Winten Property Group
and Australand Holdings

Concept Plan - 396 Lane Cove Road, Macquarie Park (MP 09_0209)

Transport and Accessibility Impacts and Car Parking

ARUP

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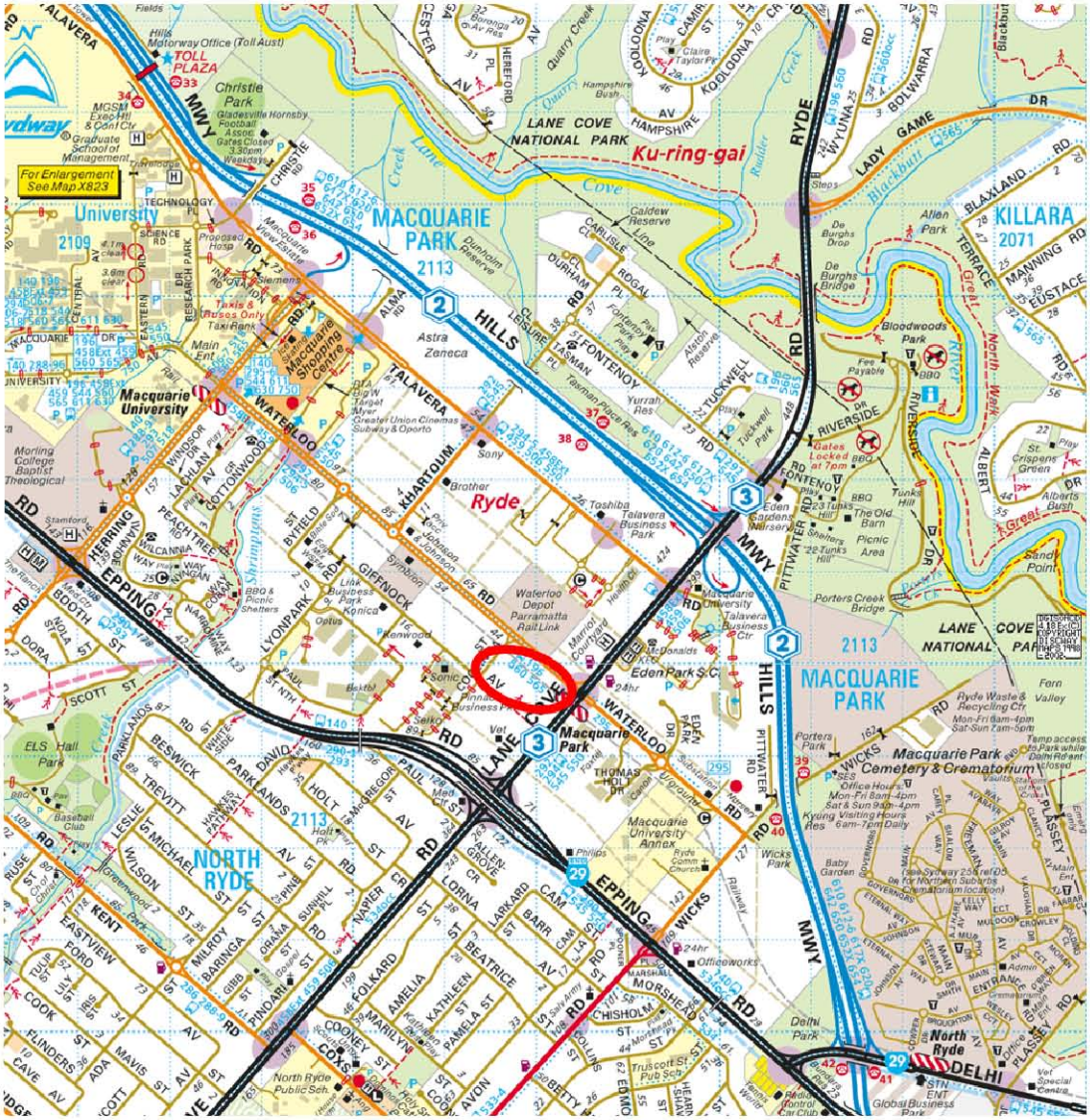
1 INTRODUCTION

Arup was commissioned by Winten Property Group and Australand Holdings to undertake a Transport and Accessibility Impact Assessment for a proposed commercial development at 396 Lane Cove Road, Macquarie Park.

The project application will be assessed as a Major Project by the Director-General of the NSW Department of Planning under Part 3A of the Environmental Planning and Assessment Act. DGRs were issued on 26 May 2010 (MP09_0209). This Transport and Accessibility Impacts report is in support of a Concept Plan application for a development that may involve approximately 83,000m^2 GFA in four buildings.

The site location is shown on Figure 1.

Figure 1 Site Location



1.1 Project Director-General's Requirements

This report responds to the project DGRs and Section 5 in particular - *Transport & Accessibility Impacts and Car Parking (Construction and Operational)* as reproduced below. The relevant section of this report that responds to each DGR is also indicated in Table 1.

Table 1 Project DGRs – Section 5: Transport and Accessibility Impacts and Car Parking

DGR No.	Description	Relevant Section of Report
5.1	Justification of the amount of on-site car parking having regard to local planning controls, RTA guidelines and the site's close proximity to public transport.	Section 4.1
5.2	Transport report considering traffic generation, access, loading dock(s) and service vehicle movements, car parking arrangements, measures to promote public transport usage, pedestrian and bicycle linkages, and any required road/intersection upgrades. The key intersections that the study should consider/model are identified in the RTA's letter dated 16 April 2010.	Section 4
5.3	The Transport and Accessibility Impact Study should consider Ryde City Council's Macquarie Park 2007 Base Paramics Model where relevant.	Section 4.3 & 4.4
5.4	Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling) including the consideration of: • an assessment of existing and proposed pedestrian and cycle movements within the vicinity of the subject site • provision of facilities to increase the non-car mode share for travel to and from the site.	Section 4.5 & 4.6
5.5	Demonstrate that a minimalist approach to car parking provision is taken based on the accessibility of the site to public transport	
5.6	Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets	

1.2 Reference Documents

The following documents have been used as reference material for this assessment:

- City of Ryde Local Environment Plan and Development Control Plan 2010 (City of Ryde, 2010)
- Macquarie Park Traffic Study (City of Ryde, July 2008)
- Traffic Impact Assessment Process for Macquarie Park Corridor Development Applications (City of Ryde, Version 3, March 2010)
- Metropolitan Transport Plan – Connecting the City of Cities (NSW Government, 2010)
- NSW State Plan 2010 (NSW Government, 2010)

- Ryde Bicycle Strategy and Masterplan 2007 (City of Ryde, October 2007)
- Planning Guidelines for Walking and Cycling (NSW Government, 2004)
- Guide to Traffic Generating Developments (RTA, 2002)
- AS 2890 Parking Facilities

1.3 Structure of Report

This Transport and Accessibility Impact Report is structured as follows:

- Section 1 Introduction and objectives
- Section 2 Description of proposed development
- Section 3 Existing transport and accessibility situation
- Section 4 Transport and accessibility impacts assessment based on the relevant DGRs
- Section 5 Summary and conclusions
- Appendices

2 DESCRIPTION OF PROPOSED DEVELOPMENT

The site has an area of approximately 16,280m^2 and is currently occupied by two 2 storey light industrial buildings and the western entrance portal to the Macquarie Park Railway Station. It is bounded by Lane Cove Road to the east, Waterloo Road to the north, Coolinga Road to the west and Giffnock Avenue to the south. The site has 153 parking spaces with vehicular access from Waterloo Road, Coolinga Road and Giffnock Ave.

The total GFA of the proposed development is approximately 83,368m^2 across four buildings. The floorspace would be mainly commercial with a small amount of retail at ground level to support activation around the railway portal.

Vehicular access to the site is proposed off Giffnock Avenue with the main address and frontage of the development to Waterloo Road. There will be approximately 1,042 car spaces in up to six basement levels.

An indented taxi/bus stop bay is proposed for Waterloo Road adjacent to the site as shown on drawing PA02-00 (Appendix A). The layout of this zone may change subject to the RTA bus priority works currently being undertaken at the Lane Cove Road/Waterloo Road intersection.

The development would be serviced by a single central loading dock with access from Giffnock Ave adjacent to the car park access point.

Concept plans produced by BatesSmart are included as Appendix A.

3 EXISTING TRANSPORT AND ACCESSIBILITY SITUATION

The following is a summary of the existing transport infrastructure and services in the vicinity of the site.

3.1 Public Transport

3.1.1 Trains

The site is directly above Macquarie Park Railway Station which is located on the Epping to Chatswood rail link. Since the integration of the station with the CityRail network in October 2009, eight train services every hour (four in either direction at 15 minute intervals) service the station between 5am and 11pm as shown in Table 2.

Table 2 Existing Train Services to Macquarie Park Station

Direction	Weekday Services			Saturday Services		Sunday Services	
	AM Peak	PM Peak	Off-Peak	AM Peak	PM Peak	AM Peak	PM Peak
Chatswood to Epping	4	4	4	4	4	4	4
Epping to Chatswood	4	4	4	4	4	4	4
TOTAL	**8**	**8**	**8**	**8**	**8**	**8**	**8**

3.1.2 Buses

The Macquarie Park area is served by a number of different bus routes to destinations including the City, Chatswood, Gordon, Ryde, Epping and Parramatta. These service use Lane Cove Road, Epping Road and Talavera Road. Bus services run at high frequencies in both the morning and evening peak periods with lower frequencies at off-peak times. Only one service, 197 Mona Vale to Macquarie Park, is routed along Waterloo Road adjacent to the site with a bus stop situated on the southern side of the road between Lane Cove Road and Coolinga Street.

3.2 Walking and Cycling

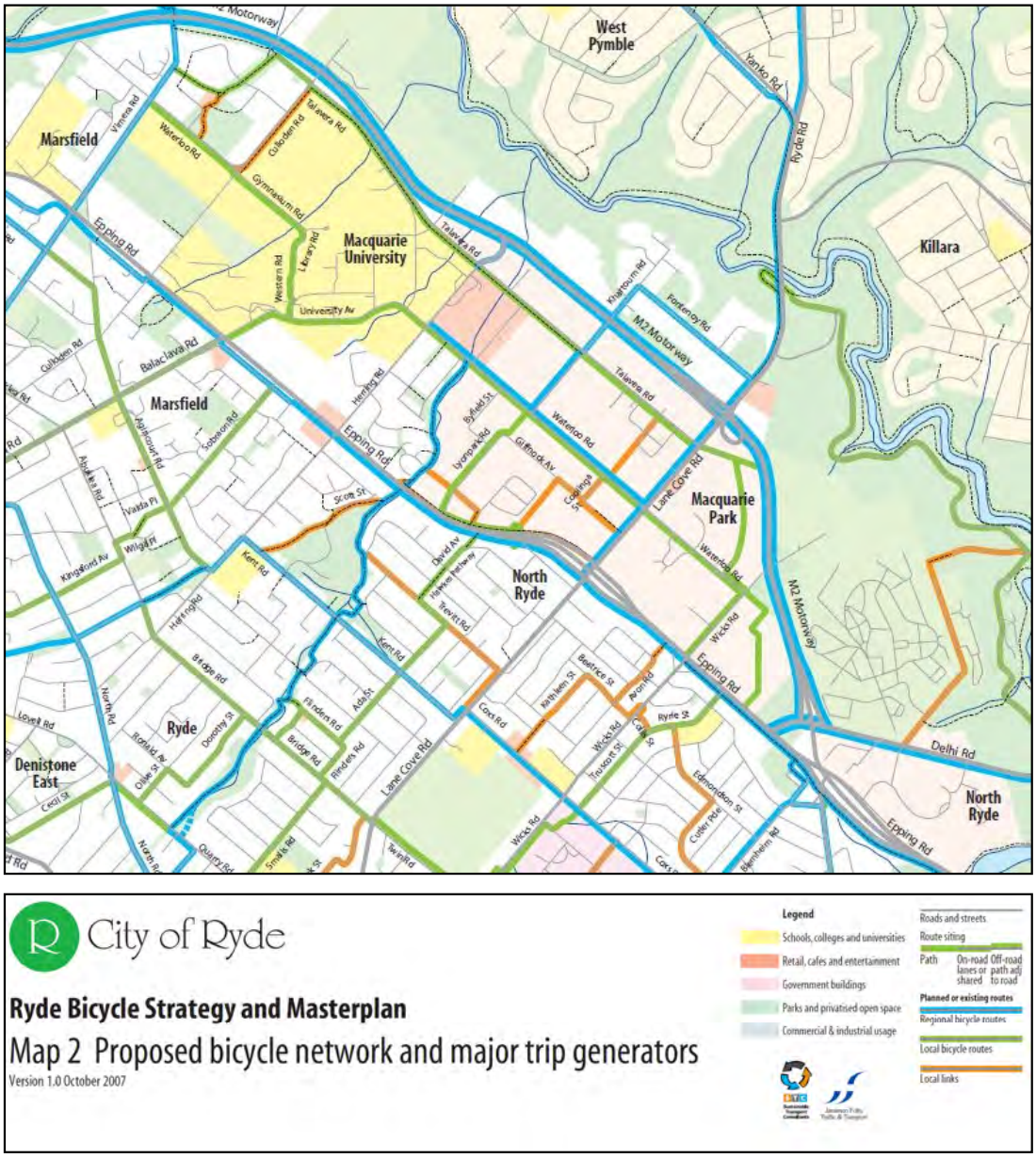
Pedestrian and cycle access in the vicinity of the site is generally limited due to priority being given, in general, to vehicular travel over pedestrian/cycle travel. An example of this is the Lane Cove Road/Waterloo Road intersection where pedestrian crossings only exist on three of the four approaches with no crossing on the Lane Cove Road southern approach. Signalised crossings exist at major intersections, but are located at long distances as a result of the large block sizes in the Macquarie Park area.

The long term vision for the Macquarie Park area, contained in LEP 2010, is implementation of a new street network with smaller street blocks, increasing pedestrian and cycleway links and greatly improving the pedestrian environment.

There are presently few dedicated cycling facilities (i.e. on road bike lanes, shared paths) in the vicinity of the site. End of trip facilities are provided in some commercial developments, such as parking, showers and lockers. Two blocks of public bike lockers/bike rails exist on the northern side of Waterloo Road on either side of Lane Cove Road.

The *Ryde Bicycle Strategy and Masterplan* outlines a series of both infrastructure and non-infrastructure measures to promote cycling with the City of Ryde. The proposed network of bicycle routes in the vicinity of the site is presented in Figure 2 although few of the measures have been implemented at this stage.

Figure 2 City of Ryde Existing and Proposed Bicycle Network



3.3 Road Network

3.3.1 Major Roads

The site is located at the intersection of two major roads – Lane Cove Road and Waterloo Road and the local road network is shown on Figure 1.

The administrative classification of main roads in Macquarie Park is as follows:

- Lane Cove Road (State road)
- Epping Road (State road)
- M2 Motorway (State road)
- Herring Road (Regional road between Epping Road and Talavera Road)
- Talavera Road (Regional road between Lane Cove Road and Talavera Road)
- Waterloo Road (Local road)
- Wicks Road (Local road)

3.3.2 Key Intersections

The key intersections in the vicinity of the site are:

- Lane Cove Road/Epping Road
- Lane Cove Road/Waterloo Road
- Lane Cove Road/Talavera Road
- Lane Cove Road/M2 Motorway
- Epping Road/Lyon Park Road
- Waterloo Road/Khartoum Road

3.3.3 Traffic Volumes

A weekday AM/PM peak hour traffic survey was undertaken on Thursday 24 June 2010 at key intersections as summarised in Figure 3. Pedestrian movements across key roads were also surveyed as summarised in Figure 4.

3.4 Car Parking

The Macquarie Park area contains significant on-site parking within commercial developments but there are no major off-street public car parks. Public on-street parking is provided on most local streets such as Coolinga Street and Giffnock Road This parking generally has a 12 hour limit charged at a rate of $10 per day or $2 per hour. These spaces typically have high occupancy levels during business hours.

Figure 3 Existing AM/PM Peak Hour Traffic Volumes

LEGEND:
AM 07:45 - 08:45
(PM) 16:45 - 17:45

Thursday 24 June 2010

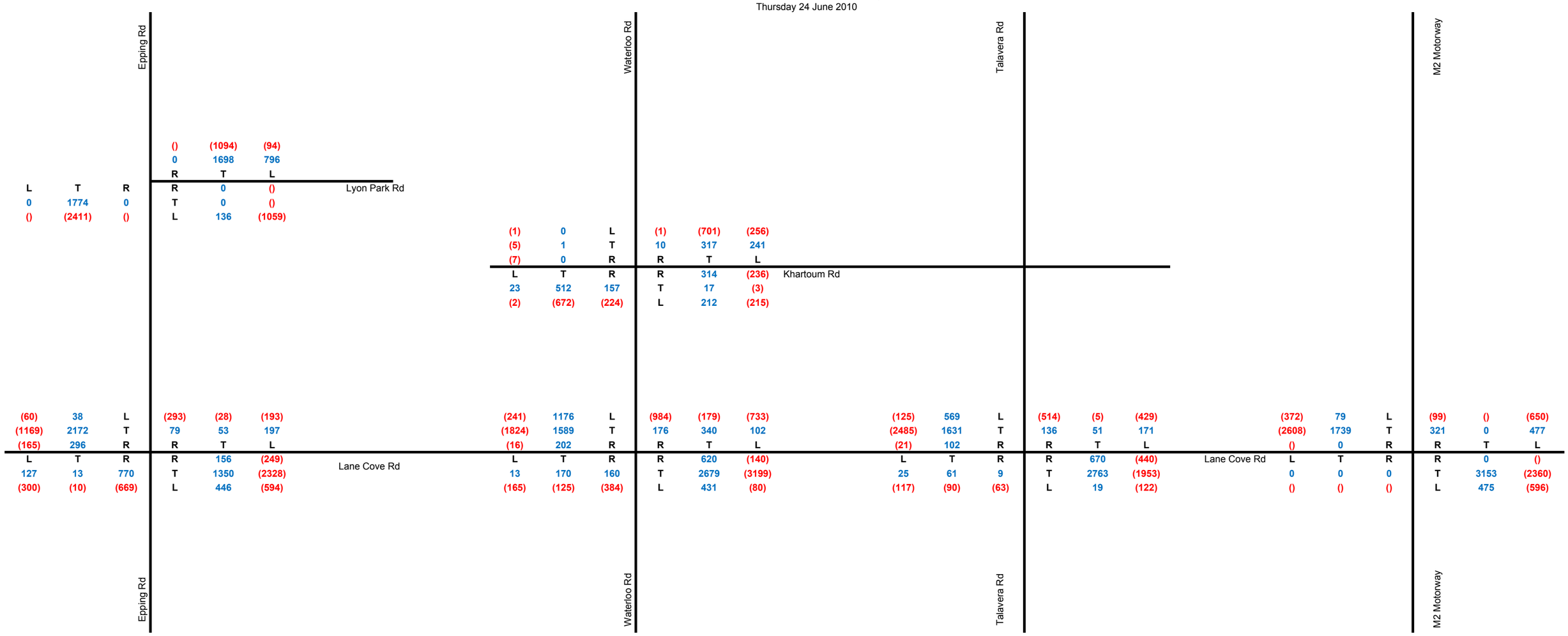
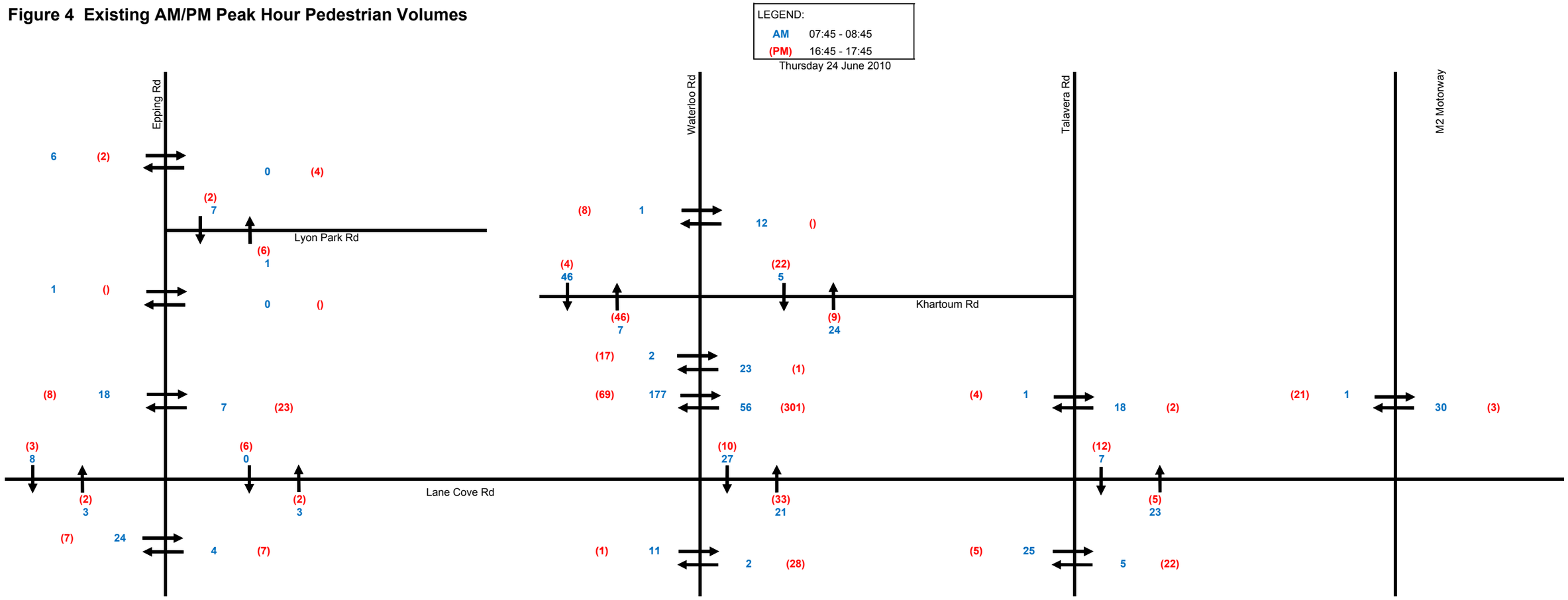


Figure 4 Existing AM/PM Peak Hour Pedestrian Volumes



4 TRANSPORT AND ACCESSIBILITY IMPACTS

4.1 On-site Car Parking (DGR 5.1 & 5.5)

DGR 5.1 - Justification of the amount of on-site car parking having regard to local planning controls, RTA guidelines and the site's close proximity to public transport.

DGR 5.5 - Demonstrate that a minimalist approach to car parking provision is taken based on the accessibility of the site to public transport.

The development will include approximately 1,042 car spaces in up to six basement levels including a number of disabled parking spaces. There will also be parking for motorcycles and bicycles.

The car park layout will be designed in accordance with the following Australian Standards:

- AS 2890.1 Parking Facilities, Part 1: Off-street Car Parking
- AS 2890.2 Parking Facilities, Part 2: Off-street Commercial Vehicle Facilities
- AS 2890.3 Parking Facilities, Part 3: Bicycle Parking Facilities
- AS 2890.6 Parking Facilities, Part 6: Off-street Parking for People with Disabilities

The car park, accessed from Giffnock Ave, will be subject to access control to prevent access by the general public. Access by visitors will be subject to concierge control. The design provides for two entry and two exit lanes to accommodate peak flows.

Ryde Local Environmental Plan 2010 was gazetted on the 30 June 2010. Clause 4.5E states:

Off-street parking controls

(1) The objectives for off-street parking controls in the Macquarie Park Corridor are as follows:

a) to encourage accessibility by foot, bicycle and public transport,

b) to support the management and supply of parking as the primary means to influence travel behaviour of employees,

c) to encourage greater reliance on public transport,

d) to assist in the management of increased car usage and traffic congestion in the corridor,

e) to effect a greater shift to public transport.

(2) The maximum off-street parking spaces for commercial and industrial development in the Macquarie Park Corridor are those shown on the Macquarie Park Corridor Parking Restrictions Map.

The relevant Macquarie Park Corridor Parking Restrictions Map is included as Figure 5.

Ryde Local Environmental Plan 2010

Macquarie Park Corridor Parking Restrictions Map - Sheet MPP_005

Macquarie Park Corridor

Parking

90 1 Space / 90 m2 gross floor space

70 1 Space / 70 m2 gross floor space

45 1 Space / 45 m2 gross floor space

Cadastre

Cadastre 30/07/2009 © City of Ryde

Figure 5

The proposed parking provision for the development of 1 space per 80m^2 GFA is therefore consistent with the current LEP. The rates in the LEP have been adopted on the basis of consultation by City of Ryde with DoP, RTA and MoT. The LEP contains three different rates for the Macquarie Park Corridor which take into account proximity to public transport. The subject site falls within the zone with the lowest parking rate, due to its location adjacent to Macquarie Park Station and Lane Cove Road bus routes. The rate is also considerably lower than the RTA *Guide to Traffic Generating Developments* rate of 1 space per 40m^2 GFA for an unrestrained situation. The adopted rate therefore represents a minimalist approach to parking.

4.2 Service Vehicle Movements (DGR 5.2a)

DGR 5.2a - Details of service vehicle movements.

The design of the development includes a loading dock on basement level 1. It will be separate from the car park and will have a separate access from Giffnock Ave. Security will manage the movement of all service vehicles to the facility. An east-west service corridor will provide access to the lifts serving the four buildings.

The development is primarily commercial in nature and most of the service vehicle movements will relate to waste, small deliveries and general maintenance of the building. Tenant deliveries and service vehicle access for maintenance would generally occur within working hours using small vans or small rigid vehicles. The retail component of the development would generate daily deliveries, e.g. fresh food, newspapers etc including some truck movements.

The loading dock has been designed to accommodate approximately 2 heavy rigid vehicles (HRV), 3 medium rigid vehicles (MRV) and 4 small rigid vehicles (SRV). The adequacy of the loading dock vehicle manoeuvring area is demonstrated by a number of swept paths for an HRV as presented in Appendix B. Capacity for approximately 24 courier vehicles will be provided on basement level 1 within the main car park.

4.3 Traffic Generation (DGR 5.2b & 5.3)

DGR 5.2b – Details of traffic generation.

Daily and peak traffic generation forecasts for the development have been calculated on the basis of the RTA's *Guide to Traffic Generating Developments*. The guide states that two periods of traffic generation need to be considered:

- the peak activity time of the development itself.
- the peak activity time of the adjacent road network.

The first of these is generally used as a basis for reviewing access to the site and driveway design requirements. The second is used to assess the effect of the development on the road system. Such an assessment should identify whether any road improvements or traffic management measures are required to accommodate the increased traffic on the system.

The peak activity time of the development and the peak activity time of the adjacent road network are likely to coincide due to the commercial nature of the development with a strong commuter profile. The peak periods adopted were selected to coincide with the City of Ryde's Macquarie Park 2007 Base Paramics Model peak periods:

- 07:45 – 08:45 AM
- 4:45 – 5:45 PM

For the purposes of the Concept Plan traffic analysis it has been assumed that the development contains 80,000m^2 GFA of office and commercial floor space and 1,000 parking spaces. The small difference between these values and those contained in the architectural plans will result in negligible difference to the Paramics modelling outcomes (section 4.4).

Based on the RTA's unrestrained parking trip rate for offices of 2 trips per 100m^2 GFA the development would generate 1,600 peak hour vehicle trips. Thus each of the 1,000 parking spaces would generate 1.6 vehicle trips per hour. This total trip generation is unrealistic because, in practice, turnover of office parking spaces would be less than 1 vehicle trip per hour to reflect the predominantly commuter nature of the travel profile.

The RTA Guide allows for standard traffic generation rates to be reduced where parking is less than the parking rate included in the RTA guide. The RTA Guide specifies an unrestrained parking rate of 1 space per 40m^2 for office and commercial. The proposed parking rate for the development is 1 space per 80m^2. Thus a traffic generation rate of 2 x 40/80 = 1.0 trip per 100m^2 GFA is appropriate. This equates to a total peak hour traffic generation of 800 vehicle trips. The RTA guide states that daily vehicle trips for office and commercial can be estimated as five times the peak hour rate, equating to 4,000 vehicle trips per day.

The traffic generation of the existing site has been estimated on the basis of the existing number of parking spaces which is 153. The proposed development is forecast to generate 0.8 peak hour trips per parking space and assuming a similar rate for the existing site, the existing generation is approximately 125 vehicle trips per hour.

The forecast traffic generation used for this assessment, including the traffic generation for the existing site and the overall net increase, is presented in Table 3.

Table 3 Forecast Traffic Generation

Time Period	Forecast Traffic Generation (vehicle trips)					
	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Existing Development	100	25	125	25	100	125
Proposed Development	640	160	800	160	640	800
Net Increase	540	135	675	135	540	675

It is likely, however, that the actual traffic generation rates for the development would be lower than those presented in the table due to the proximity of good public transport, both bus and train, other sustainable transport measures described in the following sections and the likely spread-out nature of employee arrival/departure profiles.

4.4 Traffic Impact (DGR 5.2c)

DGR 5.2c – Details of traffic impacts. The key intersections that the study should consider/model are identified in the RTA's letter dated 16 May 2010.

DGR 5.3 - The Transport and Accessibility Impact Study should consider Ryde City Council's Macquarie Park 2007 Base Paramics Model where relevant.

4.4.1 Modelling Approach

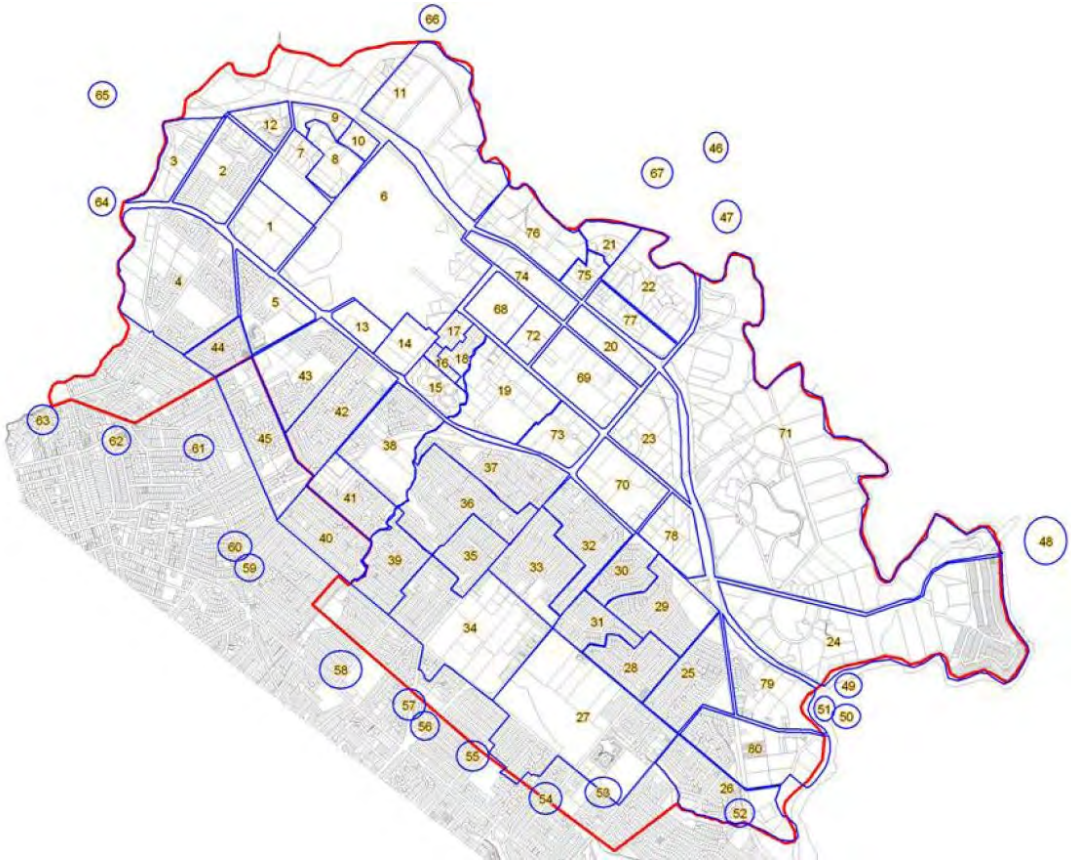
The forecast traffic impact of the development has been assessed on the basis of guidance contained in the following three documents:

- RTA's *Guide to Traffic Generating Developments*
- City of Ryde Council's *Traffic Impact Assessment Process for Macquarie Park Corridor Development Applications* (Version 3, March 2010)
- RTA letter to DoP dated 16 April 2010.

4.4.2 City of Ryde Macquarie Park 2007 Base Paramics Model

As part of the Macquarie Park Traffic Study, City of Ryde (CoR) developed a Q-Paramics micro-simulation model for the 2007 road network. The model has 80 zones, 1130 nodes and 2542 links as shown on Figure 6. It covers two one-hour weekday peak periods: 07:45 – 08:45 AM and 4:45 – 5:45 PM. The intention is that this model be used to assess the impacts of proposed new developments. The subject site is represented by zone 73.

Figure 6 Macquarie Park Corridor Paramics Model – Coverage and Zones



The modelling approach follows the steps listed in the *Traffic Impact Assessment Process for Macquarie Park Corridor Development Applications*, i.e:

- Creation of "with development" model network (Section 4.4.3
- Calculate development traffic (Section 4.4.4)
- Calculate traffic distribution (Section 4.4.5)
- Impact Assessment (Section 4.4.6)

4.4.3 Creation of "with development" Model Network

A new zone, 81, was created for the subject development. The proposed Giffnock Ave access point from the development was coded into the Paramics model as a normal driveway.

The CoR process specifies that no allowance should be made for any change in background traffic growth levels. A simple "without development" versus "with development" was therefore undertaken.

Apart from the new zone for the development there were no other major road network changes included in the "with development" model. It was assumed that there would be no change to the current configuration of the two laneways adjoining the north-western side of Lane Cove Road between Epping Road and Waterloo Road. Bus priority works are currently under construction at the intersections of Lane Cove Road / Waterloo Road and Lane Cove Road / Epping Road but these are unlikely to have a significant impact on general traffic conditions. The impact of the proposed M2 upgrade was excluded from the assessment.

4.4.4 Traffic Generation

The traffic generation for the proposed development is summarised in Table 3.

4.4.5 Traffic Distribution

An alternative distribution pattern for the new zone 81 was adopted because the distribution for the current model zone is heavily skewed towards access from the north and west, with little from the south and east, and therefore unrealistic for the proposed development. The alternative distribution is presented in Table 4.

Table 4 Alternative Traffic Distribution for New Zone

Zone	Trips To/From			
	North	East	South	West
81 (new zone)	30%	20%	30%	20%

4.4.6 Impact Assessment

The assessment of impacts has focused on the following key intersections and includes the intersections specified in the RTA letter dated 16 April 2010:

- Lane Cove Road/Epping Road
- Lane Cove Road/Waterloo Road
- Lane Cove Road/Talavera Road
- Lane Cove Road/M2 Motorway
- Epping Road/Lyon Park Road
- Waterloo Road/Khartoum Road

The AM and PM "without development" and "with development" models were run and a variety of data extracted to determine the impacts of the development. Detailed model outputs are presented in Table 5 and Table 6. Screenshots are presented in Appendix C and the standard RTA Paramics Model Checklist in Appendix D. The data includes a comparison of link flows and delays. The model outputs are discussed below.

It should be noted that the analysis is based on conservative traffic generation forecasts and these forecasts are unlikely to be realised due to the proximity of the site to good public transport.

Table 5 Forecast Turning Volumes and Delays – AM Peak

Intersection	Approach	Direction	Movement	Base turn volume (veh/h)	Development turn volume (veh/h)	Absolute Difference	Base turn delay (s/veh/hr)	Development turn delay (s/veh/hr)	Absolute Difference
M2 ramps / Lane Cove Road	M2 Ramps	Eastbound	Left	572	590	18	24	24	0
			Right	338	351	13	2	2	0
	Lane Cove Road	Northbound	Left	18	22	4	1	1	0
			Through	1792	1842	50	8	9	1
	Lane Cove Road	Southbound	Through	2960	3147	187	3	3	-1
			Right	503	503	0	2	2	0
Talavera Road/ Lane Cove Road	Talavera Road	Westbound	Left	53	57	4	40	47	7
			Through	50	52	2	57	61	4
			Right	4	3	-1	92	50	-42
	Talavera Road	Eastbound	Left	185	270	85	80	49	-30
			Through	71	68	-3	173	137	-37
			Right	292	312	20	151	129	-22
	Lane Cove Road	Northbound	Left	491	437	-54	16	17	1
			Through	1624	1591	-33	20	18	-2
			Right	49	7	-42	69	77	8
	Lane Cove Road	Southbound	Left	157	178	21	10	9	-1
			Through	2491	2639	148	10	9	0
			Right	603	638	35	40	41	1
Waterloo Road/ Lane Cove Road	Waterloo Road	Westbound	Left	83	82	-1	59	61	2
			Through	175	169	-6	89	90	0
			Right	195	212	17	88	80	-9
	Waterloo Road	Eastbound	Left	73	85	12	1	0	-1
			Through	155	151	-4	70	70	0
			Right	138	204	66	65	61	-4
	Lane Cove Road	Northbound	Left	885	967	82	14	21	7
			Through	1880	1757	-123	14	14	1
			Right	333	330	-3	61	50	-11
	Lane Cove Road	Southbound	Left	457	490	33	19	16	-2
			Through	1921	1977	56	18	17	-1
			Right	419	483	64	41	45	4
Epping Road/ Lane Cove Road	Epping Road	Westbound	Left	134	125	-9	23	35	11
			Right	712	707	-5	65	74	8
	Epping Road	Eastbound	Left	305	285	-20	8	35	27
			Right	204	213	9	68	66	-3
	Lane Cove Road	Northbound	Left	67	59	-8	4	9	5
			Through	2140	2109	-31	7	8	2
			Right	444	414	-30	82	82	-1
	Lane Cove Road	Southbound	Left	460	502	42	2	2	0
			Through	1452	1504	52	11	12	1
			Right	221	250	29	67	67	0
Epping Road/ Lyon Park Road	Epping Road	Eastbound	Left	557	664	107	0	0	0
			Through	1723	1780	57	0	0	0
			Right	0	0	0	0	0	0
	Lyon Park Road	Southbound	Left	329	349	20	0	0	0
Waterloo Road/ Khartoum Road	Waterloo Road	Westbound	Left	0	0	0			
			Through	745	666	-79			
			Right	132	124	-8			
	Waterloo Road	Eastbound	Left	777	744	-33			
			Through	231	233	2			
			Right	0	0	0			
	Khartoum Road	Northbound	Left	6	4	-2			
			Through	7	8	1			
			Right	11	6	-5			
	Khartoum Road	Southbound	Left	63	70	7			
			Through	247	280	33			
			Right	208	211	3			

Note: Q-Paramics does not output delay data for roundabouts

Table 6 Forecast Turning Volumes and Delays – PM Peak

Intersection	Approach	Direction	Movement	Base turn volume (veh/h)	Development turn volume (veh/h)	Absolute Difference	Base turn delay (s/veh/hr)	Development turn delay (s/veh/hr)	Absolute Difference
M2 ramps / Lane Cove Road	M2 Ramps	Eastbound	Left	577	594	17	21	23	2
			Right	116	145	29	1	1	0
	Lane Cove Road	Northbound	Left	309	300	-9	1	1	0
			Through	2703	2632	-71	6	7	1
	Lane Cove Road	Southbound	Through	1957	2059	102	0	1	1
			Right	711	682	-29	2	2	0
Talavera Road/ Lane Cove Road	Talavera Road	Westbound	Left	83	50	-33	46	93	47
			Through	15	10	-5	46	119	73
			Right	71	47	-24	45	47	1
	Talavera Road	Eastbound	Left	298	273	-25	95	90	-5
			Through	17	7	-10	132	158	26
			Right	381	333	-48	109	138	29
	Lane Cove Road	Northbound	Left	185	164	-21	9	12	3
			Through	2643	2618	-25	9	9	0
			Right	3	5	2	89	68	-21
	Lane Cove Road	Southbound	Left	10	7	-3	3	5	3
			Through	1676	1750	74	3	9	6
			Right	380	395	15	40	41	1
Waterloo Road/ Lane Cove Road	Waterloo Road	Westbound	Left	245	213	-32	57	63	6
			Through	108	108	0	76	84	8
			Right	265	272	7	82	88	5
	Waterloo Road	Eastbound	Left	544	509	-35	13	14	1
			Through	209	145	-64	54	57	3
			Right	629	674	45	57	62	5
	Lane Cove Road	Northbound	Left	349	417	68	5	5	1
			Through	2004	1991	-13	10	10	0
			Right	45	73	28	83	78	-4
	Lane Cove Road	Southbound	Left	65	71	6	37	42	5
			Through	1867	1781	-86	33	40	7
			Right	150	164	5	67	71	4
Epping Road/ Lane Cove Road	Epping Road	Westbound	Left	280	269	-11	1	2	1
			Right	471	503	32	41	42	1
	Epping Road	Eastbound	Left	294	321	27	3	6	3
			Right	302	354	52	53	60	7
	Lane Cove Road	Northbound	Left	179	155	-24	15	17	1
			Through	1644	1695	51	16	15	-1
			Right	326	312	-14	54	58	4
	Lane Cove Road	Southbound	Left	533	519	-14	8	23	15
			Through	1917	1865	-52	16	16	0
			Right	280	235	-44	57	56	-1
Epping Road/ Lyon Park Road	Epping Road	Eastbound	Left	49	81	32	0	0	0
			Through	1301	1234	-67	0	0	0
			Right	0	0	0	0	0	0
	Lyon Park Road	Southbound	Left	945	1004	59	0	0	0
Waterloo Road/ Khartoum Road	Waterloo Road	Westbound	Left	0	0	0			
			Through	514	662	48			
			Right	64	98	34			
	Waterloo Road	Eastbound	Left	214	231	17			
			Through	412	349	-63			
			Right	1	0	-1			
	Khartoum Road	Northbound	Left	11	20	9			
			Through	3	5	2			
			Right	28	31	3			
	Khartoum Road	Southbound	Left	348	302	-46			
			Through	20	23	3			
			Right	138	124	-14			

Note: Q-Paramics does not output delay data for roundabouts

Q-Paramics does not report output data in the form of Level of Service unless various plug-ins provided by third parties are used. The CoR *Traffic Impact Assessment Process* states that traffic impact should be assessed by a comparison of link flows and delays on each link. A comparison of these two parameters is included in Table 5 and Table 6.

Traffic routes used by vehicles to and from the site is influenced by characteristics of the local road network:

- A central median in Waterloo Road opposite Coolinga Street prevents traffic from turning right from Waterloo Road into Coolinga Street and right out of Coolinga Street into Waterloo Road.
- Giffnock Ave, Byfield Street and Lyon Park Road perform important functions in providing access to the site.
- Traffic accessing the site from the M2 to the northwest has a choice of using Lane Cove Road or Christie Road/Herring Road interchanges.
- Khartoum Road, Fontenoy Road and Wicks Road provide alternatives to Lane Cove Road and Epping Road.

Observation of the operation of the Macquarie Park road network at periods suggest that key routes for arriving at the site would be:

- Lane Cove Road for traffic from the north
- Epping Road or Wicks Road-Waterloo Road for traffic from the east including from the Lane Cove Tunnel
- Lane Cove Road-Waterloo Road for traffic from the south
- Lyon Park Road for traffic from the west along Epping Road
- Lane Cove Road and/or Herring Road-Waterloo Road-Byfield Street for traffic from the northwest along the M2

Key routes for departing the site would be:

- Waterloo Road–Khartoum Road and Talavera Road and/or Fontenoy Road for traffic to the north along Lane Cove Road
- Lyon Park Road for traffic to the east along Epping Road
- Lyon Park Road for traffic to the south along Lane Cove Road
- Waterloo Road-Herring Road (southbound) for traffic to the west along Epping Road
- Waterloo Road-Herring Road (northbound) for traffic to the northwest along the M2

The forecast operation of the road network in the vicinity of key intersections, based on the results of the Paramics modelling, is discussed below.

Lane Cove Road/Epping Road

In the AM peak, there is forecast to be a slight increase in delays on the through movement along Lane Cove Road northbound and right turn from Epping Road westbound.

In the PM peak, there is forecast to be an increase in delays (approximately 7 seconds) on the right turn from Epping Road eastbound due to southbound development traffic exiting the site via Lyon Park Road.

In both the AM and PM peaks the Lane Cove Road/Epping Road intersection is forecast to perform at an acceptable level of service.

Lane Cove Road/Waterloo Road

The main impact in the AM peak at this intersection will be an increase in traffic on the right turn into Waterloo Road for traffic from the north. The forecast increase in delay is only 4 seconds and it is anticipated that the dual right turn bay will have capacity to accommodate the traffic increase and therefore blocking of southbound through traffic on Lane Cove Road is unlikely to occur. The other significant increase will occur on the left turn into Waterloo Road for traffic from the south. This movement is generally not critical because it is in the non-peak direction and is an uncontrolled left turn.

The traffic management measures of the local road network, particularly the restrictions at the intersection of Waterloo Road/Coolinga Street, will contribute to only a small increase in traffic through the Lane Cove Road/Waterloo Road intersection in the PM peak.

Lane Cove Road/Talavera Road

In the AM peak there will be an increase in southbound traffic on Lane Cove Road for traffic coming from the north. This is an already congested movement in the peak direction and the development will contribute to an increase in delays.

In the PM peak there is unlikely to be a significantly impact at this intersection due to the traffic management measures of the local road network and the alternative routes available for traffic bound for the M2 or Lane Cove Road to the north.

Lane Cove Road/M2 Motorway

The M2 off-ramps have high capacity with two left and two right turn lanes and the development is unlikely to result in a significant change in performance in the AM peak, apart from existing congestion on Lane Cove Road southbound.

In the PM peak, impacts are likely to be relatively minor as per the discussion for Lane Cove Road/Talavera Road.

Epping Road/Lyon Park Road

The Epping Road/Lyon Park Road intersection is a critical intersection serving the development. Although there will be a significant increase in left-in and left-out traffic in both the AM and PM peaks, the intersection has capacity to accommodate this increase. A deceleration lane is provided for the left turn in and an acceleration lane for the left turn out. The intersection is located on a relatively free-flowing stretch of Epping Road.

Waterloo Road/Khartoum Road

The Waterloo Road/Khartoum Road intersection is a high capacity two lane roundabout.

In the AM peak there will be a slight increase in traffic through the intersection but this will have no significant impact on delays.

In the PM peak there will be a significant increase in westbound traffic on Waterloo Road. This will result in increased delays but the roundabout will still perform at an acceptable level of service.

4.4.7 Summary

The results of the Q-Paramics modelling show that, as a result of the development, generated traffic will be dispersed across a number of different routes. This will result in a significant increase in delays on only a small number of movements.

Although Q-Paramics does not output level of service parameters as previously described, it is unlikely that the overall level of service at any of the key intersections would change as a result of the development. This is because generated traffic, which would be quite dispersed, is a relatively small proportion of existing background traffic at most locations.

As a result, the findings of the traffic impact assessment demonstrate that the development does not warrant the need for any improvement works.

4.5 Pedestrian and Bicycle Linkages (DGR 5.2d)

DGR 5.2d – Details of pedestrian and bicycle linkages.

The existing pedestrian and bicycle linkages within the vicinity of the site have been described in Section 3.2.

The development includes secure bicycle parking for up to 538 bicycles within the basement car park. This level exceeds the minimum requirement specified in the *Planning Guidelines for Walking and Cycling* and the *Macquarie Park Corridor DCP 2010*. Short term bicycle parking will also be provided within the various plazas at ground level. The bicycle parking will be supplemented by showers and locker facilities. Transport NSW bicycle lockers/rails also exist on the northern side of Waterloo Road.

The *Ryde Bicycle Strategy and Masterplan* proposes off-road regional shared paths on both Waterloo Road and Lane Cove Road. A key focus is to maximise interchange opportunities with bus and rail public transport. The *2010 NSW Bikeplan* identifies North Ryde to Macquarie University as a major missing link in the Metro Sydney Bike Network. The Bikeplan states that “the NSW Government will fully fund construction of an average of 10 kilometres of new connections in the Metro Sydney Bike Network each year, focusing first on the identified priority metro links”.

A shared path currently exists on Waterloo Road between Shrimptons Creek and Herring Road and the extension of this path to Lane Cove Road will improve integration with the Ryde bicycle network. The development provides the potential for the Waterloo Road regional bike route to be constructed adjacent to the site.

The site is strategically located above Macquarie Park Station and the most critical pedestrian linkage is between the development and the station. The development will be totally integrated with the station and will activate the ground level around the station. The development contains four separate buildings which will enable east-west and north-south through site links to be created which is consistent with an aim of the LEP to increase pedestrian permeability throughout the Macquarie Park Corridor. These links will improve access to the station from other major developments such as the Optus campus.

4.6 Promotion of Non-car Travel Modes (DGR 5.4 & 5.6)

DGR 5.4 - Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling) including the consideration of:

- *an assessment of existing and proposed pedestrian and cycle movements within the vicinity of the subject site*

- *provision of facilities to increase the non-car mode share for travel to and from the site.*

DGR 5.6 - Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets

The proposed indented taxi/bus stop bay on Waterloo Road adjacent to the site will be of benefit to both users of the railway station and the development. The bus bay will give the relevant authorities flexibility to allow for the provision of better STA bus services to the Macquarie Park Station area.

The NSW State Plan 2010 includes the following transport targets:

- Increase the proportion of total journeys to work by public transport in the Sydney Metropolitan Region to 28% by 2016 (2009 value 24%)
- Increase the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, to 5% by 2016 (2009 value 1%)

These targets will be met by measures to promote sustainable means of transport including public transport usage, car sharing, car pooling and pedestrian and bicycle linkages as described below.

Measures to increase pedestrian and cycle travel have been described in Section 4.5. The level of cycling has the potential to increase significantly, in percentage terms, if key cycling routes are constructed.

A Work Place Travel Plan (WPTP) will be prepared at the Development Application stage of the development in accordance with the requirements of DCP 2010. The DCP states that a WPTP is required for all developments that exceed 15,000m^2 floor space or 300 employees.

The objectives of work place travel planning within the Macquarie Park Corridor, as stated in the DCP, are to:

1. Provide incentives for employers to encourage staff to utilise improved accessibility (by public transport, cycling and walking) to, from, and within the Corridor.
2. Minimise rates of private vehicle use for commuters and business trips as a contribution to the regional goal of 20% transport modal shift.
3. More effectively manage the use of private vehicles within the area.
4. Encourage the use of alternative modes of transport within the region.
5. Reduce congestion and the cumulative impacts of vehicle emissions upon air quality.

A suitably qualified workplace travel co-ordinator to implement the strategies of the WPTP will be employed once the development is operational. This role may be a standalone position or it may be combined with other roles.

The WPTP is a travel management tool that promotes the development, implementation and monitoring of a co-ordinated transport strategy for a site. The primary purpose of a WPTP is to influence the travel behaviour of employers, employees and occasional visitors to an organisation, away from single-occupancy car use towards more sustainable forms of transport.

Public transport usage to the Macquarie Park area will continue to increase as public transport services improve with measures such as:

- additional bus priority measures
- more frequent bus services
- Epping to Parramatta Rail Link

- Northwest Rail Link

Higher densities in the Macquarie Park area, including the proposed development, will help to stimulate the provision of improved public transport services.

Other measures that could be introduced to increase the non-car mode share to the site include:

- Integration of the site into a broader Macquarie Park car pooling scheme. The scheme would allow drivers and participants to be matched based on origin and general travel times.
- Promotion of flexible working practices for the various tenants within the development.
- Investigation of a travel pass scheme to provide for reduced cost annual public transport tickets.
- Provision of visitors to the site with public transport and cycling transport information.

5 SUMMARY AND CONCLUSIONS

This report describes the existing situation, development proposal, car parking arrangements, service vehicle movements, forecast traffic generation, forecast traffic impacts and sustainable transport measures of the proposed development at 396 Lane Cove Road. The development may involve approximately 83,000m^2 GFA of commercial floorspace in four buildings.

Key findings of this assessment are:

- The development will be well-served by public transport, both bus and train, allowing for high levels of non-car travel to the site. It is located directly above Macquarie Park Rail Station.
- The development will include approximately 1042 car parking spaces in accordance with the rates contained in Ryde LEP 2010.
- The development will include an indented taxi/bus stop bay on Waterloo Road adjacent to the site which will be of benefit to both users of the railway station and the development.
- The loading dock has been designed to accommodate a 12.5m heavy rigid vehicle, the largest service vehicle likely to be accessing the site.
- The development is forecast to result in a net increase of up to 650 vehicle trips in the weekday peak hours, based on standard RTA traffic generation rates, although this estimate is unlikely to be realised due to the proximity of the site to good public transport.
- Traffic modelling was undertaken using the CoR Macquarie Park Paramics Model. The modelling demonstrates that, although the road network in the vicinity of the site is congested, no external road improvement works are required as part of the development.
- The development includes measures to allow for significant levels of pedestrian and bicycle travel. It includes secure bicycle parking for over 500 bicycles in addition to showers and locker facilities.
- The development will include a number of through site links which will greatly increase the pedestrian permeability of the area around the railway station.
- A Work Place Travel Plan would be prepared at the Development Application stage to influence the travel behaviour of employers, employees and occasional visitors to the site.

Appendix A

Concept Design Drawings

BATESSMART™

Macquarie Park Commerce Centre
Macquarie Park Station
Waterloo Road

Architectural Design Statement
S10758 August 2010

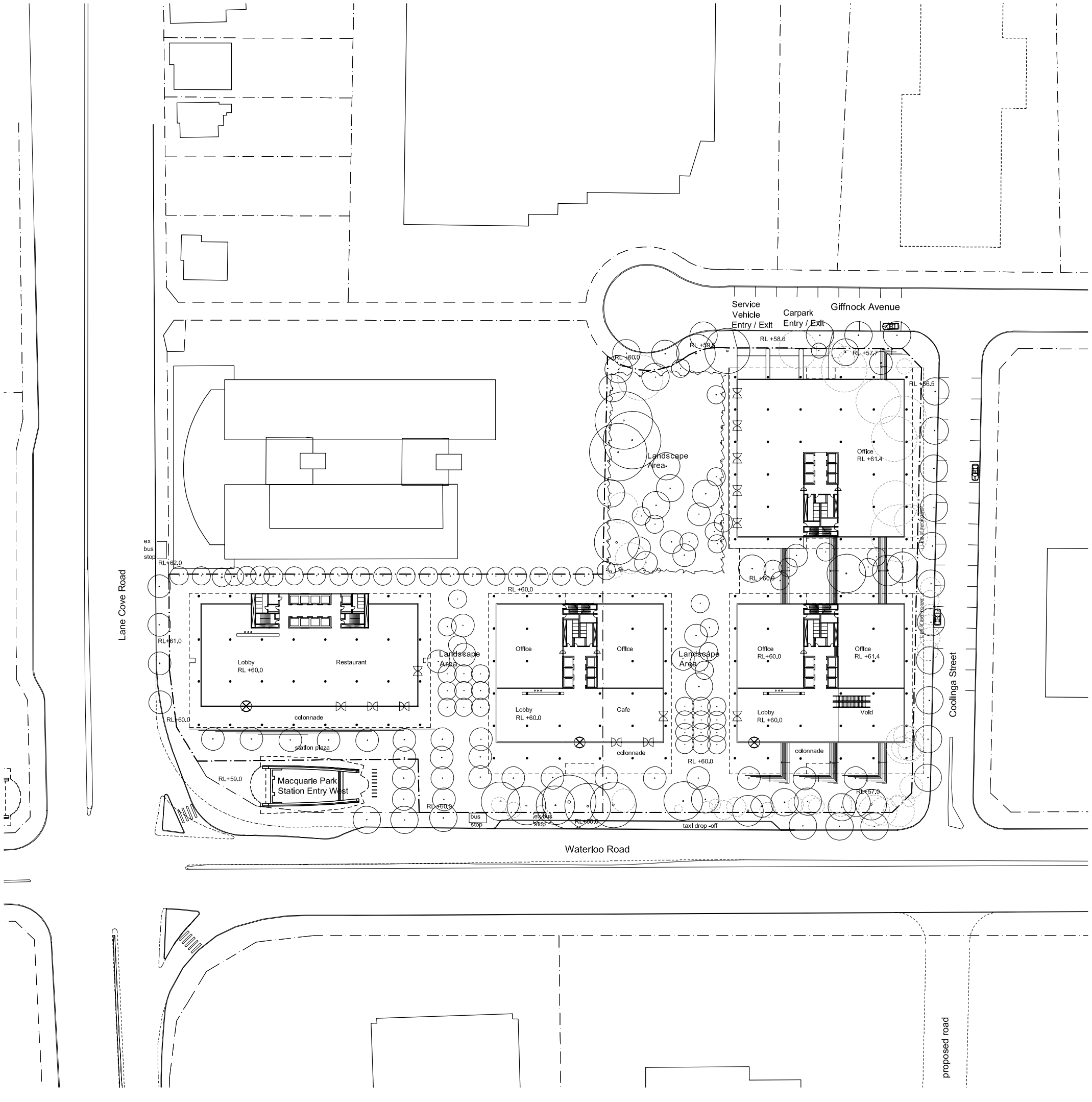
PA02-00 Ground Level Plan

Scale 1:1000

Legend

Trees to be removed

New Trees



BATESSMART™

Macquarie Park Commerce Centre

Macquarie Park Station
Waterloo Road

Architectural Design Statement
S10758 August 2010

PA02-001 Basement Level 001 Plan

Scale 1:1000

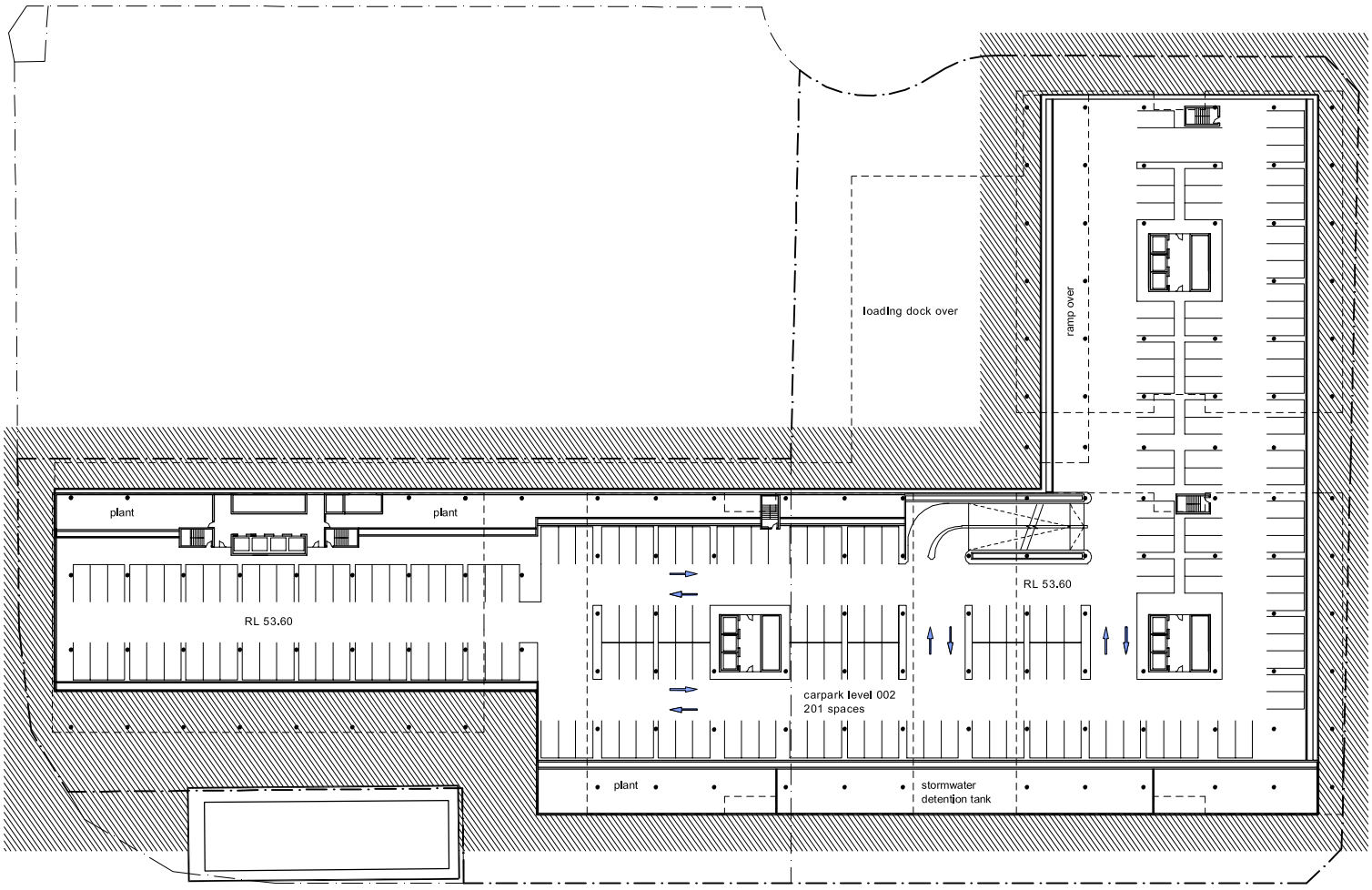
BATESSMART™

Macquarie Park Commerce Centre
Macquarie Park Station
Waterloo Road

Architectural Design Statement
S10758 August 2010

PA02-002 Basement Level 002 Plan

Scale 1:1000



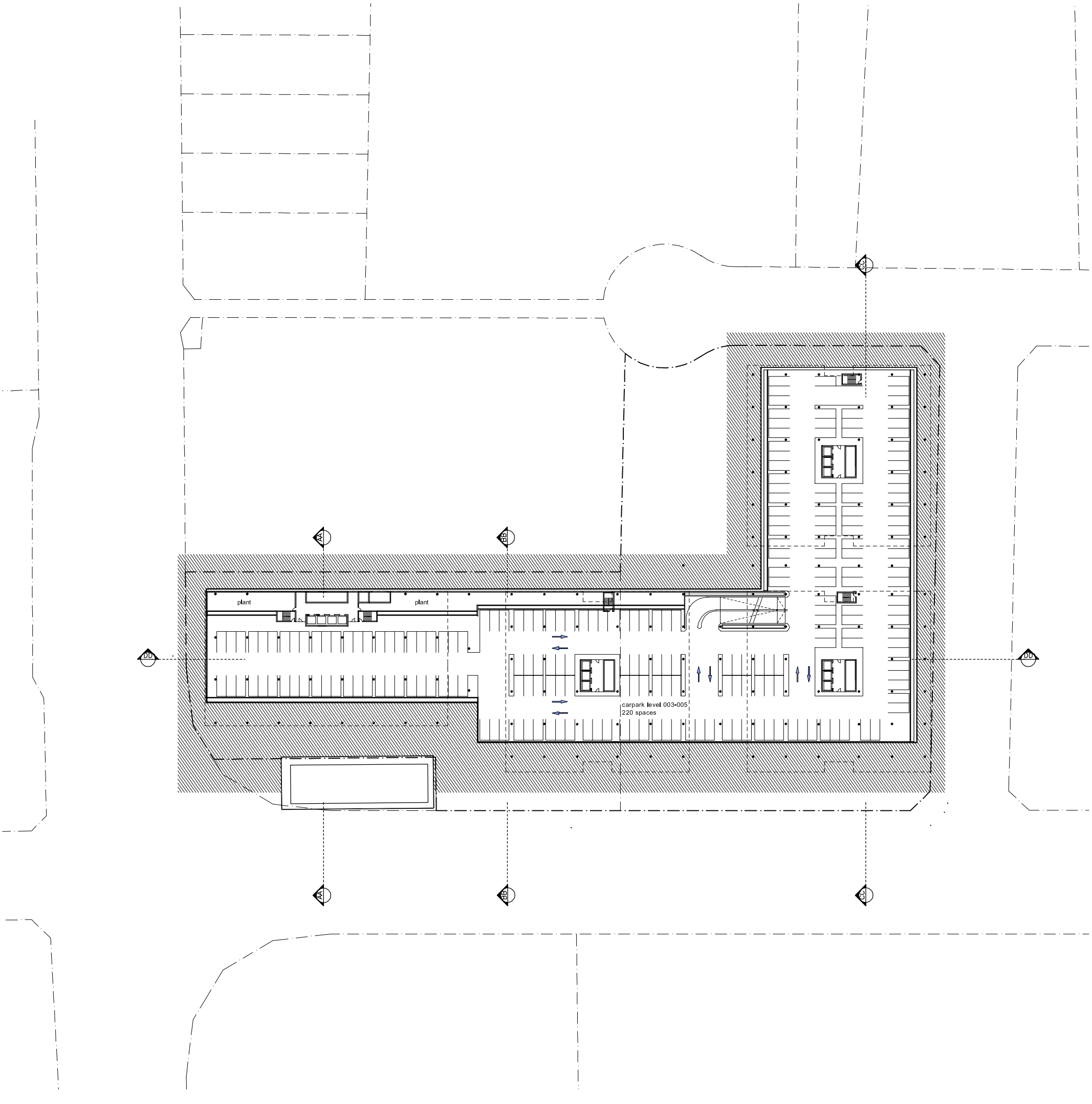
BATESSMART™

Macquarie Park Commerce Centre
Macquarie Park Station
Waterloo Road

Architectural Design Statement
S10758 August 2010

PA02-003 Basement Level 003-005 Plan

Scale 1:1000



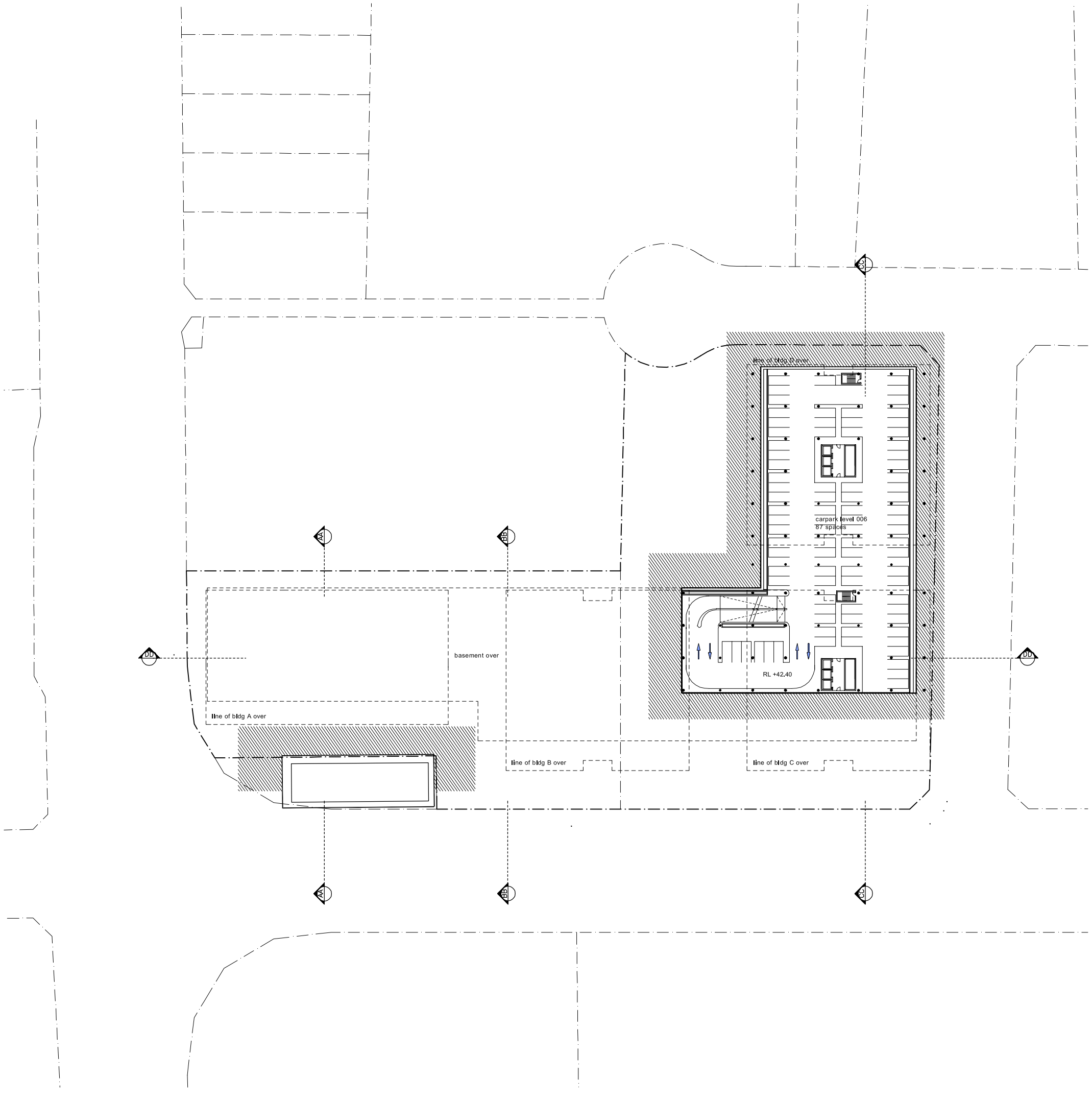
BATESSMART™

Macquarie Park Commerce Centre
Macquarie Park Station
Waterloo Road

Architectural Design Statement
S10758 August 2010

PA02-006 Basement Level 006 Plan

Scale 1:1000



Appendix B

Service Vehicle Swept Path Diagrams

A3

A B C D E F G

1 2 3 4 5 6

Carpark
Entry / Exit
RL +58.6

Giffnock Avenue

RL +59.0

RL +57.0

Retail
RL +56.8

Retail

Retail

Lobby
RL +56.8

ch
rms

Rainwater tank RL 54.3

Bin
store

Loading Dock
RL +54.3

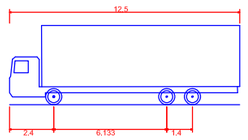
Dock
office

R

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



HRV - Heavy Rigid Vehicle

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Bates Smart

Job Title
396 Lane Cove Road

Drawing Title
Turning Paths
12.5m HRV

Scale at A3 1:250

Discipline

Drawing Status
Sketch

Job No	Drawing No	Issue
220691	**SKT003**	**A**

J:\220691 - 396 Lane Cove Rd\07 Drawings\SKT003-A Loading Dock.dwg 6 Aug 2010 15:39:32

Do not scale

A3

A B C D E F G

1 2 3 4 5 6

Carpark Entry / Exit
RL +58.6

Giffnock Avenue

RL +59.0

RL +57.0

Retail
RL +56.8

Retail

Retail

Lobby
RL +56.8

ch
rms

Bin store

Rainwater tank RL 54.3

Loading Dock
RL +54.3

Dock office

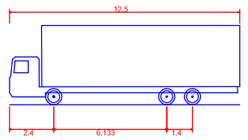
R

Do not scale

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Bates Smart

Job Title
396 Lane Cove Road

Drawing Title
Turning Paths
12.5m HRV

Scale at A3 1:250

Discipline

Drawing Status
Sketch

Job No	Drawing No	Issue
220691	**SKT002**	**A**

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A3

Carpark Entry / Exit
RL +58.6

Giffnock Avenue

RL +59.0

RL +57.0

Retail
RL +56.8

Retail

Retail

Lobby
RL +56.8

ch rms

Bin store

Rainwater tank RL 54.3

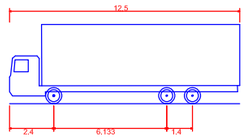
Loading Dock
RL +54.3

Dock office

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Bates Smart

Job Title
396 Lane Cove Road

Drawing Title
Turning Paths
12.5m HRV

Scale at A3 1:250

Discipline

Drawing Status
Sketch

Job No	Drawing No	Issue
220691	**SKT001**	**A**

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Do not scale

A3

Carpark
Entry / Exit
RL +58.6

Giffnock Avenue

RL +59.0

RL +57.0

Retail
RL +56.8

Retail

Retail

Lobby
RL +56.8

ch
rms

Bin
store

Rainwater tank RL 54.3

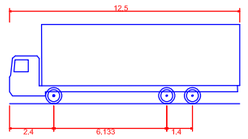
Loading Dock
RL +54.3

Dock
office

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Bates Smart

Job Title
396 Lane Cove Road

Drawing Title
Turning Paths
12.5m HRV

Scale at A3 1:250

Discipline

Drawing Status
Sketch

Job No	Drawing No	Issue
220691	**SKT006**	**A**

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Do not scale

Appendix C

Paramics Screenshots

Grey vehicles represent background traffic, pink vehicles inbound development traffic, yellow vehicles outbound development traffic

Lane Cove Road / Epping Road - AM

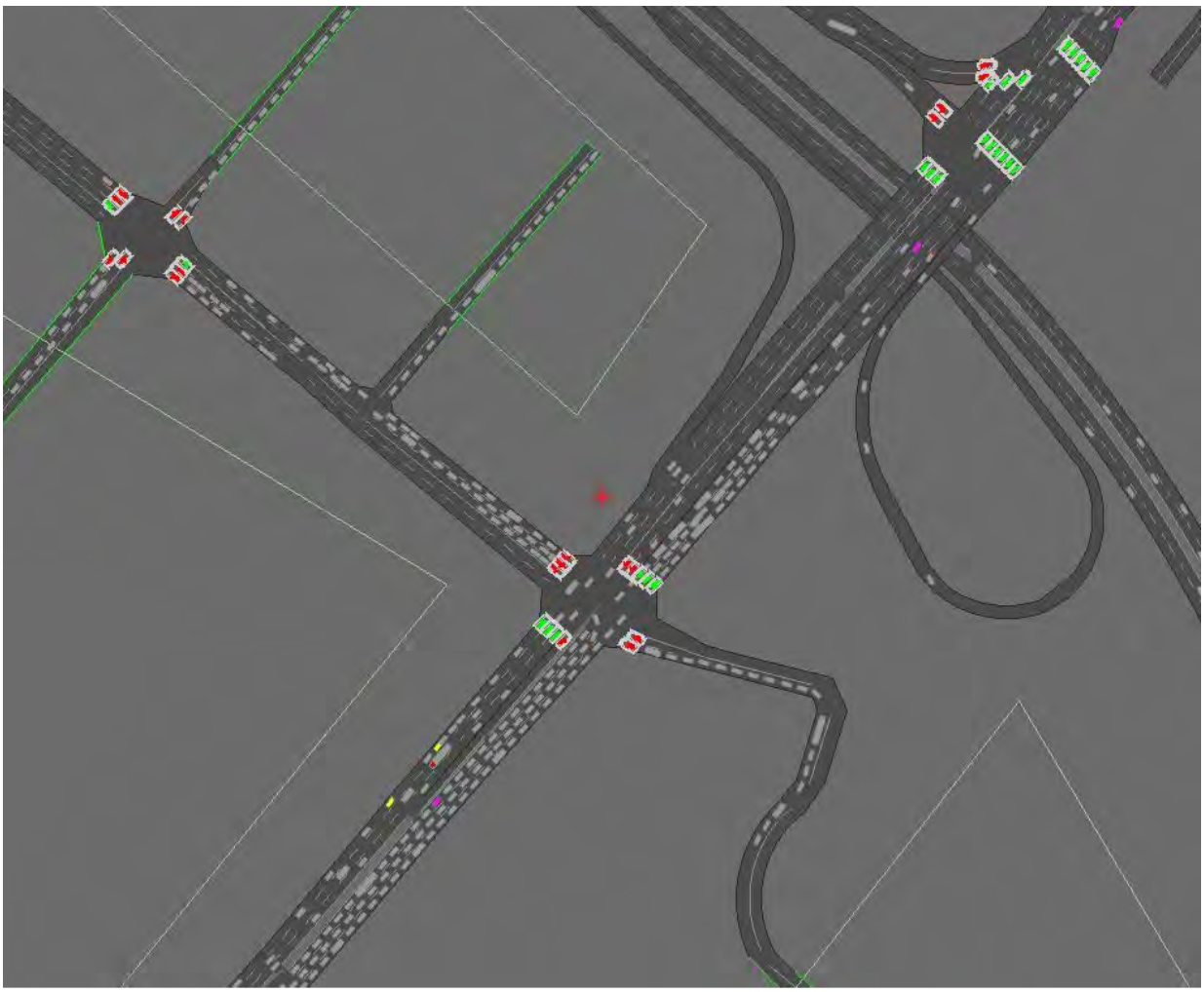
Lane Cove Road / Epping Road - PM

Lane Cove Road / Waterloo Road - AM

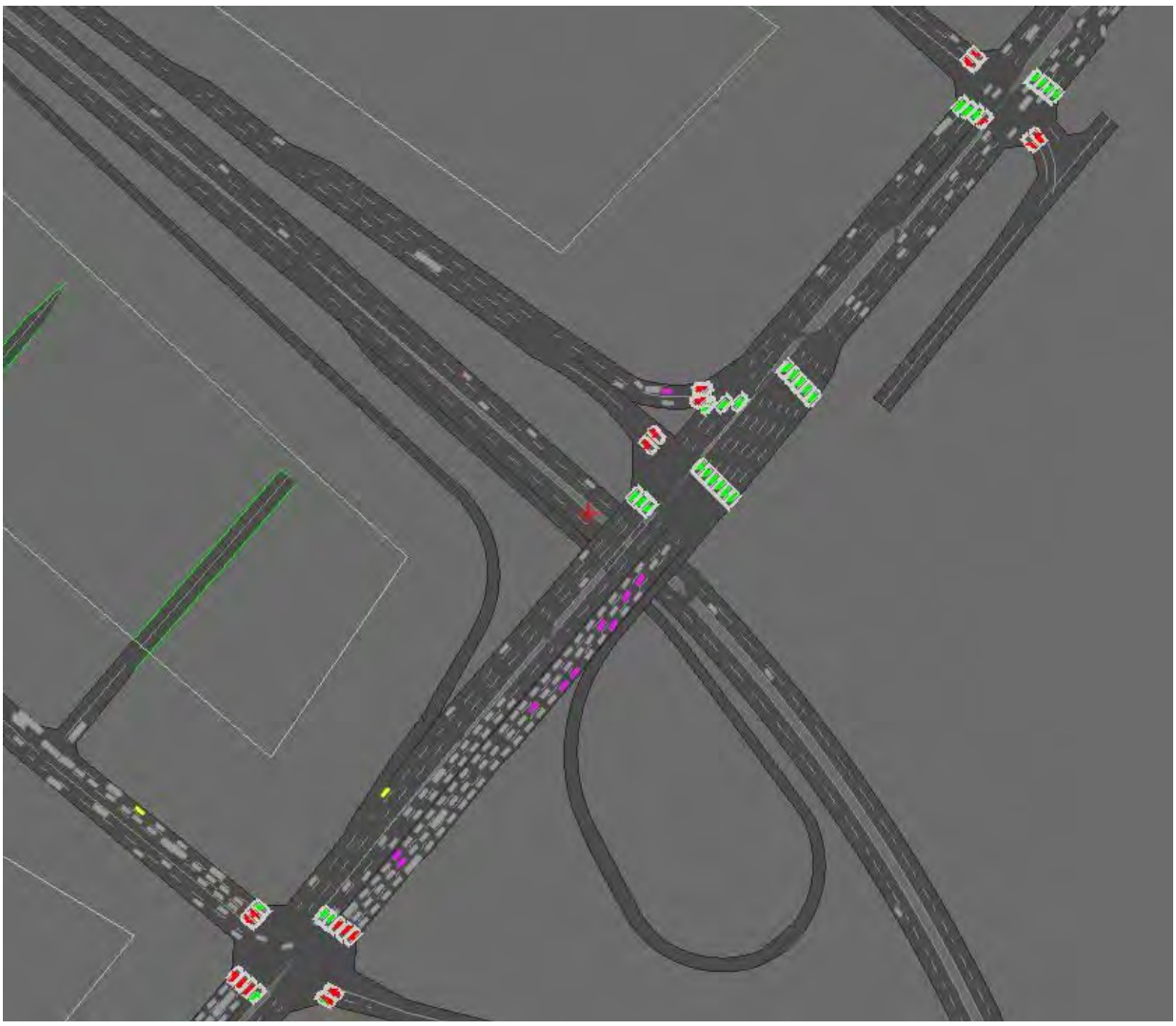
Lane Cove Road / Waterloo Road - PM

Lane Cove Road / Talavera Road – AM

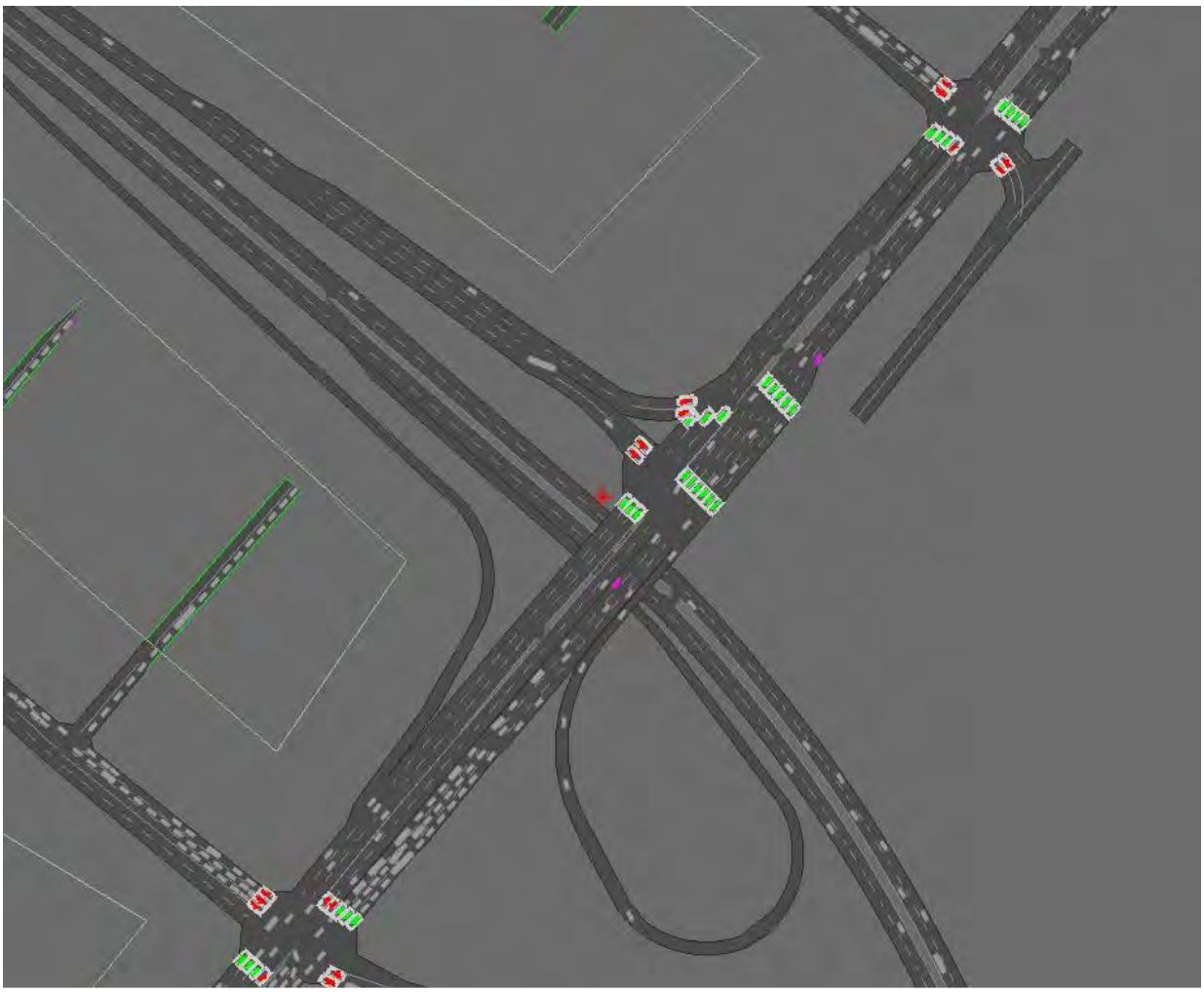
Lane Cove Road / Talavera Road – PM



Lane Cove Road / M2 Interchange - AM

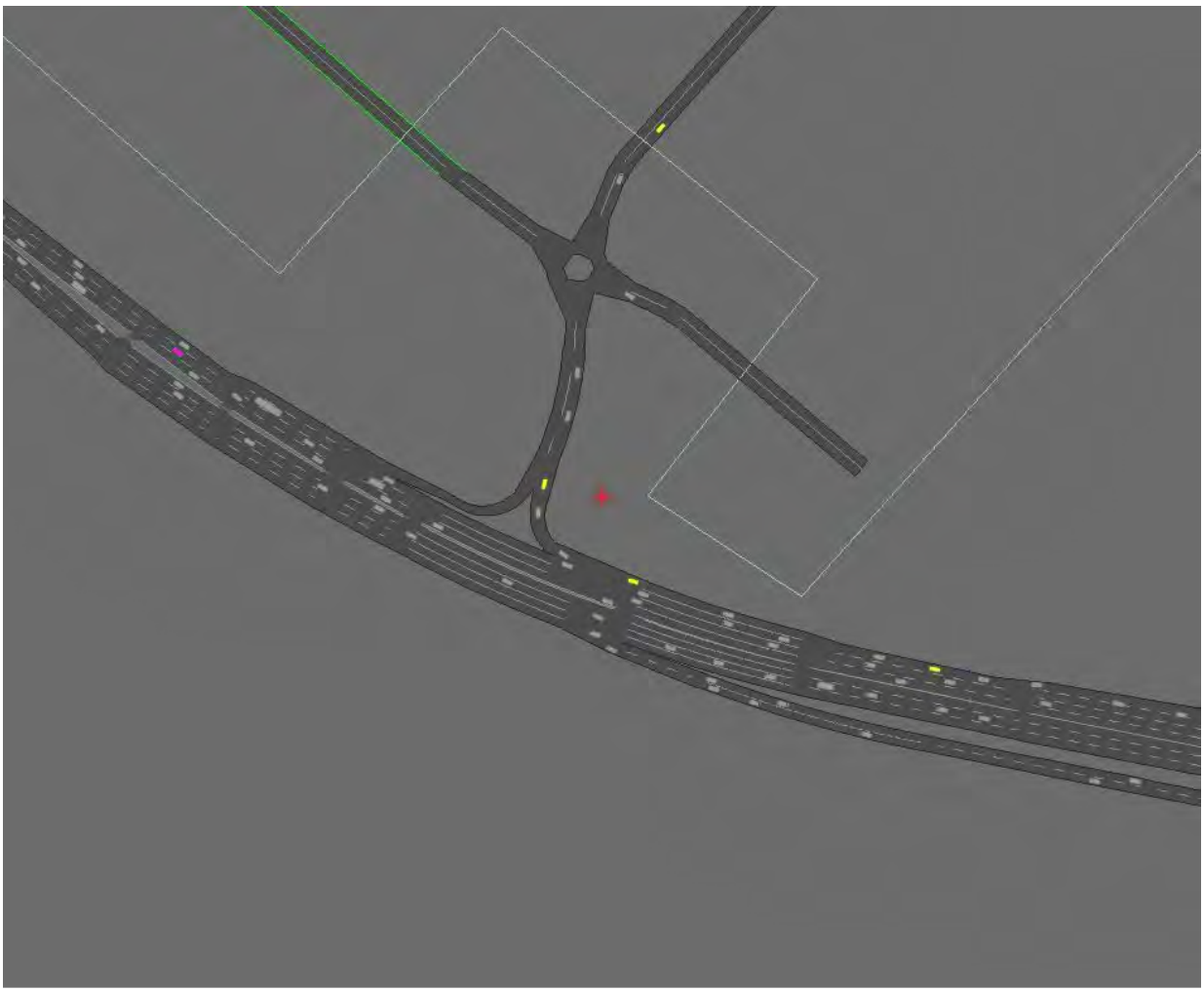


Lane Cove Road / M2 Interchange - PM

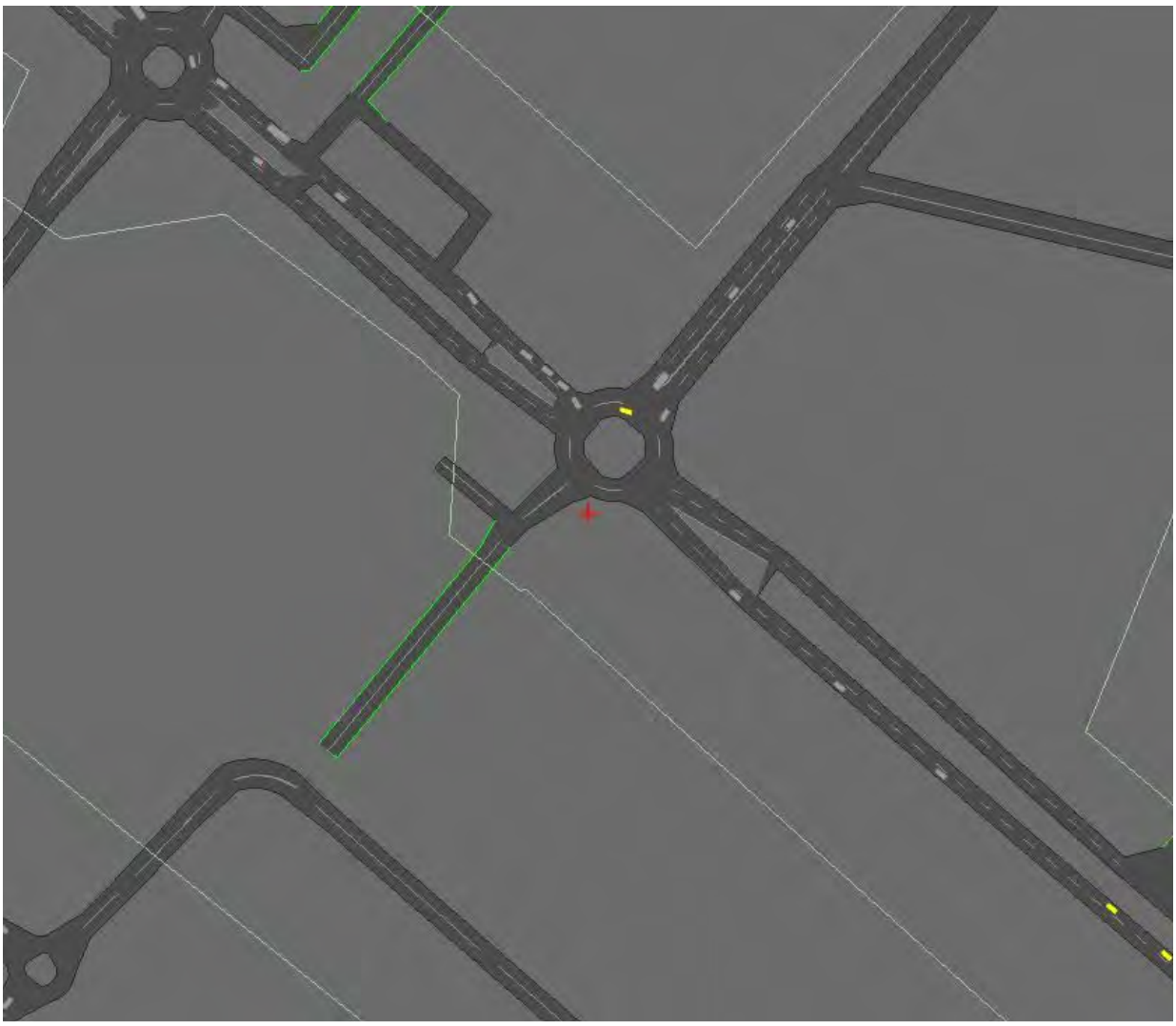


Epping Road / Lyon Park Road - AM

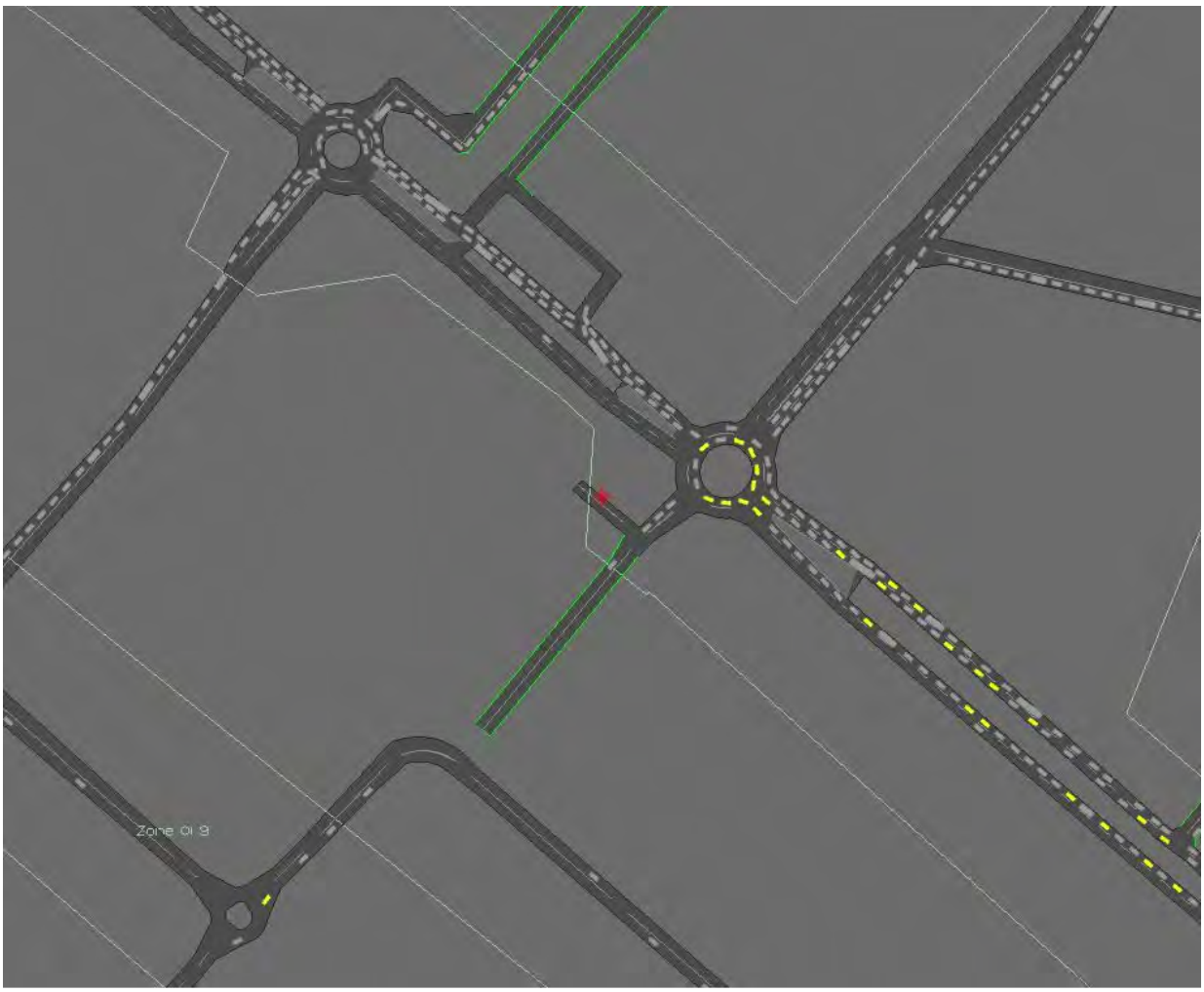
Epping Road / Lyon Park Road - PM



Waterloo Road / Khartoum Road - AM



Waterloo Road / Khartoum Road - PM



Appendix D

RTA Paramics Model Checklist

RTA Paramics Model Checklist

PROJECT DETAILS

Please provide general information about the project.

Client	Winten Property Group		
Project Title	**396 Lane Cove Road, Macquarie Park (MP 09_0209)**		
Route Name		*Scheme Location (including grid reference)*	
Study carried out by:	Arup		
Previous Reports: Title			*Date*

Project Description: *Assess the traffic impact of the 396 Lane Cove Road development using the City of Ryde's Macquarie Park Corridor Paramics Model (MPCPM). The 2007 Base MPCPM has been used as the base for this project. Project Case Scenarios with 396 Lane Cove Road for the AM and PM peak period have been developed by Arup based on City of Ryde's Traffic Impact Assessment Process For Macquarie Park Corridor Development Applications and Macquarie Park Corridor Paramics Model User Manual.*

Calibration and Validation of the Traffic Model

Model Base: *N/A*			***Size of Model (Calibration Base[1[1]])***		
Year			*Number of Zones*		
Traffic flow units			*Number of Links*		
Time Dependent Model	*Yes* ☐	*No* ☐	*Number of Nodes*		
Modelled time period(s)			*Number of Modelled Junctions*		
			Number of Signals	*FT*	*VA*

Calibration and Validation Statistics

Have modelled flows and travel times been validated to acceptable standards?			*Yes* ☐	*No* ☐
If "yes" please specify the standards adopted?	*NSW* ☐	*UK DMRB* ☐	*Other* ☐	
If "other" please specify				
Are results reported in Model Validation Report?			*Yes* ☐	*No* ☐

Model Trip Database[2[2]]

Type	***No.***	***Date***	***Type***	***No.***	***Date***
Roadside Interviews			*SCATS Counts*		
Registration Number Survey			*Link Count Only*		
Manual Classified Counts			*Commercial Vehicle Survey*		
Automatic Traffic Counts			*Postcard Questionnaires*		
Junction Counts			*Household Interviews*		

Matrix Estimation Techniques used

Link and Junction Count only	
Observed Matrix	
Synthetic Matrix (give details)	
Partial Matrix (give details)	
Combination of Observed and Synthetic (give details)	
Other (please specify)	

Present Year Validation

Is the model base year more than three years earlier than the current year?	*Yes*	*No*
If yes, has a Present Year validation been undertaken?	*Yes*	*No*

[1[1]] Please ensure the Local Model Validation Report contains a network diagram showing numbered links and nodes, for both base and design.
[2[2]] Please list counts used to derive base year matrices as detailed in the Traffic Survey.

Details of Sub-models (software) used	Application Name	Version
Traffic assignment model		
Trip End Model		
Mode Choice Model		
Other (please specify)		

MODEL INPUT

This section lists changes made to default values (either Paramics default values or NSW default values). Please indicate which default values were used and what changes were made to the Paramics files and comment on the reasons for the changes.

Run Initialisation

Configuration File

Tick default used

NSW Paramics ☐
Paramics ☐
Other ☑

List and comment on changes where applicable.

Description	***Paramics Default Values***	***NSW Paramics Default Values***	t	*Other non default values*	
				Values Used	*Comment on reason for changes*
Mean Headway	1.0	1.0			
Mean reaction time	1.0	1.0			
Demand weight	100.0	100.0			
Demand matrix tuning level	0	0			
Curve speed factor	1.0	1.0			
Amber time	3.0	3.0			
Timestep detail	2	2			
Cost Coefficients	1,0,0	1,0,0			
Feedback	disabled	disabled		2 min	as per Base MPCPM
Perturbation	disabled	disabled		Square root	as per Base MPCPM
Generator	0	0			

Behaviour File

Have the "aggression" levels been changed from the default normal distribution? Yes ☐ No ☑
Have the "awareness" levels been changed from the default normal distribution? Yes ☐ No ☑
If "yes", please provide comments on reasons for changes.

"Behaviour" File	*Comment on reasons for changes*
Aggression	
Awareness	

Network

Categories File

Tick default used NSW Paramics ☑
Paramics ☐

Were changes made or additional categories used? Yes ☐ No ☑
If "yes" or if a new set of categories were defined, please complete the following table.

List Changes or Additional Categories	
Category Number	*Reason for changes*

(please use additional sheet if necessary)

Next Lanes File

Was the default lane mapping changed? Yes ☐ No ☑
If "yes", please complete the following table with reference to the "nextlanes" file.

Lane mapping, "nextlanes" file	
Node Number	*Reasons for changes from default*

(please use additional sheet if necessary)

Signposts File

Was the look ahead lane/route choice changed? Yes ☑ No ☐

If "yes", please complete the following table with reference to the "hazards" (signposting) file.

Lane/route choice, "hazards" (signposting) file.	
Link Number	*Reasons for changes from default*
425:444	Priority coding corrected to reflect actual configuration
446:444	Priority coding corrected to reflect actual configuration
445:444	Priority coding corrected to reflect actual configuration

(please use additional sheet if necessary)

Restriction File

Have network restrictions been modelled? Yes ☑ No ☐

If "yes", specify the location and type of the restriction in the following table.

Network restriction, "restrictions" file	
Link Number	*Description of coded restrictions*
	Network restrictions as per the MPCPM

(please use additional sheet if necessary)

Demand

Vehicles File

Tick default used NSW Paramics ☑
Paramics ☐

Were changes made or were additional vehicle types used? Yes ☑ No ☐
If "yes" or if a new set of vehicle types were defined, please list changes and complete the following table.

List Additional Vehicle Type							
No.	*Type*	*Speed (kph)*	*Matrix*	*Proportion*	*Perturbation*	*Familiarity*	*Colour*
21	car	unchanged	2	100	5	25	gray

(please use additional sheet if necessary)

Incidents File

Have incidents been coded? Yes ☐ No ☑
If "yes", please describe the type of incident, the location, and explain why incident modelling has been included.

Incidents File		
Type	*Location*	*Comment*

(please use additional sheet if necessary)

Summary of OD Data input to Paramics

Please complete the following tables for trip matrices and vehicle proportions.

Trip Matrices

Time Period	*Year*	*Profile Number*	*Profile Interval (mins)*	*Proportions per Interval*	*Corresponding OD movements (e.g. all, zones 2 to 4, etc.)*
all		1	15	25 %	all

(please use additional sheet if necessary)

Vehicle Classification Proportions

Time Period	*Year*	*Matrix No.*	*Vehicle Type / Trip purpose*	*Proportion*	*Matrix Totals (vehicles)*
all		1	car	90	
all		1	MRV	5	
all		1	HRV	3	
all		1	Articulated	2	
all		2	Car_81 (396 Lane Cove Road)	100	

(please use additional sheet if necessary)

Assignment

Generalised cost equation		(1 x T) + (0 x D) + (0 x P)					
Assignment method (please tick)		*All or nothing*					
		Stochastic		√ ✔	*or %*		
		Dynamic Feedback	✓	*Feedback interval (minutes)*		✓	2

Vehicle Type	*Percentage Familiar*	*Perturbation*
Car	25	5
MRV	25	5
HRV	25	5
Articulated	25	5
Car_81	25	5

Routing Table Number	*Familiar / Unfamiliar*	*Describe Restriction Criteria (e.g. taxi only, 2T weight limit)*	*Vehicle Types which Restrictions apply to*

(please use additional sheet if necessary)