GTAconsultants

John Cootes Site
246-264 Woodville Road, Merrylands
Transport Impact Assessment

Client // Wiltex Wholesale Pty Limited
Office // NSW
Reference // 15S1396000
Date // 09/10/15

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	25/05/15	Final	Andrew Farran	Brett Maynard	Brett Maynard	Brett Maynard
B	12/06/15	Revised Final with additional intersection analysis following community consultation	Andrew Farran	Brett Maynard	Brett Maynard	Brett Maynard
C	09/10/15	Revised to reflect updated yields	Andrew Farran	Brett Maynard	Brett Maynard	

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Executive Summary

A Planning Proposal is to be lodged with Parramatta City Council to amend the current planning controls for the site located at 246-264 Woodville Road in Merrylands. An indicative development yield for the site comprises some 590 residential apartments and 8,400sq.m of non-residential land uses, including supermarket, retail and community uses. Vehicle access to the site is proposed via a new signalised intersection to Woodville Road, as well as via two local connections to Lansdowne Street and Highland Street. The access points would be connected by a new internal public street network.

The proposed development has a DCP parking requirement to provide in the order of 1,143 car parking spaces. It is anticipated that this level of car parking will generally be provided within two basement car park levels, noting that there may be an opportunity to share some of the short-term retail and residential visitor parking demands.

It is envisaged that bicycle parking for the development will generally be provided in accordance with the requirements set out in the DCP.

The development is anticipated to generate in the order of 720 trips during the PM peak hour (including 580 new trips) and 870 trips during the Saturday lunchtime peak hour (including 700 new trips).

When developing the vehicle access strategy for the site, three options were considered for the primary vehicle access point from Woodville Road:

- via Oxford Street and Highland Street
- via a new access opposite Kimberley Street
- via Lansdowne Street

Given the level of traffic anticipated to be generated by the development it is considered most appropriate to provide a new access road rather than relying on the existing local road network for access. This was particularly pertinent given the sensitivities of the existing surrounding land uses including a primary school and traditional low density residential dwellings. Further to this it is noted that:

- The Oxford Street corridor already carries significant through traffic volumes and has limited spare capacity.
- While all turning movements are currently available at Lansdowne Street, traffic signals at this location could encourage additional through traffic between Woodville Road and Railway Terrace.
- Signalising Kimberley Street would provide improved access to the residential area east of Woodville Road, as well as a direct connection to the site and associated local shopping facilities. This would limit turning movements on/off Woodville Road for such local trips.

Whilst it is acknowledged that the future signalised intersection to the site is located relatively close to the existing Oxford Street signals, it is still considered to be offset greater than minimum requirements. Indeed, whilst the proposed intersection treatment (incorporating the downstream right turn lane at Oxford Street) is not typical, there are several examples of similar facilities throughout metropolitan Sydney. It is noted that the future signals will be coordinated with the existing signals located at Oxford Street to minimise any adverse impacts.

Based on the above the proposed access strategy is considered to balance the needs of maintaining through traffic capacity on Woodville Road, vehicles accessing the site and the amenity of surrounding residents, and as such, is considered appropriate.

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1. Introduction

1.1 Background

It is understood that a Planning Proposal is to be lodged with Parramatta City Council to amend the current planning controls for the site located at 246-264 Woodville Road in Merrylands.

The Planning Proposal seeks to rezone the site to a B4 Mixed use zone and increase the permissible height limits for the site and introduce a site specific floor space ratio. An indicative development yield for the site comprises some 590 residential apartments set above 8,400sq.m GFA of lower level non-residential land uses.

GTA Consultants (GTA) was commissioned by Wiltex Wholesale Pty Limited in February 2015 to undertake a transport impact assessment for the proposed development.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i existing traffic and parking conditions surrounding the site
ii suitability of the proposed parking in terms of supply (quantum)
iii service vehicle requirements
iv pedestrian and bicycle requirements
v the traffic generating characteristics of the proposed development
vi suitability of the proposed access arrangements for the site
vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- Parramatta City Council Development Control Plan (DCP) 2011
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- traffic and car parking surveys undertaken for GTA Consultants as referenced in the context of this report
- plans and yield estimates for the proposed development prepared by Giles Tribe Architects, Job Reference 14073, dated 02/10/15.
- other documents and data as referenced in this report.

2. Existing Conditions

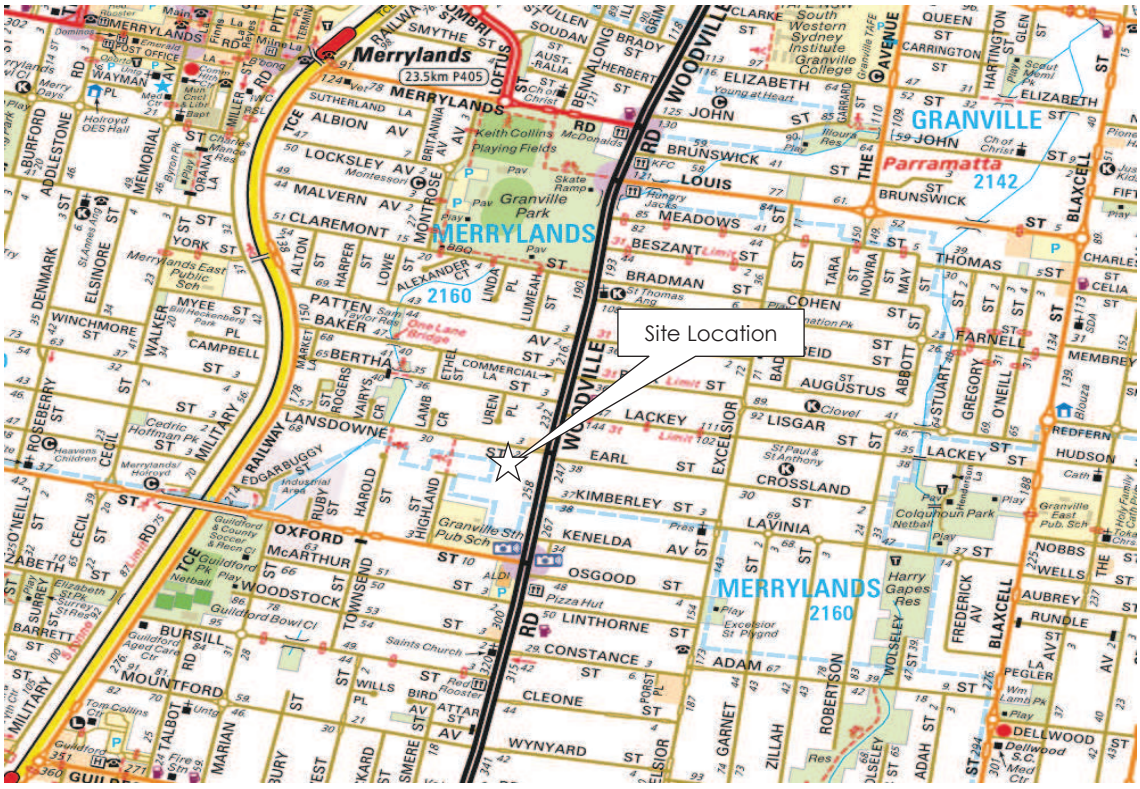
2.1 Subject Site

The subject site is located at 246-264 Woodville Road in Merrylands. The site of approximately 2.61ha has frontages to Woodville Road, Lansdowne Road and Highland Street. The site currently is currently occupied by John Cootes Furniture outlet and a number of residential dwellings. The majority of the site is zoned as B6 Enterprise Corridor with the existing residential properties zoned R2 Low Density Residential.

The surrounding properties predominantly include residential uses, with the Granville South Public School abutting the site to the south and a number of retail uses fronting Woodville Road.

The location of the subject site and its surrounding environs is shown in Figure 2.1 and Figure 2.2.

Figure 2.1: Subject Site and Its Environs – Street Map



Basemap source: Sydway Publishing Pty Ltd

Figure 2.2: Subject Site and Its Environs – Aerial Map

Basemap source: NearMap (used under licence)

2.2 Road Network

2.2.1 Adjoining Roads

Woodville Road is classified as a State Road and is under the care and control of Roads and Maritime Services (RMS). It is aligned in a north-south direction running between Parramatta Road to the north and Hume Highway in the south. It is typically configured with dual three lane carriageways generally separated by a narrow concrete median. In the vicinity of the site it is configured with two through traffic lanes in each direction, with a southbound right turn lane (to the Oxford Street intersection) provided adjacent to the subject site. Clearway restrictions apply during the AM (6 to 10am) and PM (3 to 7pm) peak periods. Outside of these periods 'No Stopping' restrictions generally apply, with some unrestricted parking also provided. Pedestrian footpaths are provided on both sides of Woodville Road, whilst no formal bike facilities are provided.

The speed limit along Woodville Road is generally 70km/h, with a number of 40km/h school speed zones also provided along its length (including one for Granville South Public School located immediately south of the site).

Advice from RMS indicates that Woodville Road carries approximately 40,000 vehicles per day (vpd). Historically traffic volumes on Woodville Road peaked at 45,000vpd, but have plateaued at their current level following the opening of the M7 Motorway which provides a broader alternate route for vehicles travelling north-south in this vicinity.

A summary of the average peak hour vehicle speeds along the length of the corridor is provided in Table 2.1. The results indicate that there is significant congestion along the corridor during peak periods,

Table 2.1: Woodville Road Average Vehicle Speeds [1]

Location	Average Vehicle Speed	
	AM Peak Period	PM Peak Period
Woodville Road	34km/h	28km/h

[1] Provided by RMS at a project meeting dated 17 June 2014.

Oxford Street, Lansdowne Street and Highland Street are local roads provided in the vicinity of the site. Oxford Street is a collector road and includes a signalised intersection at Woodville Road and a grade separated crossing of the railway line to the west of the site.

Highland Street is currently a 'dead-end' street (hammerhead treatment) and primarily provides vehicle access to the adjacent residential properties and the Granville South Public School. Highland Street currently carries 500vpd[1]. On-street car parking demands are high on Highland Street during school times and particularly during the peak pick up and drop off periods for the primary school.

Lansdowne Street forms an east-west link between Woodville Road and Railway Terrace. There are a number of Local Area Traffic Management (LATM) treatments on Lansdowne Street, including traffic islands and road narrowings that seek to reduce vehicle speeds on Lansdowne Street. Lansdowne Street currently carries 1,500vpd[2].

Woodville Road, Oxford Street, Highland Street and Lansdowne Street are shown in Figure 2.3 to Figure 2.6.

Figure 2.3: Woodville Road – Looking South

Figure 2.4: Oxford Street – Looking West

[1] Based on week-long tube counts on Highland Street (approximately 50m north of Oxford Street) undertaken between 9 and 16 May 2015.

[2] Based on peak hour traffic counts commissioned by GTA in May 2015 and assuming a peak-to-daily ratio of 10%.

Figure 2.5: Highland Street – Looking South

Figure 2.6: Lansdowne Street – Looking West

2.2.2 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Woodville Road / Lansdowne Street / Earl Street (priority controlled offset X-intersection)
- Woodville Road / Kimberley Street (priority controlled T-intersection)
- Woodville Road / Oxford Street (signalised T-intersection)
- Oxford Street / Highland Street (priority controlled T-intersection).

2.3 Traffic Volumes

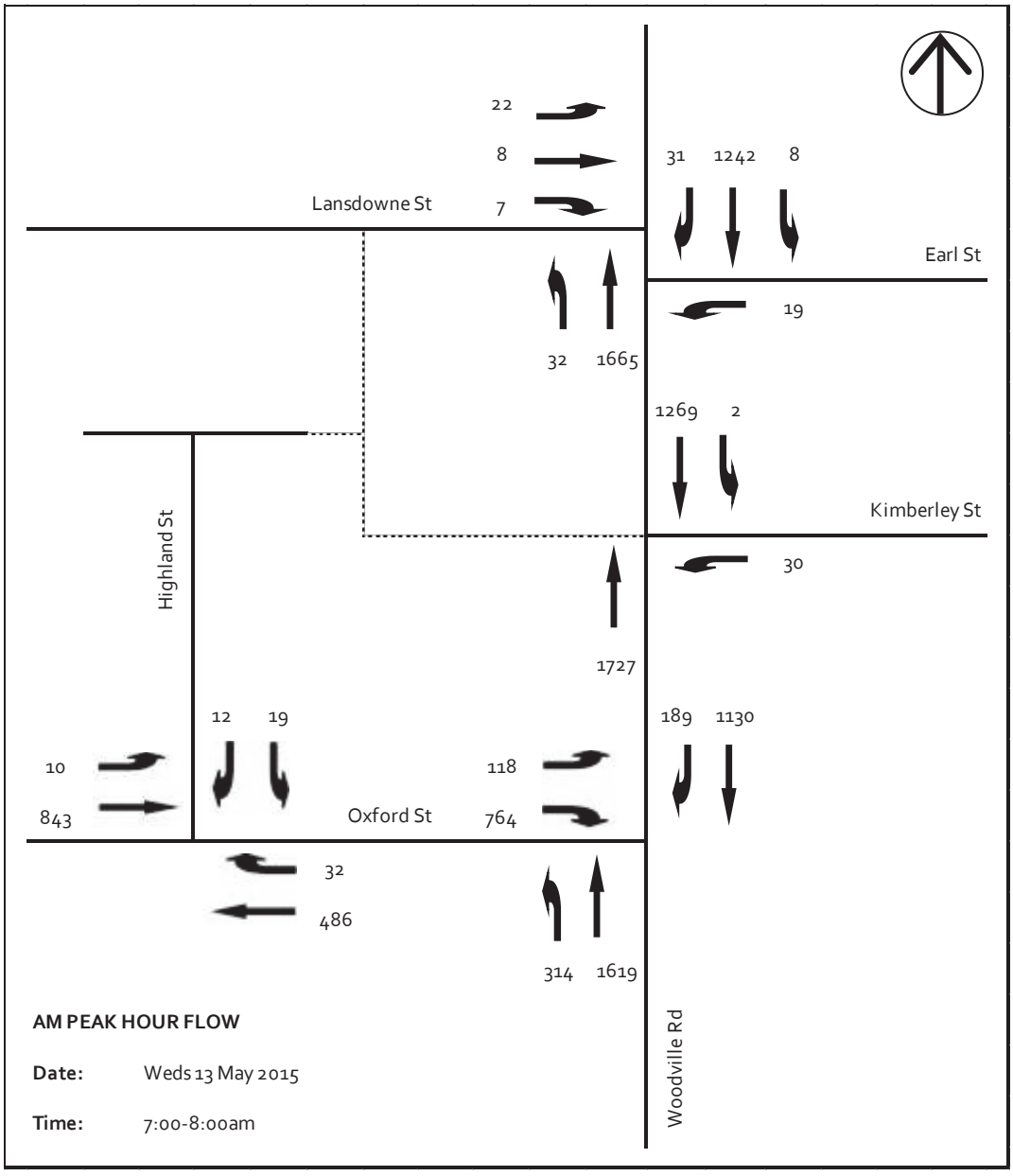
GTA Consultants commissioned traffic movement counts at the immediate Woodville Road intersections during the following peak periods:

- Wednesday 13 May 2015 between 7:00 to 9:00am and 4:00 to 6:00pm
- Saturday 16 May 2015 at between 10:00am to 1:00pm.

Supplementary traffic movement counts were undertaken on Oxford Street at Highland Street (weekday only) and Woodville Road on Thursday 21 May and Saturday 23 May 2015. The additional counts were undertaken as a result of comments made by the Granville South Public School Parents and Citizens Association at the community consultation session held at the John Cootes Furniture Warehouse on Wednesday 13 May 2015 at 6pm.

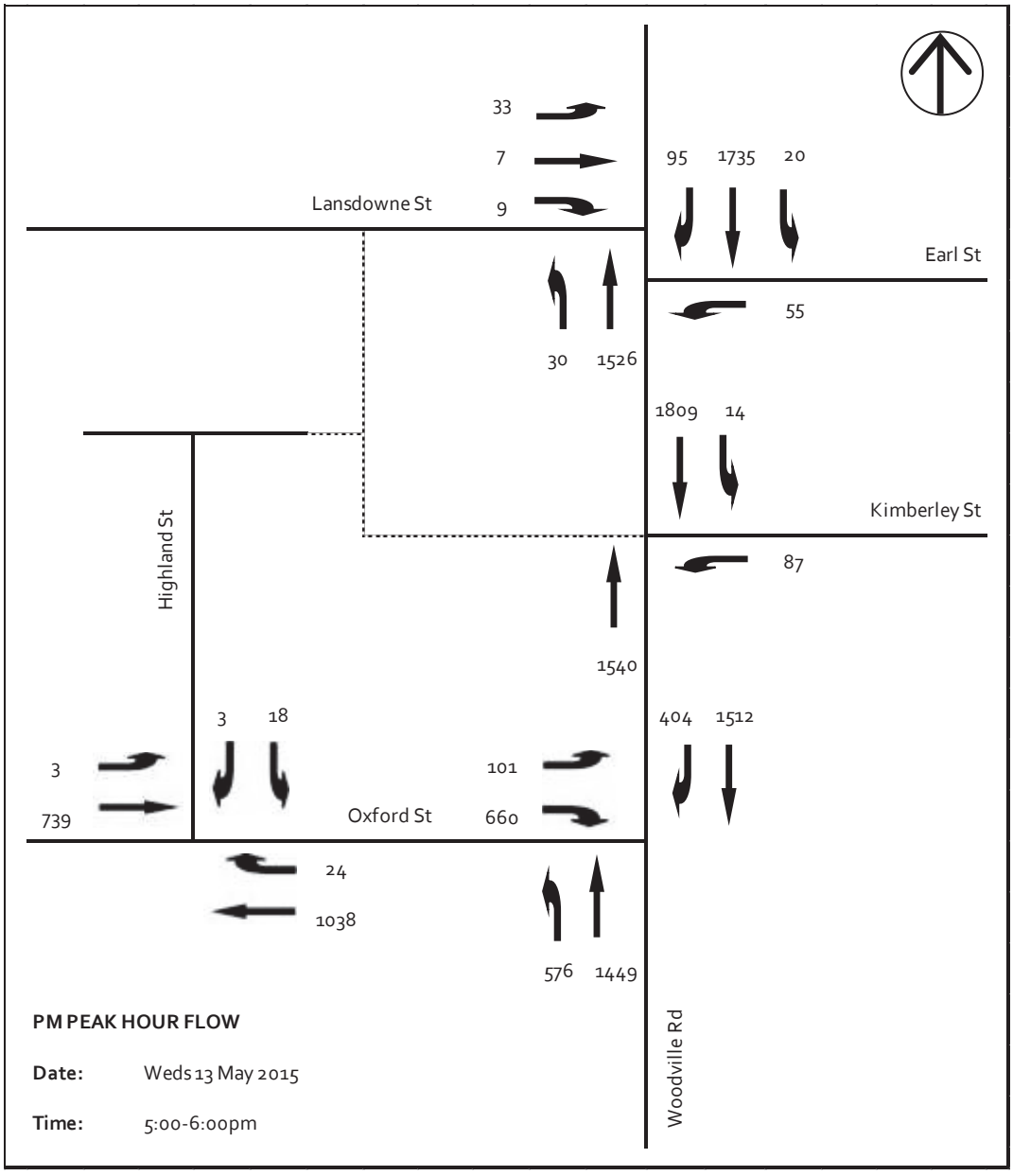
The weekday AM and PM and Saturday lunchtime peak hour traffic volumes are summarised in Figure 2.7, Figure 2.8, and Figure 2.9 respectively, with full results contained in Appendix A.

Figure 2.7: Existing Weekday AM Peak Hour Traffic Volumes [1]



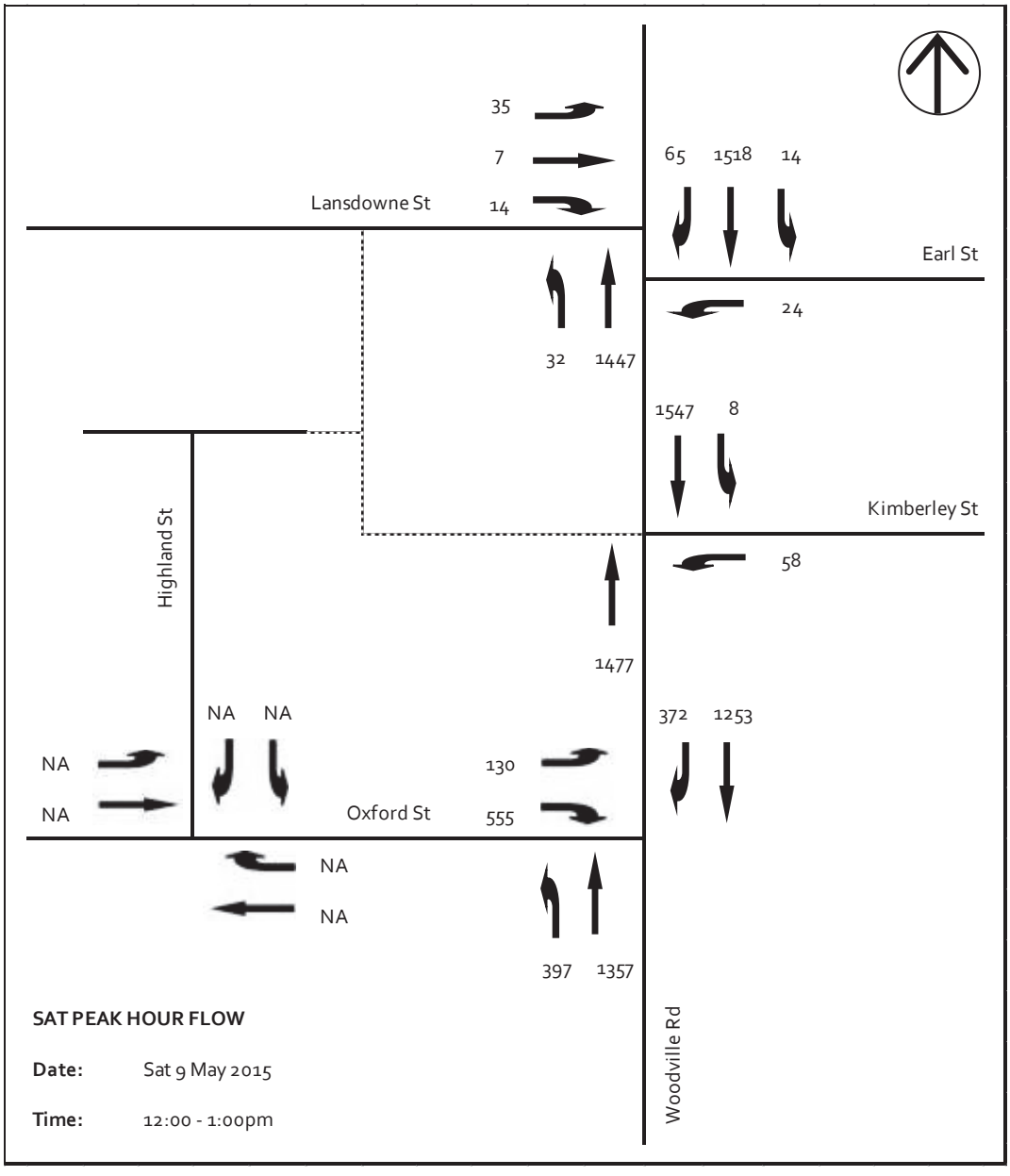
[1] The traffic counts at the Woodville Road / Oxford Street and Oxford Street/ Highland Street intersections were undertaken on Thursday 21 May 2015.

Figure 2.8: Existing Weekday PM Peak Hour Traffic Volumes [1]



[1] The traffic counts at the Woodville Road/ Oxford Street and Oxford Street / Highland Street intersections were undertaken on Thursday 21 May 2015.

Figure 2.9: Existing Saturday Lunchtime Peak Hour Traffic Volumes [1, 2]



[1] The traffic counts at the Woodville Road/ Oxford Street intersection were undertaken on Saturday 23 May 2015.
[2] Saturday traffic counts were not undertaken of the Oxford Street/ Highland Street intersection as the capacity concerns at this intersection relate to school traffic, which is not an issue on weekends.

2.3.1 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION[3], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

[3] Program used under license from Akcelik & Associates Pty Ltd.

Table 2.2 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.2: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.3 presents a summary of the existing operation of each of the intersections in the vicinity of the site, with full results presented in Appendix B of this report (including operating conditions by intersection approach). It is noted that each of the intersections have been modelled in isolation.

Table 2.3: Existing Operating Conditions

Intersection	Peak Hour	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Woodville Road/ Lansdowne Street [1]	AM	1.0	3	23	A
	PM	1.0	4	22	A
	Sat	1.0	4	24	A
Woodville Road/ Kimberley Street	AM	0.48	0	2	A
	PM	0.78	2	25	A
	Sat	0.43	1	7	A
Woodville Road/ Oxford Street	AM	0.91	37	412	C
	PM	0.94	44	437	C
	Sat	0.86	33	316	C
Oxford Street/ Highland Street	AM	0.48	4	40	A
	PM	0.61	8	94	A

[1] The DOS results reflect the existing delays experienced by drivers on the west approach to the intersection. The through traffic on Woodville Road is not delayed by this intersection.

Table 2.3 indicates that generally each of the nominated intersections currently operates satisfactorily with manageable queues and delays on all approaches. It is noted that as a result of the heavy through movements on Woodville Road, there are significant delays for vehicles turning right from Lansdowne Street into Woodville Road, hence a DOS of 1.00 for the west approach at this intersection (i.e. at capacity). This is consistent with on-site observations at the Woodville Road/ Lansdowne Street intersection.

It is further noted that southbound queues from the Woodville Road/ Oxford Street intersection often extend beyond the Kimberley Street and Lansdowne Street intersections, particularly during the PM peak hour. Similarly, northbound queues were observed to extend a significant distance to the south of the Woodville Road/ Oxford Street intersection during the AM peak hour.

The modelling indicates that during the road network peak hours, the Oxford Street/ Highland Street intersection operates with a satisfactory level of service. However, the traffic volumes indicate increased activity to and from Highland Street during peak school pick-up and drop-off

periods. During the peak 15 minute periods at 8:45am and 3:00pm, there was a three-fold increase in traffic accessing Highland Street. During these periods there was increased queuing and delays, beyond those presented in Table 2.3, on Highland Street.

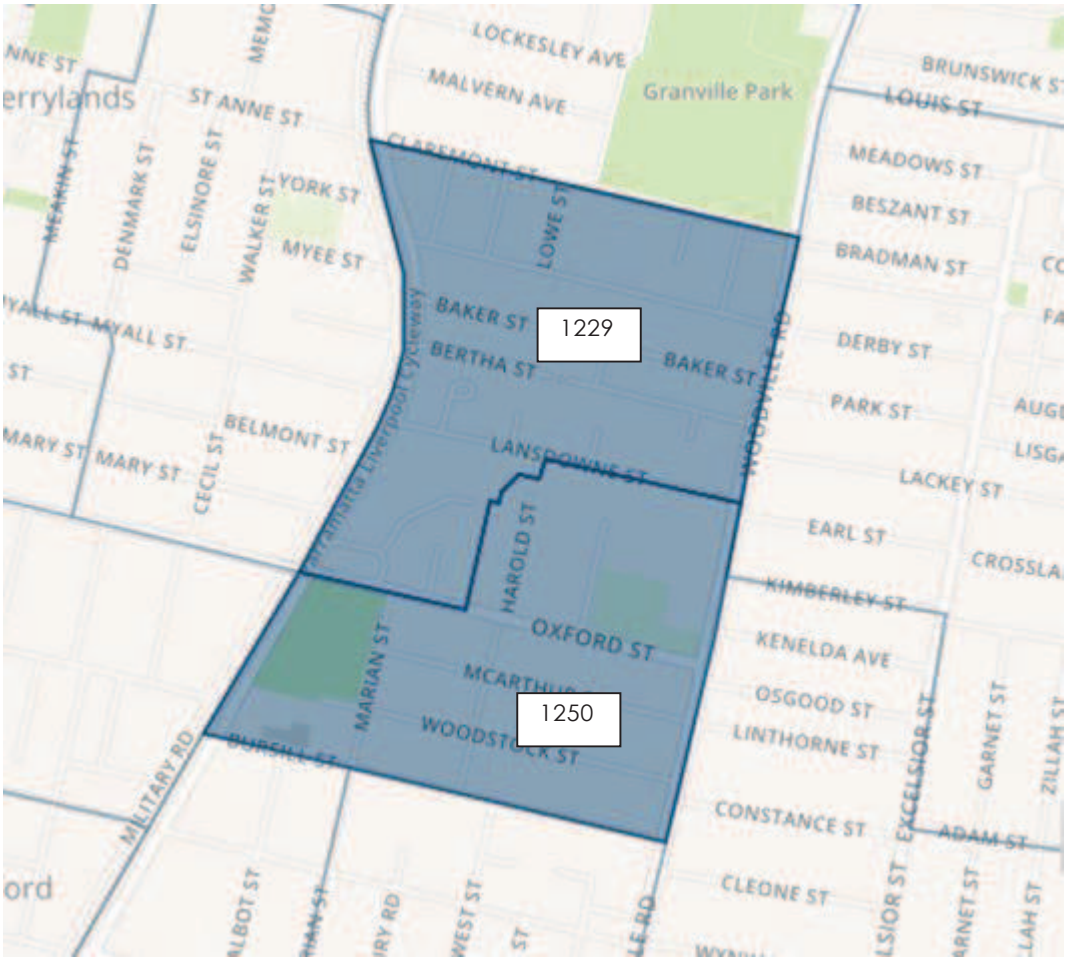
2.4 Existing Travel Characteristics

2.4.1 ABS Data: Journey to Work

The NSW Bureau of Transport Statistics (BTS) is responsible for collating and analysing transport related data for the state, including census data collected by the Australian Bureau of Statistics. The smallest geographical area that travel data is available is a Travel Zone (TZ).

The ABS data has been sourced for the two nearest travel zones to the site (1229 and 1250) and are illustrated in Figure 2.10.

Figure 2.10: ABS Journey to Work Data – Travel Zones



(Source: http://www.bts.nsw.gov.au/)

Employees of Study Area

Of the trips travelled by the employed population within these Travel Zones, 83% are by private vehicle, either as the driver or passenger. Travelling by public transport (train and bus services) accounts for only 5% of trips while 6% of people walked to work.

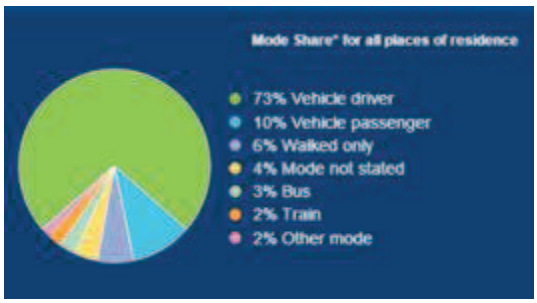
According to the 2011 Census, 49% of the employed population within the nominated Travel Zones live in the same area (Merrylands-Guildford). This indicates that many of the trips to/from work based in this area are local trips.

Figure 2.11 and Figure 2.12 illustrate the most popular origin locations and modes of transportation used to travel to work within the nominated TZs.

Figure 2.11: Top Ten Ranking Origin Locations

Source: Bureau of Transport Statistics

Figure 2.12: Methods of Transport from Origin Locations



Residents of Study Area

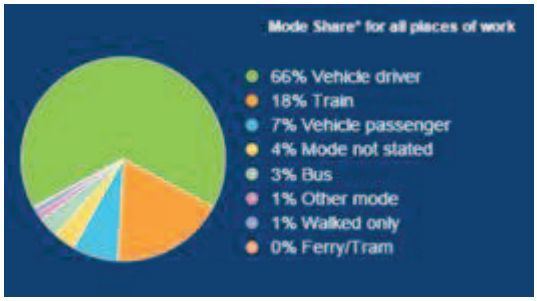
Of the employed residents in the nominated Travel Zones 20% work in the same area (Merrylands-Guildford). In addition, 75% of residents commute to work by private vehicle, either as a driver or passenger, while 21% travelled by public transport (train and bus services).

Figure 2.13 and Figure 2.14 show the full list of destination locations and modes of transportation used by employed residents of the nominated TZs to travel to work.

Figure 2.13: Top Ten Ranking Destination Locations

Source: Bureau of Transport Statistics

Figure 2.14: Methods of Transport to Destination Locations



Comparison to Metropolitan Sydney

A summary of the results for the above TZs has been benchmarked against all Sydney Greater Metropolitan Region (GMR) employees and residents and is summarised in Table 2.4.

Table 2.4: Comparison of ABS Journey to Work Data

Mode	Study Area		Sydney GMR (Employees and Residents)
	Residents	Employees	
Vehicle (as driver or passenger)	73%	83%	72%
Public Transport (bus or train)	21%	5%	20%
Walk or Cycle	1%	6%	4%
Other	5%	6%	4%

[2] Includes BTS Travel Modes 1229 and 1250.

Table 2.4 indicates that residents have a comparable mode share to the Sydney GMR, whilst employees have a greater reliance on private vehicle travel (83% v 72%) and a lower use of public transport (5% v 20%) compared to the Sydney GMR.

2.4.2 ABS Data: Car Ownership

ABS car ownership data has been collated for the study area, including the suburbs of Merrylands and Guildford (noting that the site is on the border of both suburbs).

A summary of the car ownership data for existing residents (for dwellings in apartment buildings) from the 2011 ABS is summarised below:

- Studio apartments: 0.16 (sample size of 31 apartments)
- 1-bedroom apartments: 0.52 (sample size of 306 apartments)
- 2-bedroom apartments: 1.00 (sample size of 3,114 apartments)
- 3-bedroom apartments: 1.39 (sample size of 368 apartments)

It is further noted that 24% of residents of existing studio, 1, 2 and 3-bedroom apartments do not own a car.

2.5 Woodville Road Urban Design Study (Draft)

Roberts Day, on behalf of Parramatta City Council, is currently preparing the Woodville Road Urban Design Study that looks at potential options to regenerate development along the Woodville Road corridor. The study has yet to be finalised.

2.6 Sustainable Transport

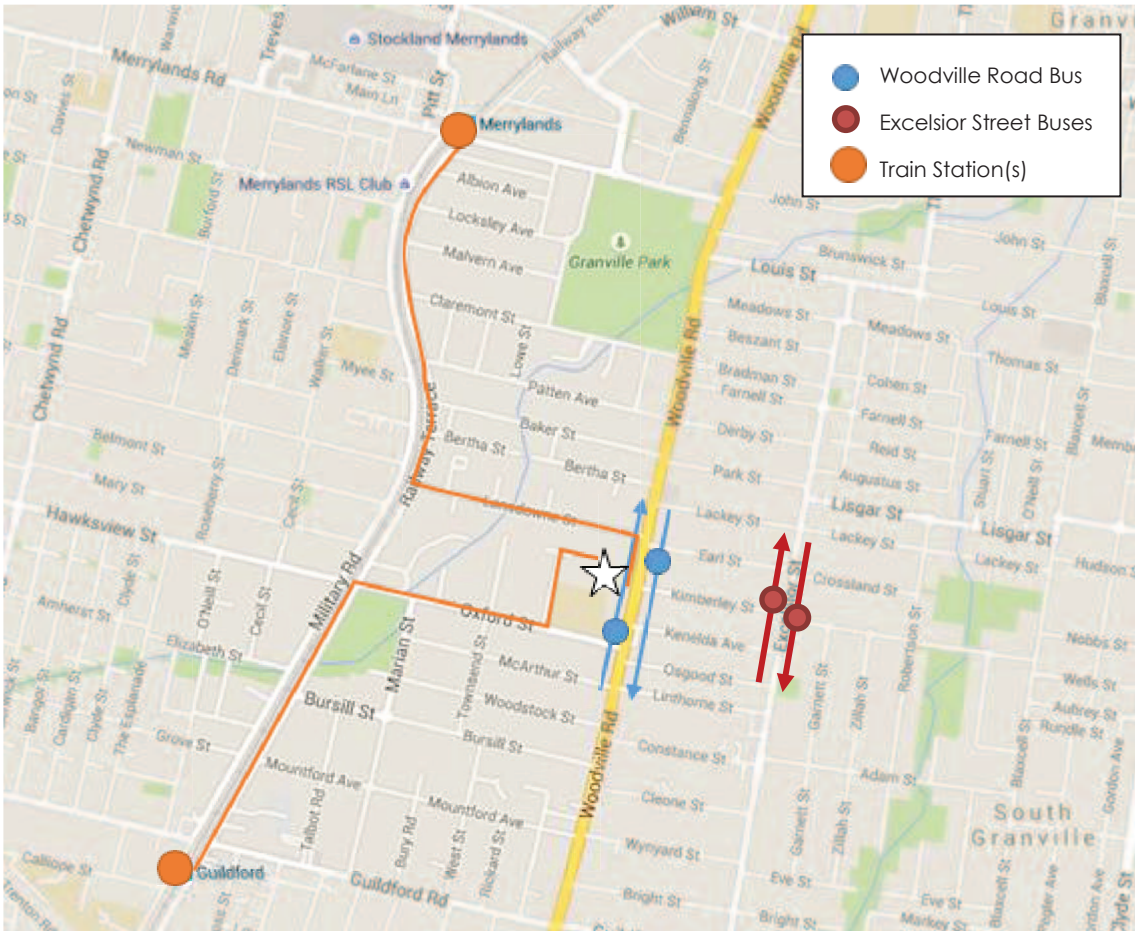
2.6.1 Public Transport

The following public transport facilities are provided in the vicinity of the site:

- Buses on Woodville Road (<100m from the site)
- Buses on Excelsior Street (400m east of the site)
- Merrylands Railway Station (1.7km northwest of the site)
- Guildford Railway Station (1.7km southwest of the site)

The nearby public transport facilities are illustrated in Figure 2.15.

Figure 2.15: Surrounding Public Transport Facilities



A review of the public transport services available in the vicinity of the site is summarised in Table 2.5.

Table 2.5: Public Transport Provision

Station Name	Bus Service / Rail Line	Frequency of Services	Walking Distance to Site	Pedestrian/Cyclist Links
Woodville Road Bus Stop	907	Every 20 – 30 minutes	<100m (2 minutes)	Pedestrian footpaths provided
Excelsior Street Bus Stop	906	Every 30 minutes	400m (5 minutes)	Pedestrian footpaths provided on Earl Street
	908	Every 60 minutes		
Guildford	T2 Airport, Inner West and South Line T5 Cumberland Line	Every 15 minutes	1.7km (20 minutes)	Pedestrian footpaths and on-road bicycle lanes are provided in each direction on Guildford Road
Merrylands	T2 Airport, Inner West and South Line T5 Cumberland Line	Every 15 minutes	1.7km (20 minutes)	Pedestrian footpaths and wide kerbside lane provided for cyclists in each direction on Merrylands Road

In addition, it is noted that Woodville Road may in the future cater for light rail services connecting Parramatta to Bankstown or alternatively could cater for a rapid bus route.

2.6.2 Pedestrian Infrastructure

Pedestrian footpaths are provided on both sides of Woodville Road, Oxford Street and Highland Street (abutting the school). Pedestrian paths are provided on the north side of Lansdowne Street (but do not extend to Railway Terrace) and are not typically provided on Kimberley Street.

A signalised pedestrian crossing of Woodville Road is provided on the north side of the Woodville Road/ Oxford Street intersection.

A shared path is provided along Railway Terrace and provides a connection to Merrylands and Guildford Railway Stations.

2.6.3 Cycle Infrastructure

Limited cycle facilities are currently provided in the vicinity of the site.

2.6.4 Local Car Sharing Initiatives

There are currently no car sharing pods located in reasonable walking distance of the site.

3. Development Proposal

3.1 Land Uses

The Planning Proposal seeks to rezone the subject site from B6 Enterprise Corridor and R2 Low Density Residential to a B4 Mixed Use zoning and permissible Floor Space Ratio of 2.24:1. Specifically, the proposal includes the construction of a number of buildings set around a central square. The buildings range from 3 to 12 storeys and include a combination of all residential and mixed uses.

A summary of the indicative land uses (subject to change) are provided in Table 3.1.

Table 3.1: Indicative Development Schedule

Land Use	Description	Size
Residential	1-bedroom	148 dwellings
	2-bedroom	383 dwellings
	3-bedroom	59 dwellings
	Total	590 dwellings
Non-Residential	Supermarket, Retail and Community Use	8,362sq.m GFA (6,833sq.m NLA) [1]

[1] Incorporating 3,000sq.m NLA supermarket and 3,833sq.m NLA of retail and community uses.

3.2 Vehicle Access

Vehicle access to the future land uses is proposed to be provided via a new internal road network. The internal road network would connect to the surrounding existing road network as follows:

- Signalised intersection to Woodville Road
- Priority controlled intersection to Lansdowne Street
- Continuation of Highland Street

It is proposed to provide vehicle access to the each of the buildings from the internal road network as well as to Highland Street. No direct site vehicle access is proposed from Woodville Road or Lansdowne Street.

The three existing driveways from Woodville Road to the subject site would be removed.

When developing the vehicle access strategy for the site, three options were considered for the primary vehicle access point from Woodville Road:

- via Oxford Street and Highland Street
- via a new access opposite Kimberley Street
- via Lansdowne Street

Given the level of traffic anticipated to be generated by the development it is considered most appropriate to provide a new access road rather than relying on the existing local road network for access. This was particularly pertinent given the sensitivities of the existing surrounding land uses including a primary school and traditional low density residential dwellings. Further to this it is noted that:

- The Oxford Street corridor already carries significant through traffic volumes and has limited spare capacity.

- While all turning movements are currently available at Lansdowne Street, traffic signals at this location could encourage additional through traffic between Woodville Road and Railway Terrace.
- Signalising Kimberley Street would provide improved access to the residential area east of Woodville Road, as well as a direct connection to the site and associated local shopping facilities. This would limit turning movements on/off Woodville Road for such local trips.

Based on the above the proposed access strategy is considered to balance the needs of maintaining through traffic capacity on Woodville Road, vehicles accessing the site and the amenity of surrounding residents, and as such, is considered appropriate.

Further discussion regarding the proposed intersection and vehicle access arrangements are provided in Section 5 of this report.

3.3 Car Parking

Car parking would generally be provided in basement car parking areas (typically 2 levels). The basement car parking would be complemented by on-street car parking to be provided on the new internal road network.

The provision of car parking is not yet known, however, car parking would be provided generally in accordance with the current Parramatta Council DCP requirements (refer to Section 4).

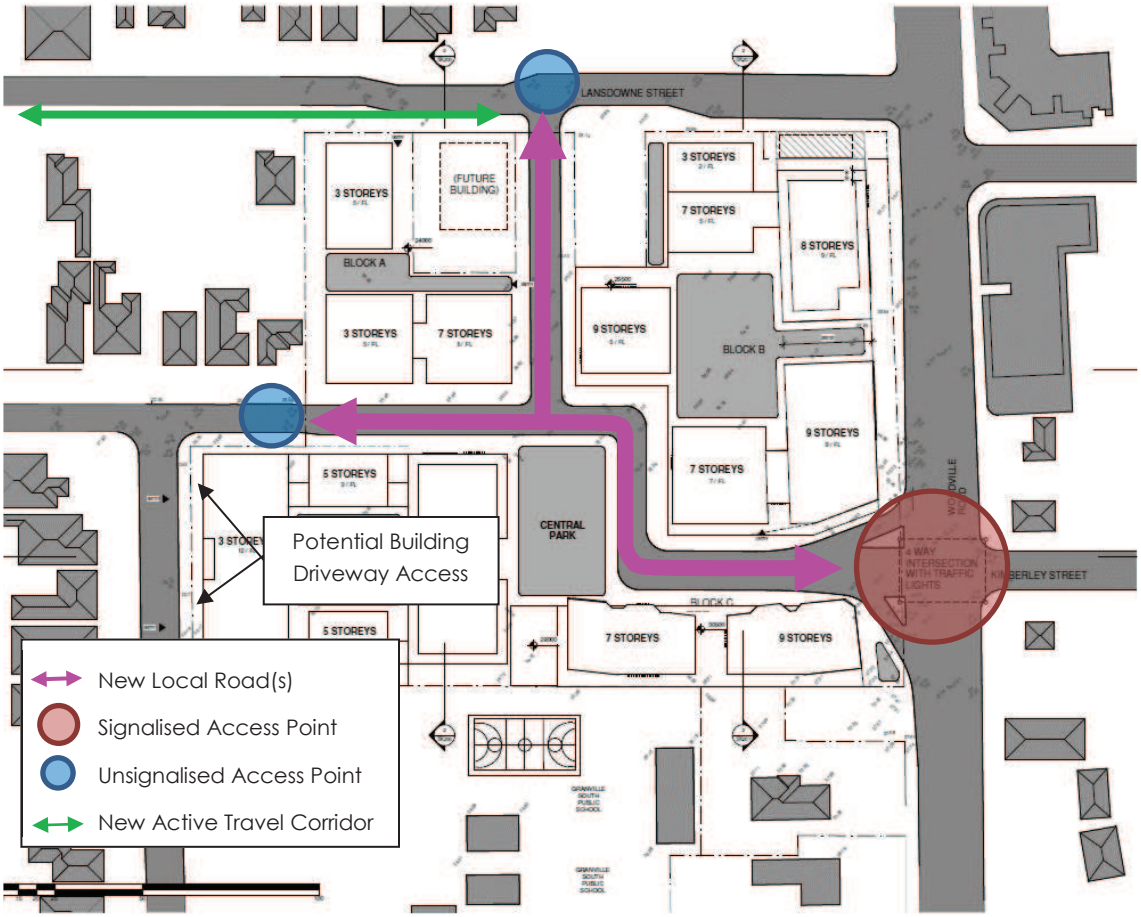
3.4 Pedestrian and Bicycle Facilities

As part of the development it is proposed to develop an active travel corridor along Lansdowne Street between the site and Railway Terrace. This would provide an improved pedestrian and cyclist connection between the site and Merrylands Railway Station.

3.5 Overview

An overview of the key transport components of the proposal are presented in Figure 3.1.

Figure 3.1: Indicative Site Layout



4. Parking Assessment

4.1 Car Parking

4.1.1 DCP Requirements

The car parking requirements for different development types are set out in Parramatta City Council DCP (Section 3.6.2). A review of the car parking rates and the floor area schedule results in a DCP parking requirement for the proposed development as summarised in Table 4.1. For assessment purposes, all the non-residential floor area has been assumed to be a generic retail land use.

Table 4.1: DCP Car Parking Requirements

Description	Use	Size / No.	DCP Parking Rate	DCP Parking Requirement
Residential	1-bedroom	148 dwellings	1 space per dwelling	148
	2-bedroom	383 dwellings	1.25 spaces per dwelling	479
	3-bedroom	59 dwellings	1.5 spaces per dwelling	89
	Visitor	590 dwellings	0.25 spaces per dwelling	148
Retail	Refer to uses indicative uses in Table 3.1	8,362sq.m GFA (6,833sq.m NLA)	1 space per 30sq.m GFA	279
Total				**1143 spaces**

Based on the above, the proposed development is required to provide in the order of 1,143 car parking spaces, subject to the make-up of the final land uses. It is noted that a visitor parking rate of 0.25 spaces per dwelling would typically be applied to smaller developments and represents a significant number of parking spaces in this instance. Future Development Application(s) for the site would need to justify any proposed visitor parking reduction.

4.1.2 Potential Car Parking Reductions

The provision of future car parking has not yet been determined and will be confirmed as part of any subsequent Development Application should the Planning Proposal be approved. Notwithstanding, it is envisaged that any future development on the rezoned lands would provide car parking generally in accordance with the DCP parking requirement presented above. However, there may be an opportunity to provide a shared car parking pool for the retail and residential visitor parking demands. In this regard, it is noted that residential visitor demands typically peak in the evening, whilst retail demands typically peak during the day. More specifically, it is commonly accepted that daytime residential visitor demands are 50% of the evening demands.

Therefore it could be appropriate that a reduction (based on a temporal profile of car parking demand) in residential visitor car parking could be applied.

Whilst not specifically required under the DCP, the provision of car share spaces (e.g. GoGet or similar) on-site in place of resident and/or visitor spaces should be considered. Industry evidence suggests a single car share space can replace the need for around 5 parking spaces for residents and/or visitors.

4.2 Active Transport

4.2.1 Bicycle Parking

Bicycle parking for the site should be provided in accordance with the requirements of the Parramatta City Council DCP 2011 (Section 3.6.2), as summarised in Table 4.2. The actual number of bicycle spaces to be provided may alter when the mix of non-residential land uses are refined at the Development Application stage.

Table 4.2: Bicycle Parking Requirements

Use	Size	DCP Bicycle Parking Rate [1]	Bicycle Parking Requirement
Residential	590 dwellings	1 space per 2 dwellings	295 spaces
Retail	8,362sq.m GFA	1 space per 200sq.m GFA	42 spaces
Total			337 spaces

[1] Sourced from Section 3.6.2 of the Parramatta City Council DCP 2011.

Table 4.2 indicates that any future development of the John Cootes site (based on the indicative yield) should provide approximately 337 bicycle spaces.

4.2.2 Cyclist and Pedestrian Access

Cyclist and pedestrian access to the new uses would be provided from the future internal road network as well as from the surrounding road network, including Woodville Road, Lansdowne Road and Highland Street. In addition a new active transport corridor on Lansdowne Road connecting the site to Railway Terrace (which in turn provides access to both Merrylands and Guildford Railway Stations) would be beneficial in promoting local and regional active travel.

The form of the potential active transport corridor has not yet been determined, but could include a continuation of the existing footpath with an on-road mixed traffic bicycle facility, an off-road shared path, a separated cycleway or similar. The make-up of the future facility would need to be determined in consultation with Council and local residents as part of the Development Application stage.

The facility would encourage residents, customers and employees of the development to walk or cycle between the site and nearby transport nodes or the Merrylands Town Centre.

4.3 Loading Arrangements

The loading provision requirements for different development types are set out in Parramatta City Council DCP (Section 3.6.2). The DCP requires that one loading bay be provided for every 400sq.m GFA of retail floor area. Application of this rate indicates that the site would have a requirement to provide 21 loading bays to service the proposed retail land uses.

Whilst the number of loading bays for the development has not yet been determined, the provision of 21 loading bays is considered excessive for a development of this size and a dispensation of the number of loading bays to be provided will likely be sought at the Development Application stage.

All loading vehicle access will be provided from the internal road network to the site. All loading vehicles would access the site via the signalised intersection from Woodville Road or Lansdowne Street (from Woodville Road), depending on vehicle size, internal access design and final internal

road geometry. Heavy vehicles would not be permitted to use Highland Street or Lansdowne Street further west, with physical constraints expected to be provided to discourage such activity.

4.4 Green Travel Plan

The Objective of a Travel Plan as defined in the DCP (2011) is reproduced below:

"To reduce car trips and encourage the use of sustainable transport."

A Travel Plan is not technically required for the site, noting that whilst the site exceeds 5,000sq.m of gross floor area, it is located greater than 800m radial distance from a Railway Station.

Notwithstanding, it is recommended that a Travel Plan be prepared at the Development Application stage and would include the following (as per the requirements of the DCP):

- mode share targets including a reduction in single vehicle trips
- travel data estimates of future trip to and from the site
- measures to achieve the mode share targets.

5. Traffic Impact Assessment

5.1 Traffic Generation

5.1.1 Residential Land Uses

Having consideration for a range of factors including the size of units and the site location, Table 5.1 sets out traffic generation estimates for both peak hour and daily periods. It is noted that the upper range of the residential yield has been adopted to present a conservative assessment.

Table 5.1: Estimated Development Traffic Generation

Access	No. of Dwellings	Design Generation Rates		Traffic Generation Estimates	
		Peak Hour [1]	Daily	Peak Hour	Daily
To/from carpark	590	0.4 vehicle movements / dwelling	4 vehicle movements / dwelling	236 vehicle movements / hour	2,360 vehicle movements / day

[1] Adopting a peak to daily ratio of 10%.

Table 5.1 indicates the residential component of the proposed development could be expected to generate approximately 2,360 vehicle movements per day and 236 vehicle movements during each respective peak hour on a typical weekday.

5.1.2 Non-Residential Land Uses

Traffic generation estimates for the non-residential development uses have been sourced from RMS 'Guide to Traffic Generating Developments' (October 2002). A summary of the generic RMS traffic generation rates and resultant traffic generation for the supermarket and retail uses are provided in Table 5.2.

Table 5.2: RMS Non-Residential Traffic Generation Rates

Land Use	Size	Adopted Traffic Generation Rate for Assessment			Resultant Traffic Generation		
		PM Peak Hour	Sat Peak Hour	Daily	PM Peak Hour	Sat Peak Hour	Daily
Supermarket	3,000sq.m NLA	15.5	14.7	147.5	465	441	4,425
Retail	3,833sq.m NLA	4.6	10.7	55.5	176	410	2,127
Total					641	851	6,552

Table 5.2 indicates the non-residential uses of the proposed development could be expected to generate approximately 6,550 vehicle movements per day and 640 and 851 vehicle movements during the weekday PM and Saturday lunchtime peak hours.

Whilst not yet finalised the proposed mix of land uses includes supermarket, retail, medical centre, gymnasium, child care, restaurants and communities facilities. In this regard, it is anticipated that some visitors to the site would visit more than one use at a time. Reference has been made to the RMS Guide which indicates that for centres up to 10,000sq.m GLFA a multi-purpose trip reduction factor of 25% could be applied.

Application of the multi-trip reduction factor indicates the following non-residential traffic generation:

- Weekday PM Peak Hour: 481vph
- Saturday Peak Hour: 638vph
- Daily: 4,914vpd

It is noted that the non-residential uses would be expected to generate significantly less traffic during the AM peak period than the weekday PM and Saturday lunchtime peak periods.

5.1.3 Summary

A summary of the weekday PM and Saturday lunchtime peak hour and daily traffic generation for the proposed development is provided in Table 5.3.

Table 5.3: Summary of Site Traffic Generation [1]

Land Use	Weekday PM Peak Hour			Saturday Lunchtime Peak Hour			Daily		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential	165	73	236	118	118	236	1,180	1,180	2,360
Non-Residential	240	241	481	319	319	638	2,457	2,457	4,914
Total	**405**	**314**	**717**	**437**	**437**	**874**	**3,637**	**3,637**	**7,274**

[1] Adopting an in / out split of 70:30 (AM) and 50:50 (Saturday) for residential and 50:50 for non-residential (PM and Saturday).

Table 5.3 indicates that the proposed development could be expected to generate in the order of 717, 874 and 7,274 movements during the weekday PM peak hour, Saturday lunchtime peak hour and daily traffic volumes, respectively.

The AM peak hour traffic generation is anticipated to be considerably less than the weekday PM and Saturday lunchtime peak hours as the non-residential uses will be generating significantly less traffic than during the other peak periods. As such, only the critical weekday PM and Saturday lunchtime peak hours have been assessed as part of the Planning Proposal assessment.

5.1.4 Characteristic Trip Types

An important characteristic of the traffic generation of the above uses is the different types of trips which may occur. These different trip types correspond to:

- 'Primary Trips'
- 'Link-diverted trips'
- 'Non-link-diverted trips'.

Primary trips and *link-diverted trips* involve a vehicle either making a special trip or a modification of the route to an existing trip. *Non-link-diverted trips,* on the other hand, correspond to those trips which do not involve a diversion from the route that would otherwise have been taken, or in other words are trips generated by passing traffic. The important distinction here is that it is only *primary trips* and *link-diverted trips* which impact upon the external road network. *Non-link-diverted trips* are already present on the adjacent road network, and although these trips need to be considered in the design of access driveways, turning lanes and so on, they do not constitute additional traffic per se.

Table 5.4 had been prepared to give an indication of the relative contribution each trip type makes as a proportion of all trips accessing the use.

Table 5.4: Trip Types for the Proposed Development [1]

Use	Primary Trips / Link-diverted trips (%)	Non-link-diverted trips (%)
Residential	100%	0%
Supermarket	72%	28%
Retail	72%	28%

[2] Austroads Guide to Traffic Management Part 12: Traffic Impacts of Developments (pg. 106).

A non-link-diverted trip proportion of 28% of the non-residential traffic equates to 5% and 8% of the weekday PM and Saturday lunchtime peak hour traffic volumes on Woodville Road, respectively.

5.1.5 Traffic Generation Summary

Based on the above information, Table 5.5 sets out the resultant vehicle generation for both the morning/evening peak hour and daily periods. The Table indicates that a maximum of 582 and 695 vehicle movements could be generated by the site during the PM and Saturday traffic peaks, with 5,898 additional vehicle movements generated over the entire day.

Table 5.5: Traffic Generation

Description	Size	Road Network PM Peak		Road Network Saturday Peak Hour		Daily Movements	
		Primary and Link-diverted trips	Non-link-diverted trips	Primary and Link-diverted trips	Non-link-diverted trips	Primary and Link-diverted trips	Non-link-diverted trips
Residential	590 dwellings	236	0	236	0	2360	0
Non-Residential (retail and supermarket)	8,362sq.m	346	135	459	179	3,538	1,376
Total		**582**	**135**	**695**	**179**	**5898**	**1376**

5.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

i configuration of the arterial road network in the immediate vicinity of the site
ii existing operation of intersections providing access between the local and arterial road network
iii distribution of households in the vicinity of the site
iv surrounding employment centres, retail centres and schools in relation to the site
v likely distribution of employee's residences in relation to the site
vi configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed:

- to Woodville Road (via new signals): 90%
  - North: 45%
  - East: 5%
  - South: 50%

- To Woodville Road (via Lansdowne Street): 5%
- Oxford Street (via Highland Street): 5%.

Based on the above, Figure 5.1 and Figure 5.2 have been prepared to show the estimated marginal increase in turning movements in the vicinity of the subject property following full site development during the weekday PM and Saturday lunchtime peak hours, respectively.

Figure 5.1: Weekday PM Peak Hour Site Generated Traffic Volumes

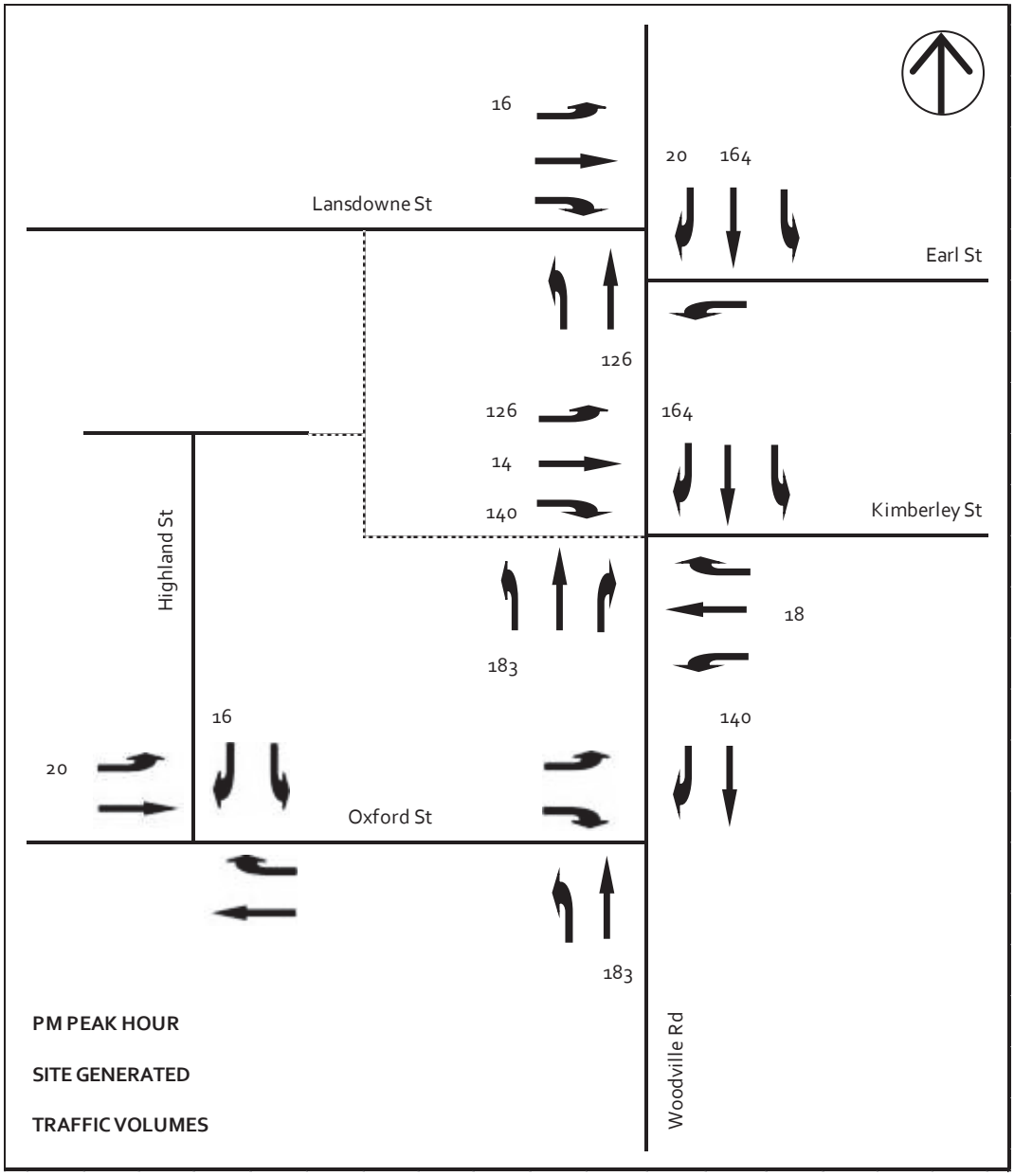
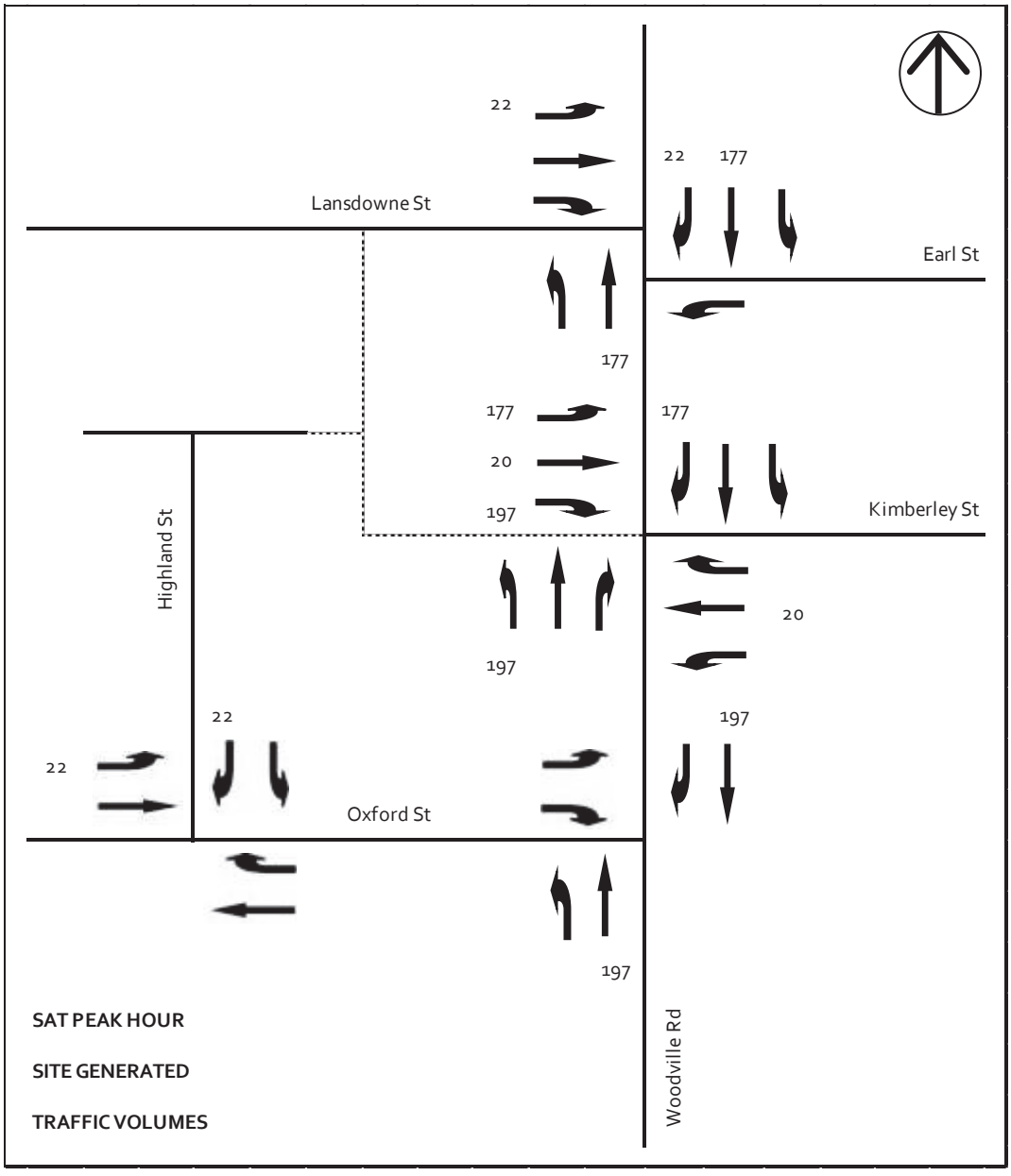


Figure 5.2: Saturday Lunchtime Peak Hour Site Generated Traffic Volumes



The resultant traffic volumes (existing volumes + development volumes – passing traffic discount) for the future weekday PM and Saturday lunchtime peak hour are presented in Figure 5.3 and Figure 5.4.

Figure 5.3: Weekday PM Peak Hour Post Development Traffic Volumes

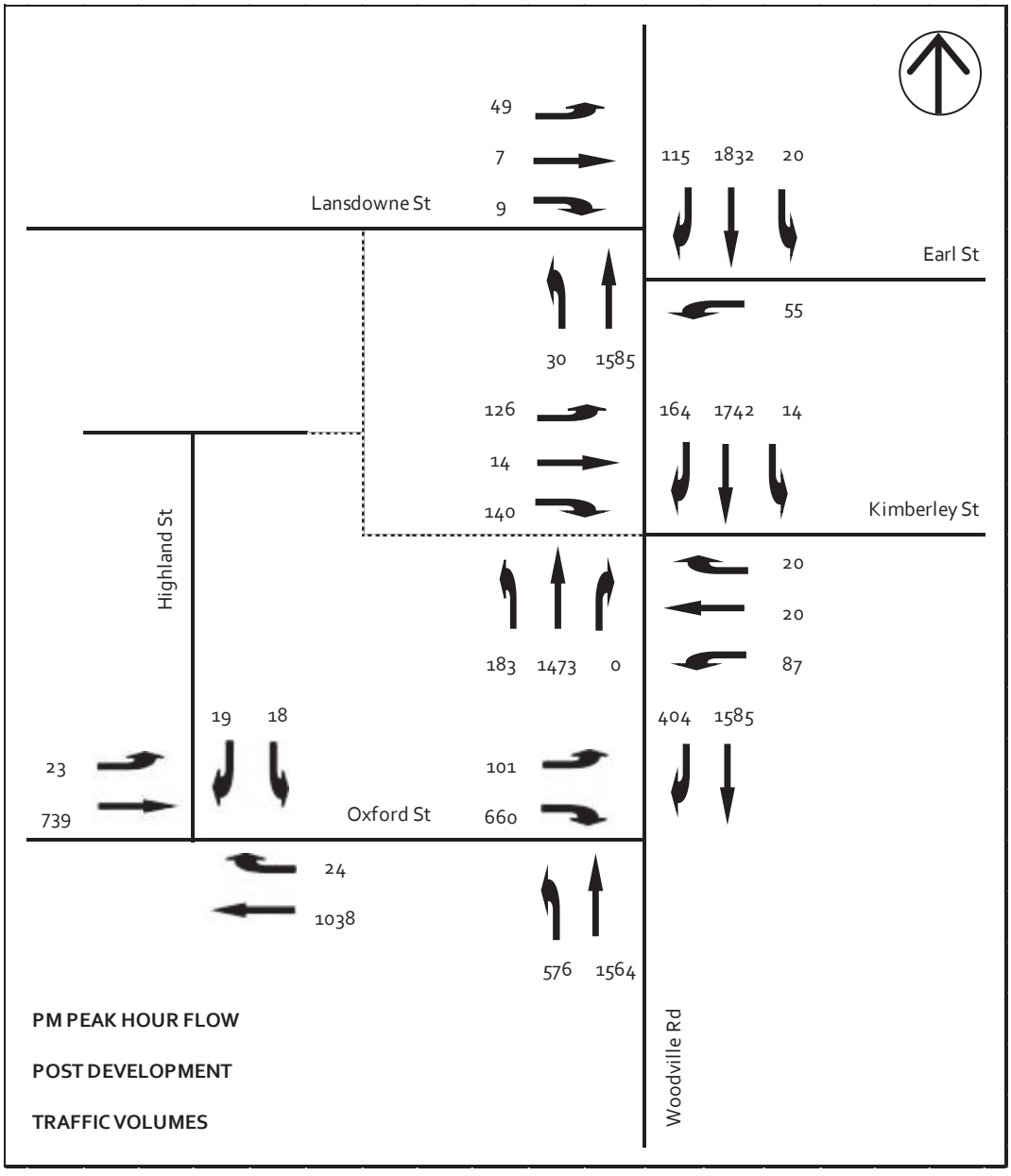
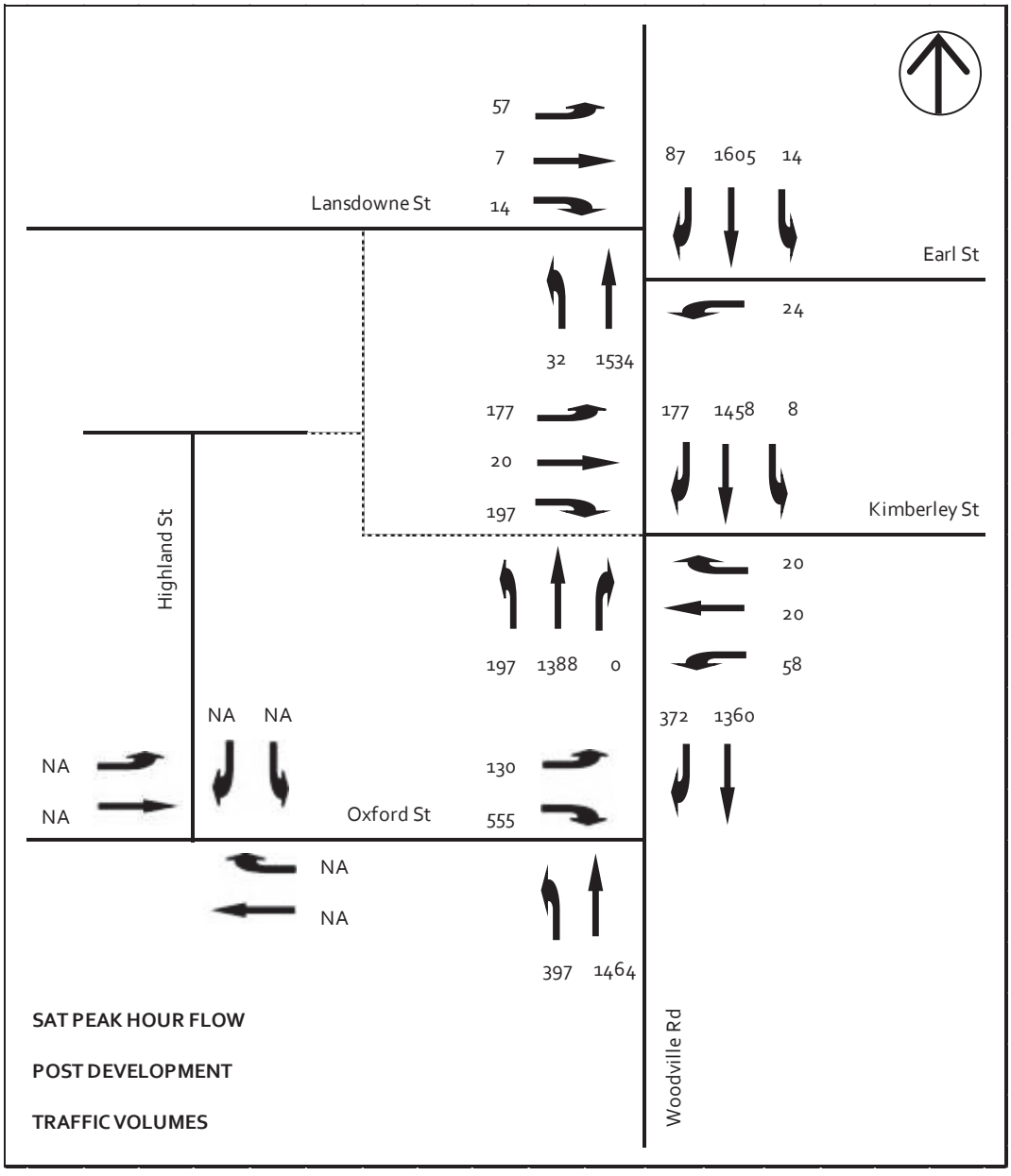


Figure 5.4: Saturday Lunchtime Peak Hour Post Development Traffic Volumes [1]



[1] Given that there is no regular school traffic on Saturdays, the post-development traffic volumes have not been assessed at the Oxford Street/ Highland Street intersection.

5.3 Proposed Intersection Works

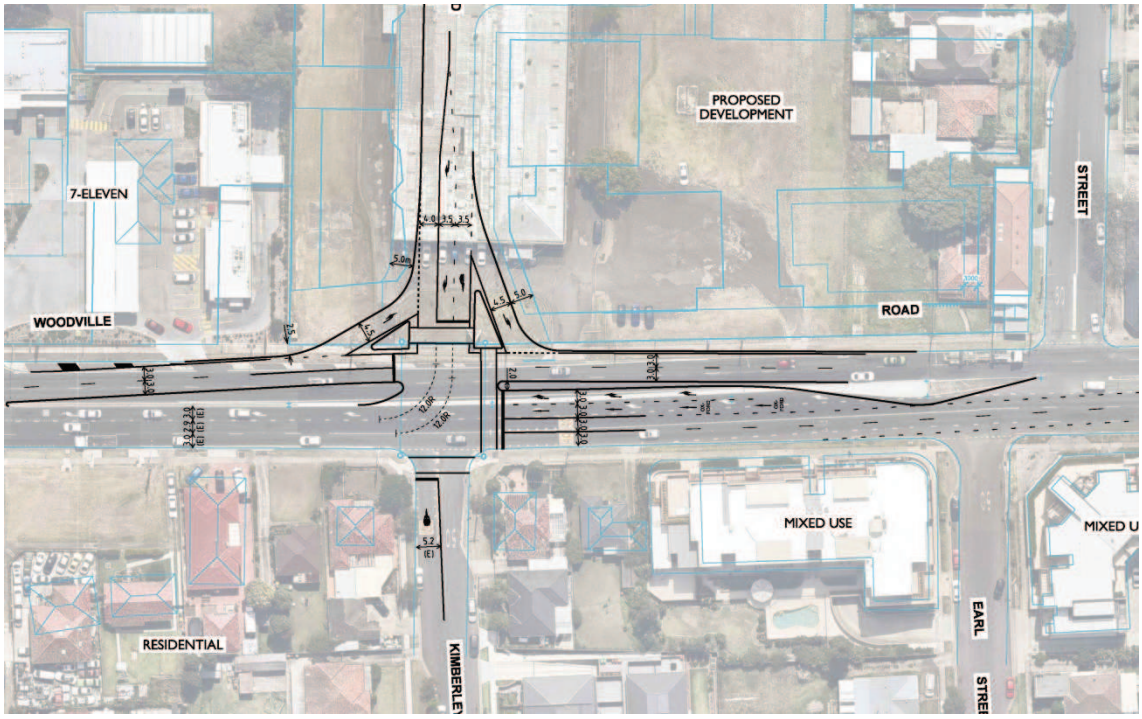
Subject to negotiations with RMS, it is proposed to provide a new signalised intersection to Woodville Road at the existing priority controlled intersection with Kimberley Street. The new signalised intersection would be located approximately 150m north of the existing signalised intersection of Woodville Road and Oxford Street. As such, the proposed signalised intersection providing access to the site would need to be linked or coordinated with the existing signals to the south. This would minimise the likelihood that any queuing on the south approach to the new intersection extends through the existing Woodville Road/ Oxford Street intersection.

The following works are proposed to provide the new site access to Woodville Road:

- Provision of a western approach to the existing Woodville Road/ Kimberley Street intersection (incorporating two approach lanes).
- Shift the two northbound lanes to the west (within the existing kerb line).
- Provide an additional right turn lane on Woodville Road (north approach) to cater for vehicles accessing the site.
- Maintain a dedicated turn lane for traffic turning right into Oxford Street from Woodville Road through the new intersection.
- The signal timings would be linked to the existing Woodville Road/ Oxford Street signals (i.e. approximately 145 second cycle time).

A sketch of the proposed vehicle access arrangements is illustrated in Figure 5.5. If required, a short left turn (deceleration) lane could be provided on the south approach to the intersection. However, in this regard it is noted that the modelling presented below indicates that a short left turn lane would not be required.

Figure 5.5: Proposed Access Arrangements – New Signalised Intersection



Whilst it is acknowledged that the future signalised intersection to the site is located relatively close to the existing Oxford Street signals, it is still considered to be offset greater than minimum requirements. Indeed, whilst the proposed intersection treatment (incorporating the downstream right turn lane at Oxford Street) is not typical, there are several examples of similar facilities throughout metropolitan Sydney.

Further design development and consultation with RMS would be required to progress the proposed traffic signals.

5.4 Traffic Impact

5.4.1 Peak Hour Traffic

The impact of the development traffic upon the surrounding intersections has been assessed using SIDRA INTERSECTION. On the basis of the turning movement estimates presented above, Table 5.6 presents a summary of the anticipated future operation of the intersections following the full development of the site. Detailed results of this analysis are provided in Appendix B of this report. It is noted that this assessment does not take into account any changes to the background traffic volumes as a result of intensification of existing surrounding land uses. Furthermore, the intersections of Oxford Street and Kimberley Street with Woodville Road have again been modelled in isolation[1]. However, appropriate model configuration with respect to intersection coordination, cycle/ phase times and vehicle arrival profile have been adopted. It is recommended that as part of any Development Application for the site, more detailed modelling be undertaken that specifically accounts for the interaction between the two signalised intersections.

Table 5.6: Post Development Operating Conditions

Intersection	Peak Hour	Existing Conditions				Post Development			
		Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Woodville Road/ Lansdowne Street [1]	PM	1.0	4	22	A	1.0	4	25	A
	Sat	1.0	4	24	A	1.0	4	24	A
Woodville Road/ Kimberley Street	PM	0.78	2	25	A	0.76	9	83	A
	Sat	0.43	1	7	A	0.78	11	109	A
Woodville Road/ Oxford Street	PM	0.94	44	437	C	1.0	50	548	D
	Sat	0.86	33	316	C	0.89	34	357	C
Oxford Street/ Highland Street	PM	0.61	8	94	A	0.62	10	95	A

[1] The through traffic on Woodville Road would continue not to be delayed by this intersection.

In general, Table 5.6 indicates that each of the intersections are anticipated to operate with comparable of levels of service to their existing operation. Further discussion regarding each of the intersections is provided below.

Woodville Road/ Lansdowne Street Intersection

The Woodville Road/ Lansdowne Street intersection is expected to operate with only minor increases to average delays and 95th percentile queues. It is noted that the right turn out of Lansdowne Street into Woodville Road is already at capacity. Additional right turning traffic is not anticipated as a result of the development, as these movements would be accommodated at the new traffic signals. Existing right turning traffic would have the opportunity to continue through the site and access the proposed new traffic signals, potentially reducing travel time delays.

[1] The intersections are unable to be adequately modelled using the SIDRA Network function as the right turn lane from the Oxford Street intersection that extends through the proposed Kimberley Street signals is unable to be accurately coded into the program.

Woodville Road/ Kimberley Street/ Site Access Intersection

The proposed signalised intersection at Woodville Road and Kimberley Street is expected to operate at an acceptable Level of Service, with manageable queues and delays on all approaches. The modelling indicates that the majority of green time would be allocated to Woodville Road, hence minimising delays to the majority of traffic.

Woodville Road/ Oxford Street

The Woodville Road/ Oxford Street intersection is expected to operate with a LOS D during the PM peak hour (up from a LOS C) and a LOS C during the Saturday lunchtime peak hour. The Oxford Street approach would operate at capacity during the PM peak hour, noting that no additional traffic is anticipated on the Oxford Street approach from the development.

Woodville Road Signalised Intersections (Combined)

It is noted that the assessment of each of the signalised intersections presented above has been undertaken separately. A qualitative assessment of their combined operation has therefore been undertaken.

The proposed future signalised intersection servicing the site would be located approximately 150m north of the existing Oxford Street signals. Given the close proximity of the intersections, the signal timings would be coordinated to maximise efficiency for through vehicles on Woodville Road. The modelling undertaken above assumes that the existing cycle time observed at the Oxford Street signals of 145 seconds is provided at both intersections in the future.

Oxford Street carries greater traffic volumes compared to the proposed site access (circa 1500vph versus 800vph) and would therefore be allocated more green time than the site access and Kimberley Street at the new signals. As such, vehicles on Woodville Road would continue to be able to access the Oxford Street intersection with minimal disruption.

The signals would be coordinated to accommodate northbound (or inbound) movements in the AM peak hour and southbound (or outbound) movements in the PM peak hour. Whilst it is acknowledged that the right turn queue into Oxford Street would (at peak times) extend through the new signals, the new signals (and the continuation of the Oxford Street right turn lane through the new signals) would not restrict the right turn capacity at Oxford Street (i.e. the storage area for 20 vehicles to queue in the right turn lane prior to the new signals would not clear in each signal cycle).

There are anticipated to be up to 200 right turn movements from the site access onto Woodville Road during the peak hour or an average of about 8 vehicles each traffic signal cycle. There would therefore be sufficient storage area between the two signalised intersections to accommodate the vehicles turning right out of the site access.

Notwithstanding the above, it is recommended that the transport impact assessment report that would accompany the Development Application takes into account the detailed interaction of the two intersections (and associated impacts) once the design of the new traffic signals has progressed further.

Oxford Street/ Highland Street

The Oxford Street/ Highland Street intersection is expected to continue to operate with comparable average delays and 95th percentile queues to its existing operation during the road network peak hours.

There are however concentrated capacity constraints at the existing Oxford Street/ Highland Street intersection during peak school pick-up and drop-off periods. The peak traffic generation from the site is predicted to occur during the PM road network peak hour and the Saturday lunchtime peak hour, which would not coincide with school peak hours. However, the site would generate some traffic during these peak school periods, which may further exacerbate the congestion at the intersection.

Whilst the school peak hour congestion at the Oxford Street/ Highland Street intersection is an existing constraint, it may be possible to increase the capacity and safety of this intersection as part of the development.

In this regard, GTA has reviewed a number of mitigating measures that could improve the operation of the intersection, including:

- Roundabout
- Traffic signals
- Seagull right turn treatment

As the existing capacity constraints only occur for a short period of time on a typical weekday, the review indicated that the provision of a 'seagull' right turn treatment (similar to the one provided at the Oxford Street/ Harold Street intersection) would be the most appropriate treatment to improve the operation of the intersection during peak school periods. The benefit of the seagull treatment is that vehicles turning right out of Highland Street only need to initially give-way to eastbound vehicles on Oxford Street rather than vehicles in both directions as is currently the case. In addition, vehicles turning right into Highland Street would not delay westbound vehicles on Oxford Street. For reference, the existing seagull treatment at the adjacent Oxford Street/ Harold Street intersection is provided in Figure 5.6.

Figure 5.6: Proposed Access Arrangements – New Signalised Intersection

Source: NearMap (used under licence, dated 6/05/15

The provision of traffic signals and/or a roundabout were investigated, however, neither treatment was consistent with other intersection treatments along the Woodville Road corridor, nor do the existing and future volumes on Highland Street warrant such treatments.

The proposed 'seagull' intersection treatment would benefit existing and future traffic accessing Highland Street.

It is noted the proposed treatment would result in the loss of a number of on-street car parking spaces which would need to be considered further by Council and local stakeholders.

5.4.2 Daily Traffic

A summary of the existing, additional and post development daily traffic volumes on the surrounding local roads are provided in Table 5.7.

Table 5.7: Daily Traffic Volume Capacity Assessment

Location	Daily Traffic Volumes			Indicative Maximum Daily Traffic Volumes
	Existing	Additional	Post Development	
Lansdowne Street	1,500vpd	+300vpd [1]	1,800vpd	3,000vpd (approx.) [2]
Highland Street	500vpd	+300vpd [1]	800vpd	

[1] Total traffic generation multiplied by the traffic to the local road network (=5,898 x 5%).
[2] Sourced from the RMS Guide to Traffic Generating Developments (Table 4.6) and assuming each road is classified as a local street.

Table 5.7 indicates that each of the surrounding local roads is anticipated to operate within the daily thresholds.

To ensure that greater levels of development traffic do not use the local road network it is recommended that some Local Area Traffic Management (LATM) measures be implemented on Lansdowne Street, Highland Street and Kimberley Street to both deter vehicles from using and slow vehicles on these local roads. The details of any LATM measures would be developed, in consultation with Council and local residents, as part of the Development Application.

The location of the potential future LATM measures is illustrated in Figure 5.7.

Figure 5.7: Potential LATM Measures

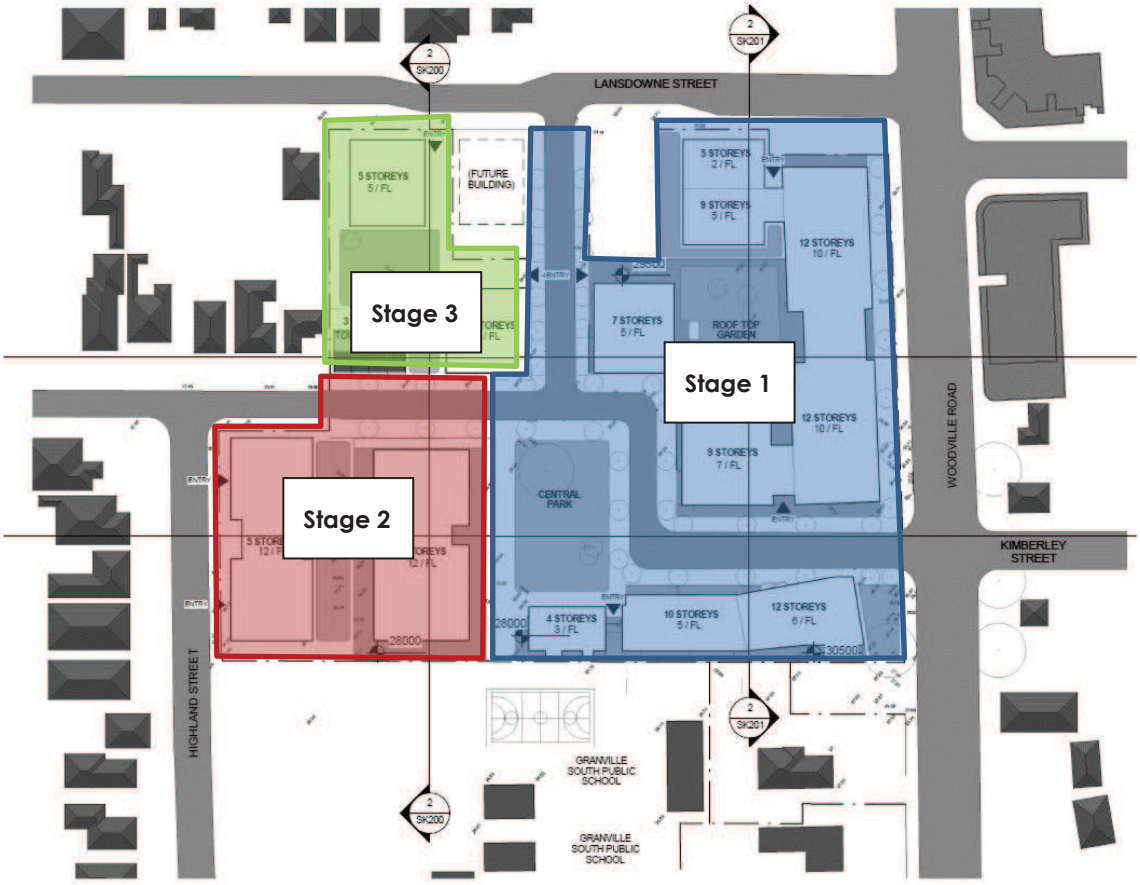
5.4.3 Summary

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development could not be expected to compromise the safety or function of the surrounding road network.

5.5 Staging

The development is proposed to be developed in three stages, as illustrated in Figure 5.8.

Figure 5.8: Indicative Staging Plan



A summary of the vehicle access arrangements for each stage are provided in Table 5.8.

Table 5.8: Vehicle Access Provisions by Stage

Stage	Vehicle Access Provisions		
	Woodville Road	Lansdowne Street	Highland Street
Stage 1	✓	✓	×
Stage 2	✓	✓	✓
Stage 3 (Overall)	✓	✓	✓

Table 5.8 indicates that initially vehicle access (Stage 1) will be provided from Woodville Road and Lansdowne Street.

As detailed in Table 5.3 the non-residential land uses are anticipated to generate the bulk of the traffic from the site. As such, there would be an opportunity to provide vehicle access to the

Stage 1 residential land uses via Lansdowne Road (and/or a temporary left-in, left-out Woodville Rod access) only prior to the development of the non-residential land uses. Following the development of the non-residential land uses the provision of the new signalised intersection to Woodville Road would be required to accommodate the additional traffic generation from the site.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i It is proposed to rezone the subject site from B6 Enterprise Corridor and R2 Low Density Residential to B4 Mixed Use Zone.

ii It is recommended that car parking for the future land uses be provided in accordance with the requirements of the Parramatta DCP 2011. There may be an opportunity to share (part of) the residential visitor parking provision with the retail parking.

iii It is recommended that bicycle parking for the future land uses be provided in accordance with the requirements of the Parramatta DCP 2011.

iv It is proposed to provide a future active travel corridor along Lansdowne Street connecting the site to the Railway Terrace shared path and Merrylands Railway Station.

v The development is anticipated to generate in the order of 720 (including 580 new trips) and 870 (including 700 new trips) vehicle trips during the weekday PM and Saturday lunchtime peak hours, respectively.

vi A new signalised intersection would be required at the existing Woodville Road/ Kimberley Street intersection, incorporating a new western approach servicing the subject site. Traffic modelling and initial sketch design indicates that such an intersection is feasible, however further design development and consultation with RMS would be required to progress the proposed traffic signals.

vii There is adequate capacity in the surrounding road network, incorporating the proposed mitigating works, to cater for the traffic generated by the proposed development.

viii The proposed traffic signals at the existing Woodville Road/ Kimberley Street intersection provide local access benefits through additional right turn opportunities to/from Woodville Road. The traffic signals would also provide a safe pedestrian crossing point along an otherwise difficult pedestrian corridor.

ix A 'seagull' intersection treatment could be provided at the Oxford Street/ Highland Street intersection to improve operation during peak school pick-up and drop-off periods.

x The development is anticipated to generate in the order of 7,300 daily vehicle movements, including 5,900 new vehicle trips and 1,400 passer by trips.

xi The predicted future daily traffic volumes on Lansdowne Street and Highland Street are within their environmental capacities.

xii It is recommended that LATM measures be implemented on Lansdowne Street, Highland Street and Kimberley Street to minimise development traffic using these residential streets. Such treatments should be cognisant of Granville South Public School operations and safety.

xiii Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development could not be expected to compromise the safety or function of the surrounding road network.

xiv It is anticipated that the proposed development would be delivered in three stages. There would be an opportunity to deliver part of the residential component of the development prior to the implementation of the signalised intersection to Woodville Road.

Appendix A

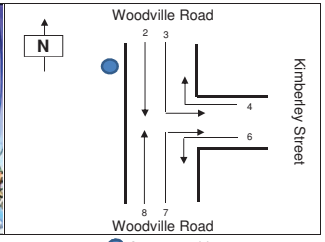
Survey Results

Intersection of Woodville Road and Kimberley Street

Saturday, 9 May 2015

Austraffic

Survey Start	**10:00 AM**
Intersection Type	T Junction
Intersection No.	**1**
North Approach	**Woodville Road**
East Approach	**Kimberley Street**
South Approach	**Woodville Road**
West Approach	
Date	**9/05/15**
Classification	**Light Heavy**



TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL		
	2			3			4			6			7			8					
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
10:00 - 10:15	261	15	276	2	0	2	0	0	0	13	0	13	0	0	0	354	14	368	630	29	659
10:15 - 10:30	283	13	296	4	0	4	0	0	0	19	1	20	0	0	0	314	15	329	620	29	649
10:30 - 10:45	317	7	324	1	0	1	0	0	0	10	0	10	0	0	0	335	14	349	663	21	684
10:45 - 11:00	297	15	312	1	0	1	0	0	0	19	0	19	0	0	0	349	16	365	666	31	697
11:00 - 11:15	350	17	367	3	0	3	0	0	0	19	1	20	0	0	0	301	13	314	673	31	704
11:15 - 11:30	321	15	336	3	0	3	0	0	0	16	1	17	0	0	0	337	14	351	677	30	707
11:30 - 11:45	364	18	382	1	0	1	0	0	0	15	0	15	0	0	0	394	12	406	774	30	804
11:45 - 12:00	338	10	348	3	1	4	0	0	0	14	0	14	0	0	0	354	19	373	709	30	739
12:00 - 12:15	372	19	391	3	0	3	0	0	0	11	0	11	1	0	1	336	15	351	723	34	757
12:15 - 12:30	384	18	402	1	0	1	0	0	0	16	0	16	0	0	0	332	13	345	733	31	764
12:30 - 12:45	372	15	387	1	1	2	0	0	0	18	0	18	0	0	0	391	17	408	782	33	815
12:45 - 13:00	358	9	367	2	0	2	0	0	0	13	0	13	0	0	0	360	13	373	733	22	755
Σ	4017	171	4188	25	2	27	0	0	0	183	3	186	1	0	1	4157	175	4332	8383	351	8734

HOURLY FLOW

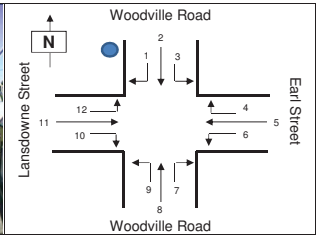
TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL			
	2			3			4			6			7			8						
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
10:00 - 11:00	1158	50	1208	8	0	8	0	0	0	61	1	62	0	0	0	1352	59	1411	2579	110	2689	
10:15 - 11:15	1247	52	1299	9	0	9	0	0	0	67	2	69	0	0	0	1299	58	1357	2622	112	2734	
10:30 - 11:30	1285	54	1339	8	0	8	0	0	0	64	2	66	0	0	0	1322	57	1379	2679	113	2792	
10:45 - 11:45	1332	65	1397	8	0	8	0	0	0	69	2	71	0	0	0	1381	55	1436	2790	122	2912	
11:00 - 12:00	1373	60	1433	10	1	11	0	0	0	64	2	66	0	0	0	1386	58	1444	2833	121	2954	
11:15 - 12:15	1395	62	1457	10	1	11	0	0	0	56	1	57	1	0	1	1421	60	1481	2883	124	3007	
11:30 - 12:30	1456	65	1523	8	1	9	0	0	0	56	0	56	1	0	1	1416	59	1475	2939	125	3064	
11:45 - 12:45	1466	62	1528	8	2	10	0	0	0	59	0	59	1	0	1	1413	64	1477	2947	128	3075	
12:00 - 13:00	**1486**	**61**	**1547**	**7**	**1**	**8**	**0**	**0**	**0**	**58**	**0**	**58**	**1**	**0**	**1**	**1419**	**58**	**1477**	**2971**	**120**	**3091**	**Peak**

Intersection of Woodville Road, Lansdowne Street and Earl Street

Saturday, 9 May 2015

Austraffic

Survey Start	**10:00 AM**
Intersection Type	Cross Junction
Intersection No.	**2**
North Approach	**Woodville Road**
East Approach	**Earl Street**
South Approach	**Woodville Road**
West Approach	**Lansdowne Street**
Date	**9/05/15**
Classification	**Light Heavy**



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
10:00 - 10:15	9	0	9	258	15	273	2	0	2	0	0	0	0	0	0	4	0	4
10:15 - 10:30	13	0	13	282	14	296	6	0	6	0	0	0	0	0	0	5	0	5
10:30 - 10:45	13	1	14	307	6	313	4	0	4	0	0	0	0	0	0	6	0	6
10:45 - 11:00	9	0	9	292	15	307	6	0	6	0	0	0	0	0	0	7	0	7
11:00 - 11:15	12	0	12	343	15	358	4	1	5	0	0	0	0	0	0	8	1	9
11:15 - 11:30	15	1	16	310	15	325	4	0	4	0	0	0	0	0	0	6	0	6
11:30 - 11:45	19	0	19	351	18	369	3	0	3	0	0	0	0	0	0	6	0	6
11:45 - 12:00	9	0	9	333	11	344	4	0	4	0	0	0	0	0	0	7	0	7
12:00 - 12:15	13	1	14	361	20	381	2	0	2	1	0	1	0	0	0	3	0	3
12:15 - 12:30	13	0	13	377	17	394	5	0	5	0	0	0	0	0	0	10	0	10
12:30 - 12:45	20	2	22	367	16	383	3	0	3	0	0	0	0	0	0	7	0	7
12:45 - 13:00	16	0	16	350	10	360	4	0	4	0	0	0	0	0	0	4	0	4
Σ	161	5	166	3931	172	4103	47	1	48	1	0	1	0	0	0	73	1	74

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
10:00 - 10:15	0	0	0	356	15	371	1	0	1	1	0	1	1	0	1	6	0	6	638	30	668
10:15 - 10:30	1	0	1	317	13	330	3	0	3	4	0	4	0	0	0	5	0	5	636	27	663
10:30 - 10:45	0	0	0	322	16	338	10	0	10	1	0	1	4	0	4	9	0	9	676	23	699
10:45 - 11:00	0	0	0	333	16	349	3	0	3	1	0	1	3	0	3	10	0	10	664	31	695
11:00 - 11:15	0	0	0	306	13	319	9	0	9	2	1	3	2	0	2	8	0	8	694	31	725
11:15 - 11:30	0	0	0	336	13	349	4	0	4	2	0	2	4	0	4	12	1	13	693	30	723
11:30 - 11:45	0	0	0	391	12	403	9	1	10	3	0	3	3	0	3	14	0	14	799	31	830
11:45 - 12:00	0	0	0	353	19	372	7	0	7	2	0	2	1	0	1	8	0	8	724	30	754
12:00 - 12:15	0	0	0	328	15	343	9	0	9	7	0	7	0	0	0	7	0	7	731	36	767
12:15 - 12:30	0	0	0	312	11	323	7	0	7	2	0	2	2	0	2	6	0	6	734	28	762
12:30 - 12:45	0	0	0	397	19	416	6	0	6	0	0	0	3	0	3	11	0	11	814	37	851
12:45 - 13:00	0	0	0	352	13	365	10	0	10	5	0	5	2	0	2	11	0	11	754	23	777
Σ	1	0	1	4103	175	4278	78	1	79	30	1	31	25	0	25	107	1	108	8557	357	8914

HOURLY FLOW

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
10:00 - 11:00	44	1	45	1139	50	1189	18	0	18	0	0	0	0	0	0	22	0	22
10:15 - 11:15	47	1	48	1224	50	1274	20	1	21	0	0	0	0	0	0	26	1	27
10:30 - 11:30	49	2	51	1252	51	1303	18	1	19	0	0	0	0	0	0	27	1	28
10:45 - 11:45	55	1	56	1296	63	1359	17	1	18	0	0	0	0	0	0	27	1	28
11:00 - 12:00	55	1	56	1337	59	1396	15	1	16	0	0	0	0	0	0	27	1	28
11:15 - 12:15	56	2	58	1355	64	1419	13	0	13	1	0	1	0	0	0	22	0	22
11:30 - 12:30	54	1	55	1422	66	1488	14	0	14	1	0	1	0	0	0	26	0	26
11:45 - 12:45	55	3	58	1438	64	1502	14	0	14	1	0	1	0	0	0	27	0	27
12:00 - 13:00	**62**	**3**	**65**	**1455**	**63**	**1518**	**14**	**0**	**14**	**1**	**0**	**1**	**0**	**0**	**0**	**24**	**0**	**24**

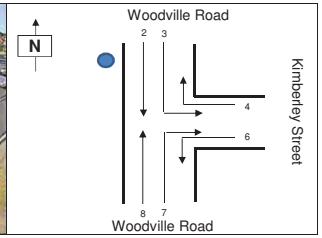
TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
10:00 - 11:00	1	0	1	1328	60	1388	17	0	17	7	0	7	8	0	8	30	0	30	2614	111	2725	
10:15 - 11:15	1	0	1	1278	58	1336	25	0	25	8	1	9	9	0	9	32	0	32	2670	112	2782	
10:30 - 11:30	0	0	0	1297	58	1355	26	0	26	6	1	7	13	0	13	39	1	40	2727	115	2842	
10:45 - 11:45	0	0	0	1366	54	1420	25	1	26	8	1	9	12	0	12	44	1	45	2850	123	2973	
11:00 - 12:00	0	0	0	1386	57	1443	29	1	30	9	1	10	10	0	10	42	1	43	2910	122	3032	
11:15 - 12:15	0	0	0	1408	59	1467	29	1	30	14	0	14	8	0	8	41	1	42	2947	127	3074	
11:30 - 12:30	0	0	0	1384	57	1441	32	1	33	14	0	14	6	0	6	35	0	35	2988	125	3113	
11:45 - 12:45	0	0	0	1390	64	1454	29	0	29	11	0	11	6	0	6	32	0	32	3003	131	3134	
12:00 - 13:00	**0**	**0**	**0**	**1389**	**58**	**1447**	**32**	**0**	**32**	**14**	**0**	**14**	**7**	**0**	**7**	**35**	**0**	**35**	**3033**	**124**	**3157**	**Peak**

Intersection of Woodville Road and Kimberley Street

Wednesday, 13 May 2015

Austraffic

Survey Start	**7:00 AM 16:00 PM**
Intersection Type	T Junction
Intersection No.	
North Approach	**Woodville Road**
East Approach	**Kimberley Street**
South Approach	**Woodville Road**
West Approach	
Date	**13/05/15**
Classification	**Light Heavy**



TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL		
	2			3			4			6			7			8					
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	284	30	314	1	0	1	0	0	0	5	1	6	0	0	0	437	39	476	727	70	797
7:15 - 7:30	280	24	304	0	0	0	0	0	0	11	0	11	0	0	0	455	41	496	746	65	811
7:30 - 7:45	301	22	323	0	0	0	0	0	0	6	1	7	0	0	0	369	27	396	676	50	726
7:45 - 8:00	302	26	328	1	0	1	0	0	0	4	2	6	0	0	0	336	23	359	643	51	694
8:00 - 8:15	281	19	300	5	1	6	0	0	0	9	0	9	1	0	1	289	18	307	585	38	623
8:15 - 8:30	260	26	286	2	0	2	0	0	0	6	1	7	0	0	0	282	30	312	550	57	607
8:30 - 8:45	295	26	321	1	0	1	0	0	0	10	0	10	0	0	0	230	24	254	536	50	586
8:45 - 9:00	291	27	318	8	0	8	0	0	0	7	2	9	0	0	0	196	28	224	502	57	559
Σ	2294	200	2494	18	1	19	0	0	0	58	7	65	1	0	1	2594	230	2824	4965	438	5403

TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL		
	2			3			4			6			7			8					
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	456	23	479	2	0	2	0	0	0	23	1	24	0	0	0	348	24	372	829	48	877
16:15 - 16:30	453	33	486	2	0	2	0	0	0	20	0	20	0	0	0	356	21	377	831	54	885
16:30 - 16:45	438	16	454	1	0	1	0	0	0	15	1	16	0	0	0	312	16	328	766	33	799
16:45 - 17:00	419	23	442	4	0	4	0	0	0	17	0	17	0	0	0	346	27	373	786	50	836
17:00 - 17:15	430	16	446	3	0	3	0	0	0	23	4	27	0	0	0	348	21	369	804	41	845
17:15 - 17:30	443	14	457	4	0	4	0	0	0	13	0	13	0	0	0	411	19	430	871	33	904
17:30 - 17:45	437	18	455	5	0	5	0	0	0	25	0	25	0	0	0	330	9	339	797	27	824
17:45 - 18:00	431	20	451	2	0	2	0	0	0	22	0	22	0	0	0	387	15	402	842	35	877
Σ	3507	163	3670	23	0	23	0	0	0	158	6	164	0	0	0	2838	152	2990	6526	321	6847

HOURLY FLOW

TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL			
	2			3			4			6			7			8						
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	**1167**	**102**	**1269**	**2**	**0**	**2**	**0**	**0**	**0**	**26**	**4**	**30**	**0**	**0**	**0**	**1597**	**130**	**1727**	**2792**	**236**	**3028**	**Peak**
7:15 - 8:15	1164	91	1255	6	1	7	0	0	0	30	3	33	1	0	1	1449	109	1558	2650	204	2854	
7:30 - 8:30	1144	93	1237	8	1	9	0	0	0	25	4	29	1	0	1	1276	98	1374	2454	196	2650	
7:45 - 8:45	1138	97	1235	9	1	10	0	0	0	29	3	32	1	0	1	1137	95	1232	2314	196	2510	
8:00 - 9:00	1127	98	1225	16	1	17	0	0	0	32	3	35	1	0	1	997	100	1097	2173	202	2375	

HOURLY FLOW

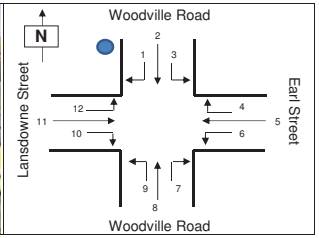
TIME PERIOD	VEHICLE MOVEMENT																		GRAND TOTAL			
	2			3			4			6			7			8						
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	1766	95	1861	9	0	9	0	0	0	75	2	77	0	0	0	1362	88	1450	3212	185	3397	
16:15 - 17:15	1740	88	1828	10	0	10	0	0	0	75	5	80	0	0	0	1362	85	1447	3187	178	3365	
16:30 - 17:30	1730	69	1799	12	0	12	0	0	0	68	5	73	0	0	0	1417	83	1500	3227	157	3384	
16:45 - 17:45	1729	71	1800	16	0	16	0	0	0	78	4	82	0	0	0	1435	76	1511	3258	151	3409	
17:00 - 18:00	**1741**	**68**	**1809**	**14**	**0**	**14**	**0**	**0**	**0**	**83**	**4**	**87**	**0**	**0**	**0**	**1476**	**64**	**1540**	**3314**	**136**	**3450**	**Peak**

Intersection of Woodville Road, Lansdowne Street and Earl Street

Wednesday, 13 May 2015

Austraffic

Survey Start	**7:00 AM 16:00 PM**
Intersection Type	Cross Junction
Intersection No.	
North Approach	**Woodville Road**
East Approach	**Earl Street**
South Approach	**Woodville Road**
West Approach	**Lansdowne Street**
Date	**13/05/15**
Classification	**Light Heavy**



Camera Position

TIME PERIOD	VEHICLE MOVEMENT																														GRAND TOTAL		
	1			2			3			4			5			6			7			8			9			10			11			12					
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	8	1	9	282	30	312	2	0	2	0	0	0	0	0	0	3	0	3	0	0	0	437	38	475	2	0	2	0	0	0	0	0	0	8	0	8	742	69	811
7:15 - 7:30	8	0	8	269	24	293	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	456	41	497	1	0	1	2	0	2	0	0	0	6	0	6	749	65	814
7:30 - 7:45	6	1	7	291	23	314	4	0	4	0	0	0	0	0	0	7	0	7	3	0	3	357	27	384	9	0	9	3	0	3	5	0	5	3	1	4	688	52	740
7:45 - 8:00	7	0	7	298	25	323	2	0	2	0	0	0	0	0	0	2	0	2	19	0	19	287	22	309	20	0	20	2	0	2	3	0	3	4	0	4	644	47	691
8:00 - 8:15	11	0	11	288	18	306	0	0	0	0	0	0	0	0	0	5	2	7	17	2	19	265	15	280	9	1	10	2	0	2	6	0	6	7	0	7	610	38	648
8:15 - 8:30	10	0	10	252	26	278	2	1	3	0	0	0	0	0	0	6	0	6	11	1	12	276	30	306	4	0	4	5	0	5	6	0	6	10	0	10	582	58	640
8:30 - 8:45	14	0	14	285	26	311	2	0	2	0	0	0	0	0	0	14	0	14	9	0	9	209	22	231	4	1	5	2	0	2	4	1	5	3	0	3	546	50	596
8:45 - 9:00	16	0	16	282	26	308	5	1	6	0	0	0	0	0	0	15	0	15	14	0	14	194	29	223	6	0	6	1	0	1	3	0	3	8	0	8	544	56	600
Σ	80	2	82	2247	198	2445	17	2	19	0	0	0	0	0	0	59	2	61	73	3	76	2481	224	2705	55	2	57	17	0	17	27	1	28	49	1	50	5105	435	5540

TIME PERIOD	VEHICLE MOVEMENT																														GRAND TOTAL		
	1			2			3			4			5			6			7			8			9			10			11			12					
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	29	1	30	431	25	456	10	0	10	0	0	0	0	0	0	13	0	13	0	0	0	345	24	369	11	0	11	2	0	2	5	1	6	6	0	6	852	51	903
16:15 - 16:30	18	0	18	443	31	474	7	0	7	0	0	0	1	0	1	12	0	12	0	0	0	351	21	372	4	0	4	2	0	2	2	0	2	7	0	7	847	52	899
16:30 - 16:45	23	0	23	421	16	437	8	1	9	0	0	0	0	0	0	9	0	9	0	0	0	304	16	320	9	0	9	2	0	2	1	0	1	8	0	8	785	33	818
16:45 - 17:00	23	2	25	425	24	449	9	0	9	0	0	0	0	0	0	12	0	12	1	0	1	340	25	365	5	0	5	3	0	3	0	0	0	10	0	10	828	51	879
17:00 - 17:15	22	2	24	393	14	407	4	0	4	0	0	0	0	0	0	18	1	19	0	0	0	349	22	371	8	1	9	3	0	3	2	0	2	5	1	6	804	41	845
17:15 - 17:30	20	0	20	433	14	447	3	1	4	0	0	0	0	0	0	11	0	11	0	0	0	404	18	422	6	1	7	2	0	2	2	0	2	7	0	7	888	34	922
17:30 - 17:45	29	0	29	422	18	440	3	0	3	0	0	0	0	0	0	13	0	13	0	0	0	329	9	338	10	0	10	2	0	2	1	0	1	14	0	14	823	27	850
17:45 - 18:00	22	0	22	421	20	441	9	0	9	0	0	0	0	0	0	12	0	12	0	0	0	380	15	395	4	0	4	2	0	2	2	0	2	6	0	6	858	35	893
Σ	186	5	191	3389	162	3551	53	2	55	0	0	0	1	0	1	100	1	101	1	0	1	2802	150	2952	57	2	59	18	0	18	15	1	16	63	1	64	6685	324	7009

HOURLY FLOW

TIME PERIOD	VEHICLE MOVEMENT																														GRAND TOTAL			
	1			2			3			4			5			6			7			8			9			10			11			12						
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	**29**	**2**	**31**	**1140**	**102**	**1242**	**8**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**19**	**22**	**0**	**22**	**1537**	**128**	**1665**	**32**	**0**	**32**	**7**	**0**	**7**	**8**	**0**	**8**	**21**	**1**	**22**	**2823**	**233**	**3056**	**Peak**
7:15 - 8:15	32	1	33	1146	90	1236	6	0	6	0	0	0	0	0	0	21	2	23	39	2	41	1365	105	1470	39	1	40	9	0	9	14	0	14	20	1	21	2691	202	2893	
7:30 - 8:30	34	1	35	1129	92	1221	8	1	9	0	0	0	0	0	0	20	2	22	50	3	53	1185	94	1279	42	1	43	12	0	12	20	0	20	24	1	25	2524	195	2719	
7:45 - 8:45	42	0	42	1123	95	1218	6	1	7	0	0	0	0	0	0	27	2	29	56	3	59	1037	89	1126	37	2	39	11	0	11	19	1	20	24	0	24	2382	193	2575	
8:00 - 9:00	51	0	51	1107	96	1203	9	2	11	0	0	0	0	0	0	40	2	42	51	3	54	944	96	1040	23	2	25	10	0	10	19	1	20	28	0	28	2282	202	2484	

HOURLY FLOW

TIME PERIOD	VEHICLE MOVEMENT																														GRAND TOTAL			
	1			2			3			4			5			6			7			8			9			10			11			12						
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	93	3	96	1720	96	1816	34	1	35	0	0	0	1	0	1	46	0	46	1	0	1	1340	86	1426	29	0	29	9	0	9	8	1	9	31	0	31	3312	187	3499	
16:15 - 17:15	86	4	90	1682	85	1767	28	1	29	0	0	0	1	0	1	51	1	52	1	0	1	1344	84	1428	26	1	27	10	0	10	5	0	5	30	1	31	3264	177	3441	
16:30 - 17:30	88	4	92	1672	68	1740	24	2	26	0	0	0	0	0	0	50	1	51	1	0	1	1397	81	1478	28	2	30	10	0	10	5	0	5	30	1	31	3305	159	3464	
16:45 - 17:45	94	4	98	1673	70	1743	19	1	20	0	0	0	0	0	0	54	1	55	1	0	1	1422	74	1496	29	2	31	10	0	10	5	0	5	36	1	37	3343	153	3496	
17:00 - 18:00	**93**	**2**	**95**	**1669**	**66**	**1735**	**19**	**1**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**54**	**1**	**55**	**0**	**0**	**0**	**1462**	**64**	**1526**	**28**	**2**	**30**	**9**	**0**	**9**	**7**	**0**	**7**	**32**	**1**	**33**	**3373**	**137**	**3510**	**Peak**

R.O.A.R. DATA

Reliable, Original & Authentic Results

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

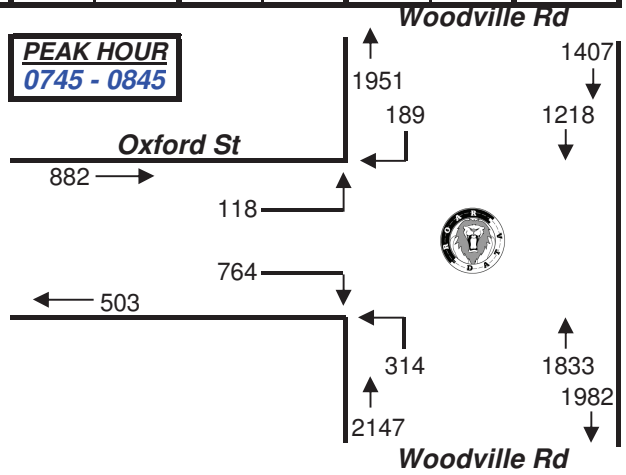
Client : GTA Consultants
Job No/Name : 5621 GUILDFORD Oxford St
Day/Date : Thursday / 21st May 2015

All Vehicles

	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Time Per	R	T	L	R	L	T	TOTAL
0700 - 0715	24	247	25	142	61	457	**956**
0715 - 0730	47	295	40	168	52	450	**1052**
0730 - 0745	47	271	30	163	47	490	**1048**
0745 - 0800	34	295	25	196	97	521	**1168**
0800 - 0815	59	303	27	201	76	386	**1052**
0815 - 0830	51	302	27	190	62	440	**1072**
0830 - 0845	45	318	39	177	79	486	**1144**
0845 - 0900	68	260	25	131	79	370	**933**
Period End	**375**	**2291**	**238**	**1368**	**553**	**3600**	**8425**

	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Peak Per	R	T	L	R	L	T	TOTAL
0700 - 0800	152	1108	120	669	257	1918	**4224**
0715 - 0815	187	1164	122	728	272	1847	**4320**
0730 - 0830	191	1171	109	750	282	1837	**4340**
0745 - 0845	189	1218	118	764	314	1833	**4436**
0800 - 0900	223	1183	118	699	296	1682	**4201**

PEAK HR	**189**	**1218**	**118**	**764**	**314**	**1833**	**4436**

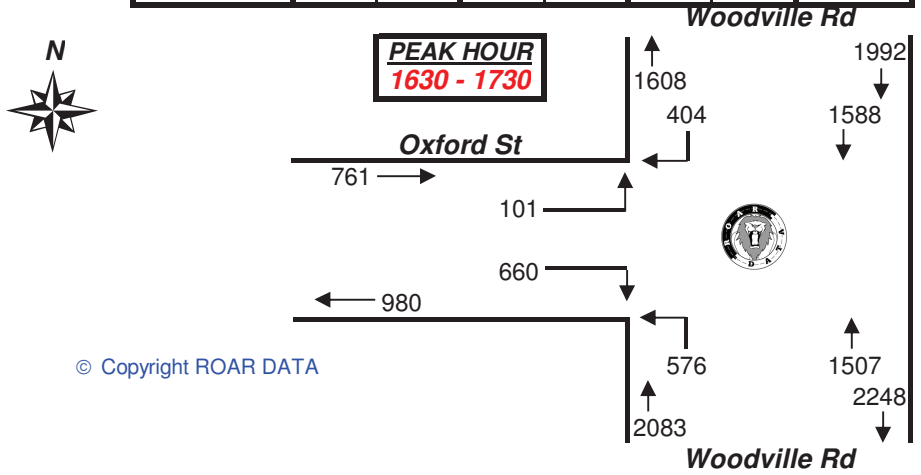


All Vehicles

	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Time Per	R	T	L	R	L	T	TOTAL
1430 - 1445	62	302	29	137	99	279	**908**
1445 - 1500	81	329	35	118	91	303	**957**
1500 - 1515	74	358	24	174	102	369	**1101**
1515 - 1530	63	408	25	134	110	369	**1109**
1530 - 1545	83	352	25	163	102	325	**1050**
1545 - 1600	127	399	21	130	120	361	**1158**
1600 - 1615	95	388	25	132	124	380	**1144**
1615 - 1630	104	417	22	151	145	346	**1185**
1630 - 1645	83	385	28	148	140	338	**1122**
1645 - 1700	104	401	23	151	137	309	**1125**
1700 - 1715	111	366	25	170	140	412	**1224**
1715 - 1730	106	436	25	191	159	448	**1365**
Period End	**1093**	**4541**	**307**	**1799**	**1469**	**4239**	**13448**

	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Peak Per	R	T	L	R	L	T	TOTAL
1430 - 1530	280	1397	113	563	402	1320	**4075**
1445 - 1545	301	1447	109	589	405	1366	**4217**
1500 - 1600	347	1517	95	601	434	1424	**4418**
1515 - 1615	368	1547	96	559	456	1435	**4461**
1530 - 1630	409	1556	93	576	491	1412	**4537**
1545 - 1645	409	1589	96	561	529	1425	**4609**
1600 - 1700	386	1591	98	582	546	1373	**4576**
1615 - 1715	402	1569	98	620	562	1405	**4656**
1630 - 1730	404	1588	101	660	576	1507	**4836**

PEAK HR	**404**	**1588**	**101**	**660**	**576**	**1507**	**4836**



R.O.A.R. DATA

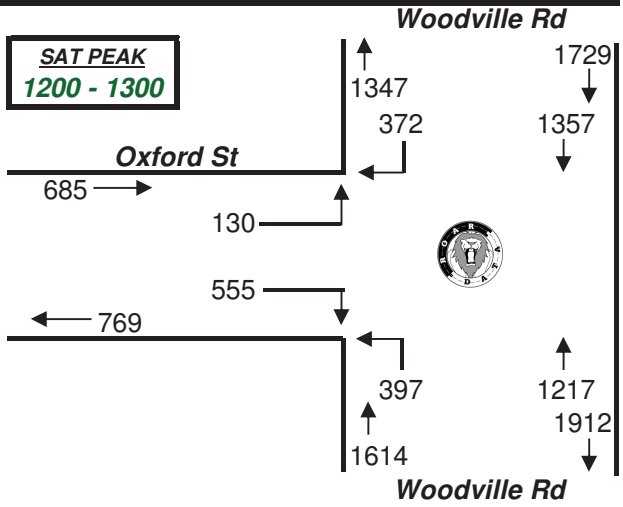
Reliable, Original & Authentic Results

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

All Vehicles	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1100 - 1115	217	75	31	175	93	288	**879**
1115 - 1130	329	68	30	115	86	325	**953**
1130 - 1145	298	69	29	174	91	347	**1008**
1145 - 1200	325	73	41	152	71	291	**953**
1200 - 1215	347	95	33	157	105	298	**1035**
1215 - 1230	350	82	30	130	115	299	**1006**
1230 - 1245	283	91	37	136	90	305	**942**
1245 - 1300	377	104	30	132	87	315	**1045**
Period End	**2526**	**657**	**261**	**1171**	**738**	**2468**	**7821**

	NORTH		WEST		SOUTH		
	Woodville Rd		*Oxford St*		*Woodville Rd*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1100 - 1200	1169	285	131	616	341	1251	**3793**
1115 - 1215	1299	305	133	598	353	1261	**3949**
1130 - 1230	1320	319	133	613	382	1235	**4002**
1145 - 1245	1305	341	141	575	381	1193	**3936**
1200 - 1300	1357	372	130	555	397	1217	**4028**

PEAK HR	**1357**	**372**	**130**	**555**	**397**	**1217**	**4028**



R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : GTA Consultants

Job No/Name : 5621 GUILDFORD Oxford St

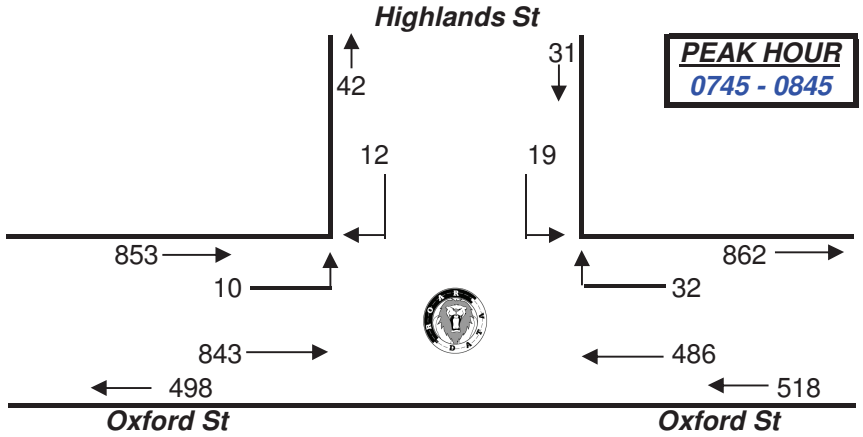
Day/Date : Thursday / 21st May 2015

All Vehicles

Time Per	WEST Oxford St L	WEST Oxford St T	NORTH Highlands St R	NORTH Highlands St L	EAST Oxford St T	EAST Oxford St R	TOTAL
0730 - 0745	1	221	1	0	93	1	**317**
0745 - 0800	1	236	1	3	139	3	**383**
0800 - 0815	2	193	1	3	132	2	**333**
0815 - 0830	2	205	6	5	99	7	**324**
0830 - 0845	5	209	4	8	116	20	**362**
0845 - 0900	7	159	19	14	107	25	**331**
0900 - 0915	0	171	6	9	100	8	**294**
0915 - 0930	0	161	5	9	95	6	**276**
Period End	**18**	**1555**	**43**	**51**	**881**	**72**	**2620**

Peak Per	WEST Oxford St L	WEST Oxford St T	NORTH Highlands St R	NORTH Highlands St L	EAST Oxford St T	EAST Oxford St R	TOTAL
0730 - 0830	6	855	9	11	463	13	**1357**
0745 - 0845	10	843	12	19	486	32	**1402**
0800 - 0900	16	766	30	30	454	54	**1350**
0815 - 0915	14	744	35	36	422	60	**1311**
0830 - 0930	12	700	34	40	418	59	**1263**

PEAK HR	10	843	12	19	486	32	1402

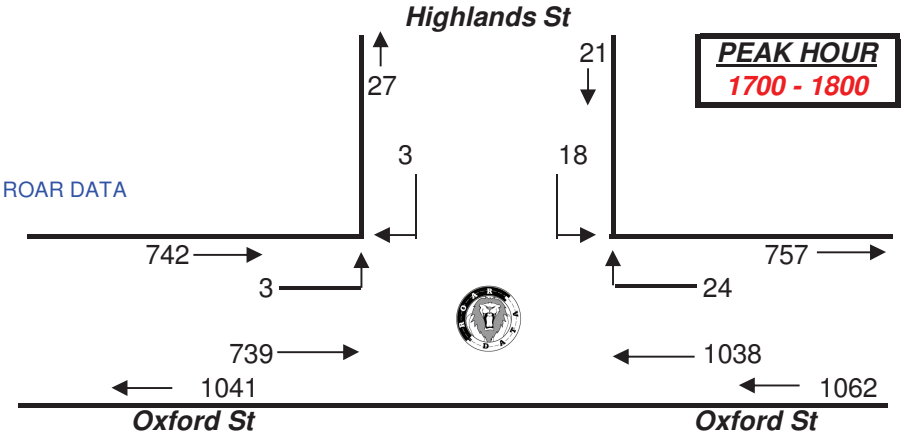


All Vehicles

Time Per	WEST Oxford St L	WEST Oxford St T	NORTH Highlands St R	NORTH Highlands St L	EAST Oxford St T	EAST Oxford St R	TOTAL
1500 - 1515	2	178	30	20	154	13	**397**
1515 - 1530	2	181	4	2	173	4	**366**
1530 - 1545	5	164	1	6	182	4	**362**
1545 - 1600	2	131	1	4	249	6	**393**
1600 - 1615	1	161	0	5	246	5	**418**
1615 - 1630	0	168	0	5	216	4	**393**
1630 - 1645	3	171	4	3	212	5	**398**
1645 - 1700	2	168	0	8	229	10	**417**
1700 - 1715	0	183	1	5	249	6	**444**
1715 - 1730	3	200	1	2	248	7	**461**
1730 - 1745	0	174	1	7	267	5	**454**
1745 - 1800	0	182	0	4	274	6	**466**
Period End	**20**	**2061**	**43**	**71**	**2699**	**75**	**4969**

Peak Per	WEST Oxford St L	WEST Oxford St T	NORTH Highlands St R	NORTH Highlands St L	EAST Oxford St T	EAST Oxford St R	TOTAL
1500 - 1600	11	654	36	32	758	27	**1518**
1515 - 1615	10	637	6	17	850	19	**1539**
1530 - 1630	8	624	2	20	893	19	**1566**
1545 - 1645	6	631	5	17	923	20	**1602**
1600 - 1700	6	668	4	21	903	24	**1626**
1615 - 1715	5	690	5	21	906	25	**1652**
1630 - 1730	8	722	6	18	938	28	**1720**
1645 - 1745	5	725	3	22	993	28	**1776**
1700 - 1800	3	739	3	18	1038	24	**1825**

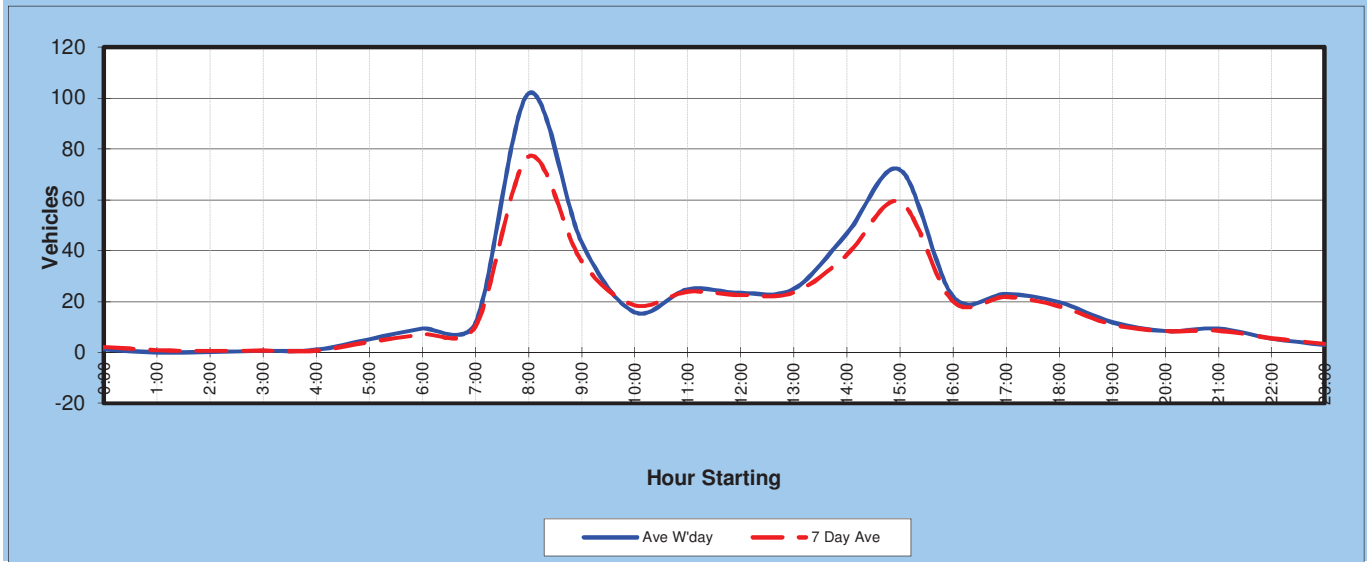
PEAK HR	3	739	3	18	1038	24	1825



Road	01 Highland Street		
Location	approx. 50m north of Oxford Street		
Site No.	1		
Start Date	Saturday	9-May-15	
Direction	Combined		

Average Weekday	485
7 Day Average	423
Weekday Heavy's	2.2%
7 Day Heavy's	2.1%

	Day of Week							Ave	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	W'day	Ave
Time	11-May	12-May	13-May	14-May	15-May	9-May	10-May		
AM Peak	108	108	98	93	102	31	20		
PM Peak	91	81	60	75	52	36	20		
0:00	0	0	4	2	0	4	5	1	2
1:00	0	0	0	0	0	2	4	0	1
2:00	0	0	0	1	0	1	2	0	1
3:00	1	1	0	0	1	2	0	1	1
4:00	1	1	1	2	0	0	0	1	1
5:00	4	9	6	2	5	1	2	5	4
6:00	10	8	8	9	12	3	0	9	7
7:00	11	9	13	14	11	9	5	12	10
8:00	108	108	98	93	102	21	9	102	77
9:00	48	33	65	24	47	24	10	43	36
10:00	13	15	22	12	17	31	20	16	19
11:00	24	28	33	18	21	25	18	25	24
12:00	30	16	15	25	31	21	20	23	23
13:00	33	23	22	28	19	20	20	25	24
14:00	65	34	42	48	45	16	19	47	38
15:00	91	81	60	75	52	36	20	72	59
16:00	26	12	38	19	15	13	17	22	20
17:00	22	12	34	26	21	26	12	23	22
18:00	19	22	23	22	13	17	11	20	18
19:00	11	17	9	12	10	6	12	12	11
20:00	10	11	4	8	9	6	11	8	8
21:00	10	8	10	7	12	9	4	9	9
22:00	3	3	8	10	3	4	8	5	6
23:00	1	0	1	3	10	4	5	3	3
Total	541	451	516	460	456	301	234	485	423
% Heavies	1.8%	3.1%	1.4%	1.3%	3.5%	1.3%	2.1%	2.2%	2.1%



Appendix B

SIDRA INTERSECTION Results

MOVEMENT SUMMARY

Site: AM Peak Hour EC

Woodville Road / Lansdowne Street
AM Peak Hour
Existing Conditions
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	34	5.0	0.473	8.4	LOS A	0.0	0.0	0.00	1.08	49.0
2	T	1753	5.0	0.473	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1786	5.0	0.473	0.2	NA	0.0	0.0	0.00	0.02	59.7
North: Woodville Rd - N Leg											
8	T	1316	5.0	0.301	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	33	5.0	0.232	37.0	LOS C	0.7	5.4	0.92	0.99	29.8
Approach		1348	5.0	0.301	0.9	NA	0.7	5.4	0.02	0.02	58.6
West: Lansdowne St - W Leg											
10	L	23	5.0	0.241	48.7	LOS D	0.7	5.2	0.94	1.00	25.7
12	R	16	5.0	1.000[4]	501.4	LOS F	3.2	23.4	1.00	1.13	4.0
Approach		39	5.0	1.000	232.2	LOS F	3.2	23.4	0.96	1.05	8.1
All Vehicles		3174	5.0	1.000	3.3	NA	3.2	23.4	0.02	0.03	55.0

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: PM Peak Hour EC

Woodville Road / Lansdowne Street
PM Peak Hour
Existing Conditions
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	32	5.0	0.434	8.4	LOS A	0.0	0.0	0.00	1.07	49.0
2	T	1606	5.0	0.434	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1638	5.0	0.434	0.2	NA	0.0	0.0	0.00	0.02	59.7
North: Woodville Rd - N Leg											
8	T	1847	5.0	0.423	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	100	5.0	0.532	38.1	LOS C	2.1	15.7	0.93	1.07	29.3
Approach		1947	5.0	0.532	2.0	NA	2.1	15.7	0.05	0.06	57.0
West: Lansdowne St - W Leg											
10	L	35	5.0	0.263	38.6	LOS C	0.8	6.1	0.92	1.00	29.1
12	R	17	5.0	1.000[4]	436.6	LOS F	3.0	21.8	1.00	1.13	4.6
Approach		52	5.0	1.000	168.5	LOS F	3.0	21.8	0.94	1.04	10.6
All Vehicles		3637	5.0	1.000	3.5	NA	3.0	21.8	0.04	0.05	54.7

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: Sat Peak Hour EC

Woodville Road / Lansdowne Street
Sat Peak Hour
Existing Conditions
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	34	5.0	0.413	8.4	LOS A	0.0	0.0	0.00	1.07	49.0
2	T	1523	5.0	0.413	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1557	5.0	0.413	0.2	NA	0.0	0.0	0.00	0.02	59.7
North: Woodville Rd - N Leg											
8	T	1613	5.0	0.369	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	68	5.0	0.314	28.5	LOS C	1.1	8.3	0.89	1.00	33.7
Approach		1681	5.0	0.369	1.2	NA	1.1	8.3	0.04	0.04	58.2
West: Lansdowne St - W Leg											
10	L	37	5.0	0.237	33.3	LOS C	0.8	5.5	0.90	0.99	31.4
12	R	22	5.0	1.000[4]	370.9	LOS F	3.3	24.4	1.00	1.17	5.3
Approach		59	5.0	1.000	159.9	LOS F	3.3	24.4	0.94	1.05	11.1
All Vehicles		3297	5.0	1.000	3.5	NA	3.3	24.4	0.04	0.05	54.7

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: PM Peak Hour PD

Woodville Road / Lansdowne Street
PM Peak Hour
Post Development
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	57	5.0	0.460	8.4	LOS A	0.0	0.0	0.00	1.06	49.0
2	T	1679	5.0	0.460	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1736	5.0	0.460	0.3	NA	0.0	0.0	0.00	0.03	59.6
North: Woodville Rd - N Leg											
8	T	1967	5.0	0.450	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	100	5.0	0.642	50.0	LOS D	2.7	19.5	0.96	1.12	25.3
Approach		2067	5.0	0.642	2.4	NA	2.7	19.5	0.05	0.05	56.3
West: Lansdowne St - W Leg											
10	L	54	5.0	0.487	53.5	LOS D	1.6	12.0	0.95	1.05	24.3
12	R	17	5.0	1.000[4]	423.8	LOS F	2.9	21.1	1.00	1.13	4.7
Approach		71	5.0	1.000	141.9	LOS F	2.9	21.1	0.96	1.07	12.2
All Vehicles		3874	5.0	1.000	4.0	NA	2.9	21.1	0.04	0.06	54.1

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: Sat Peak Hour PD

Woodville Road / Lansdowne Street
Sat Peak Hour
Post Development
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	62	5.0	0.451	8.4	LOS A	0.0	0.0	0.00	1.05	49.0
2	T	1637	5.0	0.451	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1699	5.0	0.451	0.3	NA	0.0	0.0	0.00	0.04	59.5
North: Woodville Rd - N Leg											
8	T	1726	5.0	0.395	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	68	5.0	0.409	37.3	LOS C	1.5	10.8	0.93	1.03	29.6
Approach		1795	5.0	0.409	1.4	NA	1.5	10.8	0.04	0.04	57.8
West: Lansdowne St - W Leg											
10	L	65	5.0	0.544	52.7	LOS D	1.9	14.1	0.95	1.07	24.5
12	R	22	5.0	1.000[4]	356.2	LOS F	3.2	23.5	1.00	1.16	5.5
Approach		87	5.0	1.000	129.5	LOS F	3.2	23.5	0.96	1.09	13.1
All Vehicles		3581	5.0	1.000	4.0	NA	3.2	23.5	0.04	0.06	54.0

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: AM Peak Hour EC

Woodville Road / Kimberley Street
Existing Conditions
AM Peak Hour

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
2	T	1818	5.0	0.481	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1818	5.0	0.481	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: Kimberley St - E Leg											
4	L	32	5.0	0.086	18.2	LOS B	0.3	2.2	0.81	0.94	40.1
Approach		32	5.0	0.086	18.2	LOS B	0.3	2.2	0.81	0.94	40.1
North: Woodville Rd - N Leg											
7	L	2	5.0	0.354	8.4	LOS A	0.0	0.0	0.00	1.10	49.0
8	T	1336	5.0	0.354	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1338	5.0	0.354	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		3187	5.0	0.481	0.2	NA	0.3	2.2	0.01	0.01	59.7

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 used.

MOVEMENT SUMMARY

Site: PM Peak Hour EC

Woodville Road / Kimberley Street
Existing Conditions
PM Peak Hour

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
2	T	1621	5.0	0.429	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1621	5.0	0.429	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: Kimberley St - E Leg											
4	L	92	5.0	0.776	82.4	LOS F	3.4	24.5	0.98	1.17	18.4
Approach		92	5.0	0.776	82.4	LOS F	3.4	24.5	0.98	1.17	18.4
North: Woodville Rd - N Leg											
7	L	15	5.0	0.508	8.4	LOS A	0.0	0.0	0.00	1.09	49.0
8	T	1904	5.0	0.508	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1919	5.0	0.508	0.1	NA	0.0	0.0	0.00	0.01	59.9
All Vehicles		3632	5.0	0.776	2.1	NA	3.4	24.5	0.02	0.03	56.7

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 used.

MOVEMENT SUMMARY

Site: Sat Peak Hour EC

Woodville Road / Kimberley Street
Existing Conditions
Sat Peak Hour

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
2	T	1555	5.0	0.412	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1555	5.0	0.412	0.0	NA	0.0	0.0	0.00	0.00	60.0
East: Kimberley St - E Leg											
4	L	61	5.0	0.283	28.9	LOS C	1.0	7.4	0.91	1.00	33.5
Approach		61	5.0	0.283	28.9	LOS C	1.0	7.4	0.91	1.00	33.5
North: Woodville Rd - N Leg											
7	L	8	5.0	0.433	8.4	LOS A	0.0	0.0	0.00	1.10	49.0
8	T	1628	5.0	0.433	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1637	5.0	0.433	0.0	NA	0.0	0.0	0.00	0.01	59.9
All Vehicles		3253	5.0	0.433	0.6	NA	1.0	7.4	0.02	0.02	59.1

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 used.

MOVEMENT SUMMARY

Site: PM Peak Hour PD

Woodville Road / Kimberley Street
Post Development
PM Peak Hour

Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	225	5.0	0.812	10.9	LOS A	12.7	92.9	0.24	0.88	47.0
2	T	1564	5.0	0.812	2.9	LOS A	14.2	104.0	0.24	0.23	54.2
Approach		1789	5.0	0.812	3.9	LOS A	14.2	104.0	0.24	0.31	53.2
East: Kimberley St - E Leg											
4	L	92	5.0	0.379	61.9	LOS E	8.2	60.2	0.91	0.81	22.4
5	T	22	5.0	0.379	53.5	LOS D	8.2	60.2	0.91	0.74	22.6
6	R	21	5.0	0.379	61.6	LOS E	8.2	60.2	0.91	0.80	22.4
Approach		135	5.0	0.379	60.5	LOS E	8.2	60.2	0.91	0.79	22.4
North: Woodville Rd - N Leg											
7	L	15	5.0	0.457	10.4	LOS A	3.9	28.8	0.10	1.07	47.3
8	T	1822	5.0	0.457	2.5	LOS A	4.0	28.8	0.13	0.12	55.4
9	R	202	5.0	0.804	29.4	LOS C	7.3	53.6	0.65	0.86	33.3
Approach		2039	5.0	0.804	5.2	LOS A	7.3	53.6	0.18	0.20	52.0
West: RoadName											
10	L	155	5.0	0.571	17.2	LOS B	6.3	46.2	0.70	0.81	41.1
11	T	17	5.0	0.571	9.2	LOS A	6.3	46.2	0.70	0.61	43.2
12	R	172	5.0	0.799	79.3	LOS F	12.7	93.1	1.00	0.90	18.9
Approach		343	5.0	0.799	47.9	LOS D	12.7	93.1	0.85	0.84	25.9
All Vehicles		4306	5.0	0.812	9.8	LOS A	14.2	104.0	0.28	0.31	46.7

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	7.6	LOS A	0.1	0.1	0.32	0.32
P5	Across N approach	53	60.1	LOS F	0.2	0.2	0.91	0.91
P7	Across W approach	53	13.7	LOS B	0.1	0.1	0.43	0.43
All Pedestrians		159	27.1	LOS C			0.56	0.56

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: SAT Peak Hour PD

Woodville Road / Kimberley Street
Post Development
Sat Peak Hour

Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	260	5.0	0.860	13.0	LOS A	16.7	121.6	0.30	0.88	45.1
2	T	1463	5.0	0.860	5.1	LOS A	22.4	163.7	0.35	0.33	50.9
Approach		1723	5.0	0.860	6.3	LOS A	22.4	163.7	0.34	0.42	49.9
East: Kimberley St - E Leg											
4	L	61	5.0	0.243	53.6	LOS D	6.0	43.9	0.83	0.80	24.5
5	T	26	5.0	0.243	45.2	LOS D	6.0	43.9	0.83	0.67	25.0
6	R	21	5.0	0.243	53.3	LOS D	6.0	43.9	0.83	0.79	24.6
Approach		108	5.0	0.243	51.5	LOS D	6.0	43.9	0.83	0.76	24.6
North: Woodville Rd - N Leg											
7	L	8	5.0	0.432	13.7	LOS A	7.5	54.8	0.22	1.05	44.6
8	T	1508	5.0	0.432	5.7	LOS A	7.5	54.8	0.23	0.21	50.9
9	R	234	5.0	0.973	83.0	LOS F	17.9	130.3	1.00	1.09	18.3
Approach		1751	5.0	0.973	16.1	LOS B	17.9	130.3	0.33	0.33	41.1
West: RoadName											
10	L	234	5.0	0.801	28.3	LOS B	11.2	81.6	0.77	0.88	34.1
11	T	26	5.0	0.801	20.3	LOS B	11.2	81.6	0.77	0.73	35.2
12	R	260	5.0	0.839	75.3	LOS F	19.6	142.7	1.00	0.93	19.5
Approach		520	5.0	0.839	51.4	LOS D	19.6	142.7	0.88	0.90	24.9
All Vehicles		4102	5.0	0.973	17.4	LOS B	22.4	163.7	0.42	0.45	40.0

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	10.4	LOS B	0.1	0.1	0.38	0.38
P5	Across N approach	53	53.0	LOS E	0.2	0.2	0.86	0.86
P7	Across W approach	53	17.4	LOS B	0.1	0.1	0.49	0.49
All Pedestrians		159	26.9	LOS C			0.57	0.57

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: AM Peak Hour EC

Woodville Road / Oxford Street
Existing Conditions
AM Peak Hour
Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	331	5.0	0.221	9.3	LOS A	1.4	10.5	0.07	0.68	48.0
2	T	1704	5.0	0.909	36.2	LOS C	56.4	412.0	0.92	0.91	28.8
Approach		2035	5.0	0.909	31.8	LOS C	56.4	412.0	0.78	0.87	30.8
North: Woodville Rd - N Leg											
8	T	1189	5.0	0.507	8.4	LOS A	12.2	89.3	0.32	0.29	47.6
9	R	199	5.0	0.899	93.3	LOS F	15.7	114.3	1.00	1.13	16.8
Approach		1388	5.0	0.899	20.5	LOS B	15.7	114.3	0.42	0.41	37.7
West: Oxford St - W Leg											
10	L	124	5.0	0.906	71.7	LOS F	33.5	244.8	1.00	0.95	20.2
12	R	804	5.0	0.906	74.4	LOS F	38.1	278.3	1.00	0.96	19.7
Approach		928	5.0	0.906	74.0	LOS F	38.1	278.3	1.00	0.96	19.8
All Vehicles		4352	5.0	0.909	37.2	LOS C	56.4	412.0	0.71	0.75	29.0

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	Across N approach	53	45.6	LOS E	0.2	0.2	0.79	0.79
P7	Across W approach	53	22.1	LOS C	0.1	0.1	0.55	0.55
All Pedestrians		106	33.8	LOS D			0.67	0.67

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: PM Peak Hour EC

Woodville Road / Oxford Street
Existing Conditions
PM Peak Hour
Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	606	5.0	0.481	10.8	LOS A	4.7	34.7	0.12	0.70	46.4
2	T	1525	5.0	0.944	55.4	LOS D	59.9	437.2	1.00	1.05	22.9
Approach		2132	5.0	0.944	42.7	LOS D	59.9	437.2	0.75	0.95	26.7
North: Woodville Rd - N Leg											
8	T	1592	5.0	0.617	4.3	LOS A	11.3	82.3	0.22	0.21	52.6
9	R	425	5.0	0.943	91.2	LOS F	31.1	226.7	1.00	1.19	17.1
Approach		2017	5.0	0.943	22.6	LOS B	31.1	226.7	0.39	0.41	36.6
West: Oxford St - W Leg											
10	L	106	5.0	0.943	86.5	LOS F	33.5	244.8	1.00	0.98	17.8
12	R	695	5.0	0.943	89.6	LOS F	34.1	249.1	1.00	1.00	17.3
Approach		801	5.0	0.943	89.2	LOS F	34.1	249.1	1.00	0.99	17.4
All Vehicles		4949	5.0	0.944	42.1	LOS C	59.9	437.2	0.64	0.74	27.4

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	Across N approach	53	53.0	LOS E	0.2	0.2	0.86	0.86
P7	Across W approach	53	27.9	LOS C	0.1	0.1	0.62	0.62
All Pedestrians		106	40.5	LOS E			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.

MOVEMENT SUMMARY

Site: SAT Peak Hour EC

Woodville Road / Oxford Street
Existing Conditions
PM Peak Hour
Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	418	5.0	0.325	10.0	LOS A	2.1	15.2	0.08	0.69	47.2
2	T	1428	5.0	0.857	35.9	LOS C	43.4	316.7	0.90	0.85	28.9
Approach		1846	5.0	0.857	30.0	LOS C	43.4	316.7	0.71	0.81	31.7
North: Woodville Rd - N Leg											
8	T	1319	5.0	0.511	3.8	LOS A	7.7	55.9	0.18	0.17	53.4
9	R	392	5.0	0.861	71.4	LOS F	24.9	181.7	0.98	1.13	20.2
Approach		1711	5.0	0.861	19.3	LOS B	24.9	181.7	0.37	0.39	38.9
West: Oxford St - W Leg											
10	L	137	5.0	0.843	71.0	LOS F	26.7	195.3	1.00	0.92	20.3
12	R	584	5.0	0.843	71.7	LOS F	26.7	195.3	1.00	0.92	20.2
Approach		721	5.0	0.843	71.6	LOS F	26.7	195.3	1.00	0.92	20.2
All Vehicles		4278	5.0	0.861	32.7	LOS C	43.4	316.7	0.62	0.66	31.0

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	Across N approach	53	53.0	LOS E	0.2	0.2	0.86	0.86
P7	Across W approach	53	26.7	LOS C	0.1	0.1	0.61	0.61
All Pedestrians		106	39.9	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: PM Peak Hour PD

Woodville Road / Lansdowne Street
PM Peak Hour
Post Development
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	57	5.0	0.460	8.4	LOS A	0.0	0.0	0.00	1.06	49.0
2	T	1679	5.0	0.460	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1736	5.0	0.460	0.3	NA	0.0	0.0	0.00	0.03	59.6
North: Woodville Rd - N Leg											
8	T	1967	5.0	0.450	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	100	5.0	0.642	50.0	LOS D	2.7	19.5	0.96	1.12	25.3
Approach		2067	5.0	0.642	2.4	NA	2.7	19.5	0.05	0.05	56.3
West: Lansdowne St - W Leg											
10	L	54	5.0	0.487	53.5	LOS D	1.6	12.0	0.95	1.05	24.3
12	R	17	5.0	1.000[4]	423.8	LOS F	2.9	21.1	1.00	1.13	4.7
Approach		71	5.0	1.000	141.9	LOS F	2.9	21.1	0.96	1.07	12.2
All Vehicles		3874	5.0	1.000	4.0	NA	2.9	21.1	0.04	0.06	54.1

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 used.

4 x = 1.00 due to minimum capacity

MOVEMENT SUMMARY

Site: SAT Peak Hour PD

Woodville Road / Oxford Street
Existing Conditions
PM Peak Hour
Signals - Fixed Time Cycle Time = 145 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Woodville Rd - S Leg											
1	L	418	5.0	0.322	9.9	LOS A	2.1	15.1	0.08	0.69	47.3
2	T	1568	5.0	0.899	39.0	LOS C	52.1	380.0	0.93	0.91	27.7
Approach		1986	5.0	0.899	32.9	LOS C	52.1	380.0	0.75	0.87	30.4
North: Woodville Rd - N Leg											
8	T	1459	5.0	0.555	3.1	LOS A	7.4	54.2	0.16	0.15	54.5
9	R	392	5.0	0.903	81.2	LOS F	27.0	197.4	1.00	1.16	18.5
Approach		1851	5.0	0.903	19.6	LOS B	27.0	197.4	0.34	0.36	38.7
West: Oxford St - W Leg											
10	L	137	5.0	0.894	80.0	LOS F	28.9	211.1	1.00	0.96	18.8
12	R	584	5.0	0.894	80.5	LOS F	28.9	211.1	1.00	0.96	18.7
Approach		721	5.0	0.894	80.4	LOS F	28.9	211.1	1.00	0.96	18.7
All Vehicles		4558	5.0	0.903	35.0	LOS C	52.1	380.0	0.62	0.68	30.0

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 used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	Across N approach	53	54.7	LOS E	0.2	0.2	0.87	0.87
P7	Across W approach	53	24.9	LOS C	0.1	0.1	0.59	0.59
All Pedestrians		106	39.8	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

Oxford Street / Highland Street
AM Peak Hour
Existing Conditions
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxford St - E Leg											
5	T	512	5.0	0.329	9.2	LOS A	5.4	39.8	1.00	0.00	44.1
6	R	34	5.0	0.329	17.9	LOS B	5.4	39.8	1.00	1.08	43.9
Approach		545	5.0	0.329	9.8	NA	5.4	39.8	1.00	0.07	44.1
North: Highland St - N Leg											
7	L	20	5.0	0.125	21.4	LOS B	0.4	2.9	0.82	0.94	37.7
9	R	13	5.0	0.125	21.7	LOS B	0.4	2.9	0.82	0.95	37.7
Approach		33	5.0	0.125	21.5	LOS B	0.4	2.9	0.82	0.94	37.7
West: Oxford St - W Leg											
10	L	11	5.0	0.476	8.4	LOS A	0.0	0.0	0.00	1.10	49.0
11	T	887	5.0	0.476	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		898	5.0	0.476	0.1	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		1476	5.0	0.476	4.1	NA	5.4	39.8	0.39	0.05	52.3

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 used.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: PM Network Peak Hour EC

Oxford Street / Highland Street
PM Peak Hour
Existing Conditions
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxford St - E Leg											
5	T	1093	5.0	0.614	13.3	LOS A	12.8	93.8	1.00	0.00	40.9
6	R	25	5.0	0.614	21.9	LOS B	12.8	93.8	1.00	1.28	40.8
Approach		1118	5.0	0.614	13.5	NA	12.8	93.8	1.00	0.03	40.9
North: Highland St - N Leg											
7	L	19	5.0	0.101	23.1	LOS B	0.3	2.1	0.81	0.92	36.7
9	R	3	5.0	0.101	23.4	LOS B	0.3	2.1	0.81	0.95	36.7
Approach		22	5.0	0.101	23.1	LOS B	0.3	2.1	0.81	0.92	36.7
West: Oxford St - W Leg											
10	L	3	5.0	0.414	8.4	LOS A	0.0	0.0	0.00	1.10	49.0
11	T	778	5.0	0.414	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		781	5.0	0.414	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1921	5.0	0.614	8.1	NA	12.8	93.8	0.59	0.03	46.9

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 used.

MOVEMENT SUMMARY

Site: PM Network Peak Hour PD

Oxford Street / Highland Street
PM Peak Hour
Post Development
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Oxford St - E Leg											
5	T	1093	5.0	0.616	14.1	LOS A	13.0	94.9	1.00	0.00	40.3
6	R	25	5.0	0.616	22.8	LOS B	13.0	94.9	1.00	1.28	40.1
Approach		1118	5.0	0.616	14.3	NA	13.0	94.9	1.00	0.03	40.3
North: Highland St - N Leg											
7	L	19	5.0	0.567	87.9	LOS F	1.8	13.1	0.96	1.09	17.5
9	R	22	5.0	0.567	88.2	LOS F	1.8	13.1	0.96	1.06	17.5
Approach		41	5.0	0.567	88.1	LOS F	1.8	13.1	0.96	1.07	17.5
West: Oxford St - W Leg											
10	L	28	5.0	0.428	8.4	LOS A	0.0	0.0	0.00	1.08	49.0
11	T	778	5.0	0.428	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		806	5.0	0.428	0.3	NA	0.0	0.0	0.00	0.04	59.5
All Vehicles		1965	5.0	0.616	10.1	NA	13.0	94.9	0.59	0.05	45.0

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 used.

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