              | 46.8                     |
| All Vehicles                    |        | 552                            | 0.2     | 0.153            | 4.7                     | NA                  | 0.6                                  | 3.9           | 0.13            | 0.54                              | 46.5                     |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 **Site: Proposed PM**

Wigram Street & Hassall Street Intersection  
Stop (Two-Way)

| Movement Performance - Vehicles |        |                             |      |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|--------|-----------------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | OD Mov | Demand Flows Total<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Wigram Street (south)    |        |                             |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                               | L2     | 58                          | 0.0  | 0.107            | 7.6                  | LOS A            | 0.3                                  | 2.4           | 0.08         | 0.96                           | 45.0                  |
| 3                               | R2     | 95                          | 0.0  | 0.107            | 7.5                  | LOS A            | 0.3                                  | 2.4           | 0.08         | 0.96                           | 44.6                  |
| Approach                        |        | 153                         | 0.0  | 0.107            | 7.5                  | LOS A            | 0.3                                  | 2.4           | 0.08         | 0.96                           | 44.7                  |
| East: Hassall Street (east)     |        |                             |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L2     | 56                          | 0.0  | 0.048            | 4.6                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.33                           | 47.7                  |
| 5                               | T1     | 35                          | 0.0  | 0.048            | 0.0                  | LOS A            | 0.0                                  | 0.0           | 0.00         | 0.33                           | 48.1                  |
| Approach                        |        | 91                          | 0.0  | 0.048            | 2.8                  | NA               | 0.0                                  | 0.0           | 0.00         | 0.33                           | 47.9                  |
| West: Hassall Street (west)     |        |                             |      |                  |                      |                  |                                      |               |              |                                |                       |
| 11                              | T1     | 64                          | 0.0  | 0.130            | 0.2                  | LOS A            | 0.7                                  | 4.9           | 0.16         | 0.41                           | 47.3                  |
| 12                              | R2     | 216                         | 0.0  | 0.130            | 4.8                  | LOS A            | 0.7                                  | 4.9           | 0.16         | 0.41                           | 46.5                  |
| Approach                        |        | 280                         | 0.0  | 0.130            | 3.8                  | NA               | 0.7                                  | 4.9           | 0.16         | 0.41                           | 46.7                  |
| All Vehicles                    |        | 524                         | 0.0  | 0.130            | 4.7                  | NA               | 0.7                                  | 4.9           | 0.11         | 0.55                           | 46.3                  |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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## MOVEMENT SUMMARY

 **Site: Existing AM**

Wigram Street & Parkes Street Intersection

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

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Wigram Street (south)    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 1                               | L2     | 27                 | 7.4        | 0.122         | 37.2              | LOS C            | 2.8                            | 20.3       | 0.76         | 0.65                        | 35.3               |
| 2                               | T1     | 172                | 0.0        | 0.456         | 38.1              | LOS C            | 8.4                            | 58.5       | 0.85         | 0.72                        | 32.5               |
| 3                               | R2     | 40                 | 0.0        | 0.456         | 44.3              | LOS D            | 8.4                            | 58.5       | 0.87         | 0.74                        | 33.4               |
| Approach                        |        | 239                | 0.8        | 0.456         | 39.0              | LOS C            | 8.4                            | 58.5       | 0.84         | 0.71                        | 33.0               |
| East: Parkes Street (east)      |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 4                               | L2     | 36                 | 5.6        | 0.459         | 30.6              | LOS C            | 15.5                           | 112.9      | 0.75         | 0.67                        | 39.2               |
| 5                               | T1     | 730                | 4.7        | 0.459         | 25.0              | LOS B            | 15.6                           | 113.4      | 0.75         | 0.66                        | 42.4               |
| Approach                        |        | 766                | 4.7        | 0.459         | 25.2              | LOS B            | 15.6                           | 113.4      | 0.75         | 0.66                        | 42.3               |
| North: Wigram Street (north)    |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 7                               | L2     | 65                 | 0.0        | 0.124         | 38.7              | LOS C            | 2.8                            | 19.6       | 0.78         | 0.72                        | 34.0               |
| 8                               | T1     | 71                 | 0.0        | 0.243         | 39.7              | LOS C            | 4.6                            | 32.8       | 0.85         | 0.70                        | 32.1               |
| 9                               | R2     | 27                 | 3.7        | 0.243         | 44.3              | LOS D            | 4.6                            | 32.8       | 0.85         | 0.70                        | 33.3               |
| Approach                        |        | 163                | 0.6        | 0.243         | 40.0              | LOS C            | 4.6                            | 32.8       | 0.82         | 0.71                        | 33.0               |
| West: Parkes Street (west)      |        |                    |            |               |                   |                  |                                |            |              |                             |                    |
| 10                              | L2     | 42                 | 0.0        | 0.464         | 18.6              | LOS B            | 16.8                           | 120.8      | 0.58         | 0.54                        | 45.1               |
| 11                              | T1     | 704                | 3.7        | 0.464         | 13.3              | LOS A            | 16.8                           | 120.8      | 0.62         | 0.58                        | 48.7               |
| 12                              | R2     | 106                | 1.9        | 0.464         | 19.5              | LOS B            | 8.6                            | 61.5       | 0.71         | 0.67                        | 43.8               |
| Approach                        |        | 852                | 3.3        | 0.464         | 14.3              | LOS A            | 16.8                           | 120.8      | 0.63         | 0.59                        | 47.8               |
| All Vehicles                    |        | 2020               | 3.3        | 0.464         | 23.5              | LOS B            | 16.8                           | 120.8      | 0.71         | 0.64                        | 42.0               |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |  |
| P1                                 | South Full Crossing | 3                 | 24.7              | LOS C            | 0.0                                  | 0.0        | 0.64         | 0.64                        |  |
| P2                                 | East Full Crossing  | 43                | 38.5              | LOS D            | 0.1                                  | 0.1        | 0.80         | 0.80                        |  |
| P3                                 | North Full Crossing | 16                | 13.1              | LOS B            | 0.0                                  | 0.0        | 0.47         | 0.47                        |  |
| P4                                 | West Full Crossing  | 55                | 38.5              | LOS D            | 0.2                                  | 0.2        | 0.80         | 0.80                        |  |
| All Pedestrians                    |                     | 117               | 34.7              | LOS D            |                                      |            | 0.75         | 0.75                        |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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## MOVEMENT SUMMARY

 **Site: Existing PM**

Wigram Street & Parkes Street Intersection

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

| Movement Performance - Vehicles |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
|---------------------------------|--------|--------------------|------------|---------------|-------------------|------------------|-----------------------|---------------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Wigram Street (south)    |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 1                               | L2     | 50                 | 4.0        | 0.095         | 33.9              | LOS C            | 2.3                   | 16.4                | 0.72         | 0.69                        | 35.7               |
| 2                               | T1     | 65                 | 0.0        | 0.357         | 43.3              | LOS D            | 5.3                   | 37.1                | 0.88         | 0.74                        | 30.8               |
| 3                               | R2     | 45                 | 2.2        | 0.357         | 49.6              | LOS D            | 5.3                   | 37.1                | 0.90         | 0.74                        | 31.5               |
| Approach                        |        | 160                | 1.9        | 0.357         | 42.1              | LOS C            | 5.3                   | 37.1                | 0.84         | 0.73                        | 32.4               |
| East: Parkes Street (east)      |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 4                               | L2     | 58                 | 0.0        | 0.390         | 25.9              | LOS B            | 13.3                  | 94.6                | 0.67         | 0.62                        | 41.1               |
| 5                               | T1     | 678                | 2.1        | 0.390         | 20.3              | LOS B            | 13.4                  | 95.4                | 0.67         | 0.60                        | 44.8               |
| Approach                        |        | 736                | 1.9        | 0.390         | 20.8              | LOS B            | 13.4                  | 95.4                | 0.67         | 0.60                        | 44.5               |
| North: Wigram Street (north)    |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 7                               | L2     | 51                 | 0.0        | 0.114         | 42.6              | LOS D            | 2.3                   | 16.2                | 0.81         | 0.72                        | 32.8               |
| 8                               | T1     | 109                | 0.0        | 0.391         | 43.8              | LOS D            | 7.3                   | 51.1                | 0.90         | 0.75                        | 31.0               |
| 9                               | R2     | 35                 | 0.0        | 0.391         | 48.4              | LOS D            | 7.3                   | 51.1                | 0.90         | 0.75                        | 32.1               |
| Approach                        |        | 195                | 0.0        | 0.391         | 44.3              | LOS D            | 7.3                   | 51.1                | 0.88         | 0.74                        | 31.6               |
| West: Parkes Street (west)      |        |                    |            |               |                   |                  |                       |                     |              |                             |                    |
| 10                              | L2     | 58                 | 0.0        | 0.397         | 15.5              | LOS B            | 13.2                  | 94.4                | 0.50         | 0.48                        | 46.7               |
| 11                              | T1     | 628                | 2.5        | 0.397         | 10.2              | LOS A            | 13.2                  | 94.4                | 0.53         | 0.52                        | 50.6               |
| 12                              | R2     | 105                | 1.9        | 0.397         | 16.3              | LOS B            | 7.2                   | 51.2                | 0.62         | 0.61                        | 45.4               |
| Approach                        |        | 791                | 2.3        | 0.397         | 11.4              | LOS A            | 13.2                  | 94.4                | 0.54         | 0.53                        | 49.6               |
| All Vehicles                    |        | 1882               | 1.9        | 0.397         | 21.1              | LOS B            | 13.4                  | 95.4                | 0.65         | 0.60                        | 43.2               |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |  |
| P1                                 | South Full Crossing | 12                | 21.0              | LOS C            | 0.0                                  | 0.0        | 0.59         | 0.59                        |  |
| P2                                 | East Full Crossing  | 27                | 42.6              | LOS E            | 0.1                                  | 0.1        | 0.84         | 0.84                        |  |
| P3                                 | North Full Crossing | 16                | 10.8              | LOS B            | 0.0                                  | 0.0        | 0.43         | 0.43                        |  |
| P4                                 | West Full Crossing  | 47                | 42.6              | LOS E            | 0.1                                  | 0.1        | 0.84         | 0.84                        |  |
| All Pedestrians                    |                     | 102               | 35.1              | LOS D            |                                      |            | 0.75         | 0.75                        |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 **Site: Proposed AM**

Wigram Street & Parkes Street Intersection

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

| Movement Performance - Vehicles |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
|---------------------------------|--------|--------------------------------|---------|---------------------|-------------------------|---------------------|--------------------------------------|---------------|-----------------|-----------------------------------|--------------------------|
| Mov ID                          | OD Mov | Demand Flows<br>Total<br>veh/h | HV<br>% | Deg.<br>Satn<br>v/c | Average<br>Delay<br>sec | Level of<br>Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per veh | Average<br>Speed<br>km/h |
| South: Wigram Street (south)    |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 1                               | L2     | 27                             | 7.4     | 0.131               | 35.0                    | LOS C               | 3.2                                  | 22.8          | 0.74            | 0.63                              | 36.2                     |
| 2                               | T1     | 172                            | 0.0     | 0.490               | 38.8                    | LOS C               | 8.1                                  | 56.5          | 0.85            | 0.71                              | 32.3                     |
| 3                               | R2     | 40                             | 0.0     | 0.490               | 47.0                    | LOS D               | 8.1                                  | 56.5          | 0.90            | 0.75                              | 32.5                     |
| Approach                        |        | 239                            | 0.8     | 0.490               | 39.8                    | LOS C               | 8.1                                  | 56.5          | 0.84            | 0.71                              | 32.7                     |
| East: Parkes Street (east)      |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 4                               | L2     | 36                             | 5.6     | 0.487               | 32.9                    | LOS C               | 16.2                                 | 118.1         | 0.78            | 0.70                              | 38.2                     |
| 5                               | T1     | 730                            | 4.7     | 0.487               | 27.3                    | LOS B               | 16.3                                 | 118.7         | 0.78            | 0.69                              | 41.3                     |
| Approach                        |        | 766                            | 4.7     | 0.487               | 27.6                    | LOS B               | 16.3                                 | 118.7         | 0.78            | 0.69                              | 41.2                     |
| North: Wigram Street (north)    |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 7                               | L2     | 84                             | 0.0     | 0.147               | 36.6                    | LOS C               | 3.5                                  | 24.7          | 0.76            | 0.73                              | 34.7                     |
| 8                               | T1     | 71                             | 0.0     | 0.347               | 44.3                    | LOS D               | 5.9                                  | 41.5          | 0.90            | 0.75                              | 30.7                     |
| 9                               | R2     | 45                             | 2.2     | 0.347               | 48.9                    | LOS D               | 5.9                                  | 41.5          | 0.90            | 0.75                              | 31.8                     |
| Approach                        |        | 200                            | 0.5     | 0.347               | 42.1                    | LOS C               | 5.9                                  | 41.5          | 0.84            | 0.74                              | 32.5                     |
| West: Parkes Street (west)      |        |                                |         |                     |                         |                     |                                      |               |                 |                                   |                          |
| 10                              | L2     | 49                             | 0.0     | 0.489               | 20.4                    | LOS B               | 18.2                                 | 130.9         | 0.62            | 0.58                              | 44.0                     |
| 11                              | T1     | 704                            | 3.7     | 0.489               | 15.1                    | LOS B               | 18.2                                 | 130.9         | 0.66            | 0.61                              | 47.5                     |
| 12                              | R2     | 106                            | 1.9     | 0.489               | 21.1                    | LOS B               | 9.1                                  | 65.7          | 0.75            | 0.69                              | 42.9                     |
| Approach                        |        | 859                            | 3.3     | 0.489               | 16.1                    | LOS B               | 18.2                                 | 130.9         | 0.67            | 0.62                              | 46.7                     |
| All Vehicles                    |        | 2064                           | 3.2     | 0.490               | 25.6                    | LOS B               | 18.2                                 | 130.9         | 0.75            | 0.67                              | 40.9                     |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                      |                         |                     |                                            |               |                 |                                   |
|------------------------------------|---------------------|----------------------|-------------------------|---------------------|--------------------------------------------|---------------|-----------------|-----------------------------------|
| Mov ID                             | Description         | Demand Flow<br>ped/h | Average<br>Delay<br>sec | Level of<br>Service | Average Back of Queue<br>Pedestrian<br>ped | Distance<br>m | Prop.<br>Queued | Effective<br>Stop Rate<br>per ped |
| P1                                 | South Full Crossing | 3                    | 26.7                    | LOS C               | 0.0                                        | 0.0           | 0.67            | 0.67                              |
| P2                                 | East Full Crossing  | 43                   | 36.1                    | LOS D               | 0.1                                        | 0.1           | 0.78            | 0.78                              |
| P3                                 | North Full Crossing | 16                   | 14.5                    | LOS B               | 0.0                                        | 0.0           | 0.49            | 0.49                              |
| P4                                 | West Full Crossing  | 55                   | 36.1                    | LOS D               | 0.1                                        | 0.1           | 0.78            | 0.78                              |
| All Pedestrians                    |                     | 117                  | 32.9                    | LOS D               |                                            |               | 0.73            | 0.73                              |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY



**Site: Proposed PM**

Wigram Street & Parkes Street Intersection

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

| Movement Performance - Vehicles |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
|---------------------------------|--------|--------------------------|------|---------------|-------------------|------------------|--------------------------------|------------|--------------|-----------------------------|--------------------|
| Mov ID                          | OD Mov | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate per veh | Average Speed km/h |
| South: Wigram Street (south)    |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 1                               | L2     | 50                       | 4.0  | 0.098         | 33.9              | LOS C            | 2.4                            | 16.9       | 0.72         | 0.69                        | 35.8               |
| 2                               | T1     | 65                       | 0.0  | 0.366         | 43.7              | LOS D            | 5.2                            | 36.8       | 0.88         | 0.74                        | 30.7               |
| 3                               | R2     | 45                       | 2.2  | 0.366         | 50.6              | LOS D            | 5.2                            | 36.8       | 0.91         | 0.75                        | 31.3               |
| Approach                        |        | 160                      | 1.9  | 0.366         | 42.6              | LOS D            | 5.2                            | 36.8       | 0.84         | 0.73                        | 32.3               |
| East: Parkes Street (east)      |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 4                               | L2     | 58                       | 0.0  | 0.404         | 27.3              | LOS B            | 13.8                           | 97.8       | 0.70         | 0.64                        | 40.5               |
| 5                               | T1     | 678                      | 2.1  | 0.404         | 21.7              | LOS B            | 13.8                           | 98.6       | 0.70         | 0.62                        | 44.0               |
| Approach                        |        | 736                      | 1.9  | 0.404         | 22.2              | LOS B            | 13.8                           | 98.6       | 0.70         | 0.62                        | 43.7               |
| North: Wigram Street (north)    |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 7                               | L2     | 58                       | 0.0  | 0.121         | 41.0              | LOS C            | 2.6                            | 18.1       | 0.80         | 0.72                        | 33.3               |
| 8                               | T1     | 109                      | 0.0  | 0.421         | 45.0              | LOS D            | 7.8                            | 54.4       | 0.92         | 0.76                        | 30.6               |
| 9                               | R2     | 42                       | 0.0  | 0.421         | 49.5              | LOS D            | 7.8                            | 54.4       | 0.92         | 0.76                        | 31.8               |
| Approach                        |        | 209                      | 0.0  | 0.421         | 44.8              | LOS D            | 7.8                            | 54.4       | 0.88         | 0.75                        | 31.6               |
| West: Parkes Street (west)      |        |                          |      |               |                   |                  |                                |            |              |                             |                    |
| 10                              | L2     | 76                       | 0.0  | 0.416         | 16.6              | LOS B            | 14.3                           | 102.0      | 0.53         | 0.51                        | 45.9               |
| 11                              | T1     | 628                      | 2.5  | 0.416         | 11.3              | LOS A            | 14.3                           | 102.0      | 0.56         | 0.55                        | 49.8               |
| 12                              | R2     | 105                      | 1.9  | 0.416         | 17.3              | LOS B            | 7.7                            | 55.2       | 0.64         | 0.62                        | 44.9               |
| Approach                        |        | 809                      | 2.2  | 0.416         | 12.6              | LOS A            | 14.3                           | 102.0      | 0.57         | 0.55                        | 48.7               |
| All Vehicles                    |        | 1914                     | 1.8  | 0.421         | 22.3              | LOS B            | 14.3                           | 102.0      | 0.67         | 0.62                        | 42.5               |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                             |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|-----------------------------|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate per ped |
| P1                                 | South Full Crossing | 12                | 22.2              | LOS C            | 0.0                                  | 0.0        | 0.61         | 0.61                        |
| P2                                 | East Full Crossing  | 27                | 40.9              | LOS E            | 0.1                                  | 0.1        | 0.83         | 0.83                        |
| P3                                 | North Full Crossing | 16                | 11.7              | LOS B            | 0.0                                  | 0.0        | 0.44         | 0.44                        |
| P4                                 | West Full Crossing  | 47                | 40.9              | LOS E            | 0.1                                  | 0.1        | 0.83         | 0.83                        |
| All Pedestrians                    |                     | 102               | 34.1              | LOS D            |                                      |            | 0.74         | 0.74                        |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.