Traffic Impact Assessment

Mixed-Use Commercial & Retail Development

Stage 1A– 6 Australia Avenue, Sydney Olympic Park

Reference: 12.062r01v01 Stage 1A

traffix
traffic & transport planners

po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
abn: 66065132961

Document Verification

Job Number:	12.062			
Project:	6 Australia Avenue, Sydney Olympic Park– Stage 1A			
Client:	Capital Corporation			
Revision		Initials	Date	Signature
Report V01	Prepared by:	JM	14/05/2013	
	Checked by:	GP	14/05/2013	
	Approved by:	GP	14/05/2013	

traffix
traffic & transport planners

po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
abn: 66065132961

Contents

1. Introduction

TRAFFIX has been commissioned by Capital Corporation to undertake a traffic impact assessment in support of a development application relating to a mixed use development located at 6 Australia Avenue, Sydney Olympic Park. The development is located within the Sydney Olympic Park Authority (SOPA) and has been assessed under their controls and the RMS's Guidelines.

TRAFFIX has previously prepared a Preferred Project Report and Transport & Accessibility Impact Assessment report in support of the Stage 1 Project Application for the subject site 43/44 Sydney Olympic Park. The subject Stage 1A parking requirements have been assessed with regard for the approved Stage 1 application, as the basement car park has been modified to accommodate the additional requirements of the Stage 1A development.

This report now documents the findings of our investigations in relation to Stage 1A of the development and should be read in the context of the Environmental Impact Statement prepared separately for State Significant Development. The development is a major development and does require referral to the RMS under the provisions of SEPP (Infrastructure) 2007.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Responds to the DGR's
- Section 9: Responds to RMS comments
- Section 10: Presents the overall study conclusions.

2. Location and Site

The site is located on the western side of Australia Avenue between Herb Elliott Avenue to the north and Figtree Drive to the south and is within Sydney Olympic Park. A commercial and retail development lies opposite the site across Herb Elliott Avenue and the Olympic Park railway station is less than 200 metres to the north-west of the site.

The site has an northern frontage of 70.6 metres to Herb Elliott Avenue, a western boundary of 97 metres to the future road 16, a southern site boundary of 79 metres to New Road 10 and an eastern boundary to Australia Avenue of length 83 metres. There are currently two driveway crossings accessing the site from Australia Avenue.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

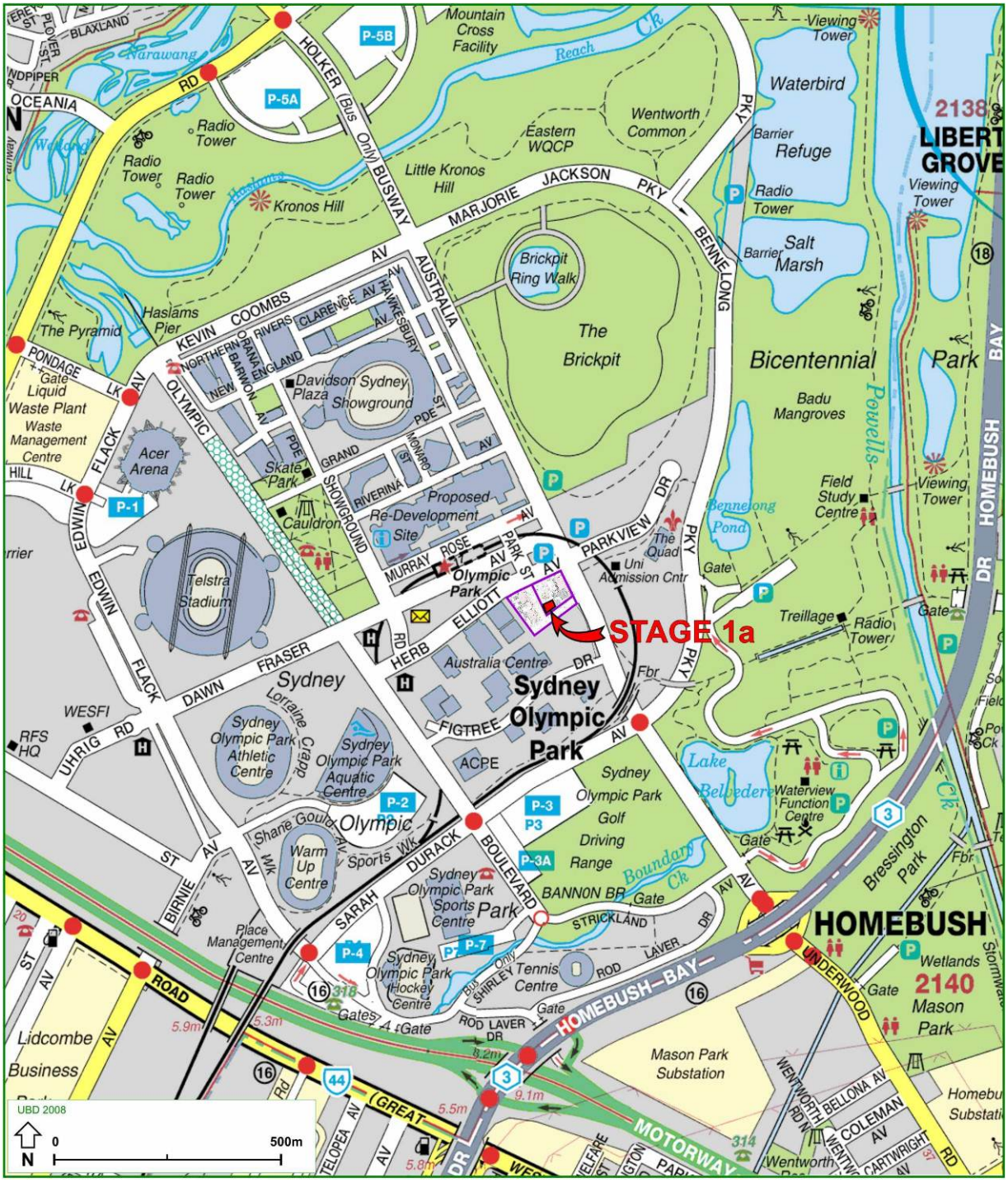


Figure 1: Location Plan

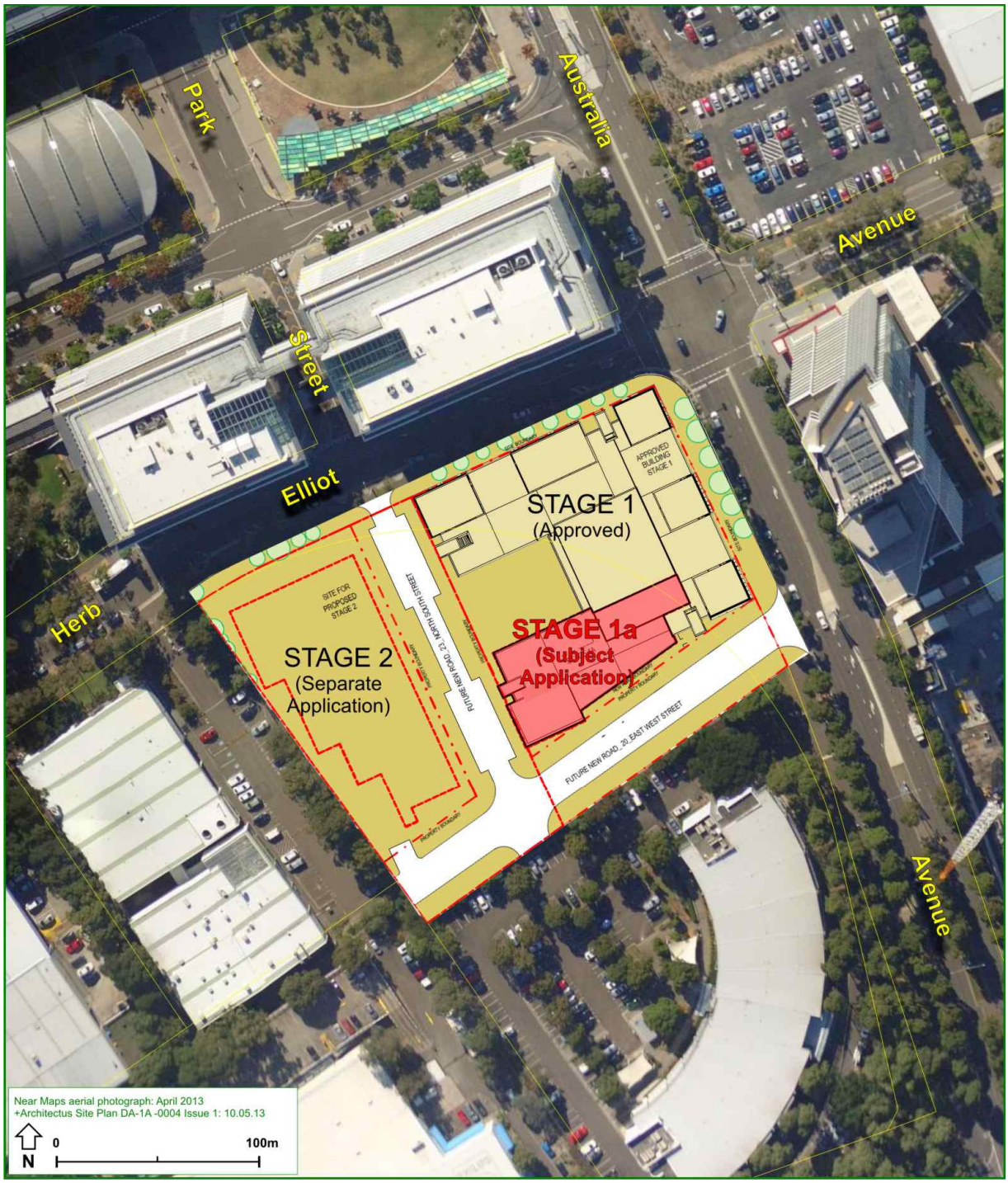


Figure 2: Site Plan

3. Existing Traffic Conditions

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- The Western Motorway: an RMS State Road (MR 6004) that generally runs in an east-west direction, forming a primary arterial link between Sydney and its western suburbs. The Western Motorway runs between Strathfield in the east and Penrith in the west and carries 83,800 vpd in the vicinity of the site;
- The Great Western Highway: an RMS State Road (MR 5) that generally runs in an east west direction, following a parallel path to the Western Motorway. The Great Western Highway carries 58,700 vpd in the vicinity of the site;
- Homebush Bay Drive: a local road that generally runs in a north-south direction between Holker Street in the north and Homebush Bay Drive in the south.
- Hill Road: a local road that generally runs in a north south direction between The Great Western Highway in the south and Burroway Road in the north.
- Australia Avenue: a local road that generally runs in a north-south direction between Holker Street in the north and Homebush Bay Drive in the south. Two site accesses are currently situated on Australia Avenue.
- Herb Elliott Avenue: a local road that generally runs in an east-west direction linking Australia Avenue in the east with Olympic Boulevard in the west
- Parkview Drive : a local road that generally runs in an east-west direction linking Australia Avenue in the east with Olympic Boulevard in the west.

- Olympic Blvd: an local that runs in an north-south direction between the intersection of Kevin Coombs Avenue/Edwin Flack Avenue in the north and Sarah Durack Avenue in the south.
- Kevin Coombs Avenue a local road that generally runs in an east west direction linking Marjorie Jackson Parkway in the east and Edwin Flack Avenue in the west.
- Marjorie Jackson Pky: a local road that runs in an easterly direction from the unsignalised intersection of Australia Avenue, Kevin Coombs Avenue and Holker Bus way and traverses in a loop to intersect with the junction of Sarah Durack Avenue and Australia Avenue in the south.
- Holker Street: a local road that runs in an east-west direction between Hill Road and Silverwater Road to the southwest of site.

It can be seen from **Figure 3** that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.

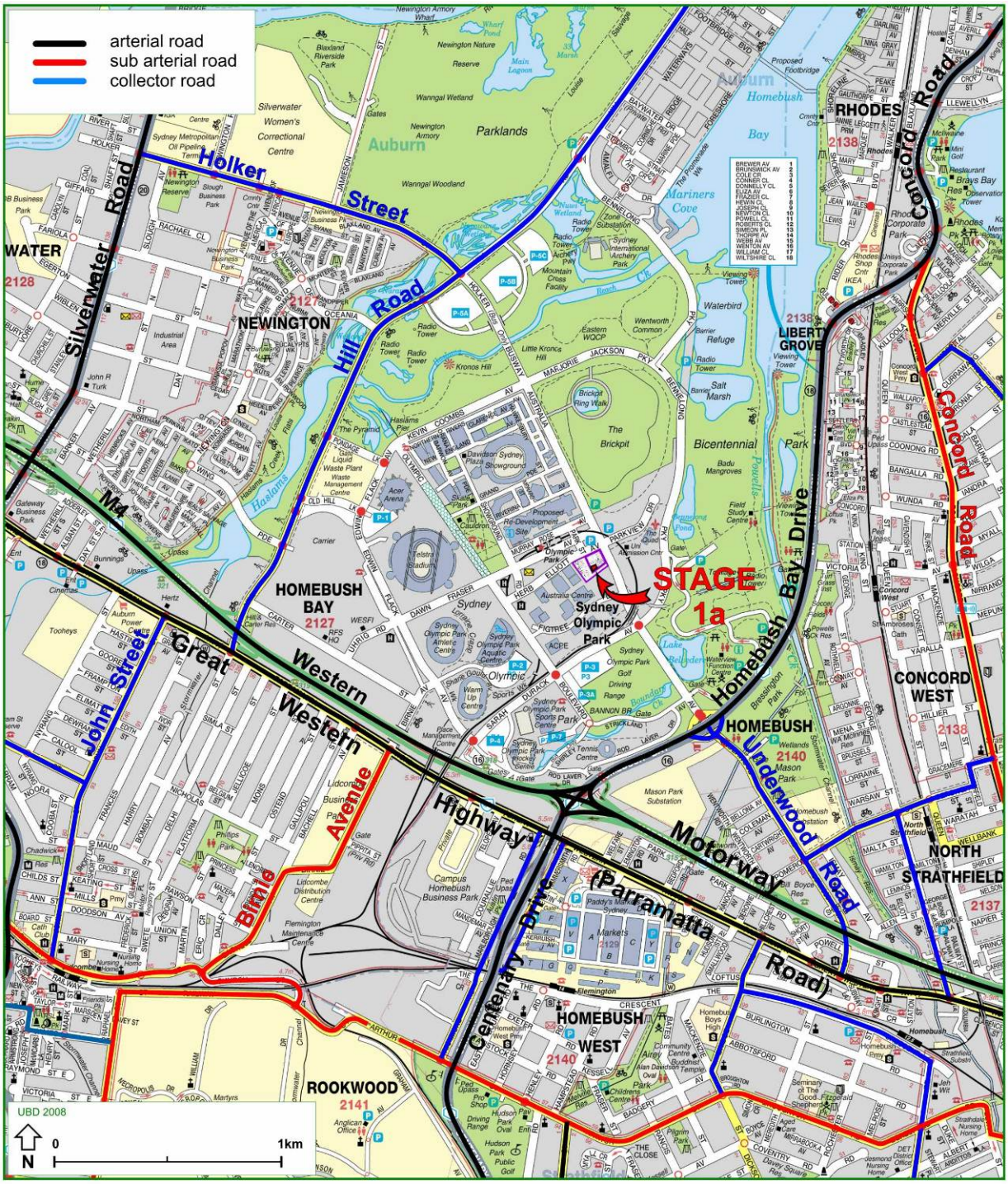


Figure 3: Road Hierarchy

3.2 Public Transport

The existing public transport that operates in the locality is shown in **Figure 4**. It is evident that the site benefits from good access to the public transport system with the following amenities provided in the Olympic Park:

- Bus services to Lidcombe, Parramatta and Chatswood via Ryde.
- Bus stops on Australia Avenue adjacent to the development and on Murray Rose Avenue adjacent to the railway station.
- The Olympic Park Railway Station is less than 200 metres to the north-west of the site from Australia Avenue. This line provides links to Lidcombe which in turn provides access to the overall metropolitan rail network.

These services will ensure a very high level of public transport accessibility.

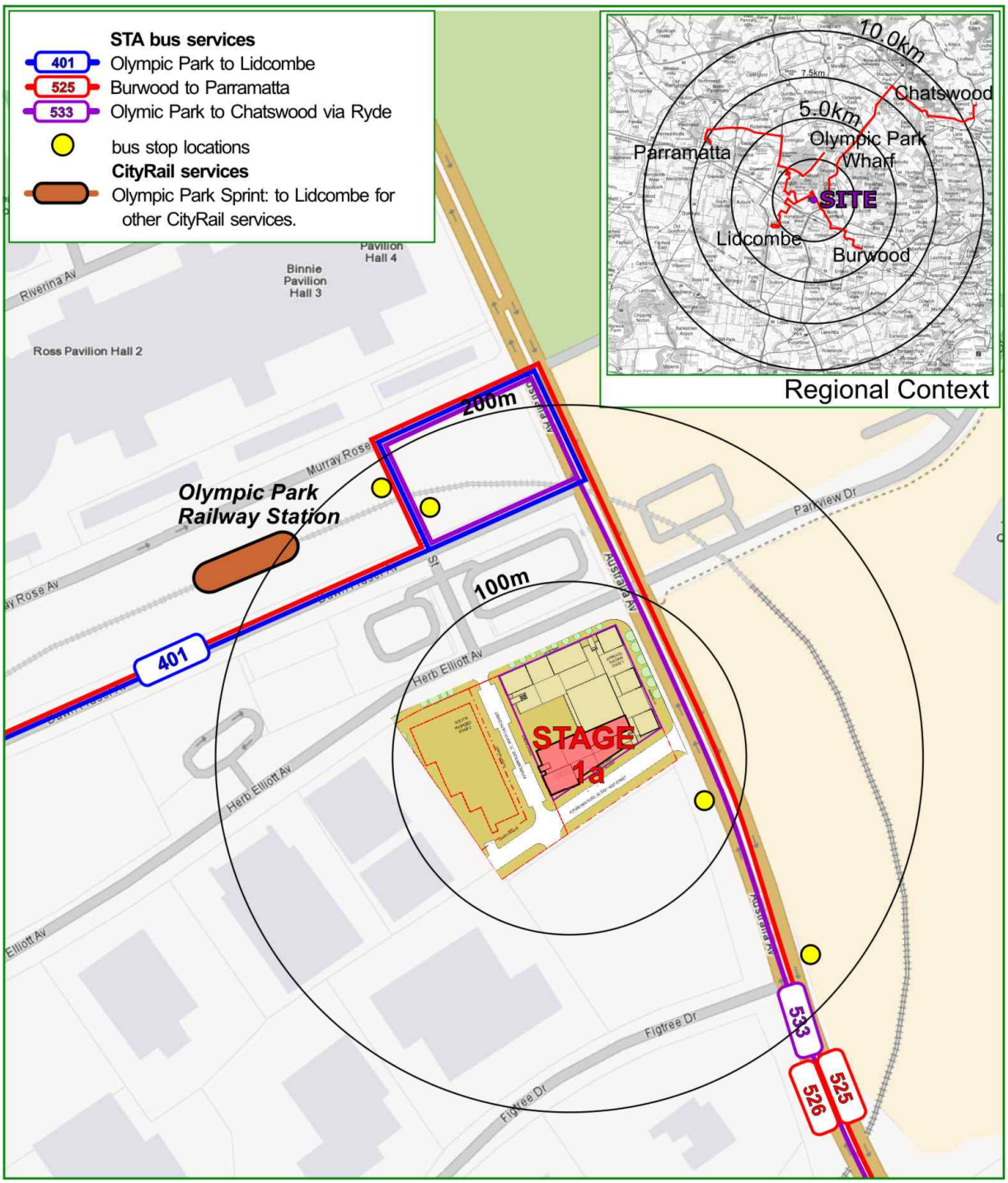


Figure 4: Public Transport

3.3 Existing Site Generation

The existing warehouse development (which is now vacant) occupied 977.8 m^2 GFA of Warehouse and 4845.2 m^2 GFA of office area. Application of the RMS Guideline Warehouse trip rate (0.5 trips per 100m^2) and associated commercial trip rate (2 trips per 100 m^2) for the additional floor area exceeding 20% of the warehouse area results in a generation of 84 vehicle trips per peak hour. This generation has been reduced by a factor of 30% taking into account the parking provision on site and results in a peak period generation of 59 veh/hr for the warehouse development. Taking the above into consideration, the existing warehouse generated:

- AM Peak 59 trips per hour (47 in, 12 out) during the morning peak and;
- PM Peak 59 trips per hour (12 in, 47 out) during the afternoon peak.

3.4 Existing Intersection Modelling Assessment

The scope of the analysis originally undertaken for the Stage 1 Project Application examined other intersections that are expected to be impacted and apart from the Australia Avenue, Parkview Drive and Herb Elliott Avenue, the following intersections were previously identified as the most critical intersections and have also been assessed:

- Herb Elliott Avenue and Olympic Boulevard
- Australia Avenue, Kevin Coombs Avenue, Holker Street and Majorie Jackson Parkway
- Australia Avenue, Bennelong Parkway and Sarah Durack Avenue
- Hill Road and M4 Off Ramp

The survey results were analysed using the SIDRA computer program to determine their performance characteristics under existing traffic conditions. These results are provided below in **Table 1.**

The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

DOS - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LOS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:

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

Table 1: Existing Intersection Performances: AM and PM Peak Hour

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Herb Elliott & Australia Ave	AM	Signals	0.472	16.9	B
	PM		0.552	15.7	B
Herb Elliott & Olympic Blvd	AM	Give-way	0.013	8.8	A
	PM		0.437	11.9	B
Australia Ave & Kevin Coombs	AM	Stop (Two-way)	0.040	16.0	B
	PM		0.015	14.4	A
Australia Ave & Sarah Durack	AM	Signals	0.643	22.8	B
	PM		0.910	41.0	C
Hill and M4 Off-Ramp	AM	Give-way	1.078	112.9	F
	PM		0.727	18.7	B

It is noted that the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the development proposed under this application, as discussed further below.

4. Description of Proposed Development

A detailed description of the proposed development is provided in the Environmental Impact Statement prepared separately for State Significant Development. In summary, the Stage 1A development for which approval is now sought comprises the following components:

- Construction of a building facing New Road 10 with a total area of 6.489m^2 (GFA) comprising of a 7 storey commercial development with ground level café/retail of 409m^2 (NLA).
- The provision of basement level car parking with a total of 59 spaces for Stage1A
- Access to the basement car park located on New Road 10 (as approved under the Stage 1 application).
- Access to the loading dock from New Road 10 (as approved under the Stage 1 application).

The traffic and parking impacts arising from the development are discussed in Sections 5 and 6. Reference should be made to the plans submitted separately to SOPA which are presented at reduced scale in **Appendix B.**

5. Parking Requirements

5.1 SOPA Controls – Stage 1A

The Sydney Olympic Park Authority requires parking for commercial and retail uses to be determined at the maximum rates shown in **Table 2**:

Table 2: Stage 1A SOPA Parking Rates & Provision

Type	Area	SOPA Parking Rates	Spaces Required	Spaces Provided
Stage 1a Commercial	6,489m^2 GFA	1 space per 80m^2	81	53
Stage 1a Retail	409m^2 NLA	1 space per 50m^2	8	6
		Totals	89	59

It can be seen that with a total GFA of 6,489m^2 of commercial area and 409m^2 of retail area (NLA), a maximum provision of 89 parking spaces is required. The development provides a total of 53 commercial parking spaces and 6 parking spaces for the retail parking component. This additional retail parking allocation will amalgamate with the approved 21 parking spaces that have been provided within Stage 1 approval. The basement car park that will serve both Stage 1 and Stage 1A and the overall car park provision is discussed below in Section 5.2 demonstrating compliance with SOPA's parking controls.

5.2 SOPA Controls – Overall Development

The overall development site includes the approved Stage 1, the subject Stage1A application and the separate Stage 2 application. **Table 3** below demonstrates the overall parking provision for the site.

Table 3: Overall Development SOPA Parking Rates & Provision

Type	Area	SOPA Parking Rates	Spaces Required	Spaces Provided
Approved Stage 1 Commercial	15,269 m^2	1 space per 80m^2	191	204
Approved Stage 1 Retail	256 m^2	1 space per 50m^2	5	5
Approved Stage 1 Supermarket	541 m^2	1 space per 25m^2	22	16
Stage 1a Commercial	6,489m^2 GFA	1 space per 80m^2	81	53
Stage 1a Retail	409m^2 NLA	1 space per 50m^2	8	6
Stage 2 Commercial	15,657 m^2 GFA	1 space per 80m^2	196	213
Stage 2 Retail	712m^2 NLA	1 space per 50m^2	14	9
		Totals	522	504

It is evident from the above that the full development requires a maximum provision of 522 parking spaces and in response the development provides 504 parking spaces in compliance with the SOPA parking controls.

5.3 Disabled Parking

All disabled parking is designed in accordance with AS 2890.6 (2009) and are provided with a 2.4 metres width with a 2.4 metre shared area. It is reasonable to assume that 2-3% of all parking should be provided as disabled parking and this would require between 6 to 9 disabled parking spaces. In response, the basement car park for Stage1 and Stage 1A provides 10 disabled parking spaces (out of a total of 282 parking spaces). Reference should be made to the Accessibility Consultant report for further information.

5.4 Bicycle Facilities

SOPA requires that commercial developments provide a minimum of 1 space per 150m^2 for staff 1 space per 750m^2 for visitors. Bicycle parking areas have been provided on both levels of basement parking as shown in **Table 4** below.

Table 4: SOPA Bicycle Parking Rates & Provision

Type	GFA	SOPA Parking Rates		Spaces Required		Spaces Provided	
		Staff	Visitors	Staff	Visitors	Staff	Visitors
Stage 1A Commercial	6,489m^2 GFA	1 space per 150m^2	1 space per 750m^2	43	9	55	9
			Totals	52		64	

It is noted that the Stage 1 approved development previously provided 101 employee bicycle parking spaces within the basement levels and 22 visitor parking spaces on the ground level. The development now provides 156 bicycle parking spaces within both basement levels which results in a provision of 55 spaces for the commercial employees of the Stage 1A development exceeding the minimum requirements for employees. The development is required to provide 9 visitor parking spaces and these will be provided on the ground level in addition to the approved 22 visitor parking spaces for Stage 1.

In addition to the bicycle parking provision, the development intends to promote alternative modes of transport by providing change-room facilities next to the bicycle parking areas which will in turn encourage sustainable transport options as specified in SOPA's Master Plan 2030.

5.5 Motorcycle Parking

The basement car park levels that will serve Stage 1A and Stage 1 provide 25 motorcycle parking spaces. This represents 9% of the total car park spaces provided and is considered appropriate provision satisfying the requirements of the development.

5.6 Servicing

The loading dock is provided on the southern side of the development with access via Australia Avenue to New Road 10. It is suitable for use by a standard service vehicle of 8.8m as (see **Appendix D**) and as previously discussed with SOPA officers during the Stage 1 application, there are numerous examples of small supermarkets/retail premises that have been approved and are operational with this design vehicle. The servicing requirements of Stage 1 and the subject Stage1a application will therefore be shared using this service area and it is envisaged that a Loading Dock Management Plan (LDMP) can be prepared in response to a suitable condition of consent.

6. Traffic Impacts

6.1 Context

The Masterplan and Stage 1 modelling assessment was documented in the traffic impact assessment during the Stage 1 application (10.228ppr1v1 Preferred Project Report 12.06.08) and assumed full development of the site (Stage 1, 1A and Stage 2) based on 40,679m^2 of commercial area and 797m^2 of retail/supermarket area.

The inherent traffic generation associated with the 'base case' assessment assumed 410 veh/hr during the AM peak and 461 veh/hr during the PM peak. The modelling assessment has been revisited due the detailed design and revised yield of the commercial/retail areas for Stage 1a and Stage 2.

6.2 Trip Generation

6.2.1 Stage 1A Commercial Generation

The estimation of traffic generation has been undertaken using a trips per space assessment and application of the RMS trip rate of 0.8 trips/space/hr has been applied to the commercial parking spaces. It is noted that the RMS had previously raised concern with regard to a 'trip per space assessment' noting that this does not take into account additional trips that may occupy on-street parking. However, this is not accepted in circumstances where:

- The parking is predominantly for tenants of the development. These tenants will not be able to use on-street parking which is subject to short term on-street parking restrictions within Sydney Olympic Park.
- Visitor parking is moderate and visitors associated with the site would generally travel between peak periods and not contribute significantly to peak period congestion;
- The principle of generating trips that are associated with on-street parking should be opposed as a matter of policy within SOPA. That is, SOPA is actively pursuing policies to limit on-street parking

and drive Government policy to promote alternate travel modes. The RMS requirement to include this traffic in any assessment is counter-productive and takes no account of restrictive policies which are appropriate, supportable and effective within SOPA;

- Even if on-street parking were to occur, this would be a short term situation and over time, on-street parking within SOPA can be expected to become more, rather than less, restrictive; and
- The traffic generation within SOPA is known from surveys to be less than 0.8 trips/space/hr, so that there is already a safety margin embodied in the assessment.

Having regard for the above, the use of 0.8 trips/space/hr (which is the effective RMS trip rate under its Guideline) is therefore considered appropriate and has been used to assess the commercial land use component. The commercial area for Stage 2 will therefore generate trips as follows:

- AM Peak 42 trips per hour (34 in, 8 out) during the morning peak; and
- PM Peak 42 trips per hour (8 in, 34 out) during the afternoon peak.

6.2.2 Stage 1A Retail Trip Rates & Generation

Stage 1A proposes 409m^2 of retail area (NLA) which may be defined as secondary retail area. A trip rate of 3 trips per space during the critical PM peak period is considered appropriate (as adopted in Stage 1) and this is based on the RMS's Guideline and is also underpinned by more recent survey data. Trips during the AM peak will be about 20% of these trips and will relate mainly to staff arrivals/departures. When applied to the 6 retail spaces as per the SOPA parking controls, this will therefore generate approximately 4 trips during the AM and 18 trips during the PM peak periods. . Accordingly, the retail uses in Stage 1A are predicted to generate trips as follows:

- AM Peak 4 trips per hour (2 in, 2 out) during the morning peak; and
- PM Peak 18 trips per hour (9 in, 9 out) during the afternoon peak.

6.2.3 Stage 1A - Combined Uses

The Stage 1A development (commercial and retail) will therefore generate the following trips during peak periods:

- AM Peak 46 trips per hour (36 in, 10 out) during the morning peak (7-8am) and;
- PM Peak 60 trips (17 in, 43 out) during the afternoon peak (4:15-5:15pm).

These trips will be associated exclusively with the access routes onto Australia Avenue (as per the Stage 1 approval) and will also benefit from the construction of New Road 16 (as part of the Stage 2 DA) providing access onto Herb Elliott Avenue.

6.3 Overall Generation (Stage 1, Stage 1a & Stage 2)

Taking the above into consideration, the overall site (all stages including the approved Stage 1) is now expected to generate:

- AM Peak 396 trips per hour (310 in, 86 out) during the morning peak (7-8am) and;
- PM Peak 461 trips (118 in, 343 out) during the afternoon peak (4:15-5:15pm).

6.4 Peak Period Intersection Performances

It is emphasised that the 396 veh/hr during the AM peak and the 461 veh/hr during the PM peak does not take into account the warehouse development that was operational during the survey period as discussed in Section 3.3. With this in mind, the net increase would be as follows:

- AM Peak 337 trips per hour (263 in, 74 out) during the morning peak and;
- PM Peak 402 trips per hour (106 in, 296 out) during the afternoon peak.

The external traffic impacts arising from this additional traffic is assessed further below. However, it is highly significant that the net additional traffic generation assessed under the Preferred Project Report was 410 veh/hr during the AM peak and 461 veh/hr during the PM peak and this reflects the changed land uses, as well as the fact that the existing generation associated with the warehouse use was not discounted previously, in order to assess a worst case scenario. Thus, the development traffic is now *reduced by about 18% in the AM Peak and 13% in the PM Peak*.

These reduced trips have been distributed onto the existing road network on the basis of journey to work data and having regard for the attractiveness of available routes with the following assumed distributions. These results are provided below in **Table 5** below.

Table 5: Existing Plus Development Intersection Performance: AM & PM Peak (RMS Rates)

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Herb Elliott & Australia Ave	AM	Signals	0.472	17.3	B
	PM		0.742	17.6	B
Herb Elliott & Olympic Blvd	AM	Give-Way	0.038	9.0	A
	PM		0.576	13.5	A
Australia Ave & Kevin Coombs	AM	Stop (Two-way)	0.044	16.9	B
	PM		0.016	14.8	B
Australia Ave & Sarah Durack	AM	Signals	0.750	23.1	B
	PM		0.975	50.3	D
Hill and M4 Off-Ramp	AM	Give-Way	1.228	112.9	F
	PM		0.769	19.9	B

It is evident that the traffic impacts from the proposed development will generally have a minor effect on the road network and the traffic modelling undertaken is still based on a worst case assessment, with the adoption of 0.8 trips/space/hr. The 337 trips generated in the AM peak and the 402 trips in the PM peak are therefore able to be accommodated.

The notable exception is at the M4 Off-Ramp which presently operates at a level of Service F and this will continue until such time as RMS provides improved capacity to serve the ongoing development within Homebush Bay, consistent with its strategic planning responsibilities. Specifically, the Master Plan 2030 identifies that a number of the intersections analysed in this report are to be upgraded gradually as required, the benefits of which are not taken into account in Table 4 above. This includes:

- New M4 East Facing ramp at Hill Road;
- Intersection upgrades for Sarah Durack/Australia Avenue, Herb Elliott Avenue/Australia Avenue and Kevin Coombs Avenue/ Australia Avenue; and
- The intersection of Australia Avenue with Homebush Bay Drive has not been separately assessed as it has been extensively assessed previously; and improvements are already proposed and are funded to provide increased capacity.

In a more local context, the assessment in Table 4 indicates that intersection of Australia Avenue and Sarah Durack Avenue reduces slightly to a level of service D in the PM Peak due principally to southbound vehicles on approach on Australia Avenue. However, this remains satisfactory based on RMS Guidelines. Nevertheless, it is considered that the intersection will operate satisfactorily and can accommodate the increased traffic demand.

6.5 Peak Period Intersection Performances – Survey Trip Rates

It is noted that the assessment undertaken in section 6.4 has been undertaken in response to the request by RMS to consider the implications of trip rates using RMS Guideline rates. While the analysis demonstrates a supportable outcome and is relied upon in this report, it is instructive to consider the impacts of reduced traffic generation based on more recent and relevant surveys. Specifically, TRAFFIX previously undertook surveys of the basement car park for Site 8a on Murray Rose Avenue which is considered to be very similar. This survey provided the following results for vehicles entering and exiting the car park:

- AM Peak: 0.4 trips/space/hr (peak 7-8am)

- PM Peak: 0.2 trips/space/hr (peak 4:15-5:15pm)

These rates are supported by additional surveys of Sites 6 and 7 (8 Herb Elliott Avenue) which is directly opposite the site. This site has 712 spaces (although this includes retail and public parking components) but nevertheless yielded significantly lower trip rates those obtained at Site 8a. Based on these reduced trip rates, the following traffic generation arises:

- AM Peak 150 trips per hour (114 in, 36 out) during the morning peak; and
- PM Peak 133 trips per hour (55 in, 78 out) during the afternoon peak.

These development trips are substantially lower than those assessed using the RMS 'standard' trip rates which are outdated, being based on surveys that are over 25 years old. If these trip rates were to occur, the analysis provided in **Table 6** would occur**.**

Table 6: Existing Plus Development Intersection Performance: AM & PM Peak (Survey Rates)

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Herb Elliott & Australia Ave	AM	Signals	0.472	17.1	B
	PM		0.598	16.0	B
Herb Elliott & Olympic Blvd	AM	Give-Way	0.026	8.9	A
	PM		0.472	12.3	A
Australia Ave & Kevin Coombs	AM	Stop (Two-way)	0.042	16.4	B
	PM		0.015	14.5	B
Australia Ave & Sarah Durack	AM	Signals	0.749	23.1	B
	PM		0.898	37.1	C

These results provide a very satisfactory outcome at all intersections and while these results are not relied upon, they nevertheless give an indication of the extent of the safety margin that is embodied in the RMS assessment methodology.

6.6 Stage1 & Stage 1A Access Arrangement

It is evident that the left in, left out access arrangement for the intersection of New Road 10 & Australia Avenue will accommodate all entry/exit movements for the approved Stage 1 development and the subject Stage 1A development until such time that Stage 2 is developed along with the New Road 16 providing an additional access route.. In this regard, the opportunity has been taken to identify the impact of the Stage 1A development upon the intersection of New Road 10 & Australia Avenue over and above the Stage 1 approved development. The analysis provided in **Table 7** demonstrates the short term impacts during the Critical PM peak.

Table 7: Intersection Performance: PM Peak (Interim Access Arrangement)

Intersection Description	Period	Control Type	Degree of Saturation	Intersection Delay	Level of Service
Existing Stage 1 Approved Australia Avenue & New Road 10	PM	Give-Way	0.259	9.8	A
Future Stage 1 Approved + Stage 1A Australia Avenue & New Road 10	PM	Give-Way	0.332	10.5	A

It is evident from Table 7 above that the intersection of New Road 10 and Australia Avenue will continue to operate at Level of Service A during the critical PM peak with a negligible increase in delay of 0.7 seconds. It is noted that the intersection is adjacent the right turn bay into 1-11 Australia Avenue however at this stage the flows are unavailable. Nevertheless, the intersection of New Road 10 and Australia Avenue will operate with a left in, left out arrangement as proposed under the Stage 1 approved development.

In summary, the Stage 1A application will have a negligible effect on the intersection which results in an 60 veh/hr (generally 1 vehicle movement every minute) during the PM peak (based on RMS RATES). This is a minor increase over and above the approved Stage 1 application and once the various arrival/departures routes are taken into consideration the effects on the external road network

are reduced and minimised. Notwithstanding this analysis, the impacts are further reduced once the survey trip rates associated with the commercial component is taken into account.

6.7 Summary

In summary, it is evident that the revised scheme results in improved conditions compared with those assessed in the Preferred Project Application (18% lower in the AM Peak and 13% lower in the PM Peak) and that under any assessment criterion, the development impacts associated with all stages are able to be accommodated.

Furthermore, sensitivity analysis has been undertaken to identify the short term impacts upon the intersection of New Road 10 and Australia Avenue for Stage 1 and Stage1A combined. The additional 60veh/hr generated by Stage 1A during the PM peak will have a negligible effect which has been assessed as a net increase over and above the approved Stage 1 development.

7. Access & Internal Design Aspects

7.1 Basement Access

The proposed development requires a Category 2 Driveway under AS 2890.1 (2004), being a combined entry-exit driveway of width 6.0 to 9.0 metres. In response, the development proposes a combined entry-exit driveway of width 6.3 metres with access to New Road 10, thereby satisfying the minimum requirements of AS 2890.1 (2004). The design complies with the requirements of AS 2890.1 (2004) and will ensure satisfactory operation.

7.2 Vehicular Control Point

AS 2890.1 (2004) states that the queuing area to be provided for a car park can be determined from consideration of the number of parking spaces in the car park and anticipated entry/exit flow in the peak periods. In this regard, a first principles assessment has been undertaken to identify the required number of queued cars to be accommodated within the property boundary for the commercial car park and this is provided in **Appendix E**. The analysis demonstrates that 3 queued vehicles will accommodate the 98th percentile for the commercial parking and a queuing area has been provided within the development that can accommodate 4 queued vehicles.

The retail parking is provided with a separate vehicular control point. Table 3.3 of AS 2890.1 (2004) is provided for use for “casual short staying” patronage and has been used to assess the minimum queuing length requirement. It specifies that for a car park of not more than 100 cars “the greater of a minimum of 2 cars or 3% of capacity” should be provided. In response, as the development proposes 27 retail parking spaces (includes Stage 1 approved provision of 21 spaces and the proposed Stage 1A provision of 6 spaces), there is a requirement to provide 2 cars queued area and this is provided within the basement level in accordance with AS 2890.1 (2004).

Basement Levels 1 and 2 are designed to provide a design solution with retail parking secured within a designated area on Basement Level 1. Vehicles associated with the retail parking will turn left once they have entered Basement 1 and vehicles associated with the commercial car park will turn right.

This will be signposted accordingly. Notwithstanding the above, a standard condition of consent requiring that a Signage Plan to be prepared can be imposed as appropriate.

7.3 Service Access

As mentioned in Section 5.5, a loading dock is provided on the southern side of the development with access via Australia Avenue to New Road 10. Swept path analysis has been undertaken of the site access, as is permissible under AS 2890.2 (2002), demonstrating satisfactory operation and this is included in **Appendix D**. The design complies with the requirements of AS 2890.2 (2002) and will ensure satisfactory operation. It should be mentioned that this service access has previously been approved under the Stage 1 application.

7.4 Major Event Impact Assessment Guidelines

Events of varying scale and duration are a regular occurrence in Sydney Olympic Park. On these occasions, road closures will generally have only a minor effect on the proposed development. The Major Event Impact Assessment Guidelines report prepared by SOPA has been reviewed in the context of the subject site in relation to site access. It is noted that Section 2.3.B.6 of the Development Control Requirements for car parking states *"New car parks should have most entry and exit points that provide direct access to the Major Event Loop Road, in order to maximise the effectiveness of event traffic access and egress*". Access to Stage 1A of the development is provided via Australia Avenue/New Road 10 (left in, left out) and also will be provided via Herb Elliott Avenue/ New Road 16. Plan 4 of the guideline (extract provided below in **Figure 5**) demonstrates that the Major Event Loop Road traverses Australia Avenue and ensures that access to the site will be available during these periods.

It is recommended that a condition of consent is imposed requiring a major event traffic statement to be provided and this can be incorporated into a 'Travel Access Guide' whereby the various access routes during these events are provided to all employees/visitors associated with the development.

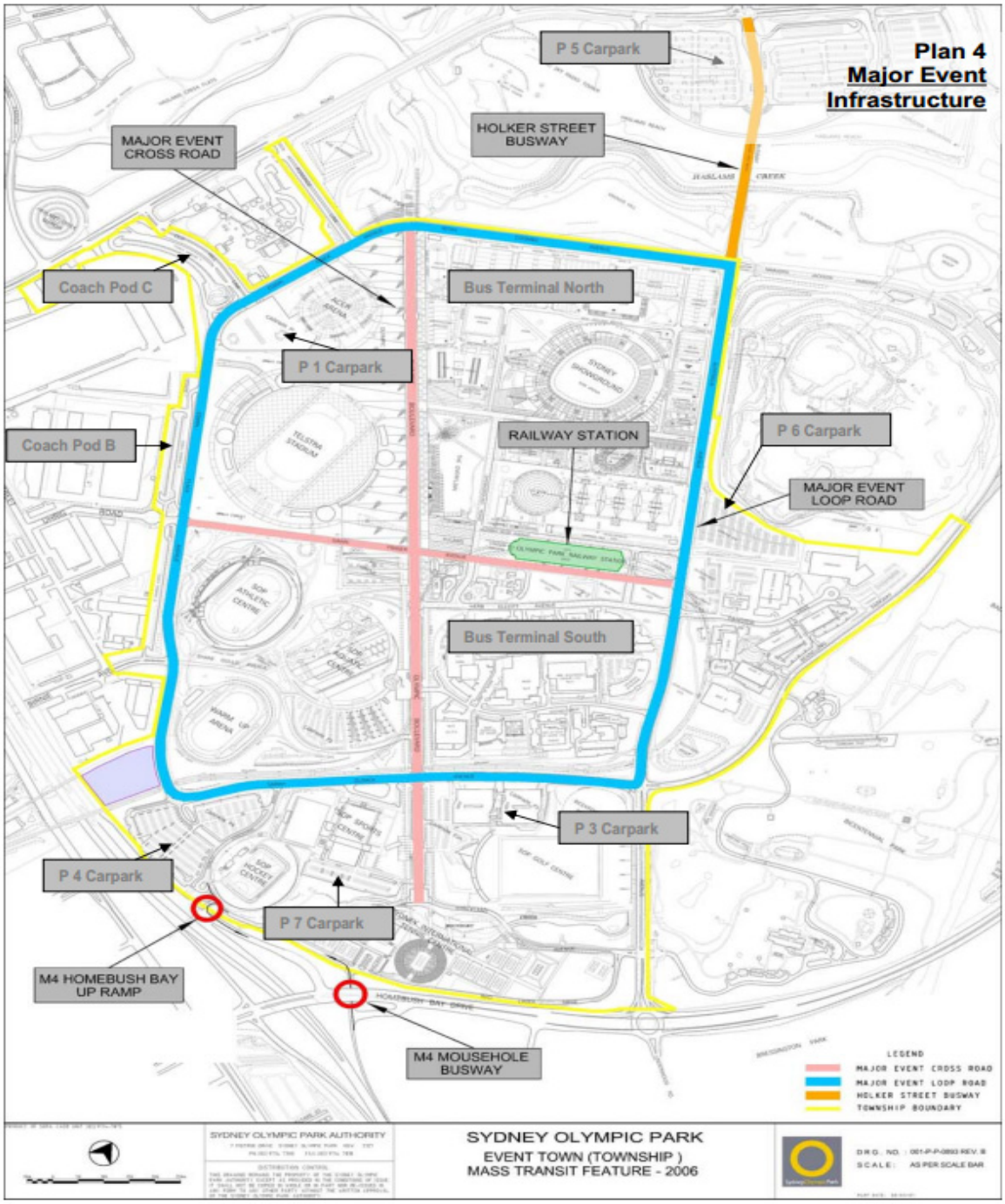


Figure 5: Major Event Infrastructure

7.5 Internal Design

The internal basement car park generally complies with the requirements of AS 2890.1 (2004) and the following characteristics are noteworthy:

7.5.1 Parking Modules

- The commercial parking spaces have been designed in accordance with a Class 1A user and are provided with a minimum space length of 5.4m a minimum width of 2.4m and a minimum aisle width of 5.8m. The parking design is in fact superior to the minimum requirements of AS 2890.1 (2004) and provides 2.5m wide parking bays and 6m aisles.
- The retail parking spaces are wider and are compliant for User Class 3A parking providing a 2.7m space width and a 6.2m aisle width in accordance with AS 2890.1 (2004).
- Small parking spaces have a minimum width of 2.3 metres and a length of 5.0 metres and meet the requirements of AS 2890.1 (2004);
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1.
- All disabled parking spaces are designed in accordance with AS2890.6. Spaces are provided with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m.

7.5.2 Ramps

- All ramps accessing the basement car park have a maximum gradient of 20% (1 in 5) with transitions of 8.3% (1 in 12). These provisions satisfy the requirements of AS 2890.1 (2004) for the car park.

7.5.3 Clear Head heights

- A minimum clear head height of 2.2m is provided for all areas within the basement car park as required by AS2890.1. A clear head height of 2.5m is provided above all disabled spaces as required by AS2890.6.

7.5.4 Other Considerations

- All columns are located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Appropriate visual splays are provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses.
- The internal design complies with the Section 3.4 of AS2890.1 with appropriate queuing areas provided and as discussed in section 7.2.

7.5.5 Service Area Design

- The internal design of the service area has been undertaken in accordance with the requirements of AS 28090.2 for the maximum length vehicle permissible on-site being a 8.8m MRV
- A minimum clear head height of 4.5m is provided within the service area
- A swept path analysis has been undertaken as permissible under AS2890.2 and confirms the internal design. The swept path assessment is included in **Appendix D**.

In summary, the internal configuration of the basement car park and loading areas have been designed in accordance with both AS2890.1 and AS2890.2. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. Response to DGR's

A summary and response to the DGR's is provided below with regard for each traffic item raised.

Detail access arrangements at all stages of operation, including access for service vehicles, and measures to mitigate any associated traffic impacts.

The access arrangements to the Stage 1a development are consistent with the approved Stage 1 development during operation. Access routes available to Stage 1A of the development will be permitted via the intersections of New Road 10/ Australia Avenue (left in, left out arrangement) as approved under the Stage 1 application. In addition, the intersection of New Road 16 and Herb Elliott Avenue (all movements permitted) will be utilised as an access route as part of the Stage 2 application (submitted separately). Service vehicles will utilise the loading area to the south of the development vie New Road 10.

Demonstrate how users of the development will be able to make travel choices that support the achievement of State Plan targets and public transport modal split targets of Master Plan 2030.

The proximity of the site to public transport is well documented as discussed in Section 3.3. As recommended for the Stage 1 project application, it is advised that the Stage 1A development will incorporate a Transport Access Guide (to be formulated under a suitable condition of consent). The TAG will encourage use of bus and rail services; as well as bicycles and car pooling. It is evident that promoting alternate travel modes as discussed above supports the 'minimalist' approach to on-site car parking, based on SOPA rates.

Detail existing pedestrian and cycle movements within the vicinity of the site and determine the adequacy of the proposal to meet the likely future demand for increased public transport and pedestrian and cycle access.

Australia Avenue incorporates a dedicated cycle path along its eastern and western side and connects directly to the development access. Bicycle paths are also found on Sarah Durack Avenue, Kevin Coombs Avenue and Holker Busway. It is evident that the Olympic Park is well served by bicycle paths and these dedicated paths, along with the provision of bicycle parking bays and changing facilities, will encourage employees to make use of these facilities

In addition, Pedestrians can utilise the signalised crossing located at the signalised intersection of Herb Elliott Avenue and Australia Avenue. There are also existing pedestrian facilities provided on either side of Herb Elliott Avenue in the form of dropped Kerbs as shown in Appendix A.

The provision of a future zebra crossing requires certain warrants to be met and therefore the pedestrian volumes and desire lines that will be generated as part of the development is unable to be assessed until such time that the development is operational. In this regard, it is considered that the existing pedestrian facilities that are provided are appropriate. An assessment can be undertaken to validate if the provision of a zebra crossing is necessary once the development is operational.

Bicycle storage facilities are to be provided for Stage 1A and these are indicated on the submitted plans. The provision of these facilities along with changing facilities for users will only encourage their use and further promote a non-car transport mode.

The NSW Planning Guidelines for Walking and Cycling recognises that there are opportunities to "promote walking and cycling within workplaces" by providing a Transport Access Guide (TAG). "as part of the development approval". It is again recommended that a condition of consent is imposed requiring a TAG to be provided in order to promote alternative methods of transport.

Describe the measures to be implemented to promote sustainable means of transport including public transport usage and pedestrian and bicycle linkages in addition to addressing the potential for implementing a location specific sustainable travel plan.

As discussed above, a Transport Access Guide/Workplace Travel Plan will be undertaken for the development and is to be formulated under a suitable condition of consent

Demonstrate the provision of sufficient on-site car parking having regard to the availability of public transport and car parking controls of Master Plan 2030. (Note: reduced car parking provision maybe supported in areas well serviced by public transport.)

Parking is essentially provided at the SOPA rate which is a moderate level of provision (generally only 50% of the RMS 'unrestrained' requirement in relation to the commercial use, so that parking is suppressed to a significant extent.

Estimate the total daily and peak hour trips generated by the proposed development, including accurate details of the current and future daily vehicle movements and assess the impacts of the traffic generated on the local road network, including intersection capacity and any potential need for upgrading or road works, having regard to local planning controls.

The estimated peak hour trips have been documented for the Stage 1A development and for full development of the site in Sections 6. The RMS guidelines specify that the evening peak period is generally 20% of the total daily trips. In this regard, it is estimated to that the overall commercial development will generate 1,870 daily vehicle trips (which include the approved Stage 1 development, the subject Stage 1A development and the Stage 2 development).

Strict application of the RMS guideline daily (Thursday) generation rate of 121 vehicles per $100m^2$ NLA would result in the generation of 2,320 daily trips. This rate is however not considered to be applicable given the site locality and function of the essentially secondary retail that will be ancillary to the commercial development.

Transport and Accessibility (Construction) Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.

It is recommended that a condition of consent is imposed requiring that a detailed Demolition and Construction Traffic Management Plan is prepared. It is anticipated that all such activity will be focussed on Australia Avenue and the Plan will need to be prepared in consultation with the appointed builder. It will need to address requirements during each stage (demolition, site preparation, excavation, construction, fit-out and landscaping) and will need to include consideration of times of operation, truck access routes, site access, average truck frequencies,

truck sizes, parking for construction workers, work zone requirements, pedestrian control, traffic management plans and any road occupancy applications.

Notwithstanding the above, a draft Construction Traffic Management Plan has been prepared separately to this report by Taylor Construction Group for inclusion within the EIS.

In summary, the relevant Policies and Guidelines have been addressed throughout this report with particular attention to the 'Guide to Traffic Generating Developments (RMS)',the EIS Guidelines – Road and Related Facilities (DoPI) and the NSW Planning Guidelines for Walking and Cycling as requested in the DGR's. The EIS Guidelines identify that the Construction and Operational Stage issues to be assessed. As discussed above, the construction issues have been identified in a draft CTMP prepared separately by Taylor Construction Group however a full CTMP report will be prepared as a suitable condition of consent. With regard the operational issues; the external road network has been addressed within the report as well as the adequacy of public transport, pedestrian and cyclist facilities within Sydney Olympic Park.

9. Response to RMS Comments

The RMS provided comment regarding Stage 2 of the 11th January 2013. A summary is provided below with a response to each item also documented.

Consideration should be given to providing pedestrian crossing facilities at Park Street/Herb Elliot Avenue/Future new road 16 as a pedestrian desire line exists between the train station and the proposed development site.

There are existing pedestrian facilities provided on either side of Herb Elliott Avenue in the form of dropped Kerbs as shown in Appendix A. It is confirmed that these facilities will be maintained with the introduction of new road 16. The provision of any zebra crossing requires 'warrants' to be met and therefore the pedestrian volumes and desire lines that will be generated as part of the development is unable to be assessed until such time that the development is operational. In this regard, it is considered that the existing pedestrian facilities that are provided are appropriate. An assessment can be undertaken to validate if the provision of a zebra crossing if necessary once the development is operational.

Future new road 10 is directly opposite the proposed entry to the site at In, Australia Avenue which was recently approved with a right turn bay on Australia Avenue, which poses a potential undesirable vehicular conflict point. This conflict should be investigated and appropriate traffic management measures identified.

Access from Australia Avenue to new road 10 is proposed as left in, left out and this formed the basis of the modelling assessment undertaken for the Stage 1 application. Appropriate signage will be provided to ensure drivers are aware of the left-out turn restriction.

The swept path of the longest vehicle (including garbage trucks) entering and exiting the subject site, as well as the manoeuvrability through the site, shall be in accordance with AUSTROADS. The plans should be submitted to demonstrate that it complies with this requirement.

The largest vehicle to access the Stage 2 development will be an 8.8m MRV and the vehicle will service the site from within the loading dock provided with access from Herb Elliott Avenue. Swept Path Analysis has been undertaken and is provided in Appendix D.

Electronic copy of traffic models should be submitted as part of EA assessment.

The electronic files have been submitted as part of this assessment. The modelling assessment as discussed in section 3.5 and section 6 has been undertaken for full development of the site.

10. Conclusions

In summary:

- The proposed use of the site as a mixed use commercial and retail development is considered appropriate and supportable in traffic/transport planning terms.

- The traffic generation arising from the full development (inclusive of Stage 1, Stage 1a and Stage 2) has been assessed as a net increase over and above existing traffic conditions. The predicted increase is 337 veh/hr and 402veh/hr for the AM and PM peak periods respectively. These trips are based on RMS trip rates and adopt the 0.8 trips per space for the commercial component. it is highly significant that the net additional traffic generation assessed under the Preferred Project Report was 410 veh/hr during the AM peak and 461 veh/hr during the PM peak and this reflects the changed land uses, as well as the fact that the existing generation associated with the warehouse use was not discounted previously, in order to assess a worst case scenario. Thus, the development traffic is now *reduced by about 18% in the AM Peak and 13% in the PM Peak*.

- The modelling assessment undertaken for the site assumes full development and includes Stage 1 (approved), Stage 1a (subject application) and Stage 2 (application to be submitted separately). This assessment has been revisited to identify the improvements from the reduced trip generation from the modelling undertaken during the Stage 1 application (now approved).

- The external road network can generally accommodate the additional traffic generated by the entire site however there are some notable exceptions. The M4 Off-Ramp which operates at a level of Service F and this will continue. In addition, the intersection of Australia Avenue and Sarah Durack Avenue reduces slightly to a level of service D in the PM Peak due to the southbound vehicles using Australia Avenue increasing the queue lengths.

- Sensitivity analysis has been undertaken which adopts trips rates for the commercial component of the development based on surveys undertaken in Sydney Olympic Park. These survey trip rates significantly reduce the traffic generated by the development and the impacts on the external road network as discussed in Section 6.5.

- An additional modelling assessment and sensitivity analysis has been undertaken to identify the short term impacts of Stage 1A over and above the Stage 1 approved development which will access the site via New Road 10 and Australia Avenue. The 60 veh/hr generated by Stage1A

during the critical PM peak will have a negligible effect upon the external road network as discussed in Section 6.6.

- With 59 off-street parking spaces for Stage 1A, the development is compliant with SOPA controls and will contain all parking demands wholly within the site.
- The proposed access driveways comply fully with the requirements of AS 2890.1 (2004).
- The proposed car park complies with the requirements of AS 2890.1 (2004).
- The proposed loading facility complies with the minimum requirements of AS 2890.2 (2002) and can accommodate an 8.8m MRV service vehicle.
- The relevant DGR's and RMS comments have been addressed within Section 8 and Section 9 of this report.

In conclusion, the Stage 1A development is supportable in traffic and transport planning terms. . This conclusion is also relevant to the overall master plan for the site that will accommodate Stage 1 (approved), Stage 2 (separate application) and Stage 1a (subject application).

Appendix A

Photographic Record

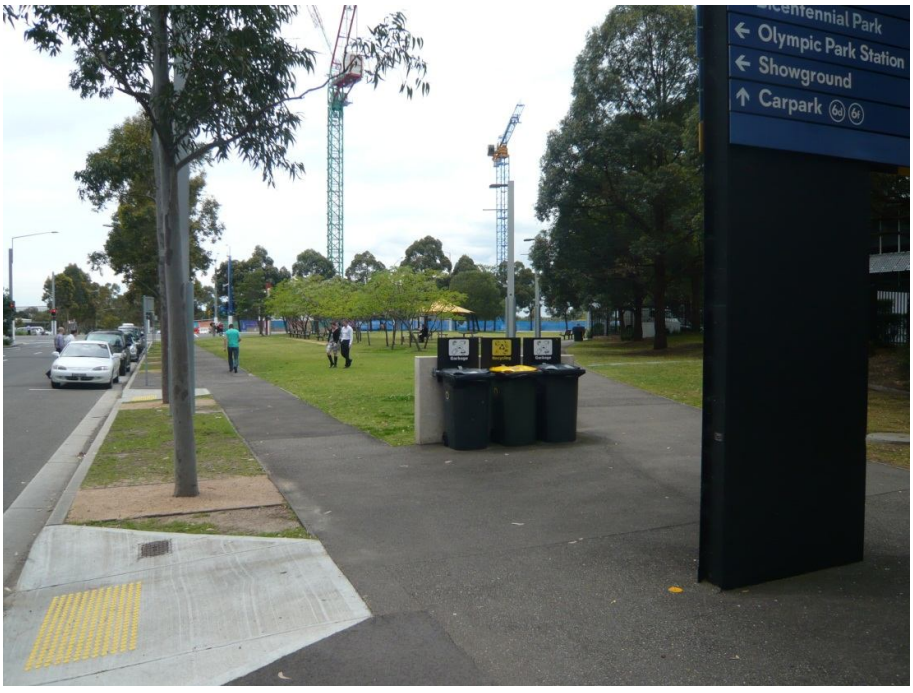
View looking east from Herb Elliott Avenue, with the proposed site to the right of the picture.

View looking south at the intersection of Australia Avenue with Herb Elliott Avenue.

View looking west across the intersection of Herb Elliott and Australia Avenue.

View looking west along Herb Elliott Avenue with site frontage on the left hand side.

View looking west along the Herb Elliott Avenue at the current entrance to the existing warehouse of ‘Silex Solar’.



View looking east from Herb Elliott Avenue at the site for stage 1 of the development.

Appendix B

Reduced Plans

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	Issued for SOPA Submission	10.05.13

KEY

EXTENT OF DA SUBMISSION

DA SUBMISSION

architectus™

Architectus Sydney
Level 3 341 George Street
Sydney NSW 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au

Sydney
Melbourne
Auckland
Brisbane
Shanghai

ABN 11 098 489 448

project

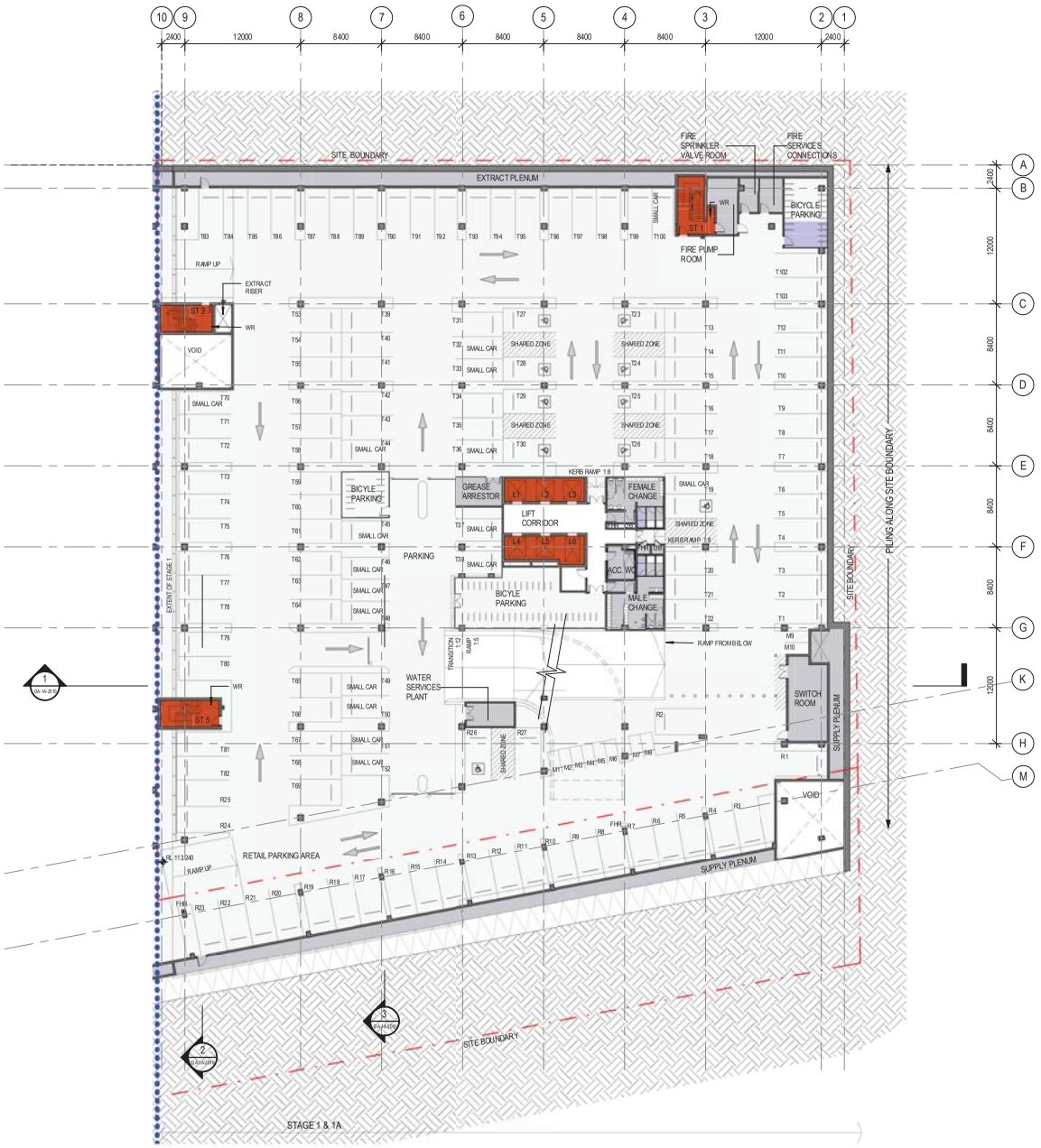
STAGE 1A
6 AUSTRALIA AVENUE
SITE 43/44 SYDNEY OLYMPIC PARK

drawing

GROUND FLOOR PLAN

scale	1 : 250
drawn	DH
checked	AT
project no	090086
drawing no.	**DA-1A-1002**
issue	**A**

10/05/2013 10:37:38 AM



Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	Issued for SOPA Submission	10.05.13

Stage 1A - Basement 1 Parking	
Parking Type	**Count**
Bicycle Space	69
Disabled Retail Space	1
Disabled Tenant Space	9
Retail Carspaces	27
Small Carspaces	18
Tenant Carspaces	75
Grand total: 199	199

KEY

TO BE BUILT UNDER STAGE 1A

DA SUBMISSION

architectus™

Architectus Sydney
Level 3 341 George Street
Sydney N.S.W. 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au

ABN 11 098 489 448

Sydney
Melbourne
Auckland
Brisbane
Shanghai

project

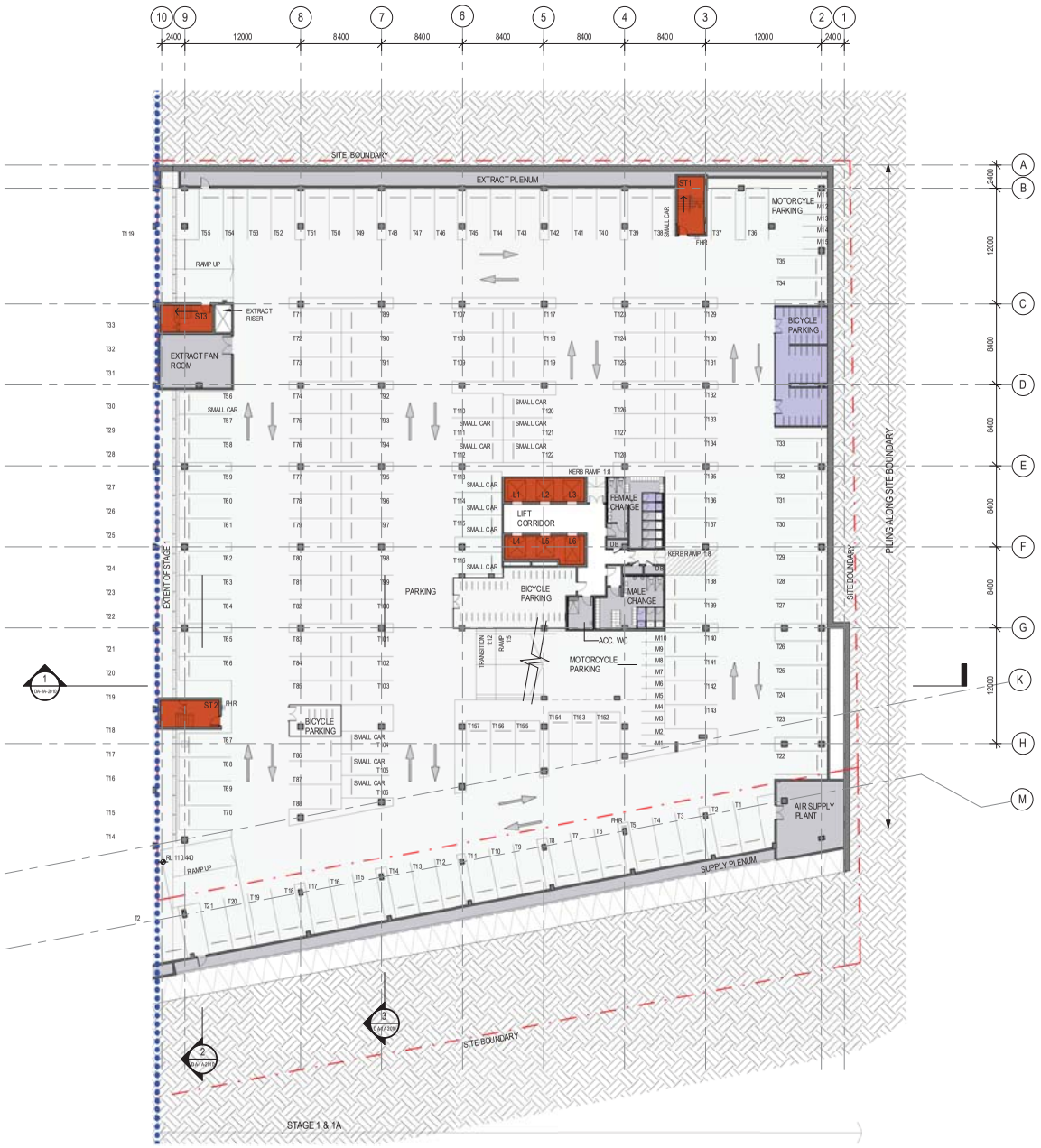
STAGE 1A
6 AUSTRALIA AVENUE
SITE 43/44 SYDNEY OLYMPIC PARK

drawing

BASEMENT 1 PLAN

scale	As indicated
drawn	DH
checked	AT
project no	090086
drawing no.	**DA-1A-1001**
issue	**A**

14/05/2013 11:01:56 AM



Do not scale drawings. Verify all dimensions on site

issue	amendment	date
A	Issued for SOPA Submission	10.05.13

Stage 1A - Basement 2 Parking	
Parking Type	**Count**
Bicycle Space	82
Motorcycle Space	15
Small Carspaces	16
Tenant Carspaces	135
Grand total: 248	248

KEY

TO BE BUILT UNDER STAGE 1A

DA SUBMISSION

architectus™

Architectus Sydney
Level 3 341 George Street
Sydney NSW 2000
T (61 2) 8252 8400
F (61 2) 8252 8600
sydney@architectus.com.au

ABN 11 098 489 448

Sydney
Melbourne
Auckland
Brisbane
Shanghai

project

STAGE 1A
6 AUSTRALIA AVENUE
SITE 43/44 SYDNEY OLYMPIC PARK

drawing

BASEMENT 2 PLAN

scale	As indicated
drawn	DH
checked	AT
project no	090086
drawing no.	**DA-1A-1000**
issue	**A**

13/05/2013 3:00:59 PM

Appendix C

Sidra Intersection Analysis

Appendix c-1

Existing

MOVEMENT SUMMARY

Site: AM Peak Existing Herb Elliott Ave & Olympic Blvd

AM Peak Existing
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	20	6.0	0.020	0.2	LOS A	0.1	0.6	0.15	0.00	56.7
3	R	16	6.0	0.020	8.3	LOS A	0.1	0.6	0.15	0.72	49.0
Approach		36	6.0	0.020	3.8	NA	0.1	0.6	0.15	0.32	53.0
East: Herb Elliot Avenue											
4	L	4	6.0	0.013	8.8	LOS A	0.0	0.3	0.16	0.63	48.3
6	R	9	6.0	0.013	8.5	LOS A	0.0	0.3	0.16	0.58	48.5
Approach		14	6.0	0.013	8.6	LOS A	0.0	0.3	0.16	0.60	48.5
North: Olympic Blvd											
7	L	40	6.0	0.045	8.5	LOS A	0.0	0.0	0.00	0.84	49.0
8	T	42	6.0	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		82	6.0	0.045	4.1	NA	0.0	0.0	0.00	0.41	54.1
All Vehicles		132	6.0	0.045	4.5	NA	0.1	0.6	0.06	0.40	53.1

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 ExistingHerb Elliott Ave & Olympic Blvd

PM Peak Existing
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	132	6.0	0.135	0.8	LOS A	0.7	4.9	0.30	0.00	53.9
3	R	94	6.0	0.135	8.9	LOS A	0.7	4.9	0.30	0.74	48.7
Approach		225	6.0	0.135	4.2	NA	0.7	4.9	0.30	0.31	51.6
East: Herb Elliot Avenue											
4	L	82	6.0	0.437	11.9	LOS A	2.7	19.8	0.51	0.76	45.6
6	R	276	6.0	0.437	11.5	LOS A	2.7	19.8	0.51	0.83	45.8
Approach		358	6.0	0.437	11.6	LOS A	2.7	19.8	0.51	0.81	45.7
North: Olympic Blvd											
7	L	98	6.0	0.123	8.5	LOS A	0.0	0.0	0.00	0.86	49.0
8	T	128	6.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		226	6.0	0.123	3.7	NA	0.0	0.0	0.00	0.37	54.7
All Vehicles		809	6.0	0.437	7.3	NA	2.7	19.8	0.31	0.55	49.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: AM Peak Existing Australia Ave, Herb Elliot Ave & Parkview Drive

AM Peak
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	315	6.0	0.472	21.5	LOS B	6.0	44.1	0.80	0.81	37.9
2	T	301	6.0	0.422	12.7	LOS A	5.6	41.0	0.78	0.66	42.1
3	R	214	6.0	0.458	22.3	LOS B	4.2	30.9	0.81	0.80	37.4
Approach		829	6.0	0.472	18.5	LOS B	6.0	44.1	0.80	0.76	39.2
East: Parkview Drive											
4	L	27	6.0	0.058	15.3	LOS B	0.6	4.6	0.66	0.69	30.8
5	T	13	6.0	0.058	10.7	LOS A	0.6	4.6	0.66	0.49	31.6
6	R	14	6.0	0.047	15.0	LOS B	0.2	1.6	0.65	0.63	30.8
Approach		54	6.0	0.058	14.1	LOS A	0.6	4.6	0.66	0.63	31.0
North: Australia Avenue											
7	L	29	6.0	0.159	19.7	LOS B	1.8	13.3	0.69	0.84	40.7
8	T	193	6.0	0.159	11.2	LOS A	1.8	13.5	0.69	0.55	43.3
9	R	19	6.0	0.064	24.2	LOS B	0.4	2.7	0.78	0.71	36.2
Approach		241	6.0	0.159	13.3	LOS A	1.8	13.5	0.70	0.60	42.3
West: Herb Elliot Avenue											
10	L	13	6.0	0.195	15.7	LOS B	1.1	8.2	0.68	0.70	30.6
11	T	11	6.0	0.195	11.1	LOS A	1.1	8.2	0.68	0.52	31.3
12	R	155	6.0	0.195	15.7	LOS B	1.8	13.5	0.70	0.70	30.5
Approach		178	6.0	0.195	15.5	LOS B	1.8	13.5	0.69	0.69	30.5
All Vehicles		1302	6.0	0.472	16.9	LOS B	6.0	44.1	0.76	0.71	38.0

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
P1	Across S approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P3	Across E approach	53	15.2	LOS B	0.1	0.1	0.78	0.78
P5	Across N approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P7	Across W approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing Australia Ave, Herb Elliot Ave & Parkview Drive

PM Peak
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	91	6.0	0.445	23.5	LOS B	5.2	38.1	0.84	0.84	38.0
2	T	435	6.0	0.445	15.0	LOS B	5.3	39.4	0.84	0.70	39.7
3	R	19	6.0	0.058	24.0	LOS B	0.4	2.7	0.78	0.71	36.3
Approach		544	6.0	0.445	16.7	LOS B	5.3	39.4	0.84	0.73	39.3
East: Parkview Drive											
4	L	152	6.0	0.234	14.2	LOS A	2.9	21.2	0.66	0.73	31.3
5	T	34	6.0	0.234	9.6	LOS A	2.9	21.2	0.66	0.54	32.0
6	R	109	6.0	0.352	13.8	LOS A	1.7	12.2	0.64	0.69	31.4
Approach		295	6.0	0.352	13.5	LOS A	2.9	21.2	0.65	0.69	31.4
North: Australia Avenue											
7	L	11	6.0	0.322	22.8	LOS B	3.6	26.7	0.80	0.87	39.2
8	T	371	6.0	0.322	14.3	LOS A	3.7	26.9	0.80	0.65	40.7
9	R	11	6.0	0.037	25.7	LOS B	0.2	1.6	0.81	0.69	35.3
Approach		392	6.0	0.322	14.9	LOS B	3.7	26.9	0.80	0.66	40.5
West: Herb Elliot Avenue											
10	L	23	6.0	0.552	15.0	LOS B	3.2	23.8	0.70	0.75	30.9
11	T	12	6.0	0.552	10.4	LOS A	3.2	23.8	0.70	0.58	31.5
12	R	442	6.0	0.552	16.9	LOS B	5.7	42.1	0.79	0.77	29.9
Approach		477	6.0	0.552	16.6	LOS B	5.7	42.1	0.78	0.77	30.0
All Vehicles		1707	6.0	0.552	15.7	LOS B	5.7	42.1	0.78	0.72	35.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model 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
P1	Across S approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P3	Across E approach	53	17.6	LOS B	0.1	0.1	0.84	0.84
P5	Across N approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P7	Across W approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing Australia Avenue, Kevin Coomb Ave,

AM Peak
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	47	6.0	0.035	8.5	LOS A	0.2	1.4	0.19	0.59	48.3
2	T	15	6.0	0.035	0.1	LOS A	0.2	1.4	0.19	0.00	55.5
3	R	1	6.0	0.035	8.0	LOS A	0.2	1.4	0.19	0.59	48.5
Approach		63	6.0	0.035	6.5	NA	0.2	1.4	0.19	0.46	49.8
East: Holker Street Busway											
4	L	1	6.0	0.040	15.0	LOS B	0.1	1.0	0.36	0.74	43.1
5	T	16	6.0	0.040	16.0	LOS B	0.1	1.0	0.36	0.94	42.6
6	R	4	6.0	0.040	15.6	LOS B	0.1	1.0	0.36	0.92	42.9
Approach		21	6.0	0.040	15.9	LOS B	0.1	1.0	0.36	0.92	42.7
North: Kevin Coombs Avenue											
7	L	4	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	23	6.0	0.206	0.2	LOS A	1.1	8.1	0.18	0.00	55.7
9	R	326	6.0	0.206	8.3	LOS A	1.1	8.1	0.18	0.60	48.5
Approach		354	6.0	0.206	7.8	NA	1.1	8.1	0.18	0.56	48.9
West: Australia Avenue											
10	L	149	6.0	0.136	11.3	LOS A	0.5	3.8	0.12	0.92	46.3
11	T	3	6.0	0.136	11.9	LOS A	0.5	3.8	0.12	0.99	45.7
12	R	21	6.0	0.044	15.8	LOS B	0.2	1.1	0.49	0.91	43.0
Approach		174	6.0	0.136	11.8	LOS A	0.5	3.8	0.16	0.92	45.9
All Vehicles		612	6.0	0.206	9.1	NA	1.1	8.1	0.18	0.67	47.9

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 Peak Existing Australia Avenue, Kevin Coomb Ave,

PM Peak Existing
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	12	6.0	0.016	8.5	LOS A	0.1	0.6	0.13	0.74	48.7
2	T	16	6.0	0.016	0.1	LOS A	0.1	0.6	0.13	0.00	57.1
3	R	1	6.0	0.016	8.0	LOS A	0.1	0.6	0.13	0.70	49.0
Approach		28	6.0	0.016	3.8	NA	0.1	0.6	0.13	0.33	53.1
East: Holker Street Busway											
4	L	1	6.0	0.015	13.4	LOS A	0.1	0.4	0.24	0.82	44.3
5	T	7	6.0	0.015	14.4	LOS A	0.1	0.4	0.24	0.91	43.8
6	R	1	6.0	0.015	13.6	LOS A	0.1	0.4	0.24	0.92	44.1
Approach		9	6.0	0.015	14.2	LOS A	0.1	0.4	0.24	0.90	43.9
North: Kevin Coombs Avenue											
7	L	3	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	24	6.0	0.133	0.1	LOS A	0.7	5.0	0.10	0.00	57.4
9	R	209	6.0	0.133	8.2	LOS A	0.7	5.0	0.10	0.62	48.8
Approach		237	6.0	0.133	7.3	NA	0.7	5.0	0.10	0.56	49.6
West: Australia Avenue											
10	L	397	6.0	0.364	11.3	LOS A	1.8	13.3	0.10	0.93	46.3
11	T	16	6.0	0.364	11.9	LOS A	1.8	13.3	0.10	0.99	45.7
12	R	76	6.0	0.127	14.1	LOS A	0.5	3.5	0.43	0.91	44.4
Approach		488	6.0	0.364	11.7	LOS A	1.8	13.3	0.15	0.93	46.0
All Vehicles		763	6.0	0.364	10.1	NA	1.8	13.3	0.14	0.79	47.3

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.

MOVEMENT SUMMARY

Site: AM Peak Exist Australia Ave, Bennelong Pky & Sarah Durack Ave

AM Peak Existing
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Australia Avenue											
1	L	383	5.0	0.214	7.8	X	X	X	X	0.60	49.8
2	T	1171	5.0	0.643	22.8	LOS B	23.4	170.9	0.81	0.73	35.2
3	R	289	5.0	0.527	22.2	LOS B	7.9	57.5	0.64	0.80	37.4
Approach		1843	5.0	0.643	19.6	LOS B	23.4	170.9	0.62	0.71	37.8
East: Bennelong Pky											
4	L	454	5.0	0.546	12.5	LOS A	9.1	66.6	0.48	0.78	44.8
5	T	33	5.0	0.643	58.7	LOS E	4.3	31.1	1.00	0.80	21.6
6	R	42	5.0	0.643	66.8	LOS E	4.3	31.1	1.00	0.80	21.6
Approach		529	5.0	0.643	19.7	LOS B	9.1	66.6	0.55	0.78	38.8
North: Australia Avenue											
7	L	4	5.0	0.162	29.0	LOS C	4.3	31.5	0.59	0.95	34.8
8	T	290	5.0	0.162	18.8	LOS B	4.4	31.8	0.59	0.50	38.1
9	R	44	5.0	0.172	24.0	LOS B	1.0	7.5	0.74	0.73	36.3
Approach		338	5.0	0.172	19.6	LOS B	4.4	31.8	0.61	0.53	37.8
West: Sarah Durack Avenue											
10	L	31	5.0	0.583	35.8	LOS C	8.6	62.4	0.90	0.82	30.6
11	T	18	5.0	0.583	27.4	LOS B	8.6	62.4	0.90	0.74	31.1
12	R	366	5.0	0.583	44.6	LOS D	8.8	64.5	0.92	0.81	27.2
Approach		415	5.0	0.583	43.2	LOS D	8.8	64.5	0.92	0.81	27.5
All Vehicles		3125	5.0	0.643	22.8	LOS B	23.4	170.9	0.64	0.72	36.2

X: Not applicable for Continuous movement.

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	8.4	LOS A	0.1	0.1	0.39	0.39
P5	Across N approach	53	49.2	LOS E	0.2	0.2	0.95	0.95
P7	Across W approach	53	22.3	LOS C	0.1	0.1	0.64	0.64
All Pedestrians		159	26.6	LOS C			0.66	0.66

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 Exist Australia Ave, Bennelong Pky & Sarah Durack Ave

PM Peak Existing
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 115 seconds (Practical 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: Australia Avenue											
1	L	480	5.0	0.268	7.8	X	X	X	X	0.60	49.7
2	T	340	5.0	0.272	30.3	LOS C	7.0	51.0	0.78	0.64	31.4
3	R	410	5.0	0.909	50.6	LOS D	19.7	143.6	1.00	1.00	25.2
Approach		1230	5.0	0.909	28.3	LOS B	19.7	143.6	0.55	0.75	33.5
East: Bennelong Pky											
4	L	551	5.0	0.820	42.2	LOS C	26.1	190.7	0.97	1.02	27.8
5	T	45	5.0	0.585	62.1	LOS E	3.4	24.7	1.00	0.77	21.2
6	R	12	5.0	0.585	70.3	LOS E	3.4	24.7	1.00	0.77	21.2
Approach		608	5.0	0.820	44.2	LOS D	26.1	190.7	0.97	1.00	27.0
North: Australia Avenue											
7	L	19	5.0	0.838	56.4	LOS D	29.6	216.0	0.99	0.98	24.7
8	T	1027	5.0	0.838	45.9	LOS D	29.6	216.1	0.99	0.97	25.4
9	R	71	5.0	0.245	19.0	LOS B	1.6	11.9	0.55	0.72	39.6
Approach		1117	5.0	0.838	44.4	LOS D	29.6	216.1	0.97	0.95	26.0
West: Sarah Durack Avenue											
10	L	15	5.0	0.634	25.3	LOS B	7.2	52.5	0.67	0.80	35.8
11	T	8	5.0	0.634	16.9	LOS B	7.2	52.5	0.67	0.56	37.6
12	R	448	5.0	0.634	39.2	LOS C	10.7	77.8	0.80	0.79	29.1
Approach		471	5.0	0.634	38.3	LOS C	10.7	77.8	0.79	0.79	29.4
All Vehicles		3426	5.0	0.909	37.7	LOS C	29.6	216.1	0.79	0.86	29.0

X: Not applicable for Continuous movement.

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	33.7	LOS D	0.1	0.1	0.77	0.77
P5	Across N approach	53	49.8	LOS E	0.2	0.2	0.93	0.93
P7	Across W approach	53	35.2	LOS D	0.1	0.1	0.78	0.78
All Pedestrians		159	39.6	LOS D			0.83	0.83

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.

Appendix c-2

Future RMS Trip Rates

MOVEMENT SUMMARY

Site: AM Peak Existing + Dev Herb Elliott Ave & Olympic Blvd

AM Peak Existing+ Development
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	20	6.0	0.021	0.4	LOS A	0.1	0.7	0.21	0.00	55.6
3	R	16	6.0	0.021	8.5	LOS A	0.1	0.7	0.21	0.71	48.9
Approach		36	6.0	0.021	4.0	NA	0.1	0.7	0.21	0.31	52.4
East: Herb Elliot Avenue											
4	L	4	6.0	0.038	9.0	LOS A	0.1	0.9	0.20	0.64	48.2
6	R	36	6.0	0.038	8.7	LOS A	0.1	0.9	0.20	0.60	48.4
Approach		40	6.0	0.038	8.7	LOS A	0.1	0.9	0.20	0.60	48.3
North: Olympic Blvd											
7	L	95	6.0	0.076	8.5	LOS A	0.0	0.0	0.00	0.76	49.0
8	T	42	6.0	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		137	6.0	0.076	5.9	NA	0.0	0.0	0.00	0.52	51.9
All Vehicles		213	6.0	0.076	6.1	NA	0.1	0.9	0.07	0.50	51.3

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.

MOVEMENT SUMMARY

Site: PM Peak Existing + Dev Herb Elliott Ave & Olympic Blvd

PM Peak Existing + Development
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	132	6.0	0.137	0.9	LOS A	0.7	4.9	0.31	0.00	53.6
3	R	94	6.0	0.137	9.0	LOS A	0.7	4.9	0.31	0.74	48.7
Approach		225	6.0	0.137	4.3	NA	0.7	4.9	0.31	0.31	51.4
East: Herb Elliot Avenue											
4	L	82	6.0	0.576	13.5	LOS A	4.8	35.2	0.60	0.87	44.2
6	R	379	6.0	0.576	13.2	LOS A	4.8	35.2	0.60	0.95	44.3
Approach		461	6.0	0.576	13.2	LOS A	4.8	35.2	0.60	0.94	44.2
North: Olympic Blvd											
7	L	120	6.0	0.136	8.5	LOS A	0.0	0.0	0.00	0.84	49.0
8	T	128	6.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		248	6.0	0.136	4.1	NA	0.0	0.0	0.00	0.40	54.1
All Vehicles		935	6.0	0.576	8.7	NA	4.8	35.2	0.37	0.64	48.2

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: AM Peak Existing + Dev
Australia Ave, Herb Elliot Ave & Parkview Drive

AM Peak + Development
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	315	6.0	0.472	21.5	LOS B	6.0	44.1	0.80	0.81	37.9
2	T	301	6.0	0.422	12.7	LOS A	5.6	41.0	0.78	0.66	42.1
3	R	214	6.0	0.458	22.3	LOS B	4.2	30.9	0.81	0.80	37.4
Approach		829	6.0	0.472	18.5	LOS B	6.0	44.1	0.80	0.76	39.2
East: Parkview Drive											
4	L	27	6.0	0.058	15.3	LOS B	0.6	4.6	0.66	0.69	30.8
5	T	13	6.0	0.058	10.7	LOS A	0.6	4.6	0.66	0.49	31.6
6	R	14	6.0	0.047	15.0	LOS B	0.2	1.6	0.65	0.63	30.8
Approach		54	6.0	0.058	14.1	LOS A	0.6	4.6	0.66	0.63	31.0
North: Australia Avenue											
7	L	29	6.0	0.159	19.7	LOS B	1.8	13.3	0.69	0.84	40.7
8	T	193	6.0	0.159	11.2	LOS A	1.8	13.5	0.69	0.55	43.3
9	R	74	6.0	0.247	25.2	LOS B	1.5	11.2	0.83	0.76	35.5
Approach		296	6.0	0.247	15.6	LOS B	1.8	13.5	0.73	0.63	40.8
West: Herb Elliot Avenue											
10	L	25	6.0	0.241	15.8	LOS B	1.4	10.3	0.69	0.71	30.5
11	T	11	6.0	0.241	11.2	LOS A	1.4	10.3	0.69	0.54	31.2
12	R	184	6.0	0.241	16.0	LOS B	2.3	17.1	0.71	0.71	30.3
Approach		220	6.0	0.241	15.7	LOS B	2.3	17.1	0.71	0.71	30.4
All Vehicles		1399	6.0	0.472	17.3	LOS B	6.0	44.1	0.76	0.72	37.6

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
P1	Across S approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P3	Across E approach	53	15.2	LOS B	0.1	0.1	0.78	0.78
P5	Across N approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P7	Across W approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing + Dev
Australia Ave, Herb Elliot Ave & Parkview Drive

PM Peak + Development
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	91	6.0	0.445	23.5	LOS B	5.2	38.1	0.84	0.84	38.0
2	T	435	6.0	0.445	15.0	LOS B	5.3	39.4	0.84	0.70	39.7
3	R	19	6.0	0.058	24.0	LOS B	0.4	2.7	0.78	0.71	36.3
Approach		544	6.0	0.445	16.7	LOS B	5.3	39.4	0.84	0.73	39.3
East: Parkview Drive											
4	L	152	6.0	0.234	14.2	LOS A	2.9	21.2	0.66	0.73	31.3
5	T	34	6.0	0.234	9.6	LOS A	2.9	21.2	0.66	0.54	32.0
6	R	109	6.0	0.374	15.3	LOS B	1.8	13.1	0.68	0.70	30.7
Approach		295	6.0	0.374	14.1	LOS A	2.9	21.2	0.67	0.70	31.1
North: Australia Avenue											
7	L	11	6.0	0.322	22.8	LOS B	3.6	26.7	0.80	0.87	39.2
8	T	371	6.0	0.322	14.3	LOS A	3.7	26.9	0.80	0.65	40.7
9	R	33	6.0	0.116	26.2	LOS B	0.7	5.0	0.83	0.73	35.0
Approach		414	6.0	0.322	15.5	LOS B	3.7	26.9	0.80	0.67	40.1
West: Herb Elliot Avenue											
10	L	75	6.0	0.742	20.0	LOS B	5.5	40.8	0.74	0.91	28.6
11	T	12	6.0	0.742	15.4	LOS B	5.5	40.8	0.74	0.77	29.1
12	R	559	6.0	0.742	21.4	LOS B	9.4	68.8	0.87	0.92	28.0
Approach		645	6.0	0.742	21.2	LOS B	9.4	68.8	0.85	0.92	28.1
All Vehicles		1898	6.0	0.742	17.6	LOS B	9.4	68.8	0.81	0.77	33.8

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
P1	Across S approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P3	Across E approach	53	17.6	LOS B	0.1	0.1	0.84	0.84
P5	Across N approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P7	Across W approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing+ Dev
Australia Avenue, Kevin Coomb Ave

AM Peak + Development
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	47	6.0	0.035	8.5	LOS A	0.2	1.4	0.19	0.59	48.3
2	T	15	6.0	0.035	0.1	LOS A	0.2	1.4	0.19	0.00	55.5
3	R	1	6.0	0.035	8.0	LOS A	0.2	1.4	0.19	0.59	48.5
Approach		63	6.0	0.035	6.5	NA	0.2	1.4	0.19	0.46	49.8
East: Holker Street Busway											
4	L	1	6.0	0.044	15.9	LOS B	0.2	1.1	0.38	0.72	42.4
5	T	16	6.0	0.044	16.9	LOS B	0.2	1.1	0.38	0.95	41.9
6	R	4	6.0	0.044	16.4	LOS B	0.2	1.1	0.38	0.94	42.2
Approach		21	6.0	0.044	16.7	LOS B	0.2	1.1	0.38	0.93	42.0
North: Kevin Coombs Avenue											
7	L	4	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	23	6.0	0.238	0.2	LOS A	1.3	9.7	0.18	0.00	55.5
9	R	381	6.0	0.238	8.3	LOS A	1.3	9.7	0.18	0.60	48.4
Approach		408	6.0	0.238	7.8	NA	1.3	9.7	0.18	0.57	48.8
West: Australia Avenue											
10	L	162	6.0	0.148	11.3	LOS A	0.6	4.2	0.12	0.92	46.3
11	T	3	6.0	0.148	11.9	LOS A	0.6	4.2	0.12	0.99	45.7
12	R	21	6.0	0.049	16.7	LOS B	0.2	1.2	0.52	0.93	42.3
Approach		186	6.0	0.148	11.9	LOS A	0.6	4.2	0.16	0.93	45.8
All Vehicles		679	6.0	0.238	9.1	NA	1.3	9.7	0.18	0.67	47.8

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 Existing + Dev
Australia Avenue, Kevin Coomb Ave

PM Peak Existing + Development
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	12	6.0	0.016	8.5	LOS A	0.1	0.6	0.13	0.74	48.7
2	T	16	6.0	0.016	0.1	LOS A	0.1	0.6	0.13	0.00	57.1
3	R	1	6.0	0.016	8.0	LOS A	0.1	0.6	0.13	0.70	49.0
Approach		28	6.0	0.016	3.8	NA	0.1	0.6	0.13	0.33	53.1
East: Holker Street Busway											
4	L	1	6.0	0.016	13.8	LOS A	0.1	0.4	0.25	0.81	43.9
5	T	7	6.0	0.016	14.8	LOS B	0.1	0.4	0.25	0.92	43.4
6	R	1	6.0	0.016	14.0	LOS A	0.1	0.4	0.25	0.92	43.8
Approach		9	6.0	0.016	14.6	LOS B	0.1	0.4	0.25	0.91	43.5
North: Kevin Coombs Avenue											
7	L	3	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	24	6.0	0.146	0.1	LOS A	0.7	5.5	0.10	0.00	57.4
9	R	232	6.0	0.146	8.2	LOS A	0.7	5.5	0.10	0.62	48.8
Approach		259	6.0	0.146	7.4	NA	0.7	5.5	0.10	0.56	49.5
West: Australia Avenue											
10	L	448	6.0	0.409	11.3	LOS A	2.2	15.9	0.11	0.93	46.3
11	T	16	6.0	0.409	12.0	LOS A	2.2	15.9	0.11	0.99	45.7
12	R	76	6.0	0.131	14.4	LOS A	0.5	3.7	0.45	0.92	44.1
Approach		540	6.0	0.409	11.7	LOS A	2.2	15.9	0.16	0.93	46.0
All Vehicles		837	6.0	0.409	10.2	NA	2.2	15.9	0.14	0.79	47.2

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: AM Peak Exist + Dev
Australia Ave, Bennelong Pky & Sarah Durack Ave

AM Peak Existing + Development
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Australia Avenue											
1	L	383	5.0	0.214	7.8	X	X	X	X	0.60	49.8
2	T	1341	5.0	0.723	23.6	LOS B	28.2	205.7	0.85	0.77	34.6
3	R	289	5.0	0.530	21.7	LOS B	7.7	56.4	0.65	0.79	37.7
Approach		2013	5.0	0.723	20.3	LOS B	28.2	205.7	0.66	0.74	37.3
East: Bennelong Pky											
4	L	454	5.0	0.563	13.0	LOS A	9.8	71.6	0.51	0.79	44.3
5	T	33	5.0	0.750	61.6	LOS E	4.4	32.1	1.00	0.85	21.0
6	R	42	5.0	0.750	69.8	LOS E	4.4	32.1	1.00	0.85	20.9
Approach		529	5.0	0.750	20.5	LOS B	9.8	71.6	0.58	0.80	38.3
North: Australia Avenue											
7	L	4	5.0	0.174	28.6	LOS C	4.7	34.2	0.59	0.95	35.0
8	T	318	5.0	0.174	18.3	LOS B	4.7	34.5	0.59	0.50	38.4
9	R	44	5.0	0.185	25.6	LOS B	1.0	7.4	0.79	0.74	35.4
Approach		366	5.0	0.185	19.3	LOS B	4.7	34.5	0.61	0.53	38.0
West: Sarah Durack Avenue											
10	L	31	5.0	0.583	36.3	LOS C	8.7	63.4	0.90	0.82	30.4
11	T	18	5.0	0.583	27.9	LOS B	8.7	63.4	0.90	0.74	30.9
12	R	366	5.0	0.583	44.9	LOS D	8.8	64.5	0.92	0.81	27.1
Approach		415	5.0	0.583	43.5	LOS D	8.8	64.5	0.92	0.81	27.4
All Vehicles		3323	5.0	0.750	23.1	LOS B	28.2	205.7	0.67	0.74	35.9

X: Not applicable for Continuous movement.

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	8.0	LOS A	0.1	0.1	0.38	0.38
P5	Across N approach	53	49.2	LOS E	0.2	0.2	0.95	0.95
P7	Across W approach	53	21.6	LOS C	0.1	0.1	0.63	0.63
All Pedestrians		159	26.3	LOS C			0.65	0.65

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 Exist Australia Ave, Bennelong Pky & Sarah Durack Ave

PM Peak Existing
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 115 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Australia Avenue											
1	L	480	5.0	0.268	7.8	X	X	X	X	0.60	49.7
2	T	340	5.0	0.296	32.8	LOS C	7.3	53.1	0.81	0.67	30.3
3	R	410	5.0	0.899	49.8	LOS D	19.7	143.6	0.95	0.99	25.4
Approach		1230	5.0	0.899	28.7	LOS C	19.7	143.6	0.54	0.75	33.3
East: Bennelong Pky											
4	L	551	5.0	0.766	36.4	LOS C	22.6	165.1	0.93	0.99	30.0
5	T	45	5.0	0.585	62.1	LOS E	3.4	24.7	1.00	0.77	21.2
6	R	12	5.0	0.585	70.3	LOS E	3.4	24.7	1.00	0.77	21.2
Approach		608	5.0	0.766	38.9	LOS C	22.6	165.1	0.94	0.97	28.9
North: Australia Avenue											
7	L	19	5.0	0.910	69.2	LOS E	34.2	249.8	1.00	1.10	21.5
8	T	1027	5.0	0.910	58.8	LOS E	34.2	249.8	1.00	1.09	22.1
9	R	71	5.0	0.235	18.1	LOS B	1.5	11.3	0.53	0.72	40.2
Approach		1117	5.0	0.910	56.4	LOS D	34.2	249.8	0.97	1.07	22.7
West: Sarah Durack Avenue											
10	L	15	5.0	0.693	25.4	LOS B	7.3	53.2	0.66	0.80	35.7
11	T	8	5.0	0.693	17.0	LOS B	7.3	53.2	0.66	0.56	37.5
12	R	448	5.0	0.693	40.4	LOS C	11.0	80.3	0.80	0.80	28.6
Approach		471	5.0	0.693	39.5	LOS C	11.0	80.3	0.80	0.80	28.9
All Vehicles		3426	5.0	0.910	41.0	LOS C	34.2	249.8	0.79	0.90	27.8

X: Not applicable for Continuous movement.

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	36.0	LOS D	0.1	0.1	0.79	0.79
P5	Across N approach	53	51.7	LOS E	0.2	0.2	0.95	0.95
P7	Across W approach	53	37.6	LOS D	0.1	0.1	0.81	0.81
All Pedestrians		159	41.8	LOS E			0.85	0.85

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.

Appendix c-3

Future Survey Trip Rates

MOVEMENT SUMMARY

Site: AM Peak Existing + Dev (Survey) Herb Elliott Ave & Olympic Blvd

AM Peak Existing + Development (Surey Trip Rates)
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	20	6.0	0.020	0.3	LOS A	0.1	0.6	0.18	0.00	56.2
3	R	16	6.0	0.020	8.4	LOS A	0.1	0.6	0.18	0.71	49.0
Approach		36	6.0	0.020	3.9	NA	0.1	0.6	0.18	0.31	52.7
East: Herb Elliot Avenue											
4	L	4	6.0	0.026	8.9	LOS A	0.1	0.6	0.18	0.64	48.3
6	R	23	6.0	0.026	8.6	LOS A	0.1	0.6	0.18	0.59	48.4
Approach		27	6.0	0.026	8.6	LOS A	0.1	0.6	0.18	0.60	48.4
North: Olympic Blvd											
7	L	64	6.0	0.058	8.5	LOS A	0.0	0.0	0.00	0.79	49.0
8	T	42	6.0	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		106	6.0	0.058	5.1	NA	0.0	0.0	0.00	0.48	52.8
All Vehicles		169	6.0	0.058	5.4	NA	0.1	0.6	0.07	0.46	52.0

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.

MOVEMENT SUMMARY

Site: PM Peak Existing + Dev (Survey) Herb Elliott Ave & Olympic Blvd

PM Peak Existing + Development (Surey Trip Rates)
Herb Elliott Avenue & Olymkpic Blvd
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: Olympic Blvd											
2	T	132	6.0	0.136	0.9	LOS A	0.7	4.9	0.31	0.00	53.7
3	R	94	6.0	0.136	9.0	LOS A	0.7	4.9	0.31	0.74	48.7
Approach		225	6.0	0.136	4.3	NA	0.7	4.9	0.31	0.31	51.5
East: Herb Elliot Avenue											
4	L	82	6.0	0.472	12.3	LOS A	3.1	23.1	0.53	0.79	45.3
6	R	301	6.0	0.472	11.9	LOS A	3.1	23.1	0.53	0.86	45.4
Approach		383	6.0	0.472	12.0	LOS A	3.1	23.1	0.53	0.84	45.4
North: Olympic Blvd											
7	L	108	6.0	0.129	8.5	LOS A	0.0	0.0	0.00	0.85	49.0
8	T	128	6.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		237	6.0	0.129	3.9	NA	0.0	0.0	0.00	0.39	54.4
All Vehicles		845	6.0	0.472	7.7	NA	3.1	23.1	0.32	0.57	49.2

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: AM Peak Existing + Dev (Survey) Australia Ave, Herb Elliot Ave & Parkview Drive

AM Peak + Development (Surey Trip Rates)
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	315	6.0	0.472	21.5	LOS B	6.0	44.1	0.80	0.81	37.9
2	T	301	6.0	0.422	12.7	LOS A	5.6	41.0	0.78	0.66	42.1
3	R	214	6.0	0.458	22.3	LOS B	4.2	30.9	0.81	0.80	37.4
Approach		829	6.0	0.472	18.5	LOS B	6.0	44.1	0.80	0.76	39.2
East: Parkview Drive											
4	L	27	6.0	0.058	15.3	LOS B	0.6	4.6	0.66	0.69	30.8
5	T	13	6.0	0.058	10.7	LOS A	0.6	4.6	0.66	0.49	31.6
6	R	14	6.0	0.047	15.0	LOS B	0.2	1.6	0.65	0.63	30.8
Approach		54	6.0	0.058	14.1	LOS A	0.6	4.6	0.66	0.63	31.0
North: Australia Avenue											
7	L	29	6.0	0.159	19.7	LOS B	1.8	13.3	0.69	0.84	40.7
8	T	193	6.0	0.159	11.2	LOS A	1.8	13.5	0.69	0.55	43.3
9	R	43	6.0	0.145	24.7	LOS B	0.9	6.3	0.80	0.74	35.9
Approach		265	6.0	0.159	14.3	LOS A	1.8	13.5	0.71	0.61	41.6
West: Herb Elliot Avenue											
10	L	19	6.0	0.218	15.8	LOS B	1.3	9.2	0.68	0.71	30.6
11	T	11	6.0	0.218	11.2	LOS A	1.3	9.2	0.68	0.53	31.2
12	R	169	6.0	0.218	15.9	LOS B	2.1	15.3	0.70	0.71	30.4
Approach		199	6.0	0.218	15.6	LOS B	2.1	15.3	0.70	0.70	30.5
All Vehicles		1347	6.0	0.472	17.1	LOS B	6.0	44.1	0.76	0.71	37.8

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
P1	Across S approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P3	Across E approach	53	15.2	LOS B	0.1	0.1	0.78	0.78
P5	Across N approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
P7	Across W approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing + Dev (Survey) Australia Ave, Herb Elliot Ave & Parkview Drive

PM Peak + Development (Surey Trip Rates)
Australia Avenue, Parkview Drive & Herb Elliot Drive
Signals - Fixed Time Cycle Time = 50 seconds (Practical 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: Australia Avenue											
1	L	91	6.0	0.445	23.5	LOS B	5.2	38.1	0.84	0.84	38.0
2	T	435	6.0	0.445	15.0	LOS B	5.3	39.4	0.84	0.70	39.7
3	R	19	6.0	0.058	24.0	LOS B	0.4	2.7	0.78	0.71	36.3
Approach		544	6.0	0.445	16.7	LOS B	5.3	39.4	0.84	0.73	39.3
East: Parkview Drive											
4	L	152	6.0	0.234	14.2	LOS A	2.9	21.2	0.66	0.73	31.3
5	T	34	6.0	0.234	9.6	LOS A	2.9	21.2	0.66	0.54	32.0
6	R	109	6.0	0.361	14.5	LOS A	1.7	12.6	0.66	0.69	31.0
Approach		295	6.0	0.361	13.8	LOS A	2.9	21.2	0.66	0.70	31.3
North: Australia Avenue											
7	L	11	6.0	0.322	22.8	LOS B	3.6	26.7	0.80	0.87	39.2
8	T	371	6.0	0.322	14.3	LOS A	3.7	26.9	0.80	0.65	40.7
9	R	21	6.0	0.075	26.0	LOS B	0.4	3.2	0.82	0.71	35.1
Approach		402	6.0	0.322	15.2	LOS B	3.7	26.9	0.80	0.66	40.3
West: Herb Elliot Avenue											
10	L	36	6.0	0.598	15.7	LOS B	3.7	27.1	0.71	0.78	30.5
11	T	12	6.0	0.598	11.1	LOS A	3.7	27.1	0.71	0.62	31.2
12	R	471	6.0	0.598	17.4	LOS B	6.4	46.8	0.80	0.79	29.7
Approach		518	6.0	0.598	17.2	LOS B	6.4	46.8	0.80	0.79	29.8
All Vehicles		1759	6.0	0.598	16.0	LOS B	6.4	46.8	0.79	0.72	35.0

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
P1	Across S approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P3	Across E approach	53	17.6	LOS B	0.1	0.1	0.84	0.84
P5	Across N approach	53	16.8	LOS B	0.1	0.1	0.82	0.82
P7	Across W approach	53	19.4	LOS B	0.1	0.1	0.88	0.88
All Pedestrians		212	17.7	LOS B			0.84	0.84

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 Existing + Dev (Survey) Australia Avenue, Kevin Coomb Ave

AM Peak + Development (Surey Trip Rates)
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	47	6.0	0.035	8.5	LOS A	0.2	1.4	0.19	0.59	48.3
2	T	15	6.0	0.035	0.1	LOS A	0.2	1.4	0.19	0.00	55.5
3	R	1	6.0	0.035	8.0	LOS A	0.2	1.4	0.19	0.59	48.5
Approach		63	6.0	0.035	6.5	NA	0.2	1.4	0.19	0.46	49.8
East: Holker Street Busway											
4	L	1	6.0	0.042	15.4	LOS B	0.1	1.1	0.37	0.74	42.8
5	T	16	6.0	0.042	16.4	LOS B	0.1	1.1	0.37	0.94	42.3
6	R	4	6.0	0.042	16.0	LOS B	0.1	1.1	0.37	0.93	42.6
Approach		21	6.0	0.042	16.3	LOS B	0.1	1.1	0.37	0.93	42.4
North: Kevin Coombs Avenue											
7	L	4	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	23	6.0	0.220	0.2	LOS A	1.2	8.8	0.18	0.00	55.6
9	R	351	6.0	0.220	8.3	LOS A	1.2	8.8	0.18	0.60	48.5
Approach		378	6.0	0.220	7.8	NA	1.2	8.8	0.18	0.56	48.9
West: Australia Avenue											
10	L	156	6.0	0.142	11.3	LOS A	0.5	4.0	0.12	0.92	46.3
11	T	3	6.0	0.142	11.9	LOS A	0.5	4.0	0.12	0.99	45.7
12	R	21	6.0	0.046	16.2	LOS B	0.2	1.2	0.51	0.92	42.7
Approach		180	6.0	0.142	11.8	LOS A	0.5	4.0	0.16	0.92	45.9
All Vehicles		642	6.0	0.220	9.1	NA	1.2	8.8	0.18	0.67	47.8

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 Existing + Dev (Survey) Australia Avenue, Kevin Coomb Ave

PM Peak Existing + Development (Surey Trip Rates)
Australia Avenue, Kevin Coombs Ave,
Holker St busway & Majory Jackson Pkwy
Stop (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: Majory Jackson Pkwy											
1	L	12	6.0	0.016	8.5	LOS A	0.1	0.6	0.13	0.74	48.7
2	T	16	6.0	0.016	0.1	LOS A	0.1	0.6	0.13	0.00	57.1
3	R	1	6.0	0.016	8.0	LOS A	0.1	0.6	0.13	0.70	49.0
Approach		28	6.0	0.016	3.8	NA	0.1	0.6	0.13	0.33	53.1
East: Holker Street Busway											
4	L	1	6.0	0.015	13.5	LOS A	0.1	0.4	0.24	0.82	44.1
5	T	7	6.0	0.015	14.5	LOS B	0.1	0.4	0.24	0.91	43.6
6	R	1	6.0	0.015	13.8	LOS A	0.1	0.4	0.24	0.92	44.0
Approach		9	6.0	0.015	14.3	LOS A	0.1	0.4	0.24	0.90	43.7
North: Kevin Coombs Avenue											
7	L	3	6.0	0.002	8.4	LOS A	0.0	0.0	0.00	0.67	49.0
8	T	24	6.0	0.139	0.1	LOS A	0.7	5.2	0.10	0.00	57.4
9	R	220	6.0	0.139	8.2	LOS A	0.7	5.2	0.10	0.62	48.8
Approach		247	6.0	0.139	7.4	NA	0.7	5.2	0.10	0.56	49.6
West: Australia Avenue											
10	L	409	6.0	0.375	11.3	LOS A	1.9	13.9	0.10	0.93	46.3
11	T	16	6.0	0.375	11.9	LOS A	1.9	13.9	0.10	0.99	45.7
12	R	76	6.0	0.129	14.2	LOS A	0.5	3.6	0.44	0.91	44.3
Approach		501	6.0	0.375	11.7	LOS A	1.9	13.9	0.15	0.93	46.0
All Vehicles		786	6.0	0.375	10.1	NA	1.9	13.9	0.14	0.79	47.2

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: AM Peak Exist + Dev (Survey) Australia Ave, Bennelong Pky & Sarah Durack Ave

AM Peak Existing + Development (Surey Trip Rates)
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Australia Avenue											
1	L	383	5.0	0.214	7.8	X	X	X	X	0.60	49.8
2	T	1245	5.0	0.749	25.1	LOS B	25.3	184.9	0.90	0.81	33.7
3	R	289	5.0	0.523	22.9	LOS B	7.7	56.4	0.69	0.81	37.0
Approach		1917	5.0	0.749	21.3	LOS B	25.3	184.9	0.69	0.77	36.6
East: Bennelong Pky											
4	L	454	5.0	0.553	12.6	LOS A	8.9	64.7	0.51	0.79	44.7
5	T	33	5.0	0.682	54.7	LOS D	3.9	28.8	1.00	0.82	22.5
6	R	42	5.0	0.682	62.9	LOS E	3.9	28.8	1.00	0.82	22.4
Approach		529	5.0	0.682	19.2	LOS B	8.9	64.7	0.58	0.79	39.2
North: Australia Avenue											
7	L	4	5.0	0.185	30.6	LOS C	4.5	32.7	0.64	0.94	34.0
8	T	304	5.0	0.185	20.2	LOS B	4.5	33.1	0.64	0.54	37.1
9	R	44	5.0	0.177	25.9	LOS B	1.0	7.4	0.82	0.74	35.2
Approach		352	5.0	0.185	21.0	LOS B	4.5	33.1	0.67	0.57	36.8
West: Sarah Durack Avenue											
10	L	31	5.0	0.530	31.2	LOS C	7.3	53.3	0.86	0.81	32.7
11	T	18	5.0	0.530	22.8	LOS B	7.3	53.3	0.86	0.71	33.4
12	R	366	5.0	0.530	39.4	LOS C	7.8	56.9	0.89	0.80	29.0
Approach		415	5.0	0.530	38.1	LOS C	7.8	56.9	0.88	0.80	29.4
All Vehicles		3213	5.0	0.749	23.1	LOS B	25.3	184.9	0.69	0.75	35.9

X: Not applicable for Continuous movement.

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	8.8	LOS A	0.1	0.1	0.42	0.42
P5	Across N approach	53	44.2	LOS E	0.1	0.1	0.94	0.94
P7	Across W approach	53	23.8	LOS C	0.1	0.1	0.69	0.69
All Pedestrians		159	25.6	LOS C			0.68	0.68

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 Exist + Dev (Survey) Australia Ave, Bennelong Pky & Sarah Durack Ave

PM Peak Existing + Development (Surey Trip Rates)
Australia Ave, Bennelong Pky & Sarah Durack Ave
Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Australia Avenue											
1	L	480	5.0	0.268	7.8	X	X	X	X	0.60	49.7
2	T	373	5.0	0.286	28.0	LOS B	7.2	52.8	0.77	0.64	32.5
3	R	410	5.0	0.898	51.7	LOS D	19.7	143.6	1.00	1.02	24.9
Approach		1263	5.0	0.898	28.0	LOS B	19.7	143.6	0.55	0.75	33.6
East: Bennelong Pky											
4	L	551	5.0	0.861	48.2	LOS D	28.3	206.8	1.00	1.06	25.8
5	T	45	5.0	0.560	59.0	LOS E	3.2	23.5	1.00	0.76	21.9
6	R	12	5.0	0.560	67.2	LOS E	3.2	23.5	1.00	0.76	21.8
Approach		608	5.0	0.861	49.4	LOS D	28.3	206.8	1.00	1.03	25.4
North: Australia Avenue											
7	L	19	5.0	0.822	52.1	LOS D	28.3	206.6	0.98	0.97	25.9
8	T	1054	5.0	0.822	41.7	LOS C	28.3	206.7	0.98	0.95	26.7
9	R	71	5.0	0.242	19.1	LOS B	1.6	11.7	0.57	0.72	39.5
Approach		1144	5.0	0.822	40.5	LOS C	28.3	206.7	0.96	0.93	27.3
West: Sarah Durack Avenue											
10	L	15	5.0	0.634	25.9	LOS B	7.2	52.8	0.71	0.80	35.5
11	T	8	5.0	0.634	17.4	LOS B	7.2	52.8	0.71	0.59	37.1
12	R	448	5.0	0.634	38.5	LOS C	10.2	74.2	0.82	0.79	29.4
Approach		471	5.0	0.634	37.7	LOS C	10.2	74.2	0.81	0.79	29.6
All Vehicles		3486	5.0	0.898	37.1	LOS C	28.3	206.8	0.80	0.86	29.2

X: Not applicable for Continuous movement.

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	31.3	LOS D	0.1	0.1	0.75	0.75
P5	Across N approach	53	48.2	LOS E	0.2	0.2	0.94	0.94
P7	Across W approach	53	32.8	LOS D	0.1	0.1	0.77	0.77
All Pedestrians		159	37.5	LOS D			0.82	0.82

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.

Appendix c-4

Future Stage1/Stage1a Sensitivity Analysis

MOVEMENT SUMMARY

Site: PM Existing Stage 1 - Interim Access Arrangement Australia-New Road 10

Existing PM Critical Peak - Australia Avenue/New Road 10
Stage 1 Approved 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: Australia Avenue South											
1	L	158	3.0	0.164	7.3	LOS A	0.0	0.0	0.00	0.83	36.0
2	T	454	6.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		612	5.2	0.164	1.9	NA	0.0	0.0	0.00	0.22	52.5
West: New Road 10											
10	L	169	3.0	0.259	9.8	LOS A	1.0	7.5	0.56	0.83	25.8
Approach		169	3.0	0.259	9.8	LOS A	1.0	7.5	0.56	0.83	25.8
All Vehicles		781	4.7	0.259	3.6	NA	1.0	7.5	0.12	0.35	45.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: PM Future Stage 1 + Proposed Stage 1a - Interim Access Arrangement Australia-New Road 10

Future PM Critical Peak - Australia Avenue/New Road 10
Stage 1 Approved Development plus Stage 1 Proposed Development
Giveway / Yield (Two-Way)

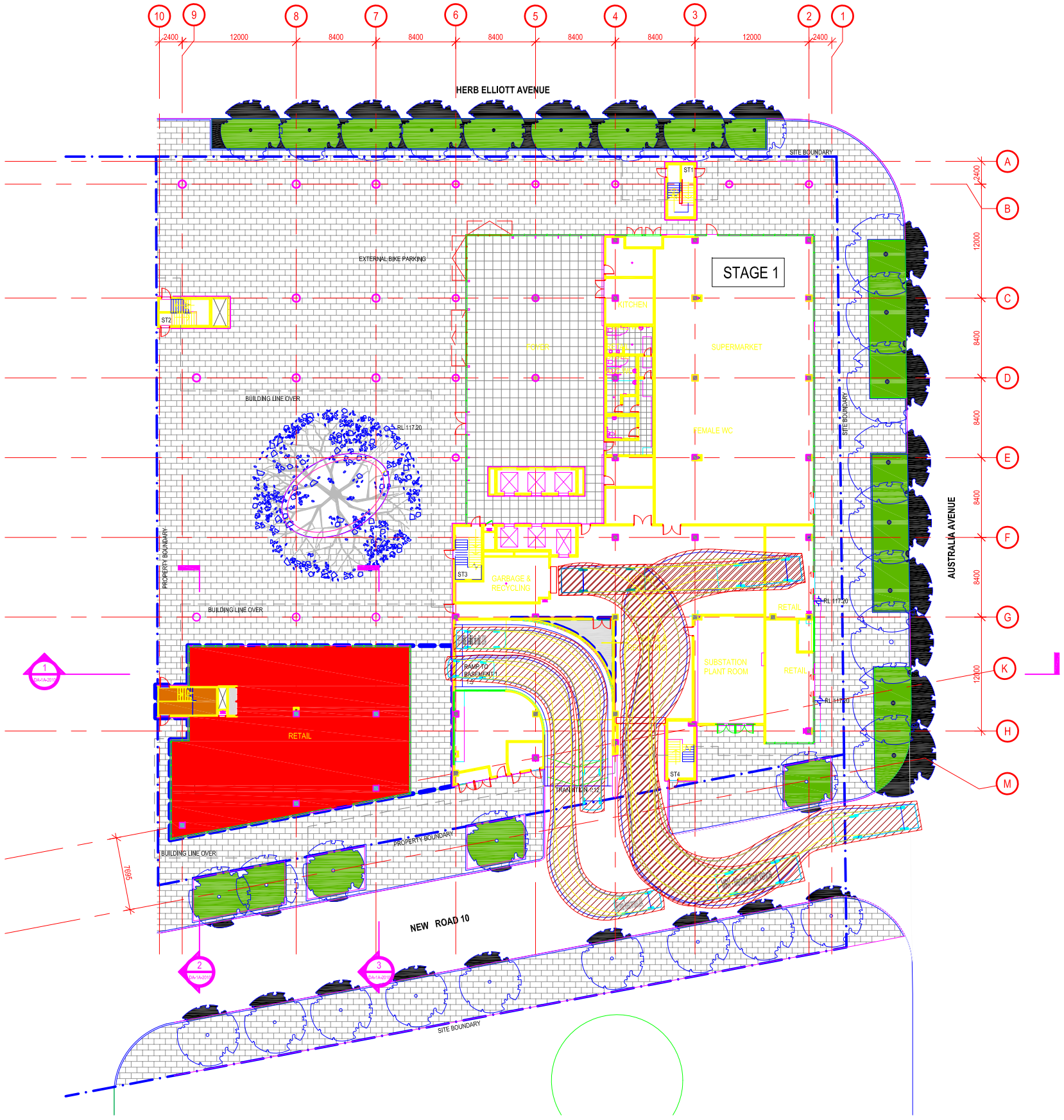
Movement Performance - Vehicles

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: Australia Avenue South											
1	L	176	3.0	0.169	7.3	LOS A	0.0	0.0	0.00	0.81	36.0
2	T	454	6.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		629	5.2	0.169	2.0	NA	0.0	0.0	0.00	0.23	51.9
West: New Road 10											
10	L	215	3.0	0.332	10.5	LOS A	1.5	11.0	0.59	0.88	25.0
Approach		215	3.0	0.332	10.5	LOS A	1.5	11.0	0.59	0.88	25.0
All Vehicles		844	4.6	0.332	4.2	NA	1.5	11.0	0.15	0.39	43.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

Appendix D

Swept Path Analysis



KEY

EXTENT OF DA S

notes

This drawing is prepared for information purposes only. It is not to be used for construction.

no.	revision note	by.	date

architect

architectus

Capital Corporation

scale

1:500 @ A3

m 5 10 15 20

0

project

Stage 1A: 6 Australia Avenue, Sydney Olympic Park.

drawing prepared by

TRAFFIX
traffic and transport planners
suite 3.08 46a macleay street
potts point NSW 2011
PO Box 1061 potts point nsw 1035
t: +61 2 8324 8700
f: +61 2 9380 4481
e: info@traffix.com.au

traffix
traffic & transport planners

drawing title

Ground Floor Basement Access & Loading Dock Access

drawn:	checked:	date:
JM	-	13-05-14

project no.	drawing phase.	drawing no.	rev
12.062	-	TX.01	-

Appendix E

Vehicle Control Queuing Analysis

12.062 - AM Stage 1/1A Commercial Queuing Theory

Vehicle Arrivals (veh/hr)	90
Total Average Time (sec)	9

Queuing Theory Factors

average arrival rate (r)	90.00	*r=(veh/hr)
average service rate (s)	300.00	*s=3600/(Total Average Time)
utilisation factor (p)	0.30000	*p=r/s
mean queue (E(m))	0.12857	*E(m)=(p/(1-p))-p

Probability of Vehicles in System (P(n))		*P(n)=(1-p)p^n
No. Vehicles in Each Entry Lane (n)	Probability (%)	
0	70.0%	
1	21.0%	
2	6.3%	
3	1.9%	
4	0.6%	
5	0.2%	
6	0.1%	
7	0.0%	
8	0.0%	
9	0.0%	
10	0.0%	

Number of spaces	257
Survey Trip Rate	0.4
Total Gen	102.8
80% in split	0.8
In	82.24

Note: Total Average Time based on maximum lane capacities for automatic card issue / boom gate of 300 veh/hr/lane, as specified in Appendix D of AS 2890.1