



Hughes Avenue, Melrose Park Planning Proposal Transport Impact Assessment

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Introduction

1.1 Background

JBA, on behalf of Ermington Gospel Trust, is in the early stages of planning that will ultimately seek to develop a mixed use residential and commercial property on land fronting Hughes Avenue and Victoria Road, Melrose Park.

The early stages of planning involve the preparation of a Planning Proposal and an Urban Design Concept. The Urban Design Concept involves incorporating an alternative access through a proposed road connection that will link future adjacent properties if approved for development.

The development proposes to rezone the land to B4 Mixed Use, with an indicative 400 apartments located over ground floor commercial/ retail space fronting Victoria Road.

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

1.3 References

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

- several inspections of the site and its surrounds
- o 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
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- 657-661 Victoria Road Ermington Traffic Impact Assessment, Bitzios Consulting, March
 2014
- plans for the proposed development prepared by Conrad Gargett Ancher Mortlock Woolley Architects
- other documents and data as referenced in this report.



2. Existing Conditions

The subject site is located at 659 Victoria Road and 15 Hughes Avenue Melrose Park. The site covers an area of approximately 47,500sq.m with frontages of 110m to Victoria Road along its northern boundary and 100m to Hughes Avenue along its western boundary.

The site has a land use classification as SP1 Special Activities and IN1 General Industrial as illustrated in Figure 2.1.

The surrounding properties predominantly include low and medium density residential properties, with industrial development to the south. A mix of retail, fast food restaurant and hotel uses also generally front Victoria Road in the vicinity.

Figure 2.1: Land Zoning

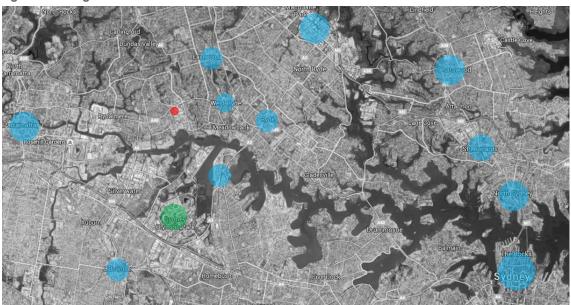


The site is currently occupied by a church facility with two separate site access driveways on Hughes Avenue along the western boundary. It is understood that it typically generates vehicular activity outside of typical weekday AM and PM peak periods. Extensive at-grade on-site parking provides for the site parking demands when required.

The location of the site in the regional and local context is shown in Figure 2.2 to Figure 2.4.

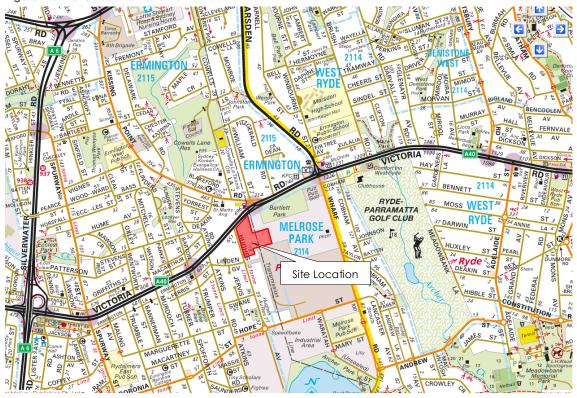


Figure 2.2: Regional Context



Basemap Source: Sydway

Figure 2.3: Site Location and Its Environs



Basemap Source: Sydway



Figure 2.4: Site Layout

Source: JBA

2.1 Road Network

2.1.1 Adjoining Roads

Victoria Road

Victoria Road is a State Road (MR165) which generally runs in an east-west direction from the Western Distributor in the east and O'Connell Street, Parramatta in the west. It is a two-way road generally configured with three lanes in each direction with a central median. Victoria Road provides an 18m wide carriageway and is set within a 26m wide road reserve with a posted speed limit of 70km/h in the vicinity of the site.

Kerbside parking is not permitted on either side of Victoria Road.

Victoria Road is shown in Figure 2.5 and carries approximately 25,500 vehicles per day in the westbound direction and 29,200 vehicles per day in the eastbound direction¹.

Figure 2.5: Victoria Road (looking west)



Hughes Avenue

Hughes Avenue is a local road travelling in a north-south direction along the western boundary of the site. It is a two-way road configured with one traffic lane and one parking lane in each direction with a posted speed limit of 50km/h.

Hughes Avenue is shown in Figure 2.6.

Figure 2.6: Hughes Avenue (looking north)





¹ RMS AADT 2012 Victoria Road data east of West Ryde.

2.1.2 Surrounding Intersections

Select few intersections surround the site as a result of Victoria Road being the dominant road through the local and regional area. As such, the following intersections currently exist in the vicinity:

- Victoria Road/ Hughes Avenue (priority controlled, left turns only)
- Victoria Road/ Marsden Road/ Wharf Road (signalised)
- Victoria Road/ Kissing Point Road (part signalised)
- Hughes Avenue/ Linden Road (priority controlled)
- Victoria Road/ Atkins Road (priority controlled)
- Victoria Road/ Trumper Street (signalised)

2.2 Traffic Study

JBA completed an Urban Design Study in early 2013 for the site located adjacent to the east which was also recently subject to a Masterplan and Stage 1 DA for a mixed use development.

The JBA study included an assessment of the Victoria Road Reservation to better understand implications of future road widening by RMS to facilitate bus lanes in conjunction with upgraded intersections to accommodate future traffic associated with the site. The layout, including a new site access road is shown in Figure 2.7.

Figure 2.7: Indicative Victoria Road Reservation Land and Adjacent Site Access



Source: JBA, Melrose Park - Urban Design Study, 25 March 2013

With this in mind, Bitzios Consulting² also completed a Traffic Impact Assessment for Council in March 2014. The purpose of the assessment was to understand the traffic impacts associated with development of the site and for the purposes of informing the road upgrade requirements. The assessment considered two similar options for up to 955 residential apartments and 2,000sq.m GTA retail space.

RMS confirmed in-principle support for a future mixed use development consisting of less than 1,000 residential apartments and less than 2,000sq.m of retail GFA.

GTA Consultants delivered transport impact assessments to accompany the Masterplan and DA³ with the submission mostly in-line with RMS requirements with further intersection concept designs

³ 657-661 Victoria Road and 4-6 Wharf Road, Melrose Park – Masterplan and Stage 1 DA, Transport Impact Assessments, 04 November 2015



² 657-661 Victoria Road Ermington Traffic Impact Assessment, Bitzios Consulting, March 2014

refining the key intersection layouts to ensure appropriate intersection operation is maintained, particularly along Victoria Road.

2.3 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION⁴, a computer based modelling package which calculates intersection performance. The existing condition traffic volumes are based on the Bitzios report volumes and SCATS data which have been reconstructed in a new isolated GTA SIDRA model.

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.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
Α	Less than 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
С	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 2.2 presents a summary of the existing operation of the study intersections.



⁴ Program used under license from Akcelik & Associates Pty Ltd.

Table 2.2: 2014 Bitzios Intersection Operating Conditions

Intersection	AM/PM Peak	Approach	Demand Flows (Veh/h)	Degree of Saturation (v/c)	Average Delay (S)	Level of Service	95% Back of Queue (m)
		Victoria Road (E)	2192	0.771	3	LOS A	33
	414	Kissing Point Road	480	0.558	16	LOS B	44
	AM	Victoria Road (W)	2016	0.844	18	LOS B	122
Victoria		All Vehicles	4688	0.844	11	LOS A	122
Road/Kissing Point Road		Victoria Road (E)	2100*	0.884	9	LOS A	110
	PM	Kissing Point Road	264	0.430	22	LOS B	21
	PIVI	Victoria Road (W)	2189	0.972	54	LOS D	271
		All Vehicles	4553	0.972	31	LOS C	271
		Wharf Road	227	0.896	84	LOS F	76
		Victoria Road (E)	2285	0.802	30	LOS C	245
	AM	Marsden Road	814	0.807	49	LOS D	150
Victoria		Victoria Road (W)	2515	0.890	21	LOS B	296
Road/Marsden		All Vehicles	5841	0.896	31	LOS C	296
Road/Wharf		Wharf Road	614	1.004	133	LOS F	237
Road		Victoria Road (E)	2106	1.004	52	LOS D	229
	PM	Marsden Road	576	0.566	41	LOS C	80
		Victoria Road (W)	2044*	0.961	51	LOS D	356
		All Vehicles	5340	1.004	58	LOS E	356

Source: Bitzios Consulting, Traffic Impact Assessment, March 2014

On the basis of the above assessment, it is clear that the study intersections operate satisfactorily during the weekday AM peak, particularly having consideration for the high traffic volumes along Victoria Road. There are significant queues along Victoria Road which are both expected and observed at the time of the site visit.

Each intersection operates with significant queues and some delay during the PM peak. The Victoria Road/ Marsden Road/ Wharf Road intersection also underperforms when compared with the Victoria Road/ Kissing Point Road intersection. This is mostly on account of the greater traffic volumes and in turn, the extent of turning movements at Marsden Road and Wharf Road.

Pedestrian activity also affects the efficiency of each intersection though site observations indicate that low pedestrian volumes currently do not require pedestrian phases to run on each cycle.

2.4 Car Parking

A review of the publicly available car parking in the vicinity of the site indicates that, where available, there is moderate to low demand for on-street parking, as illustrated by Figure 2.8.

Parking is not permitted along Victoria Road.



Figure 2.8: Hughes Avenue On-street Parking



2.5 Public Transport

The site is in close proximity to several high frequency bus routes (513, 520, 523, 544, M52) which travel along Victoria Road.

Victoria Road provides bus stops on both sides of the carriageway and at regular intervals in the vicinity of the site. These bus services combine to provide convenient and frequent connections to several key destinations including Sydney CBD, Parramatta, Ryde, Carlingford, Macquarie Centre, Auburn and the Meadowbank Wharf.

A review of the bus services available in the vicinity of the site is illustrated in Figure 2.9 with the Victoria Road bus stops shown in Figure 2.10 and Figure 2.11.



Source: http://www.sydneybuses.info/routes/routes/14054 STA region web map west.pdf



Figure 2.10: Victoria Road Bus Stop (westbound)

Figure 2.11: Victoria Road Bus Stop (eastbound)

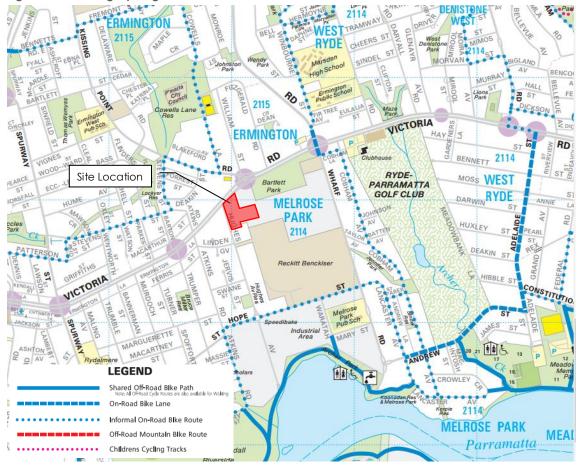




2.6 Walking and Cycling Infrastructure

The site is conveniently located in the middle of a network of cycling routes including on road bike routes which connect to on road bicycle lanes and off road shared paths. Marked pedestrian crossings and traffic signals ensure the safety of pedestrians and cyclists at key locations in the vicinity. Figure 2.12 highlights the network of cycling routes within the local and regional area.

Figure 2.12: Existing Cycling Routes



Established pedestrian footpaths generally 1.0-1.5m wide are located along both sides of Victoria Road and the eastern side of Hughes Avenue along the frontage of the site, as shown in Figure 2.13 and Figure 2.14.

Figure 2.13: Victoria Avenue Pedestrian Path (looking west)



Figure 2.14: Hughes Avenue Pedestrian Path (looking south)



The surrounding intersections do not provide marked pedestrian crossings of Victoria Road with the closest being at the Trumper Street traffic signals some 300m to the west.

That said, the Hughes Avenue and other local area footpaths generally provide convenient links to/ from key transport nodes and other local facilities and destinations.

As discussed above, the anticipated upgrade of the Victoria Road/ Kissing Point Road intersection includes new pedestrian crossings as part of full signalisation therefore improving the level of accessibility to the eastbound bus stops.

3. Planning Proposal

The proposal includes approximately 400 residential apartments distributed amongst 7 separate blocks with heights ranging between 4 storeys and 16 storeys.

The area schedules are summarised in Table 3.1 with the indicative layout for the proposal illustrated in Figure 3.1.

Table 3.1: Proposed Dwelling Schedule

Use	Dwelling Type	Indicative No. of Apartments
	1-bed	160
Residential	2-bed	201
Residential	3-bed	40
	Total	400

Figure 3.1: Indicative Site Layout



3.1 Vehicle Access

The proposal includes the construction of a new internal road that will connect all on-site uses with efficient access to Hughes Avenue at least 50m south of Victoria Road.

The proposed site access is south of the existing northern driveway with adequate sightlines north of Victoria Road and unlimited sightlines to the south. The proposal also reduces the crossovers from two to one.

3.2 Car Parking

The proposal indicatively includes provision for up to 521 on-site car parking spaces at an average of 1.3 spaces per apartment.



Provision of disabled spaces and any such motorcycle parking will be in accordance with Australian Standard AS2890.1:2004 and the Building Code of Australia.

The suitability of the car parking provision is discussed in Section 4 of this report.

3.3 Pedestrian and Bicycle facilities

The proposal will include key pedestrian connections to Victoria Road, as well as footpaths along both sides of the internal roads.

The proposal will provide bicycle facilities in accordance with Parramatta City Council Development Control Plan (DCP) 2011, that is, one bicycle space for every two dwellings. Bicycle parking would be accommodated in a Class 2 compound and/ or storage cages as specified in AS2890.3.

3.4 Service Vehicles

The proposal will provide adequate loading/servicing provisions, including for removalists, garbage collection and day-to-day maintenance vehicles.

It is understood that these will be mostly located within the basement levels with direct access to/from Hughes Avenue via the proposed internal road.



4. Car Parking

4.1 Car Parking Requirements

The car parking provision requirements for different development types are set out in DCP 2011. A review of the car parking requirement rates and the floor area schedule results in a parking requirement as summarised in Table 4.1.

Table 4.1: DCP 2011 Car Parking Requirements

Use	Туре	No. of Dwellings	DCP Parking Rate	DCP Minimum Parking Requirement
	1-bed	160	1 space/ dwelling	160 spaces
Residential	2-bed	201	1.25 spaces/ dwelling	251 spaces
Apartments	3-bed	40	1.5 spaces/ dwelling	60 spaces
	Visitor	-	1 space/ 4 dwellings	100 spaces
То	tal	401	-	571 spaces

Based on the above, the proposal is required to provide a total of 571 car parking spaces. This equates to an average of approximately 1.4 spaces per dwelling.

With consideration for the parking requirements for nearby local government areas, DCP 2011 parking requirements are considered to be somewhat onerous. This level of required parking provision is not consistent with State Government policies of reducing reliance on travel by private cars and encouraging greater use of more environmentally sustainable travel modes.

Given the above and noting the site's relative ease of access to high frequency public transport services, the RMS Guide to Traffic Generating Developments (2002) has also been referenced for sites located in metropolitan sub-regional centres.

Table 4.2: RMS Guide Residential Car Parking Requirements

Use	Туре	No. of Dwellings	RMS Parking Rate	RMS Parking Requirement
	1-bed	160	0.6 space/ dwelling	96 spaces
Residential	2-bed	201	0.9 spaces/ dwelling	181 spaces
Apartment	3-bed	40	1.4 spaces/ dwelling	42 spaces
	Visitor	-	1 space/ 5 dwellings	80 spaces
Total		401	-	399 spaces

Based on the above, the proposal is required to provide a total of 399 car parking spaces as per the requirements of the RMS Guide. This equates to an average of approximately 1 space per dwelling.

Given planning associated with provision for dedicated Victoria Road bus lanes, the site is and will continue to be located within 400m of high frequency bus stops. These upgrades will ensure good access to public transport services well into the future and partially meet the requirements of DCP 2011 to realise a marginally lower car parking provision.



4.2 Car Share Requirements

In addition to the above car parking provision, Design Control C.1 of Section 3.6.1 of DCP 2011 requires the following:

"1 car share parking space is to be provided for any residential development containing more than 50 residential units and is within a 800m radial catchment of a railway station or 400m radial catchment of a bus stop with a service frequency of an average of 15 minutes or less during the morning peak (7am-9am) in either direction."

The Victoria Road bus stops meet these criteria, and therefore the proposal is required to provide at least one car share space.

4.3 Adequacy of Parking Supply

The proposal considers an average of approximately 1.3 spaces per dwelling. This equates to a parking provision of 521 spaces with the internal road would also likely able to be capable of providing for on-street visitor and car share parking.

The provision is broadly in-line with the requirements of DCP 2011 and exceeds the requirements of the RMS Guide.

4.4 Car parking Layout Review

The proposed on-site car parks will be designed in accordance with Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009). A detailed assessment will be required as part of any DA with the following aspects typical as part of any such review and design process:

- bay and aisle width
- adjacent structures
- turnaround facilities
- circulation roads and ramps
- ramp grades
- height clearances
- internal queuing
- pick-up / set-down area
- parking for persons with disabilities
- motorcycle parking.

The car parking layout should be designed to be able to operate satisfactorily with ramp grades, height clearances, aisle widths and car space dimensions able to accommodate the largest vehicle requiring access. The car parking quantum would feasibly be able to accommodate the car parking supply and proposed uses.

The basement access ramps would either be provided for access to a large basement car park, or have separate accesses for each block with appropriate separation and sightlines where required. Internal ramps should consider the dimensional layouts and circulation patterns.

Where possible, service vehicles should be separated form key car parking circulation and/or major movements to ensure safety for all users. Areas where service vehicles need to access will be designed in accordance with Australian Standard (AS2890.2:2002) with garbage truck access to accommodate Council's largest truck, thought to be up to 10m long.



Secure access in the form of security doors with remote access will be required to ensure user safety and appropriate separation of users. A portion of visitor parking could be located within the basement car parks (with access via intercom) and the remainder along the internal road (along with the car share spaces).

5. Sustainable Transport Infrastructure

5.1 Bicycle End of Trip Facilities

DCP 2011 sets out design controls for the provision of bicycle parking for residential flat developments as 1 bicycle space per 2 dwellings. Application of this results in the need for 200 bicycle spaces.

DCP 2011 also requires bicycle parking to be located in a safe and secure location that is under cover and convenient for users.

The proposal should include provision for such facilities to be located within the basement car parks either within a secure cage or incorporated into adequately sized storage areas and associated with each car space.

Visitor bicycle parking in the form of bicycle loops etc. could also be located along the internal road close to the building entrances for convenient access and usability.

5.2 Walking and Cycling Network

The proposal will ensure that pedestrians and cyclists remain a key consideration. The indicative layout will allow for a good level of pedestrian amenity that will ensure good connectivity both internally and along the Hughes Avenue frontage.

The convenient connections between each of the blocks and the well-established existing pedestrian network along Victoria Road and, to a lesser extent, Hughes Avenue will also be key to ensuring the site functions as intended.

It is also noted that the intersection of Victoria Road and Kissing Point Road will be upgraded to provide full traffic signals and pedestrian crossings as part of the adjacent site development. This will ensure safe and efficient pedestrian crossing facilities into the future.

5.3 Public Transport

As discussed, the site is well served by several high frequency bus routes along Victoria Road that combine to provide convenient access to the several key destinations including Sydney CBD, Parramatta CBD, Macquarie Centre and Ryde.

RMS is also in the early planning stages to widen Victoria Road to extend the existing dedicated bus lanes already in operation. Such upgrades will also improve the level of accessibility to public transport services. The timing of such works is uncertain at this stage.



Traffic Impact Assessment

6.1 Traffic Generation

6.1.1 Design Rates

Traffic generation estimates for the proposal have been sourced from the Technical Direction TDT 2013/04 Guide to Traffic Generating Developments Updated traffic surveys (TDT 2013/04).

TDT 2013/04 provides updated rates for high density residential flat dwellings (2012 surveys) that are close to public transport services, greater than six storeys and almost exclusively residential in nature. TDT 2013/04 specifies an average AM peak hour trip generation for Sydney of 0.19 trips per apartment per hour, with the PM peak hour rates slightly lower at 0.15 trips/ hour. Given the proposal includes residential buildings with heights ranging between 4 and 16 stories, the average building height is considered to be greater than or equal to 6 stories. Given this and noting that the site is located in close proximity to high frequency bus services (that will likely increase in the future), these rates are considered accurate and have been adopted as part of this assessment.

Estimates of peak hour traffic volumes associated with the proposal are set out in Table 6.1 and assumes the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) as detailed in Table 6.2.

Table 6.1: Total Traffic Generation

Land Use	Period	Design Consention Rates	Proposed Vehicle Movements		
tana use		Design Generation Rates	In	Out	Total
	AM Peak	0.19 vehicle trips/hour	15/hr	61/hr	76/hr
Residential (401 apartments)	PM Peak	0.15 vehicle trips/hour	48/hr	12/hr	60/hr
(101 apairmonis)	Daily	1.52 vehicle trips/day	305/day	305/day	610/day

Table 6.2: Traffic Directional Splits

Land Use	Period	Inbound	Outbound
Desidential	AM Peak	20%	80%
Residential	PM Peak	80%	20%

Based on the above, the proposal could potentially generate **76 vehicle trips** during the AM peak hour and **60 vehicle trips** during the PM peak hour.

6.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposal 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 surrounding employment centres, retail centres and schools in relation to the site.

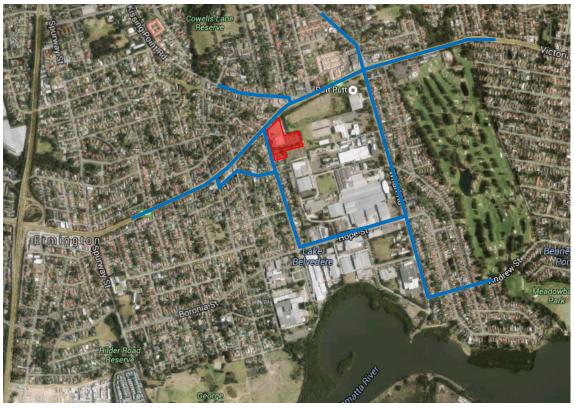
Having consideration for the above, the traffic generated by the site will be distributed across a number of routes as shown in Figure 6.1. For the purposes of estimating vehicle movements, the



following directional distributions have been assumed noting that no route should see more than an increase of 20-25 vehicles in any peak hour:

- Victoria Road (east) 25%
- o Andrew Street (east) 20%
- Victoria Road (west) 25%
- Marden Road (north) 20%
- Kissing Point Road (north and west) 10%

Figure 6.1: Key Approach and Departure Routes



6.3 Traffic Impact

As discussed, the Victoria Road corridor has a reasonable level of congestion which is typical of such a major east-west artery in Sydney. Localised congestion is common at the Victoria Road/Marsden Road/Wharf Road signalised intersection to the east, noting extensive intersection upgrades associated with the likely development to the adjacent site.

Notwithstanding this, the relatively low volumes of site generated traffic would result in relatively minor impacts to the surrounding intersections and Victoria Road traffic.

On the basis of the above, there is expected to be a minor increase in delay and queuing experienced where development traffic intersects with Victoria Road, particularly at Trumper Street to the west and potentially some additional traffic along Wharf Road to the east. Other traffic will disperse through the local roads to the south and east.

The overall LOS of the key Victoria Road signalised intersections are anticipated to be mostly maintained with more detailed traffic assessment to be included as part of any DA.



7. Conclusion

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

- The proposal incorporates 401 residential apartments on the site located on the corner of Victoria Road and Hughes Avenue in Melrose Park.
- ii The site is well served by several high frequency bus routes along Victoria Road that combine to provide convenient access to several key destinations.
- iii The indicative car parking supply of 521 spaces with further spaces likely along the internal road for use by visitors and car share scheme mostly meets the requirements of DCP 2011 and exceeds the RMS Guide.
- iv The DCP 2011 parking requirements are considered somewhat onerous and in excess of typical requirements for developments with such access to high frequency bus services.
- v Access to the development would be provided via a site access road along Hughes Avenue at least 50m south of Victoria Road.
- vi Basement car parking, loading areas, ramps and circulation aisles would be designed in accordance with the relevant Australian Standards.
- vii Bicycle spaces should be located in the basement car parks within secure cages or as part of individual storage cages at a rate of 1 space for every 2 dwellings. Bicycle racks for use by visitors would also be best located close to the site access and/ or building entrances.
- viii The proposal would include a high level of pedestrian amenity and permeability to promote greater activation both within the site and via connections with the surrounding areas.
- ix The proposal is expected to generate up to 76 and 60 vehicle trips in the weekday AM and PM peak hours respectively.
- x With consideration for the multiple approach and departure routes to the site, the traffic generated by the proposal would result in less than 20-25 vehicles on any one route during the peak hours.
- The relatively low volumes of site generated traffic result in relatively minor impacts to the surrounding intersections and Victoria Road traffic noting intersection upgrades likely as part of RMS bus programs and the adjacent site development.



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