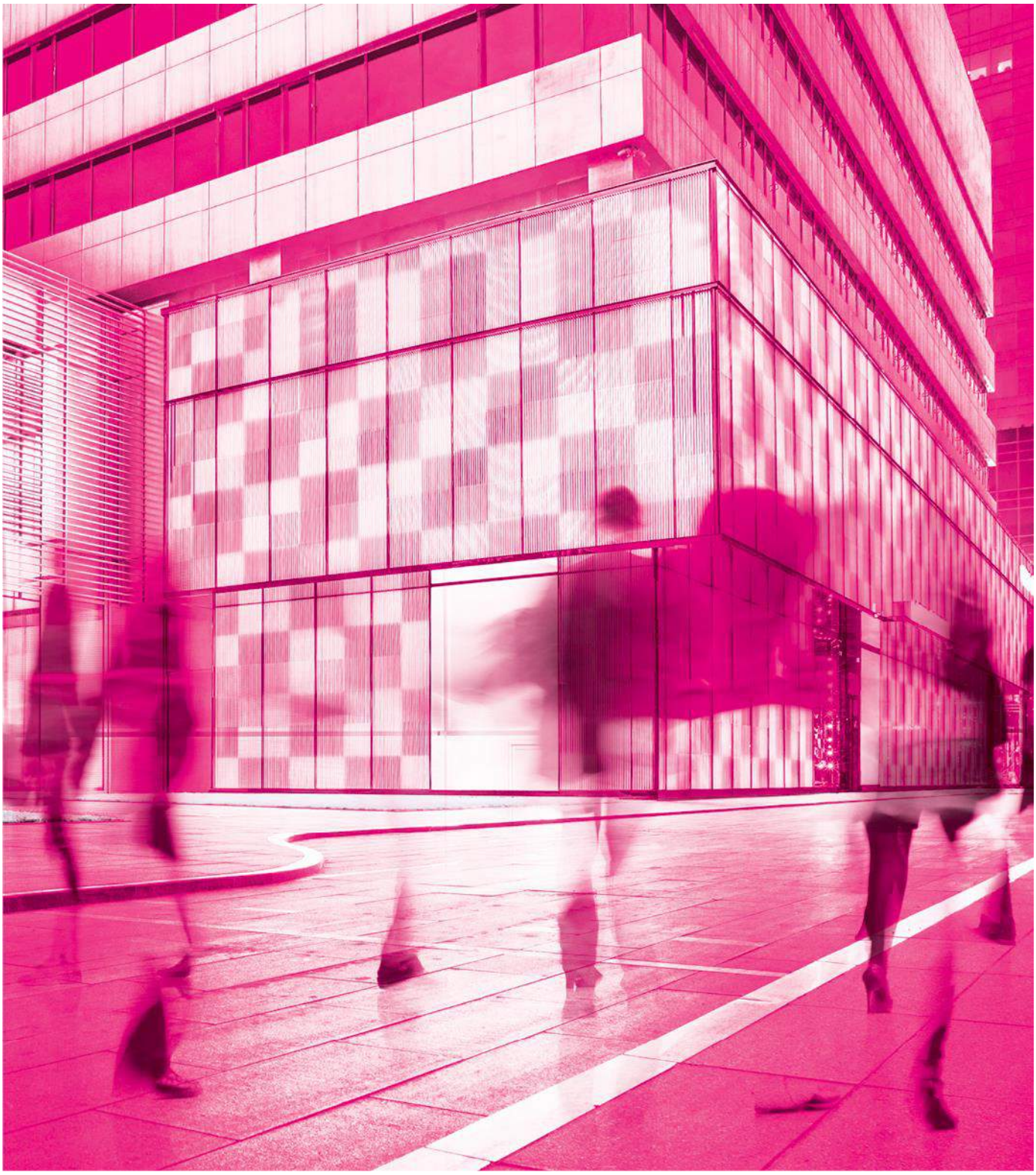

Traffic Impact Assessment;

1 & 2 Murray Rose Avenue, Sydney Olympic Park

For Austino

26th October 2018

parking;
traffic;
civil design;
wayfinding;

ptc.

Document Control

1 & 2 Murray Rose Avenue, Sydney Olympic Park, Traffic Impact Assessment

Issue	Date	Issue Details	Author	Reviewed	For the attention of
1	10/10/18	Draft Report	SW	AM	Kerry Keogh
2	22/10/18	Revised Draft Report	KB	SW	Kerry Keogh
3	26/10/18	Final Report	KB	SW	Kerry Keogh
4	26/10/18	Revised Final Report	KB	SW	Kerry Keogh

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Contents

1. Introduction

1.1 Project Summary

ptc. has been engaged by Austino Property Group to prepare a traffic impact assessment to accompany a State Significant Development Application (SSDA) to be submitted to Sydney Olympic Park Authority, for the development at 1 and 2 Murray Rose Avenue, Sydney Olympic Park.

The subject site is bounded by Murray Rose Avenue and Bennelong Parkway, as shown in Figure 1.

Figure 1 – Location of proposed Development

The development involves the construction of two multi storey towers accommodating 294 units in the following configuration:

Table 1 – Residential Unit Split

Building	One Bedroom Units	Two Bedroom Units	Three Bedroom Units	Four Bedroom Units	Building Totals
1 Murray Rose Ave	39	97	32	0	168
2 Murray Rose Ave	33	72	20	1	126
Unit Total	72	169	52	1	**294**

Figure 2 – Concept Plan of the Development Proposal – Artistic Aerial View from South – West corner

1.2 Scope of the Report

This report presents the following considerations in relation to the traffic and parking assessment of the proposal:

Section 1:	Executive Summary;
Section 2:	Introduction;
Section 3:	Background information on the proposal;
Section 4:	A description of the existing transport characteristics of the locality serving the development property;
Section 5:	Determination of the traffic activity associated with the development proposal, and the adequacy of the surrounding road network;
Section 6:	Assessment of the proposed parking provision in the context of the relevant planning control requirements;
Section 7:	Assessment of the proposed vehicular access, car park and servicing arrangements, in the context of the AS2890 series; and
Section 8:	Conclusion.

1.3 Summary of Response to Secretary's Environmental Assessment Requirements (SEARs)

Table 2 – Secretary's Environmental Assessment Requirements

No.	SEARs Key Issues - Transport Report	
Item 9.1	Accurate details of the current daily and peak hour vehicle, public transport, pedestrian and bicycle movements and existing traffic and transport facilities provided on the road network located adjacent to the proposed development;	The existing public transport options are outlined in **Section 3.3** and consist of two bus stands providing services to Parramatta, Burwood and Lidcombe, Olympic Park Rail Station providing access to the T7 –Olympic Park Line. The cycle network within Olympic Park is described in **Section 3.4** and it provides access to public transport, the local area and the wider Sydney cycle network.
Item 9.2	Assessment of the operation of existing and future transport networks including the rail and bus networks and their ability to accommodate the forecast number of trips to and from the development;	The existing public transport options are outlined in **Section 3.3** and consist of two bus stands providing services to Parramatta, Burwood and Lidcombe, Olympic Park Rail Station providing access to the T7 –Olympic Park Line. The cycle network within Olympic Park is described in **Section 3.4** and it provides access to public transport, the local area and the wider Sydney cycle network. The existing transport facilities are deemed to be adequate to accommodate any increase in demands.
Item 9.3	Determine the adequacy of the proposal to meet the likely increase in pedestrian and cycle demands;	As outlined in **Section 3.3** and **Section 3.4**, sustainable travel options are available within close proximity of the site, which includes train and bus services and cycle facilities. End of trip facilities such as showers are provided within the building for the use for staff in the commercial/retail area.
Item 9.4	Identify measures, for residents, employees and visitors, to promote travel choices, such as implementing a location-specific sustainable travel plan and provision of end of trip facilities	The existing public transport options are outlined in **Section 3.3** and consist of two bus stands providing services to Parramatta, Burwood and Lidcombe, Olympic Park Rail Station providing access to the T7 –Olympic Park Line. The cycle network within Olympic Park is described in **Section 3.4** and it provides access to public transport, the local area and the wider Sydney cycle network. The existing transport facilities are deemed to be adequate to accommodate any increase in demands.
Item 9.5	Provide details of the total daily and peak hour trips generated by the proposed development, including 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 (if required)	Intersection modelling of the intersections affected by the development has been undertaken, incorporating the recommended trip generation from the 'RMS Guide to Traffic Generating Developments' and is outlined in **Section 4.3**. The intersection modelling results indicate that the development should have no detrimental effect on the road network in the vicinity of the site.
Item 9.6	Assessment of the existing and future performance of key intersections providing access to the site, and any upgrades (road/intersections)	As outlined in **Section 3.4.1**, the development maintains the existing pedestrian facilities in the vicinity of the site and provides a pedestrian

Item 9.7	Assessment of the cumulative impacts of traffic volumes from the proposal together existing and approved developments in the area and potential conflict with traffic movements generated by existing users;	A cumulative traffic impact assessment has been undertaken and is outlined in **Section 4.**
Item 9.8	Details of the proposed number of car parking spaces and justify the level of car parking provided on site;	The number of car parking spaces proposed is outlined in **Section 5.** The provisions and layouts meet the requirements of the SOPA Masterplan and the relevant Australian Standards.
Item 9.9	Details of the proposed access, bicycle and car parking provision and end of trip facilities associated with the proposed development, including compliance with the relevant parking codes and Australian Standards and proposed measures to mitigate any associated impacts on public transport, pedestrian, cycle and traffic networks;	The access, car and cycle parking facilities proposed are outlined in **Section 5** and **Section 6** and the provisions and layouts meet the requirements of the SOPA Masterplan and the relevant Australian Standards.
Item 9.10	Appropriate provision, design and location of on-site bicycle parking, and how bicycle provision will be integrated with the existing bicycle network;	The number of bicycle parking spaces as well as their layout and location proposed are outlined in **Section 5.5**. The provisions and layouts meet the requirements of the SOPA Masterplan and the relevant Australian Standards.
Item 9.11	Demonstrate the provision and sufficient arrangement of on-site bicycle and car parking having regard to the availability of public transport and parking controls of Master Plan 2030;	The number of bicycle parking spaces as well as their layout and location proposed are outlined in **Section 5.5**. The provisions and layouts meet the requirements of the SOPA Masterplan and the relevant Australian Standards.
Item 9.12	Details of any access requirements for the hotel and serviced apartment components of the proposal, including pick up/drop off areas	
Item 9.13	Details of servicing vehicle movements and site access arrangement including vehicle types and likely arrival and departure times of service vehicles, loading dock provision and access for the proposed range of uses within buildings	
Item 9.14	A road safety assessment of any proposed signage, lighting displays and reflectivity on roads.	
Item 9.15	Assessment of impact in relation to construction traffic: • details of peak hour and daily construction and servicing vehicle movements and access arrangements and the likely impacts, including cumulative impact from surrounding development sites on the local road network, public transport services and parking (including the temporary loss of parking on the site) and how these impacts will be mitigated; • assessment of road safety at key intersections and locations subject to heavy vehicle movements and high pedestrian activities;	Preliminary arrangements for construction traffic management is outlined in the Environmental Impact Assessment and in the Concept Construction Traffic Management Plan. A detailed Construction Traffic Management Plan would be undertaken at Construction Certificate stage to outline the management of the construction process.

	• details of access arrangements for workers to/from the site, emergency vehicles and service vehicles; • details of temporary cycling and pedestrian access during construction; • details of proposed construction vehicle access arrangements at all stages of construction; • assessment of traffic and transport impacts during construction and how theses impacts will be mitigated for any associated traffic, pedestrians, cyclists and public transport operations, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of impact. This Plan needs to include vehicle routes, number of trucks, hours of operation, access arrangements and traffic controls measures for all demolition/construction activities.	

Item 10 – SEARs Key Issues - Construction Impacts		
Item 10.1	Potential impacts of the construction on surrounding areas including adjoining rail corridor, development and the public domain with respect to noise and vibration, air quality and odour impacts, dust and particle emissions, water quality, storm water runoff, groundwater seepage, soil pollution and construction waste	Preliminary arrangements for construction traffic management is outlined in the Environmental Impact Assessment and in the Concept Construction Traffic Management Plan. A detailed Construction Traffic Management Plan would be undertaken at Construction Certificate stage to outline the management of the construction process.
Item 10.2	With respect to excavation and/or remediation provide details of the annual volume of materials to be extracted, processed or stored on site during construction and how the extracted material will be disposed of or reused.	Preliminary arrangements for construction traffic management is outlined in the Environmental Impact Assessment and in the Concept Construction Traffic Management Plan. A detailed Construction Traffic Management Plan would be undertaken at Construction Certificate stage to outline the management of the construction process.

Item 11 – SEARs Key Issues - Major Events		
Item 11.1	Adequately address the impact of major events in the precinct as they relate to the proposed development within the Town Centre (SOP Major Event Impact Assessment Guidelines)	The impact of Major Events on the development is outlined **Section 7**.
Item 11.2	Demonstrate that the proposed development and future operation can provide acceptable amenity in major event mode, including any management or mitigation measure to address potential impacts.	The impact of Major Events on the development is outlined **Section 7**.

2. Background

2.1 Site Context

The subject sites occupy the western half of the city block bounded by Rose Murray Avenue (north / south) and Bennelong Parkway (west), currently zoned for B4 (Mixed Use) Land Use.

The subject site comprises the following property:

- 1 Rose Murray Avenue: Lot 1 DP1185060
- 2 Rose Murray Avenue: Lot 2 DP1185060

Figure 3 – Local Land Use Map (Source: NSW Planning Viewer)

2.2 Development Sites

The development sites comprise the western portion of the city block and are located at 1 and 2 Murray Rose Avenue, see Figure 4. Both sites are currently vacant.

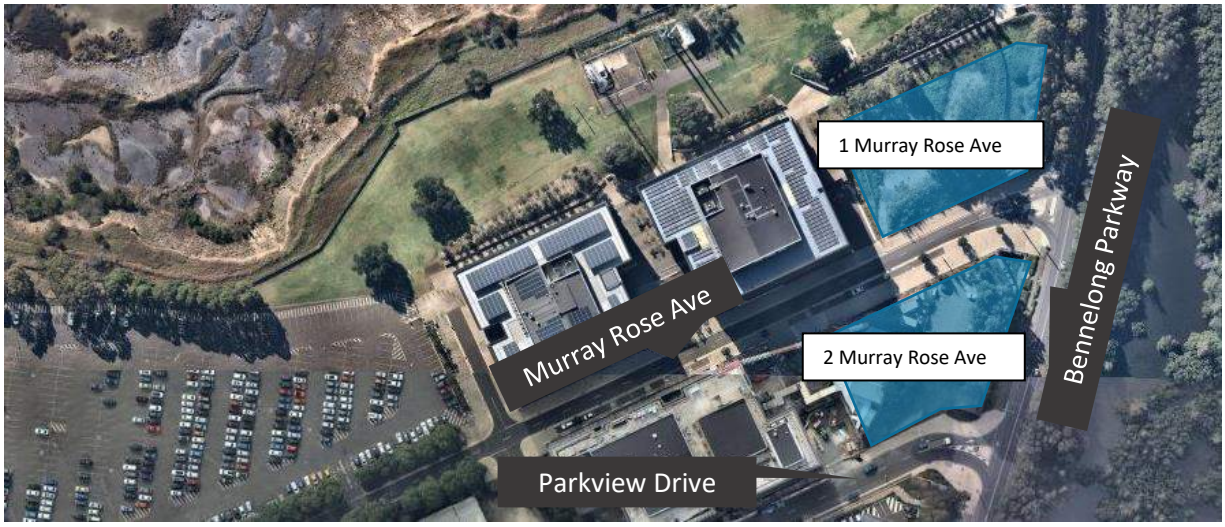


Figure 4 – Location of the Development Site at 1 Murray Rose Avenue

The frontage of the development site at 1 Murray Rose Avenue is formed by Murray Rose Avenue and Bennelong Parkway, see Figure 5.

Figure 5 – Development Site viewed from corner of Murray Rose Avenue and Bennelong Parkway

The frontage of the development site at 2 Murray Rose Avenue is formed by Murray Rose Avenue, Parkview Drive and Bennelong Parkway, as shown in Figure 6.

Figure 6 – Development Site viewed from corner of Parkview Drive and Bennelong Parkway

3. Existing Transportation Facilities

3.1 Road Hierarchy

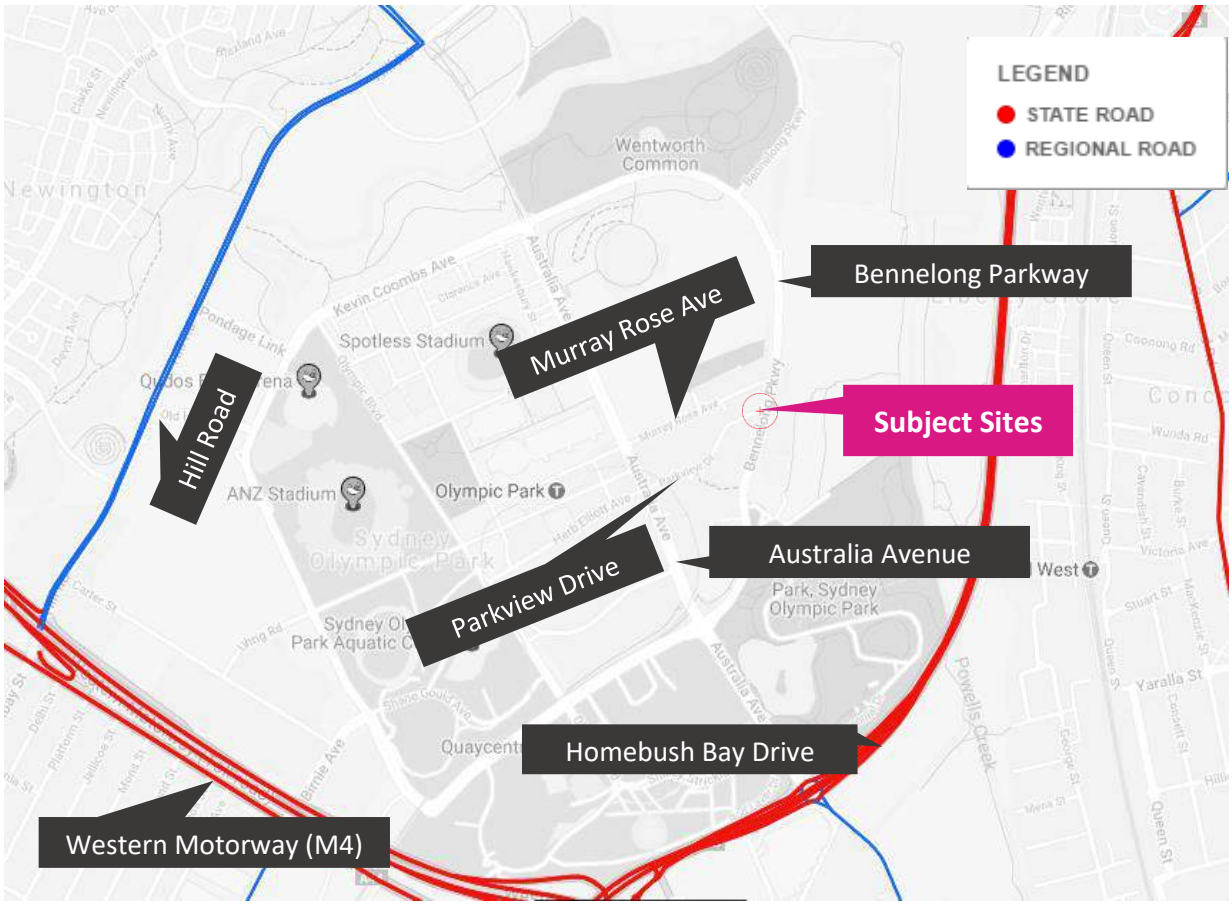


Figure 7 – Road Hierarchy (Source: RMS State and Regional Roads)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

State Roads - Freeways and Primary Arterials (RMS Managed);

Regional Roads - Secondary or sub arterials (Council Managed, Part funded by the State); and

Local Roads - Collector and local access roads (Council Managed).

3.1.1 Road Network

Table 3 – External Road Network – M4 Western Motorway

M4 Western Motorway	
Road Classification	State Road (Motorway)
Alignment	East - West
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	40 metres
Speed Limit	90 kph
School Zone	No
Parking Controls	Motorway
Forms Site Frontage	No

Figure 8 - Western Motorway M4

Table 4 – External Road Network – Homebush Bay Drive

Homebush Bay Drive	
Road Classification	State Road
Alignment	North - South
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	34 metres
Speed Limit	80 kph
School Zone	No
Parking Controls	Clearway 24 hours
Forms Site Frontage	No

Figure 9 - Homebush Bay Drive

Table 5 – Existing Road Network – Australia Avenue

Australia Avenue	
Road Classification	Perimeter Avenue
Alignment	North - South
Number of Lanes	3 lanes northbound, 2 lanes southbound
Carriageway Type	Divided
Carriageway Width	22 metres
Speed Limit	60 kph
School Zone	No
Parking Controls	No Stopping
Forms Site Frontage	No

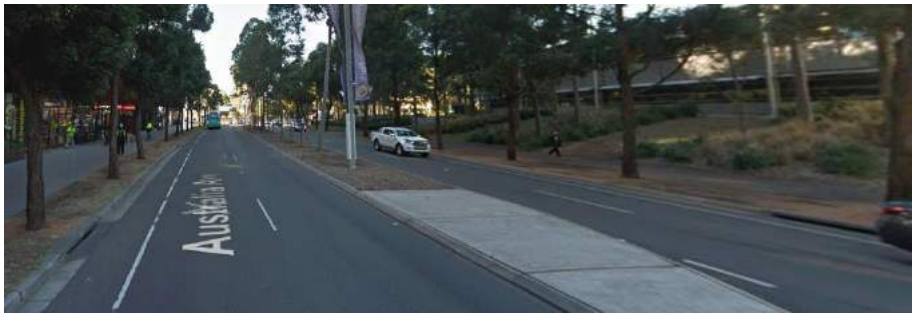


Figure 10 – Australia Avenue

Table 6 – Existing Road Network – Murray Rose Avenue

Murray Rose Avenue	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lanes in each direction
Carriageway Type	Undivided
Carriageway Width	7 metres
Speed Limit	40 kph
School Zone	No
Parking Controls	Restricted parking in bays only P30 minutes
Forms Site Frontage	Yes

Figure 11 – Murray Rose Avenue

Table 7 – Existing Road Network – Parkview Drive

Parkview Drive	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lanes in each direction
Carriageway Type	Undivided
Carriageway Width	9 metres
Speed Limit	40 kph
School Zone	No
Parking Controls	½ P (south kerb), No Parking (north kerb)
Forms Site Frontage	Yes

Figure 12 – Parkview Drive

Table 8 – Existing Road Network – Bennelong Parkway

Bennelong Parkway	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	1 lanes in each direction
Carriageway Type	Undivided
Carriage Width	11 metres
Speed Limit	60 kph
School Zone	No
Parking Controls	No parking
Forms Site Frontage	Yes

Figure 13 – Bennelong Parkway

3.2 Surrounding Parking Provisions

3.2.1 On-Street Parking

The following on-street parking facilities are provided within the vicinity of the development site:

- Separated parking bays parallel to Murray Rose Avenue, which allow for 30 min free parking;
- Parallel parking, scattered along Parkview Drive, which allow for 15 to 60 min free parking.

The on-street parking facilities are shown in Figure 14.

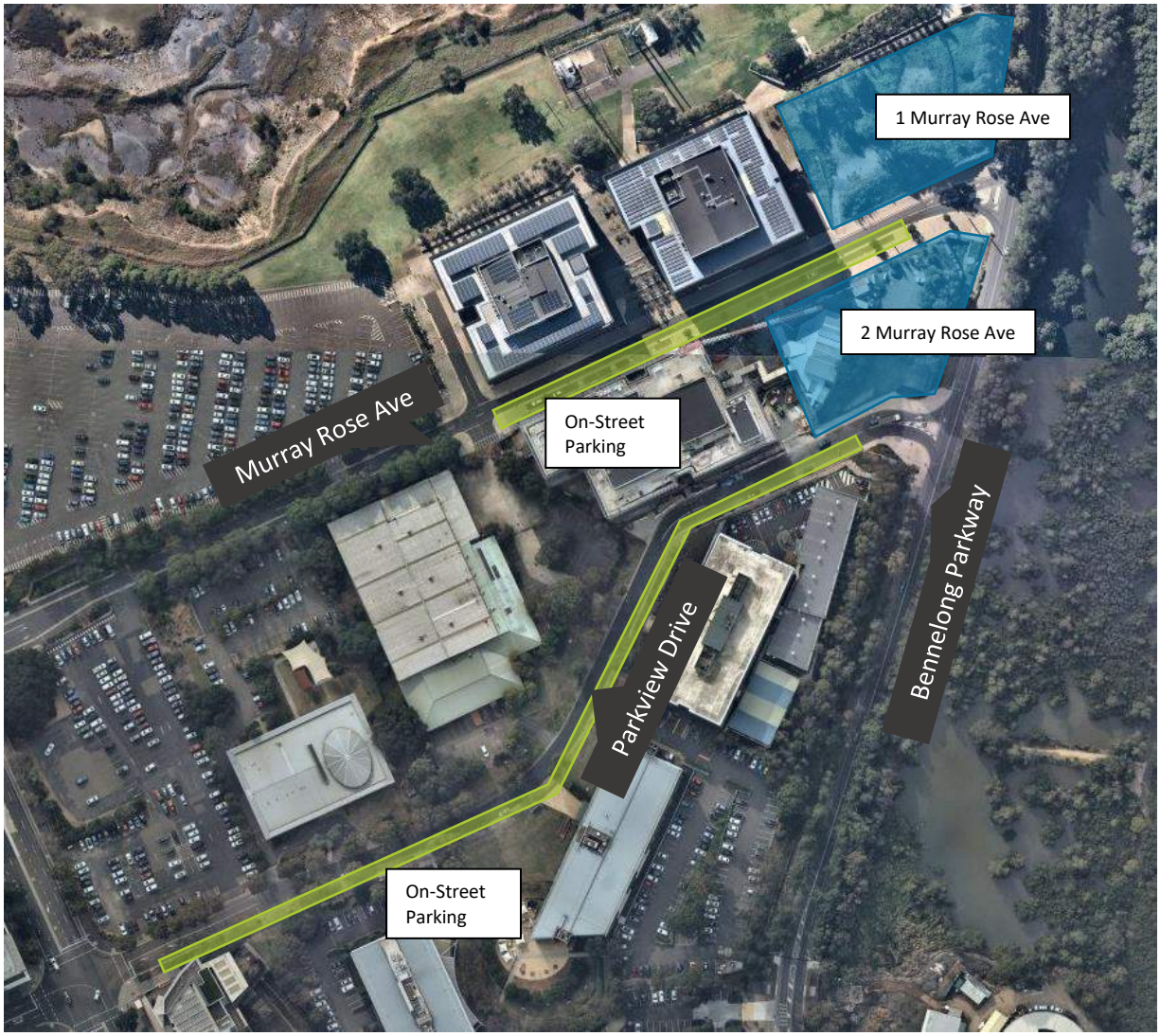


Figure 14 – Location of On-Street Parking

3.2.2 Off-Street Parking

A public car park (Car Park 6A) is located less than 400m west of the development. Currently, the car park consists of two separate areas, which are located on either side of Murray Rose Avenue, see Figure 15. It should be noted that the southern car park will be demolished in due course of a new development.

The two car parks combined have a maximum capacity of 859 parking spaces, with 638 in the northern part and 221 in the southern part.

The northern part of the car park can be entered via Murray Rose Avenue and exited via Australia Avenue. The southern part of the car park can be accessed in both directions via Murray Rose Avenue and Parkview Drive.

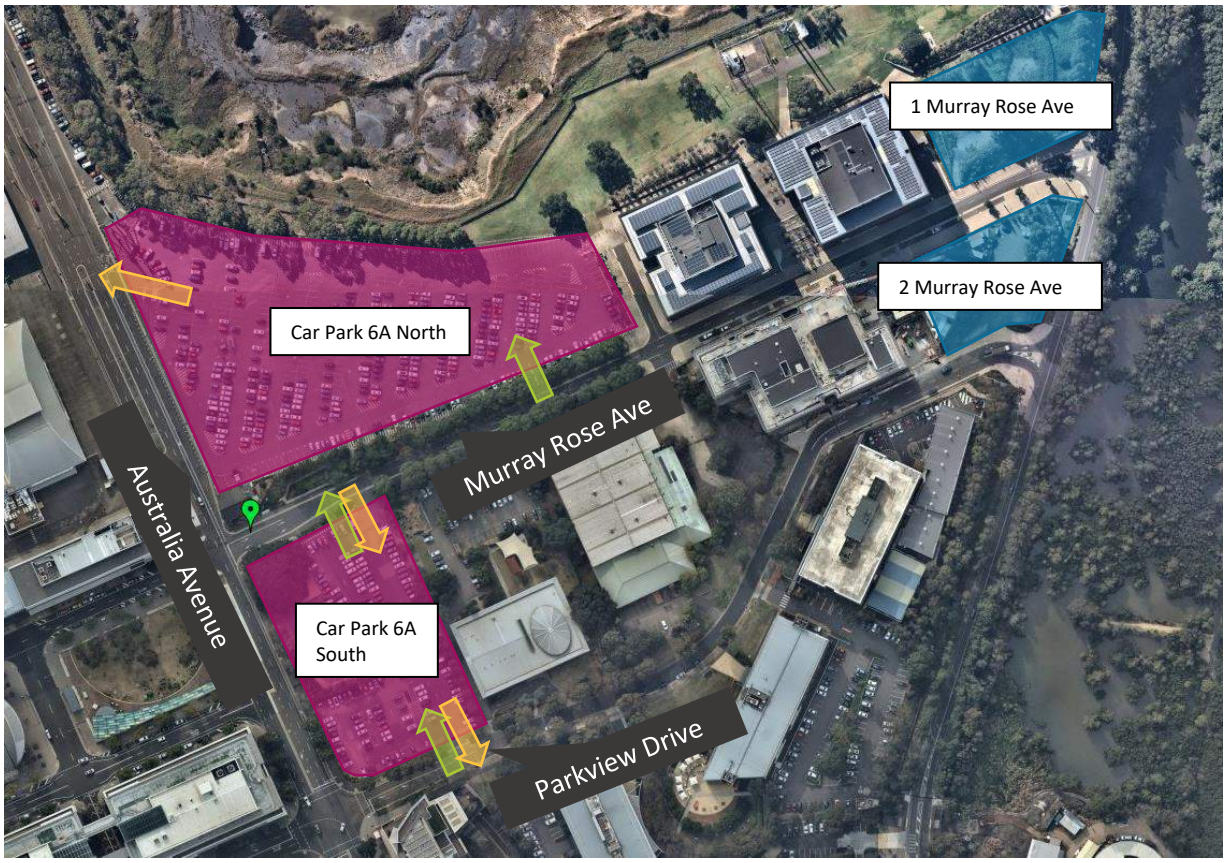


Figure 15 – Location of Car Park 6A

3.2.3 Parking Occupation Survey

To assess the existing parking availability within the vicinity of the site, an Occupation Survey was undertaken on 'Car Park 6A'.

This carpark was chosen as it is within 400m of the development site and this distance is deemed an acceptable walking distance, as per the requirements of the 'Planning Guidelines for Walking and Cycling 2004'.

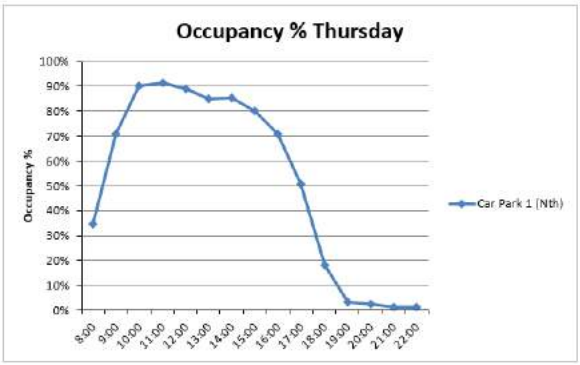
The occupancy survey was undertaken on both the northern and southern parts of the car park, between 8.00am and 10.00pm on Thursday 5th May and Saturday 7th May 2018.

As the southern car park is planned to be developed and therefore will not be available for long term use, the following assumptions have been made for the purpose of this report:

- Currently, the total capacity of the car park is 859 parking spaces, with 638 in the northern part and 221 in the southern part. In order to determine the future parking provision more accurately, the analysis of the Parking Occupancy Survey incorporates the fact that the southern car park will be not available. Hence, it has been assumed that the total capacity of the car park will be 638 (that of the northern part).
- All vehicles recorded at the southern car park are assumed to be using the northern car park instead in the future.

The results of this survey, inclusive the described assumptions, are shown in Table 9 and Table 10.

Table 9 – Occupnacy Survey – Thursday 5th May 2018



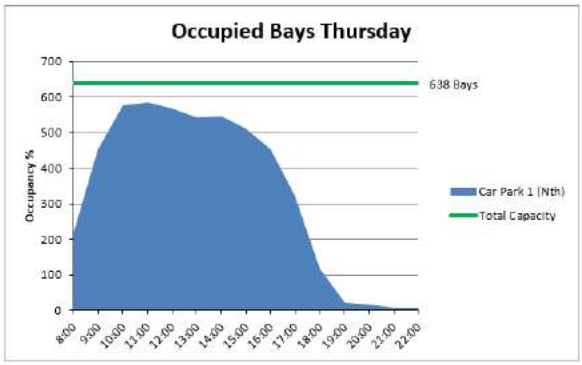
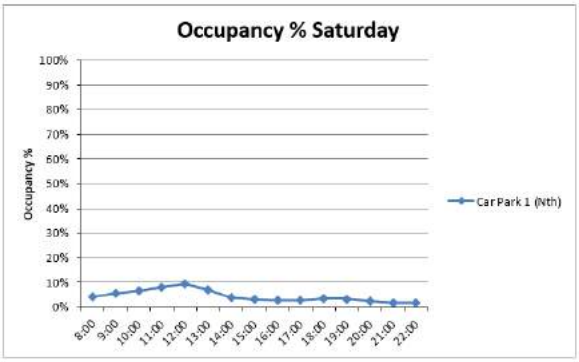
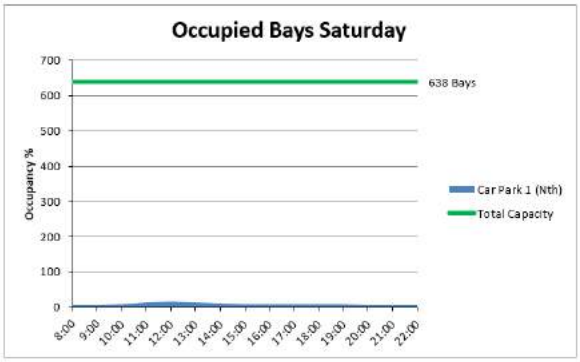


Table 10 – Occupnacy Survey – Saturday 7th May 2018





Car Park 6A (northern section) has a maximum capacity of 638 and the survey results show that the:

- Weekday daytime peak (11.00am) occupancy is 584 vehicles (54 vacant spaces);
- Weekday evening peak (6.00pm) occupancy is 117 vehicles (521 vacant spaces); and
- Weekend peak (12.00pm) occupancy is 60 vehicles (578 vacant spaces)

From these results, we can reasonably ascertain that within Car Park 6A, on a typical week day, there would be in the region of 50 spaces available and during the evenings and weekends there would be in the region of 520 available spaces.

3.3 Public Transport

3.3.1 Trains

Olympic Park Station is located approximately 500m from the Sites and is well within what is considered the comfortable walking distance based on NSW Planning Guidelines for Walking and Cycling (2004), and train journeys will likely form a key mode share for staff and visitors to the development (Figure 16).

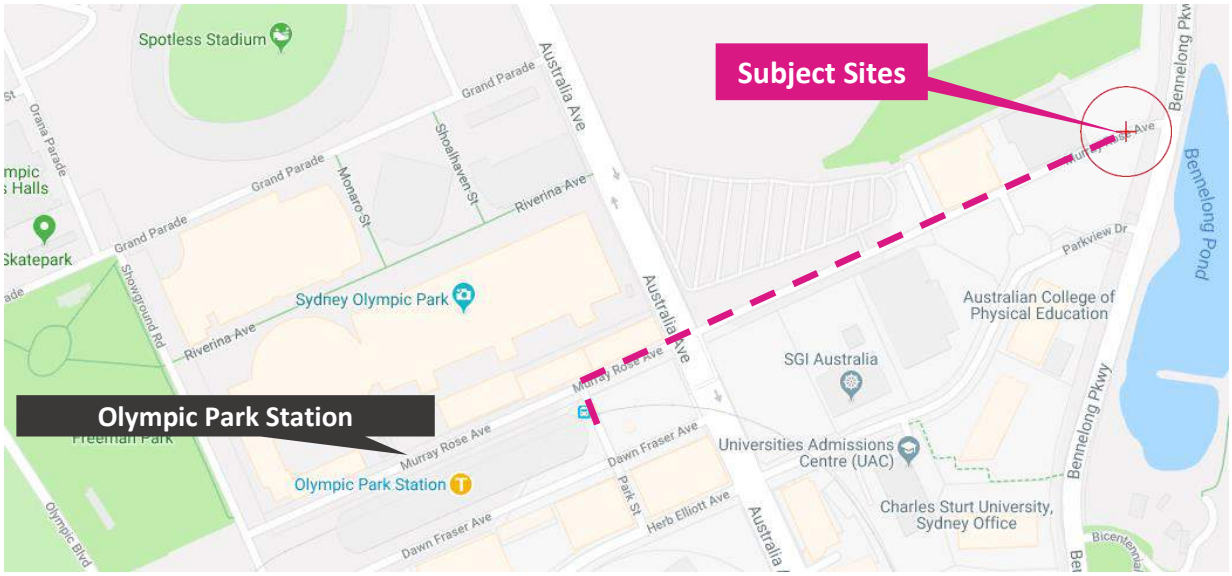


Figure 16 – Walking path from the Sites to Olympic Park Station

Olympic Park Station by Sydney Trains T7 Olympic Park Line, operating between Sydney Olympic Park and Lidcombe with services running every 10 to 20 minutes from 5 am to 12 am on weekdays and weekends.

Alternatively, Sydney Trains operate T1 –Northern line, from Concord West Rail Station, between Hornsby and the City. Concord West Station is located approximately 1.6km (a 20 minute walk) from the site and theses services operate at approximately 15 minute intervals, between 05.00 and 00.00.

The precinct will also be part of the Sydney Metro West line, which is an extension of the Sydney Metro project and is expected to be operational from the second half of the 2020s. The exact location of the station in Sydney Olympic Park is yet to be determined.

3.3.2 Buses

The subject site is served by a comprehensive network of bus services operated by Transport NSW, as shown in the network map in Figure 17.

Figure 17 – Bus Stops in vicinity of the Site

The closest bus stops servicing the subject sites are on Park Street opposite the Olympic Park Station. The frequency of bus services are summarised in Table 11 below.

Table 11 – Bus Services

Route	Frequency (approximate)	Coverage
525	36 daily services, Mon – Fri. 30 daily services, Sat. 28 daily services, Sun & PH	Parramatta to Burwood via Sydney Olympic Park
526	41 daily services, Mon – Fri. 31 daily services, Sat. 29 daily services, Sun & PH	Burwood to Rhodes Shopping Centre
533	31 daily services, Mon – Fri;	Sydney Olympic Park to Chatswood via Rhodes & North Ryde
N81	5 daily services, Mon – Fri; 5 daily services, Sat.	Parramatta to City Town Hall via Sydney Olympic Park
X25	26 daily services, Mon – Fri;	Sydney Olympic Park to Strathfield

3.4 Active Transport

The locality was reviewed for features that would attractive active transport trips (walking and cycling). It is noted that the site is located within comfortable walking distance to the Sydney Olympic Park commercial centre (within 800 metres catchment) as suggested by the NSW Planning Guidelines for Walking and Cycling (2004), where a large range of destinations including supermarkets, health care, banks and restaurants are located.

3.4.1 Walking

Figure 18 - Pedestrain pathways within the vicinity of the Site

Due to the commercial, retail and residential density in the area, the site is well provided with pedestrian footpaths and crossings.

There are signalised pedestrian crossings on all major intersections on Australia Avenue (Parkview Drive and Sarah Durack Avenue).

3.4.2 Cycling

As shown in Figure 19, the site is well provided with bicycle lanes or bicycle friendly roads, throughout Sydney Olympic Park.

The proposed development also includes extensive cycle parking facilities which should further encourage cycling as a viable mode share.

Figure 19 – Existing and proposed cycling network (Source: Google Maps)

4. Traffic Impact Assessment

The traffic impact assessment has been undertaken with reference to the RMS Guide to Traffic Generating Developments (2002), and intersection survey data collected on Wednesday, 13th June 2018.

4.1 Existing Traffic Generation

The development is proposed on land which is currently vacant and therefore does not generate any traffic activity.

4.2 Existing Traffic Volumes and Distribution

To determine the current traffic volumes within the vicinity of the development site, interaction surveys were conducted on Tuesday, Wednesday, 13th June 2018, between 7am -9am and 2pm – 6pm at the following intersections:

- Murray Rose Avenue and Australia Avenue;
- Parkview Drive and Australia Avenue;
- Murray Rose Avenue and Bennelong Parkway; and
- Parkview Drive and Bennelong Parkway.

The intersection location surveys are shown in Figure 20.

Figure 20 – Location of Intersction Surveys.

4.2.1 Existing Peak Hour Traffic Volumes

The peak hour for the corresponding intersections has been determined as follows:

- Murray Rose Avenue and Australia Avenue; 8.00am to 9.00am and 5.00pm to 6.00pm
- Parkview Drive and Australia Avenue; 8.00am to 9.00am and 4.45pm to 5.45pm
- Murray Rose Avenue and Bennelong Parkway; 7.45am to 8.45am and 4.30pm to 5.30pm
- Parkview Drive and Bennelong Parkway. 8.00am to 9.00pm and 4.15pm to 5.15pm

Tabulated results of the survey are shown in Table 12 to Table 15.

Table 12 – Murray Rose Avenue and Australia Avenue, Peak Hour Existing Traffic Volumes

Intersection of Australia Avenue and Murry Rose Avenue

Normal	Australia Ave Nth			Australia Ave Sth			Murry Rose Ave East			Murry Rose Ave West			Normal Vehicle	Total Vehicle
Morning	Straight to Australia Ave Sth①	Turn Left to Murray Rose Ave East②	Turn Right to Murry Rose Ave West③	Straight to Australia Ave Nth④	Turn Left to Murry Rose Ave West⑤	Turn Right to Murry Rose Ave East⑥	Straight to Murry Rose Ave West⑦	Turn Left to Australia Ave Sth⑧	Turn Right to Australia Ave Nth⑨	Straight to Murry Rose Ave East⑩	Turn Left to Australia Ave Nth⑪	Turn Right to Australia Ave Sth⑫		
7:00-8:00	228	70	17	140	43	75	4	3	1	11	8	22	622	671
7:15-8:15	256	99	18	167	42	94	3	5	3	10	16	23	736	793
7:30-8:30	267	119	13	184	38	128	4	12	3	8	18	23	817	872
7:45-8:45	276	148	12	198	49	156	6	17	3	11	17	27	920	970
8:00-9:00	273	157	17	194	43	171	5	18	2	11	17	27	935	988
Afternoon	Straight to Australia Ave Sth①	Turn Left to Murray Rose Ave East②	Turn Right to Murry Rose Ave West③	Straight to Australia Ave Nth④	Turn Left to Murry Rose Ave West⑤	Turn Right to Murry Rose Ave East⑥	Straight to Murry Rose Ave West⑦	Turn Left to Australia Ave Sth⑧	Turn Right to Australia Ave Nth⑨	Straight to Murry Rose Ave East⑩	Turn Left to Australia Ave Nth⑪	Turn Right to Australia Ave Sth⑫		
4:00-5:00	213	11	7	243	18	7	12	57	31	5	9	33	646	681
4:15-5:15	257	12	12	296	15	10	10	55	33	4	13	38	755	794
4:30-5:30	276	13	18	287	14	11	7	65	27	6	13	40	777	815
4:45-5:45	287	8	24	302	14	14	9	92	37	8	16	33	844	883
5:00-6:00	312	6	26	305	17	13	8	88	34	8	19	32	868	903

Table 13 – Parkview Drive and Australia Avenue, Peak Hour Existing Traffic Volumes

Intersection of Australia Avenue and Parkview Drive

Normal	Australia Ave Nth			Australia Ave Sth			Parkview Dr			Herb Elliott Ave			Normal Vehicle	Total Vehicle
Morning	Straight to Australia Ave Sth①	Turn Left to Parkview Dr②	Turn Right to Herb Elliott Ave③	Straight to Australia Ave Nth④	Turn Left to Herb Elliott Ave⑤	Turn Right to Parkview Dr⑥	Straight to Herb Elliott Ave⑦	Turn Left to Australia Ave Sth⑧	Turn Right to Australia Ave Nth⑨	Straight to Parkview Dr⑩	Turn Left to Australia Ave Nth⑪	Turn Right to Australia Ave Sth⑫		
7:00-8:00	210	43	7	271	142	74	5	26	5	7	9	89	888	970
7:15-8:15	214	53	8	307	160	88	9	31	6	11	7	91	985	1072
7:30-8:30	222	73	13	334	178	103	14	38	12	14	11	89	1101	1186
7:45-8:45	225	74	18	377	183	108	14	48	17	16	12	74	1166	1239
8:00-9:00	220	75	21	400	195	112	14	50	18	17	9	79	1210	1283
Afternoon	Straight to Australia Ave Sth①	Turn Left to Parkview Dr②	Turn Right to Herb Elliott Ave③	Straight to Australia Ave Nth④	Turn Left to Herb Elliott Ave⑤	Turn Right to Parkview Dr⑥	Straight to Herb Elliott Ave⑦	Turn Left to Australia Ave Sth⑧	Turn Right to Australia Ave Nth⑨	Straight to Parkview Dr⑩	Turn Left to Australia Ave Nth⑪	Turn Right to Australia Ave Sth⑫		
4:00-5:00	286	19	9	295	45	31	18	118	36	14	15	190	1076	1134
4:15-5:15	326	23	8	267	42	42	15	125	48	18	13	223	1150	1207
4:30-5:30	370	22	7	252	44	38	15	134	56	19	13	236	1206	1259
4:45-5:45	415	23	8	298	51	52	15	132	55	20	9	220	1298	1345
5:00-6:00	422	23	10	291	55	59	14	128	55	20	12	202	1291	1331

Table 14 – Murray Rose Avenue and Bennelong Parkway, Peak Hour Existing Traffic Volumes

Intersection of Murry Rose Avenue & Bennelong Parkway

Normal	Bennelong Pkwy Nth	Bennelong Pkwy Sth	Murry Rose Ave	Normal Vehicle	Total Vehicle
Morning	Straight to Bennelong Pkwy Sth①	Turn Left to Murry Rose Ave②	Turn Left to Bennelong Pkwy Nth③		
7:00-8:00	657	23	4	684	700
7:15-8:15	690	32	6	728	745
7:30-8:30	682	39	7	728	748
7:45-8:45	683	52	7	742	764
8:00-9:00	646	64	9	719	741
Afternoon	Straight to Bennelong Pkwy Sth①	Turn Left to Murry Rose Ave②	Turn Left to Bennelong Pkwy Nth③		
4:00-5:00	384	6	28	418	422
4:15-5:15	457	5	30	492	498
4:30-5:30	494	6	38	538	544
4:45-5:45	483	5	45	533	539
5:00-6:00	482	4	42	528	534

Table 15 – Parkview Drive and Bennelong Parkway, Peak Hour Existing Traffic Volumes

Intersection of Parkview Drive & Bennelong Parkway

Normal	Bennelong Pkwy Sth		Parkview Dr	Normal Vehicle	Total Vehicle
	Straight to Bennelong Pkwy Nth①	Turn Left to Parkview Dr②	Turn Left to Bennelong Pkwy Nth③		
Morning					
7:00-8:00	271	47	8	326	372
7:15-8:15	280	50	9	339	382
7:30-8:30	280	51	9	340	377
7:45-8:45	289	48	7	344	377
8:00-9:00	297	53	6	356	393
	Straight to Bennelong Pkwy Nth①	Turn Left to Parkview Dr②	Turn Left to Bennelong Pkwy Nth③		
Afternoon					
4:00-5:00	422	31	35	488	505
4:15-5:15	455	33	42	530	546
4:30-5:30	448	38	40	526	540
4:45-5:45	424	41	51	516	530
5:00-6:00	414	36	57	507	521

4.2.2 Existing Traffic Distribution

The existing traffic distribution, based on the traffic surveys are shown in Figure 21 and Figure 22.

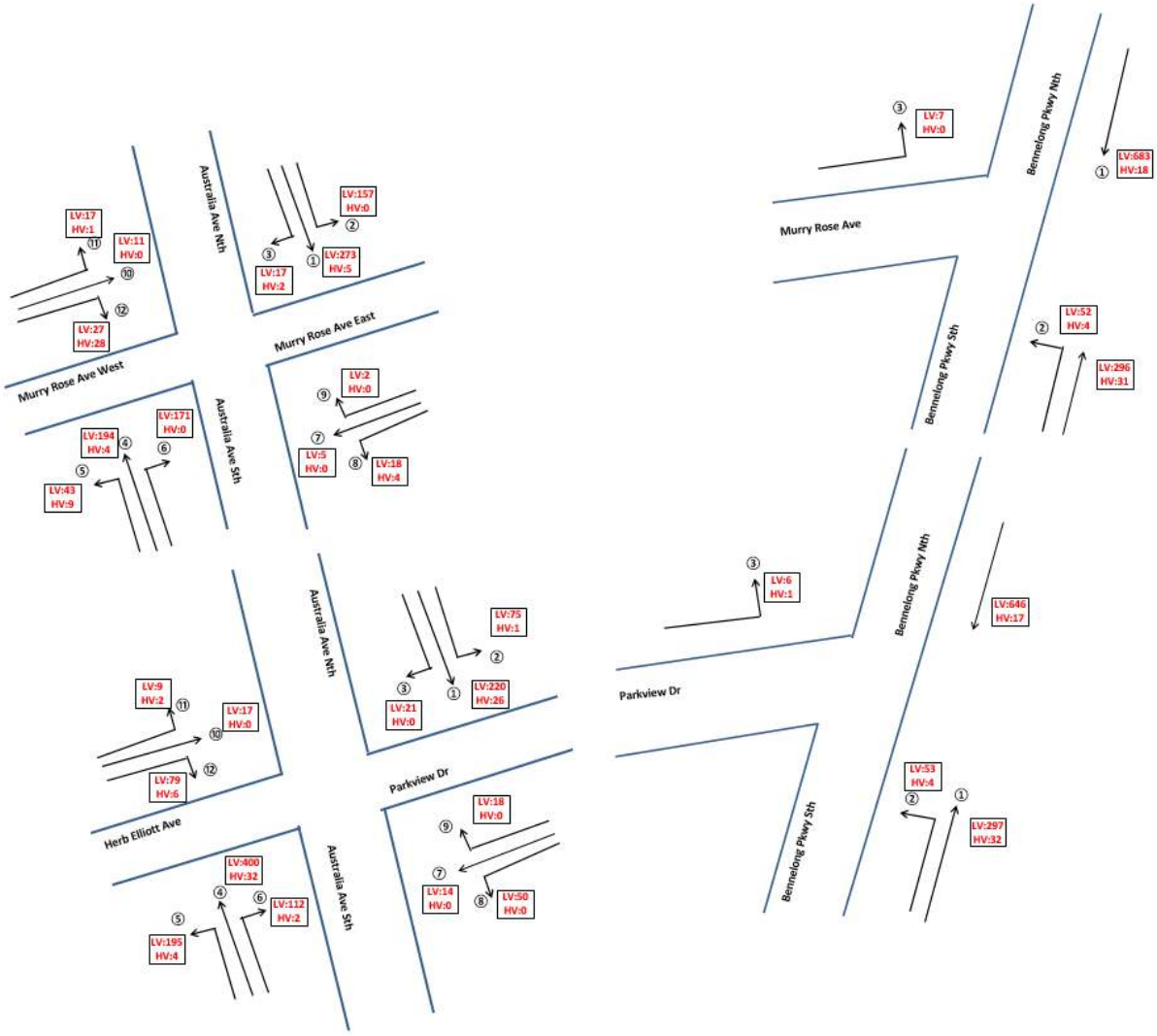


Figure 21 – Existing Traffic Distribution AM Peak.

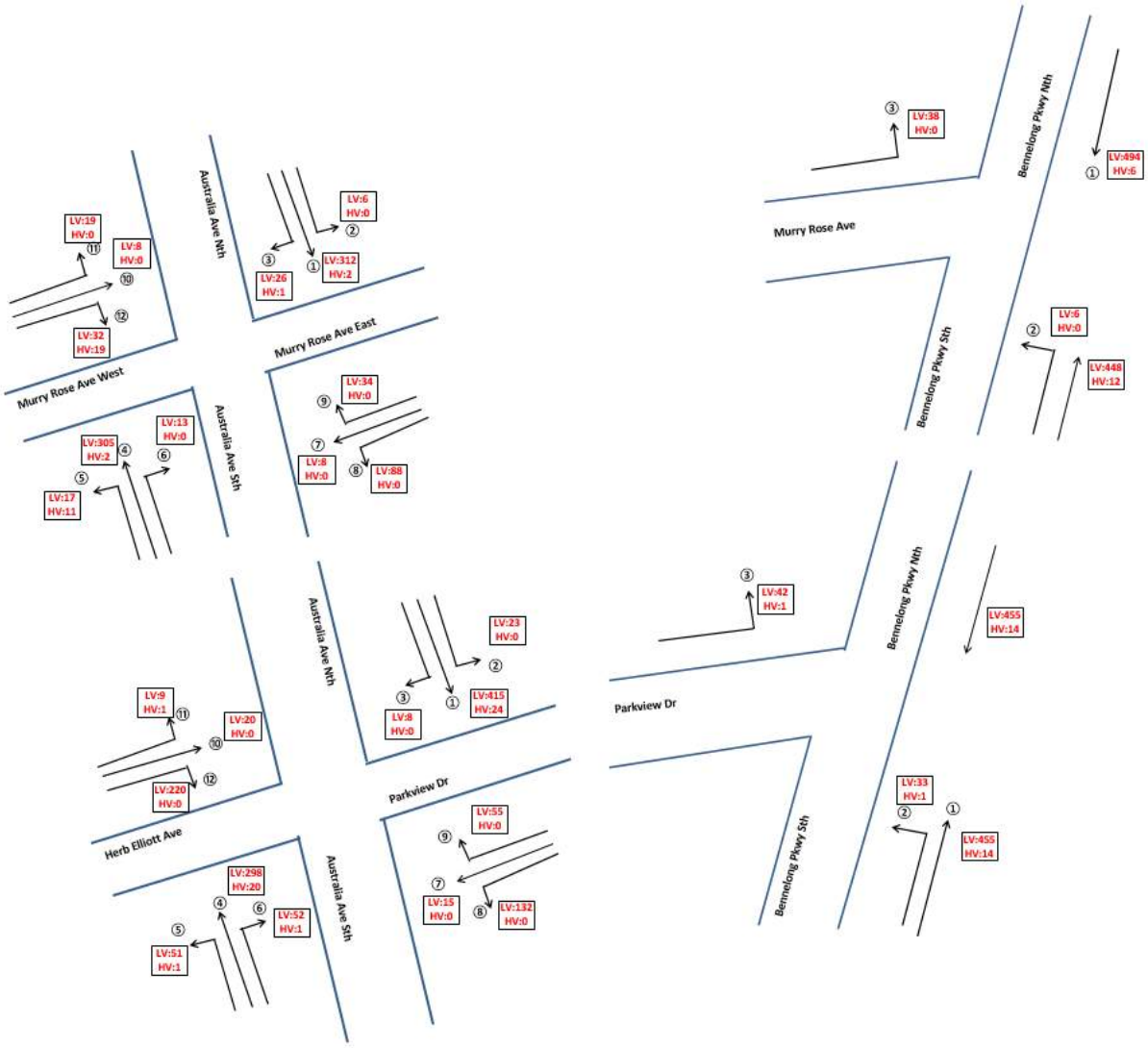


Figure 22 – Existing Traffic Distribution PM Peak.

4.2.3 Existing Network Operation

From the survey data, a volume analysis was performed using SIDRA Intersection 7.0 software, a micro-analytical tool for individual intersections and whole-network modelling. The models are based on the collected traffic survey data. SIDRA provides a number of performance indicators, outlined below:

- Degree of Saturation – The total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation. (e.g. 0.8=80% saturation)
- Average Delay- The average delay encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.
- Level of Service (LoS) - This is a categorization of average delay, intended for simple reference. The RMS adopts the following bands:
- 95% Queue Lengths (Q95) – is defined to be the queue length in metres that has only a 5-percent probability of being exceeded during the analysis time period. It transforms the average delay into measurable distance units.

Level of Service is a good indicator of overall performance for individual intersections, with each level summarised in Table 16.

Table 16 – Intersection Performance - Levels of Service

Level of Service	Average Delay (secs/vehicle)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Extra capacity required	Extreme delay, major treatment required

The SIDRA results for each intersection are shown in Table 17.

Table 17 – Summary of Existing Intersection Modelling

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Murray Rose Avenue and Australia Avenue	AM Peak	LOS B	4.4	0.307	12.0
	PM Peak	LOS B	3.0	0.279	9.7
Parkview Drive and Australia Avenue	AM Peak	LOS B	18.4	0.718	50.3
	PM Peak	LOS B	17.4	0.553	31.4
Murray Rose Avenue and Bennelong Parkway	AM Peak	LOS A	0.4	0.385	0.2
	PM Peak	LOS A	0.3	0.278	1.1
Parkview Drive and Bennelong Parkway	AM Peak	LOS A	0.4	0.364	0.2
	PM Peak	LOS A	0.5	0.278	1.0

Based on the traffic volumes, the results indicate the intersections provide an acceptable level of service during the typical peak periods.

4.3 Development Traffic Generation

4.3.1 Traffic generation

Typically, the traffic activity associated with a development or land-use can be derived through reference to published data, for example the RMS Guide to Traffic Generating Developments. This form of traffic projection is useful where the development has unrestrained on-site parking provision. However, the development site has a restricted on-site parking provision, which is in accordance with the local planning control i.e. Sydney Olympic Park Master Plan 2030 (Masterplan).

4.3.2 Residential Traffic generation

The Guide to Traffic Generating Developments (RMS, 2002), and the updated RMS survey data for High Density Residential Developments in TDT 2013/04 define any residential flat building containing greater than twenty (20) dwellings as high density. Concerning such developments, the RMS guide suggests the following average trip rates per car space for Sydney:

- Daily vehicle trips = 1.34 per space;
- Morning peak hour trips = 0.15 per space; and
- Evening peak hour vehicle trips = 0.12 per space.

Furthermore, the TDT 2013/04 provides exemplary trip generation data for specific, individually surveyed sites. In order to find the most comparable trip generation based on these individual sites, an assessment of the 'Bureau of Statistics Journey to Work Database' has been undertaken to ascertain the existing travel modes utilised by residents of Sydney Olympic Park. Based on the information taken from the "Place of Residence' study, undertaken in 2016, the method of travel is shown in Figure 23.

Main method of travel	Number	%
a Bicycle	6	0.6
Bus	35	3.5
Car - as driver	495	49.0
Car - as passenger	42	4.2
Did not go to work	69	6.9
Motorbike	3	0.3
Not stated	16	1.6
Other	12	1.2
Taxi	5	0.6
Train	236	23.4
Tram or Ferry	16	1.6
Truck	3	0.3
a Walked only	44	4.4
a Worked at home	21	2.2
Total employed persons aged 15+	1,010	100.0

Figure 23 – Method of Travel to Work for Sydney Olympic Park (source: profile.id.com.au)

It can be concluded that:

- 49% of residents travel to work as the driver of a vehicle,
- 5% of residents travel to work as a passenger of a vehicle, and
- 34% of residents travel to work by other means (Train, bus, cycle, walk etc)

Reviewing the RMS survey data for High Density Residential developments within TDT 2013/04, it has been assessed that, based on having the most similar mode split, the Liberty Grove site is the most comparable data set to use. An additional benefit of this site is the proximity to the development site.

The mode split for the Liberty Grove site is as follows;

- 48% of residents travel to work as the driver of a vehicle,
- 20% of residents travel to work as a passenger of a vehicle, and
- 32% of residents travel to work by other means (Train, bus, cycle etc)

For the Liberty Grove site, the trip generation rates, per car space (based on the RMS data) is

- AM peak – 0.19 per car spaces
- PM peak – 0.28 per car space

Based on this analysis, it is concluded that a more suitable traffic generation rate for the development is **0.19** trips per car space (AM peak) and **0.28** trips per car space (PM peak).

Applying the above rates to the of proposed development of 294 units and 329 parking spaces (as discussed further in Section 5), leads to the following trip generation;

Table 18 – Trip Generation

Building	Period	Trip generation rate	Number of spaces	Trip Generation
1	AM Peak	0.19 per space	204	39
	PM Peak	0.28 per space	204	58
2	AM Peak	0.19 per space	125	24
	PM Peak	0.28 per space	125	35

The trip generation has been calculated per building, due to each building having separate access points onto different roads and therefore having differing effects on the traffic distribution. Building 1 accesses Murray Rose Avenue and Building 2 accesses Parkview Drive.

4.3.3 Summary of Proposed Traffic Generation

In summary the development should therefore generate a total of 63 trips in the AM peak, with Building 1 generating 39 trips and Building 2 generating 24 trips, and a total of 93 trips in the PM peak, with Building 1 generating 58 trips and Building 2 generating 35 trips.

4.4 Proposed Traffic Distribution

The proposed traffic distributions for the development are shown in Figure 24 and Figure 25.

The proposed traffic distribution has been allocated as follows:

- AM peak – 80% outbound trips, 20% inbound trips, with all outbound traffic exiting towards Australia Avenue, due to the 'left turn only' restriction at Bennenlong Avenue.
- PM Peak – 80% inbound, 20% outbound, with all inbound traffic accessing the site from Bennelong Avenue, as this provides the quickest route to the site from Homebush Bay Drive,

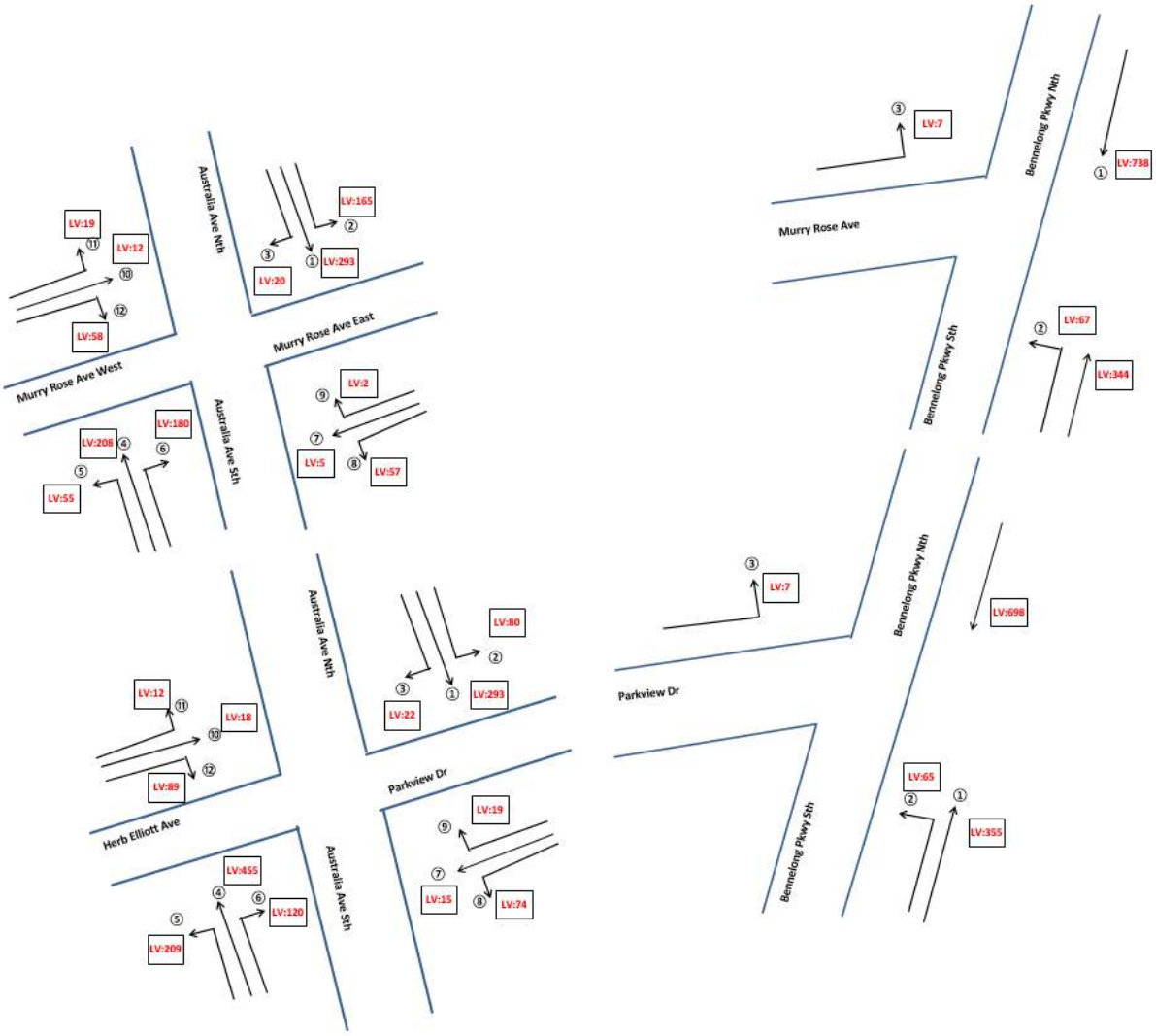


Figure 24 – Proposed Traffic Distribution AM Peak.

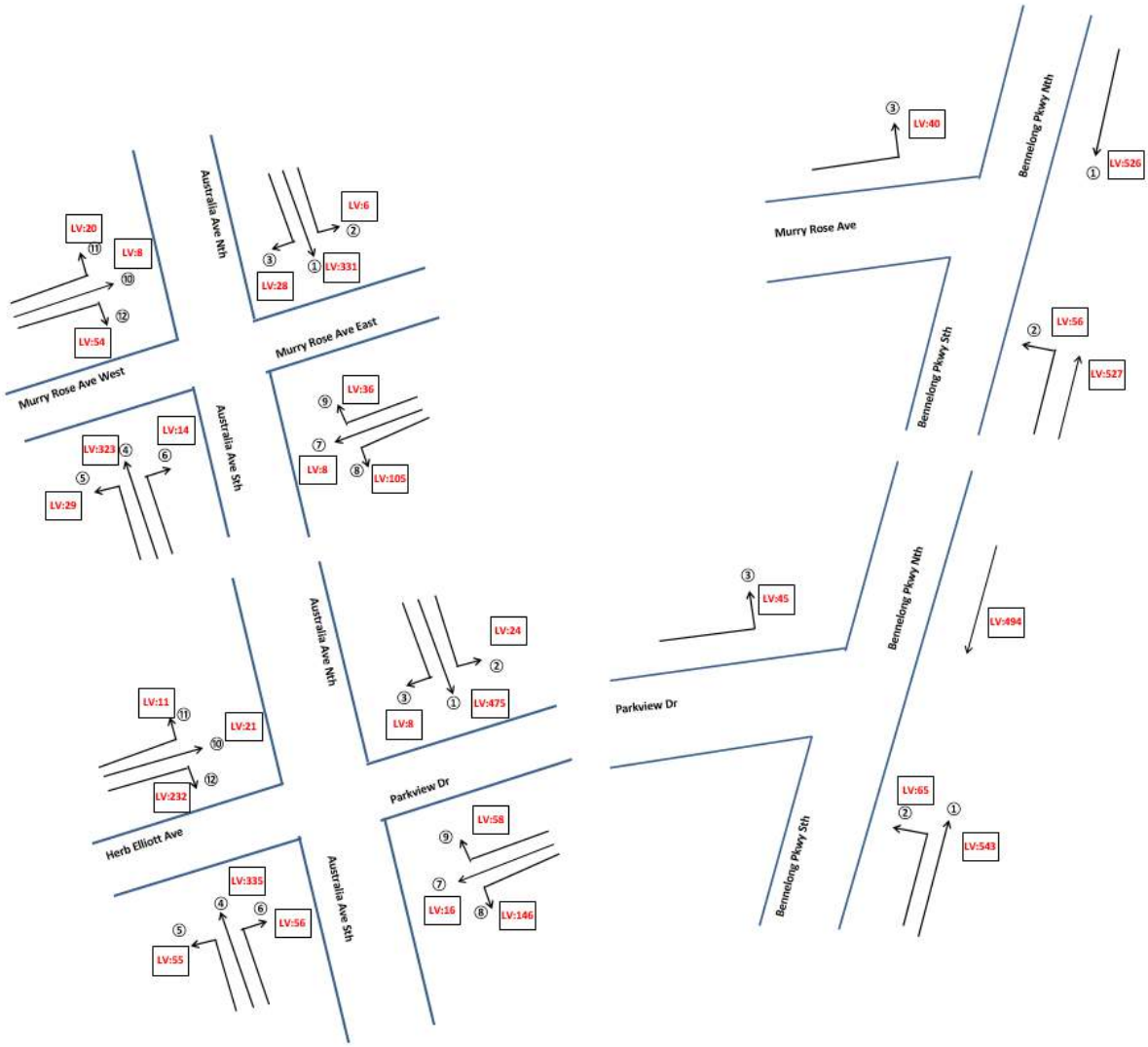


Figure 25 – Proposed Traffic Distribution PM Peak.

It should be noted that the distributions shown are outputs from SIDRA 8.0 and include an additional 5% to allow for daily traffic variation.

4.5 Proposed Network Operation

The projected traffic generations and distribution have been applied to the two surveyed intersections and intersection modelling has undertaken using SIDRA 8.0 and the results are summarised in Table 19.

Table 19 – Summary of Proposed Intersection Modelling

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Murray Rose Avenue and Australia Avenue	AM Peak	LOS B	4.5	0.326	12.9
	PM Peak	LOS B	3.1	0.285	10.0
Parkview Drive and Australia Avenue	AM Peak	LOS B	18.4	0.718	50.3
	PM Peak	LOS B	17.5	0.579	32.4
Murray Rose Avenue and Bennelong Parkway	AM Peak	LOS A	0.4	0.385	0.2
	PM Peak	LOS A	0.6	0.305	1.1
Parkview Drive and Bennelong Parkway	AM Peak	LOS A	0.4	0.364	0.2
	PM Peak	LOS A	0.6	0.319	1.1

The intersection modelling indicates that, during both the morning and afternoon peak periods, the two intersections will continue to operate similar to the existing situation.

In this regard, the development proposal should not cause any detrimental impact on the operation of the road network in the context of the existing and proposed traffic activity.

The full SIDRA outputs can be found in Attachment 1.

4.6 Pedestrian Activity

With reference to the 'Bureau of Statistics Journey to Work Database' and based on the information taken from the "Place of Residence' study, undertaken in 2016, it was concluded that:

- 49% of residents travel to work as the driver of a vehicle,
- 5% of residents travel to work as a passenger of a vehicle,
- 1% of residents travel to work by bicycle, and
- 33% of residents travel to work by other means (Train, bus, walk etc)

From the 2016 census it was determined that the 'Average household size' was 2.0 persons per dwelling. Based on this data, it is reasonable to assume that the occupation of the development (294 units) would be 588 people.

Utilising the figure of 33% of residents travelling to work by train/bus/cycle, it is reasonable to assume that up to 194 occupants could be walking to work or walking to another mode of transport.

As outlined in Section 3.4.1, there is a well-established network of pedestrian footpaths and pedestrian crossings adjacent to and in the vicinity of the development, which are more than adequate to accommodate the potential increase in pedestrian activity.

4.7 Cyclist Activity

Using the same analysis for cyclist activity as was used for pedestrian activity, the "Place of Residence' study, undertaken in 2016, indicates that 1% of residents of Sydney Olympic Park, travel to work by bicycle.

Again, based on the 2016 census, 'Average household size' was 2.0 persons per dwelling, the likely occupancy number for the development is 588 people.

Therefore, it is reasonable to assume that 6 occupants would cycle to work, although the facilities in SOP could result in higher usage.

As outlined in Section 3.4.2, there is a well-established network of cycle facilities adjacent to and in the vicinity of the development, which provide connection to Sydney Olympic Park train station and the wider Sydney cycle network and these facilities are more than adequate to accommodate the potential increase in cyclist activity.

5. Parking Provision Assessment

The parking provision assessment has been undertaken in accordance with SOPA Masterplan 2030

5.1 Car Parking

The following maximum parking rates required for the proposed development as per the SOPA Masterplan 2030

- One Bedroom Unit – 1.0 space per unit
- Two Bedroom Unit – 1.2 spaces per unit
- Three Bedroom Unit – 1.5 spaces per unit
- Four Bedroom Unit – 2.0 spaces per unit
- Visitors – 0.25 spaces per unit

As set out in Section 1.1, the development involves the construction of two multi storey towers accommodating 294 units in the following configuration:

Table 20 – Residential Unit Split

Building	One Bedroom Units	Two Bedroom Units	Three Bedroom Units	Four Bedroom Units	Building Totals
1 Murray Rose Ave	39	97	32	0	168
2 Murray Rose Ave	33	72	20	1	126
Unit Total	72	169	52	1	**294**

Based on unit split and the maximum requirements of SOPA Masterplan 2030, the development proposes the following parking provision.

Table 21 – Car Parking Provision – 1 Murray Rose Avenue

User Type	Units	Maximum Parking Requirement Rate	Maximum Allowable Parking Requirement		Provided Parking Provision
One bedroom Units	39	1.0 space per unit	39	204	204
Two bedroom units	97	1.2 spaces per unit	117		
Three bedroom units	32	1.5 spaces per unit	48		
Visitors	168	0.25 spaces per unit	42		0
Total			**246**		**204**

Table 22 – Car Parking Provision – 2 Murray Rose Avenue

User Type	Units	Maximum Parking Requirement Rate	Maximum Allowable Parking Requirement		Provided Parking Provision
One bedroom Units	33	1.0 space per unit	33	152	125
Two bedroom units	72	1.2 spaces per unit	87		
Three bedroom units	20	1.5 spaces per unit	30		
Four bedroom units	1	2.0 spaces per unit	2		
Visitors	126	0.25 spaces per unit	32		0
Total			**183**		**125**

As shown in Table 21 and Table 22 the development requires a maximum of 356 residential spaces and 74 visitor spaces. Due to site constraints, the development proposes 329 residential spaces and no visitor spaces.

The proposed 329 residential spaces, is below the maximum required by the SOPA Masterplan 2030 and therefore meets the requirements of the Masterplan.

In order to accommodate the visitor parking, the possibility of utilising the Car Park 6A has been considered, as it lies within a suitable walking distance of 400 metres of the development, in accordance with the 'Planning Guidelines for Walking and Cycling 2004'. Looking at the occupancy distribution throughout the day, as illustrated in Section 3.2, it is fair to conclude that, between 8.00am and 5.00pm, the car park is mainly used by employees working in the vicinity of the car park. Furthermore, it is fair to assume that the main time for visitors to arrive at the development site will be in the evenings and on weekends. When analysing the parking occupancy data (see Table 9 and Table 10), the car park offered over 500 parking spaces during the evening and at weekends.

Given that the visitor parking requirement for the proposed development is 74 spaces, we conclude that there is adequate parking available for visitors to the development site, within a suitable walking distance and that the zero visitor parking provision proposed, should not have any adverse effects on the surrounding road network.

5.2 Accessible Car Parking

In accordance with the SOPA Access Guidelines, with one accessible space provided for each accessible unit, the accessible parking has been determined as summarised in Table 23.

Table 23 – Accessible Parking Provision

User Type	Accessible Units	Maximum Parking Requirement Rate	Parking Requirement	Provided Parking Provision
Adaptable units 1 Murray Rose Ave	17	1.0 space per unit	17	17
Adaptable units 2 Murray Rose Ave	13	1.0 spaces per unit	13	13
Total			**30**	**30**

As a zero parking provision for visitors is proposed within the development, no accessible visitor parking spaces have been provided.

5.3 Additional Parking

In additional the residential parking provision, the development proposes the provision of a Building Manager car spaces, located on the loading area of the ground floor of Building 1 and a car wash bay in Basement 3 of Building 1.

5.4 Service Vehicle Parking

With reference to Section 4.3-D5 of the Auburn DCP 2010 (now part of the Paramatta City Council DCP) the requirements for refuse collection vehicle s are as follows:

'When collection vehicles are required to enter a building (to collect waste and recycling), the following access controls apply:

1. Maximum grade 1 in 20 for first 6 metres from street, then 1 in 8 or 1 in 6.5 with a transition of 1 in 12 for 4 metres at lower end.
2. Minimum vertical clearance height required is 4.0 metres. (Note: Clearances must take into account service ducts, pipe works, etc).
3. Minimum width of driveway required is 3.6 meters.
4. Minimum radius of the turning circle required is 10.5 metres.
5. Collection vehicles shall enter and exit in a forward direction.
6. Collection point for waste shall comply with relevant Australian Standards for loading bays.'

Based on this criteria, the design vehicle of the waste collection has been determined as a Medium Rigid Vehicle (MRV).

To accommodate this requirement, three service vehicles bays have been provided across the development.

- One MRV and one SRV loading bay within Level 00 of 1 Murray Rose Avenue; and
- One MRV loading bay within Level 00 of 2 Murray Rose Avenue.

These bays will be available for use by both refuse vehicles and tenants and a management plan will be put in place to co-ordinate the usage.

5.5 Bicycle Parking

The bicycle parking requirements relating to new developments with in Olympic Park are presented in Table 4.12, in the Sydney Olympic Park Master Plan 2030.

The bicycle parking rates are presented as a minimum provision in line with the SOPA planning principle of "promoting access and travel by public transport, walking and cycling".

The masterplan specifies the following minimum bicycle parking requirements;

- Residential use
    - One bedroom units - 1 space per unit
    - Two bedroom units - 1.2 spaces per unit
    - Three bedroom units - 1.5 spaces per unit
    - Four bedroom units - 2.0 spaces per unit
    - Visitors - 0.25 spaces per unit

The required bicycle parking provision for the development is shown in

Table 24 – Bicycle Parking Provision – 1 Murray Rose Avenue

User Type	Units	Minimum Parking Requirement Rate	Minimum Allowable Parking Requirement		Provided Parking Provision
One bedroom Units	39	1.0 space per unit	39	204	204
Two bedroom units	97	1.2 spaces per unit	117		
Three bedroom units	32	1.5 spaces per unit	48		
Visitors	168	0.25 spaces per unit	42		42
Total			**246**		**246**

Table 25 – Bicycle Parking Provision – 2 Murray Rose Avenue

User Type	Units	Minimum Parking Requirement Rate	Minimum Allowable Parking Requirement		Provided Parking Provision
One bedroom Units	33	1.0 space per unit	33	152	152
Two bedroom units	72	1.2 spaces per unit	87		
Three bedroom units	20	1.5 spaces per unit	30		
Four bedroom units	1	2.0 spaces per unit	2		
Visitors	126	0.25 spaces per unit	32		32
Total			**184**		**184**

The residential spaces are to be provided as either individual bicycle parking spaces within the basement structure or within a unit storage cage, suitably sized to accommodate the bicycle parking envelope, with the majority of cages sized to accommodate two bicycles.

Visitor bicycle parking will be provided within the visitor bicycle store (Site 1, Level 1) or the public domain (Site 2, Level 01) in the form of bicycle racks meeting the minimum requirements of AS2890.3.

5.6 Parking Assessment Summary

A summary of the required

Table 26 – Summary of Proposed Parking Provisions

Parking Provision	Parking Rate	Spaces Required	Spaces Provided
Car Parking	Residential	354 maximum	329 (inc accessible spaces)
	Visitor	74 maximum	0
Accessible Car Parking	Residential	30	30
Service Vehicle Parking			2 x 8.8m Bays 1 x 6.6m Bay
Bicycle Parking	Residential	356 minimum	356
	Visitors	74 minimum	74

6. Access and Design Review

6.1 Car Park Arrangement

The car park access and parking arrangements have been designed in accordance with the requirements of Section 2 of AS2890.1.

Table 1.1 of AS2890.1 presents a number of classifications applicable to different land-uses. According to the Table, the most appropriate car park classification applicable to the subject car park will be a Class 1A facility, which is suitable for “Residential, domestic and employee parking”.

The parking space dimensions and associated aisle widths for each classification are presented in Table 2.2, and accordingly, a Class 1A facility requires parking space dimensions of 2.4 x 5.4 metres with an access aisle width of 5.8 metres. The proposed car park has been designed to provide compliant parking space widths of 2.4 metres and a minimum aisle width of 5.8 metres, which meets the minimum requirement.

The proposal provides 48 spaces as 24 tandem pairs. All tandem spaces will be allocated to a single unit and residents will manage the access to the rear space.

An assessment of all elements of the basement car parks have been undertaken including column locations, aisle extensions headroom and ramp grades and in this regard, the car park design complies with the requirements of AS2890.1-2004.

Access to Site 2, Level 00 is proposed via a 3.1 metre wide ramp, which will operate as a one-way ramp. Traffic signals are to be provided to control access to the ramp, with priority given to entering vehicles. Full details of the signal system will be provided at CC stage.

The layout also provides 30 accessible parking spaces and these spaces have been assessed against the requirements within AS2890.6:2009, which requires an accessible space dimension of 2.4 x 5.4 metres with a shared space of 2.4 metres width adjacent to any space and a headroom of 2.5m. An assessment of theses spaces has been undertaken and in this regard, the accessible spaces comply with the requirements of AS2890.6:2009.

The access and parking assessment can be found in Attachment 1

6.2 Vehicular Access

With regard to the vehicular driveway width, reference is made to Table 3.1 and Table 3.2 of AS2890.1. According to Table 3.1, both driveways will be classified as a Category 2 as the total car parking provision is between 101 and 300 spaces, with the driveway located on a local road. According to Table 3.2, the width of a Category 2 driveway should be within the range of 6.0m to 9.0m for combined driveways.

The proposed vehicular driveway widths are 7.0m and 9.0m wide, therefore meeting the requirements of the standard

The service bay driveway provides access for vehicles up to 8.8mm in length and this driveway has been assessed on a performance basis by means of swept path analysis. As shown in Attachment 1, the proposed driveway width of 13.0m, accommodates the expect movements, is fit for purpose and therefore, meets the intent of the standards.

It should be noted that this driveway is shared with the adjacent property as the access point for service vehicles to that development.

6.3 Sight Splay

The sight distance requirements are described in Section 3.2 of AS2890.1 and are prescribed on the basis of the sign posted speed limit or 85th percentile vehicle speeds along the frontage road, which for Murray Rose Avenue and Parkview Drive is 50km/hr.

According to Figure 3.2 of AS 2890.1, a property on a 50km/hr road must provide a minimum sight distance of 45m and a desirable distance of 69m. It was noted that the proposed driveway will meet these requirements, being located on a straight alignment. Whilst vegetation and parked cars lead to partial visual obstructions, the issue can be circumnavigated as the user slowly proceeds forward, without needing to encroach onto oncoming traffic.

6.4 Bicycle Parking

The bicycle parking arrangements have been designed in accordance with the requirements of AS2890.3.

The bicycle parking has been provided as horizontal spaces and the space requirements are listed below;

- Horizontal spaces – 1.8m length, 0.5m width, 1.5m wide access aisle
- Vertical spaces – 1.2m length, 0.5m width, 1.5m wide access aisle

An assessment of the bicycle spaces and storage cages, including aisle widths and access has been undertaken and in this regard the bicycle parking provisions complies with the requirements of AS2890.3.

6.5 Servicing

As discussed in Section 6.2, servicing of the development, including waste collection, will be undertaken by vehicles up to 8.8m in length.

To accommodate this, two 8.8m by 3.5m and one 6.6m x 3.5m loading bays have been provided within the ground level and swept path analysis has been undertaken to indicate the access and egress paths of these vehicles. This analysis can be found in Attachment 1.

AS2890.2 requires headroom of 4.5m for on-site parking facilities accommodating MRV's. This requirement is based on the maximum height of 4.2m for a MRV and a clearance of 300mm.

An assessment of refuse vehicle specifications corresponding to this length of vehicle has been undertaken as follows:

- SITA Rear Lift: Overall Length – 8.0 metres, Overall Width – 2.5 metres, Height (in operation) – 3.4 metres.
- Veolia Rear Lift 4x2: Overall Length – 8.65 metres, Overall Width – 2.2 metres, Max Height – 3.04 metres.
- ACCO 2350 G 4x2: Overall Length – 8.13 metres, Overall Width – 2.48 metres, Max Height – 3.44 metres.

Based on this assessment, the likely maximum height of a refuse vehicle would be 3.44 metres and allowing for a 300mm tolerance for headroom, the proposed 4.0 metre clearance for vehicle access is adequate.

Further to this the loading area is to be used by Medium Rigid Vehicles (MRV) providing removalist services for the residents.

Typical heights for vehicles undertaking these operations are as follows:

- Hino 700 Series - Length – 8.7 metres, Width – 2.49 metres, Body Height– 3.05 metres.
- Iveco Acco 4x2 - Length – 8.45 metres, Width – 2.18 metres, Cab Height– 2.69 metres.
- Isuzu FRD LWB - Length – 8.6 metres, Width – 2.17 metres, Cab Height– 2.59 metres.

Allowing for a typical additional body height of 1 metre, to the cab height dimension and a 300mm tolerance, the typical vehicle heights fall below the proposed 4.0 metre headroom. In addition height bar restrictions of 4.0 metres would be provided at the entrance to the loading area access and residents and retail space occupiers would be aware of the height restrictions and would be required to limit any delivery or removalist heights as such. Therefore, the provision of a 4.0 metre headroom does not impact of the serviceability of the development, given that there are a range of vehicles with a height of less than 4.0 metres that can service the development.

A loading dock management, supplemented by a 'Drivers Code of Conduction' can also be put in place to inform all users of the loading dock of the requirements of using the facility.

An assessment of all elements of the service vehicle areas have been undertaken including column locations, aisle extensions, ramp grades and headroom and in this regard, the car park design complies with the requirements of AS2890.2-2002 or has been assessed to meet the intent of the standards and is fit for purpose.

7. Impact of Special Events

Sydney Olympic Park hosts a number of major events during a typical year, most notably the Royal Easter Show over the Easter Period.

In addition to the above events, the Sydney Olympic Park hosts numerous sporting events and entertainment events within ANZ Stadium and Acer Arena. For ease of reference, we have classified the events affecting the operation of the proposed building can be summarised as the following four modes:

7.1 Normal Operation (No Event)

The road network will function in the normal manner providing sufficient capacity as described in Section 4 of this report. All vehicular and pedestrian access to the building will operate in a normal manner.

7.2 Royal Easter Show Operation

The Royal Easter Show is an annual event and last for two weeks over the Easter period. This event is organised by Royal Agricultural Society (RAS) and preparation for this event start two weeks prior to the actual event and RAS requires one week after the official show period to vacate the showground.

Figure 26 – Royal Easter Show Plan

Service vehicle access into the Easter Show site is provided at the intersection of Murray Rose Avenue and Australia Avenue. A controlled pedestrian entry and egress is also located at the eastern end of Murray Rose Avenue to provide access into the showground for patrons arriving or departing via Olympic Park Railway Station. There may also be varying degrees of access control implemented by SOPA (Gate 15) in and around Murray Rose Avenue (Jacaranda Square) to facilitate taxi access and coordination of other service vehicles associated with the show.

The show typically operates between 7am and 9pm with the carnival operating until 11pm during the two weeks of the Easter Show.

Access and egress to the proposed Site 9 development would still be available via Homebush Bay Road, Australia Avenue and Sarah Durack Avenue.

The following strategies are proposed to minimise impacts to buildings and the event as part of the proposed development:

- Regular communication between the Building Manager and SOPA with regard to event dates and potential impacts,
- Regular communication between Building Manager, residents and staff (emails, notices etc...) regarding possible impacts and provide clear information on alternative travel / access arrangements or shutdowns,
- Building Manager to monitor SOPA's published six monthly event calendar and provide regular updates to residents / staff as necessary,
- Coordinate with relevant authorities as required,
- Provision of staff access passes / identification if required for certain tenants / staff,
- Encourage staff and residents to use public transport or implement an office closure on Friday to minimise the need for travel to Sydney Olympic Park thereby easing unnecessary congestion. This would need to be discussed / negotiated with tenants during tenancy negotiations,
- Retail tenants to coordinate deliveries prior to and after the event. Close consultation may be required with Building Manager to assist with this process;

Access and egress to the proposed development would still be available via Murray Rose Avenue, Parkview Drive and Bennelong Parkway.

7.3 Stadium Events

The third operating mode relates to major sporting events or concerts that occur regularly throughout the year at ANZ Stadium and Acer Arena. Typically, these events occur outside of standard working hours, there will inevitably be impacts for businesses operating in the area with regard to access.

The major impact that will affect residents and staff during major events such as that described above, is:

- Traffic access to and from Olympic Park before and after events. Often, alternative traffic egress routes are suggested to tenants and staff to avoid delays at major intersections such as Homebush Bay Drive and Underwood Road;

The following strategies are proposed to minimise impacts for future tenants and the event as part of the proposed development:

- Regular communication between the Building Manager and SOPA with regard to event dates and potential impacts;
- Building Manager to monitor SOPA's published six monthly event calendar and provide regular updates to residents / staff as necessary;
- Coordinate with relevant authorities as required;

- Regular communication between Building Manager, residents and staff (emails, notices etc...) regarding possible impacts and provide clear information on alternative travel / access arrangements or shutdowns;
- Retail tenants to coordinate deliveries prior to and after the event. This may involve limiting deliveries to prior to 12pm on weekdays and no deliveries on Saturday or Sundays during events. Close consultation may be required with Building Manager to assist with this process;

These strategies are intended to comply with the Sydney Olympic Park Major Event Impact Assessment Guidelines based on discussions with SOPA's Major Events Coordinator. The strategies can be formalised following the outcome of the approval process and will be prepared in close consultation with SOPA and other relevant authorities.

Access and egress to the proposed development would still be available via Murray Rose Avenue, Parkview Drive and Bennelong Parkway.

8. Conclusion

In summary, the development proposal involves the construction of two multi storey residential towers accommodating 294 units as well as parking for 329 vehicles within two 3 level basements.

The assessment of traffic activity has established that the development will likely result an increase in traffic movements when compared to the current use of the site. However, this increase is unlikely to have any detrimental impact on the overall performance of the surrounding road network.

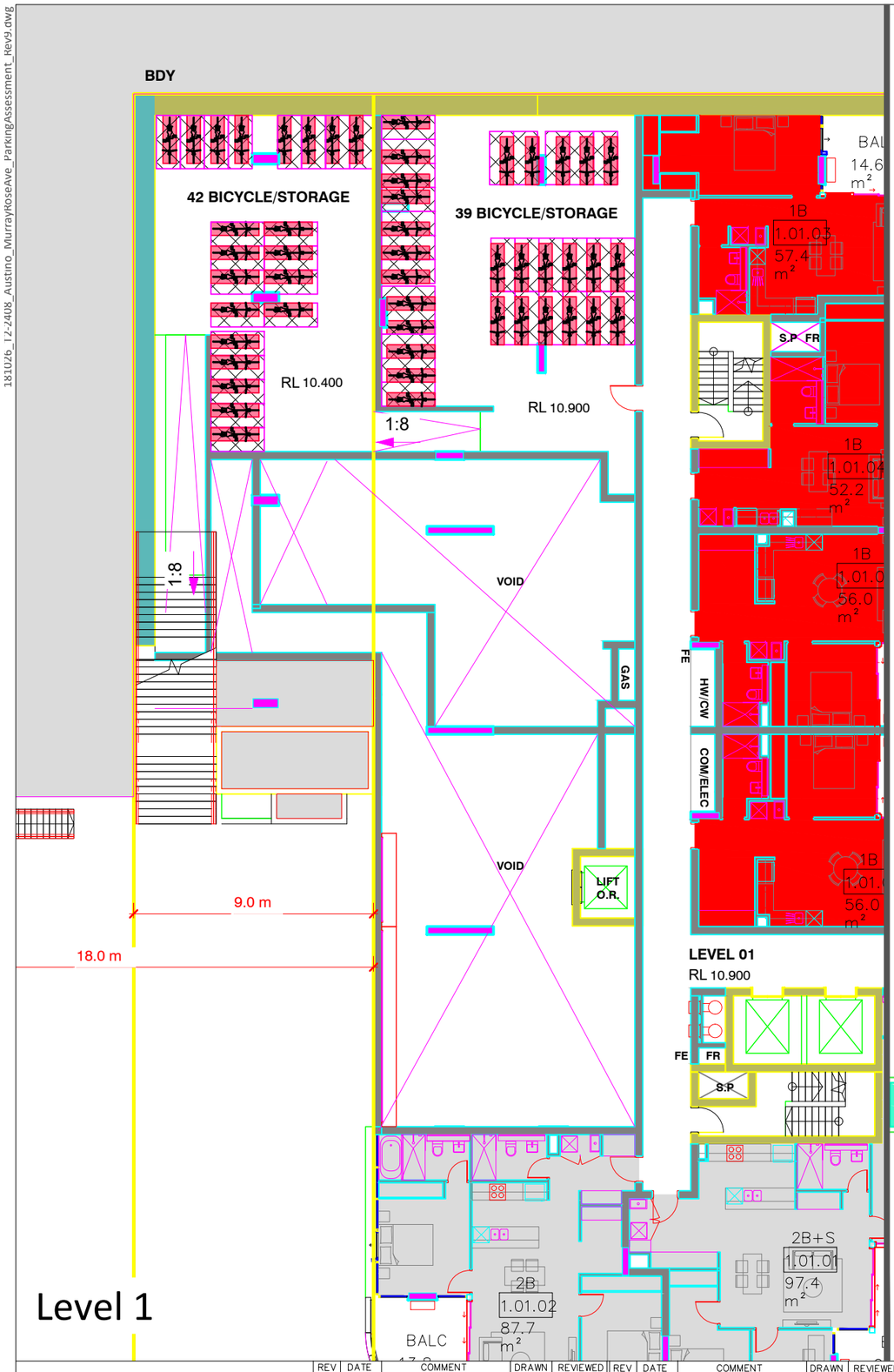
The parking provision of 329 car spaces, 430 bicycle spaces and three loading bays is considered to be suitable in the context of the Masterplan and Austroads Standards requirements and is unlikely to increase the demand for on-street parking.

The parking and vehicular access arrangements have been designed in accordance with the relevant standard, being AS2890 Part 1, Part 2, Part 3 and Part 6 or have been assessed, deemed to meet the intent of the standards and fit for use.

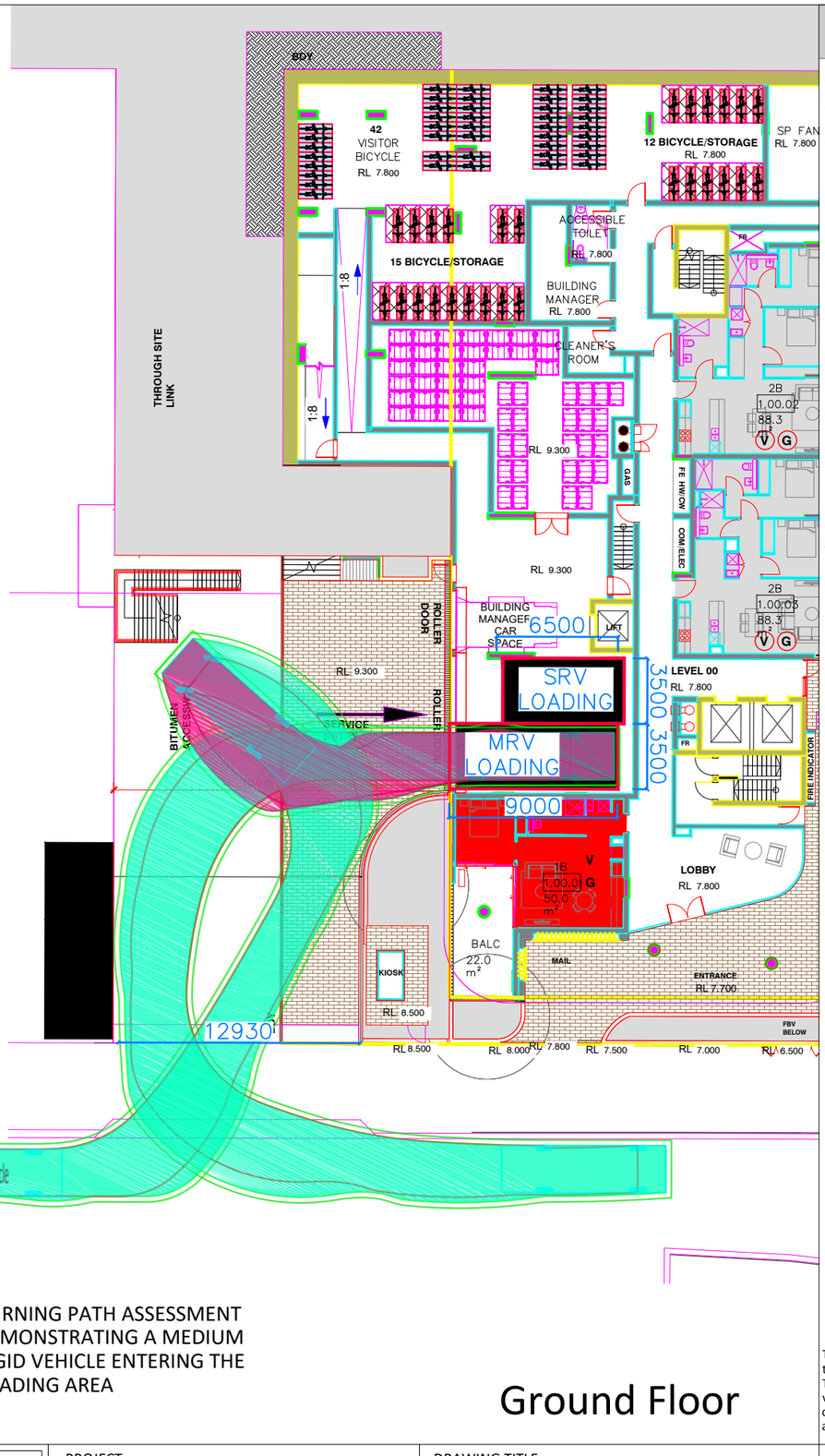
The location of the proposed access driveway should not present any traffic capacity constraints or safety concerns.

Attachment 1 Car Park Assessment

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



Level 1



TURNING PATH ASSESSMENT DEMONSTRATING A MEDIUM RIGID VEHICLE ENTERING THE LOADING AREA

Ground Floor

COMMENTS

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
X wherever access is required for a refuse vehicle (and safety clearance envelope)

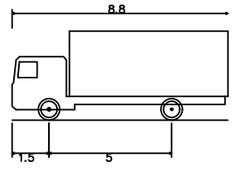
Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e, standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.



MRV – Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	10.000m

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
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3	18/06/18	Revised Layout	SW	AM					
2	13/06/18	Revised Layout	SW	AM	9	26/10/18	Updated Layout	SW	AM
XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

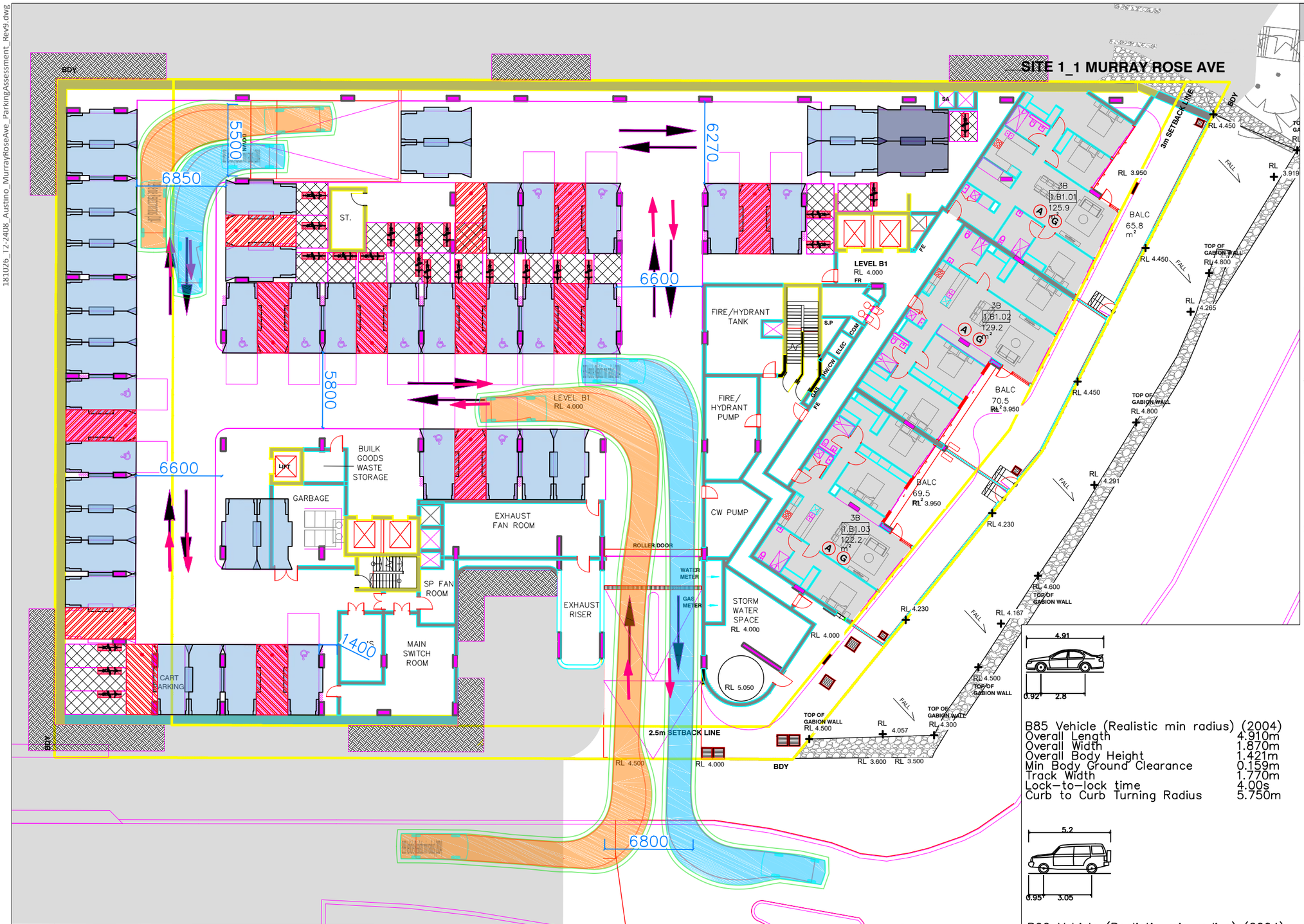
PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 1
Preliminary Parking and Access Assessment
Ground Floor & Level 1

CLIENT:	Austino
DRG. #:	SK-B1-001
PROJECT #:	T2-2408
SCALE:	1:300

REV: 9

1910126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



COMMENTS

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays
X wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

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Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.

B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	5.750m

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	6.250m

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

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3	18/06/18	Revised Layout	SW	AM
2	13/06/18	Revised Layout	SW	AM
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REV	DATE	COMMENT	DRAWN	REVIEWED
9	26/10/18	Updated Layout	SW	AM
8	23/10/18	Updated Layout	SW	AM

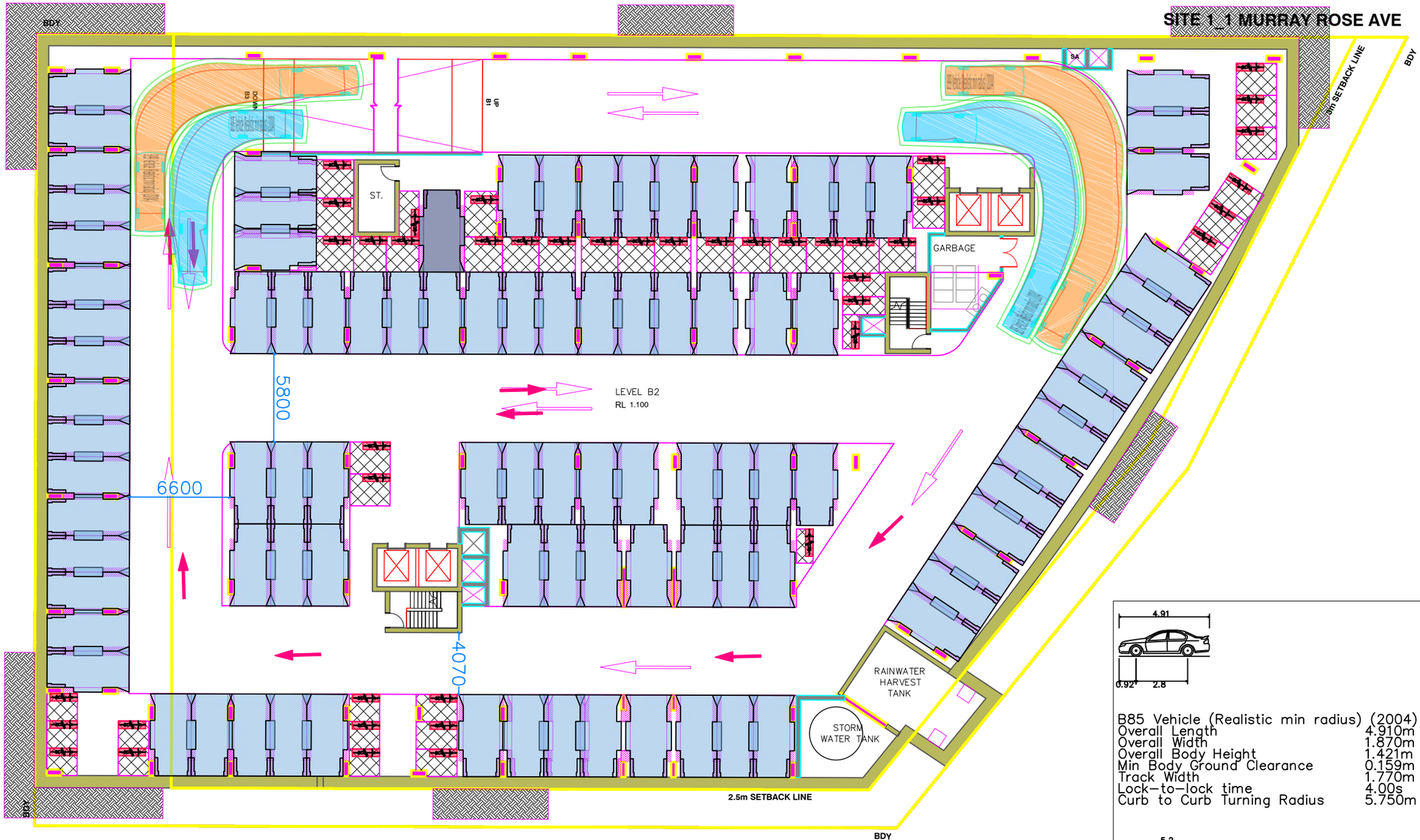
PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 1
Preliminary Parking and Access Assessment
Basement 1

CLIENT: Austino
DRG. #: SK-B1-002
PROJECT #: T2-2408
SCALE: 1:300

REV: 9

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



COMMENTS

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays **X** wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

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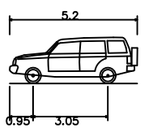
Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.

B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	5.750m



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XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

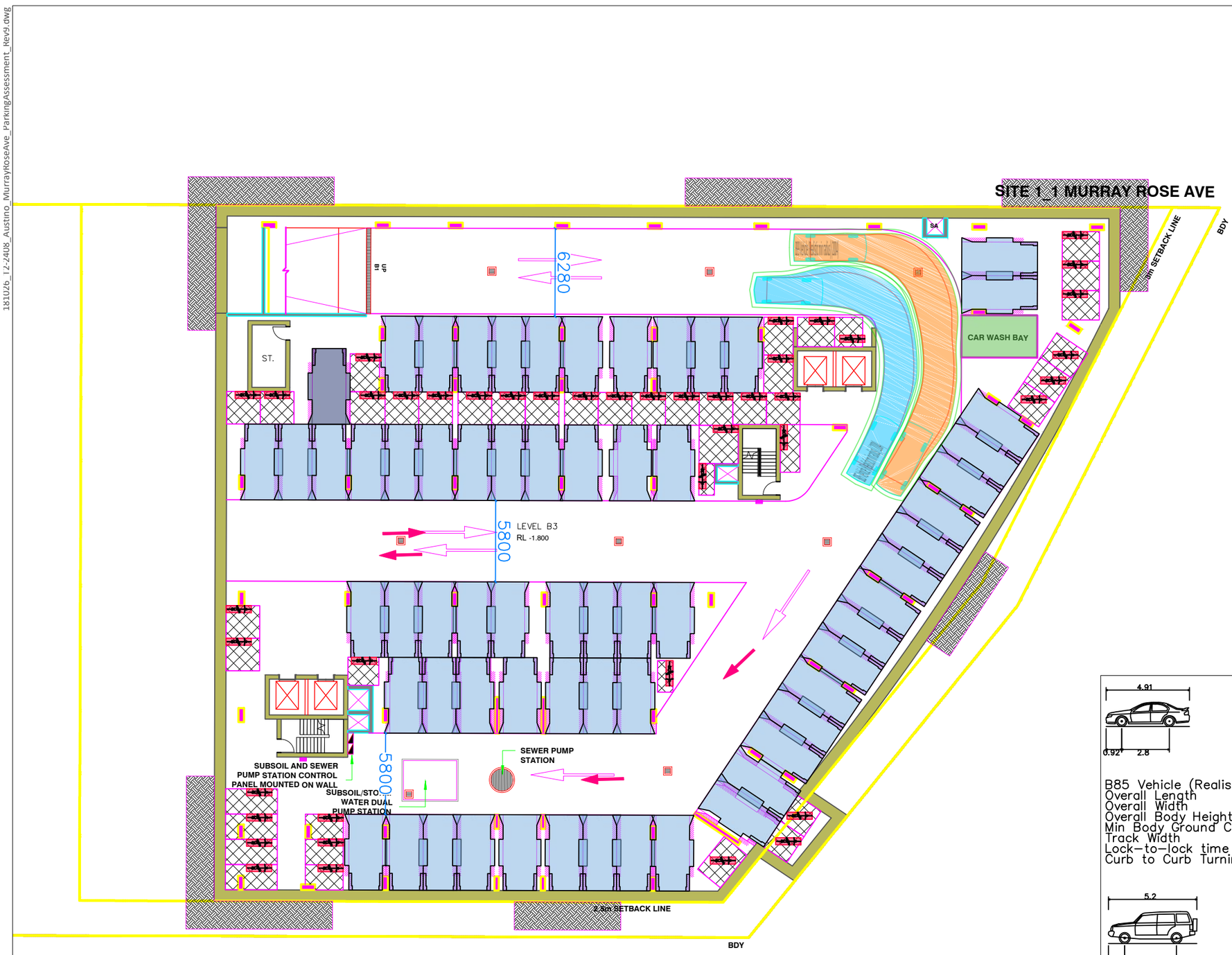
PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 1
Preliminary Parking and Access Assessment
Basement 2

CLIENT: Austino
DRG. #: SK-B1-003
PROJECT #: T2-2408
SCALE: 1:300

REV: 9

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



COMMENTS

A3

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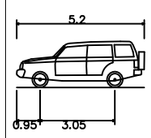

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XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 1
Preliminary Parking and Access Assessment
Basement 3

CLIENT: Austino
DRG. #: SK-B1-004
PROJECT #: T2-2408
SCALE: 1:300

REV: 9

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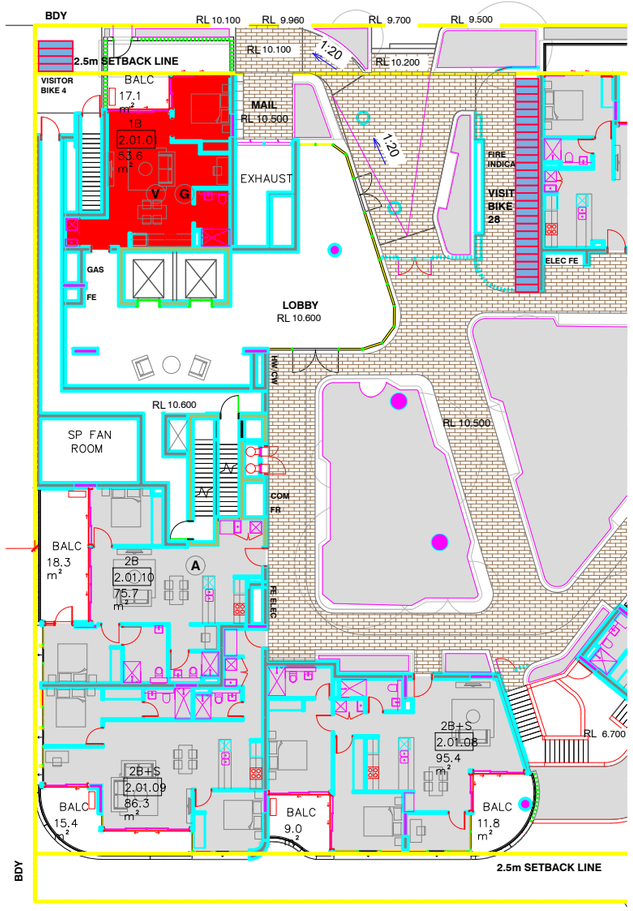

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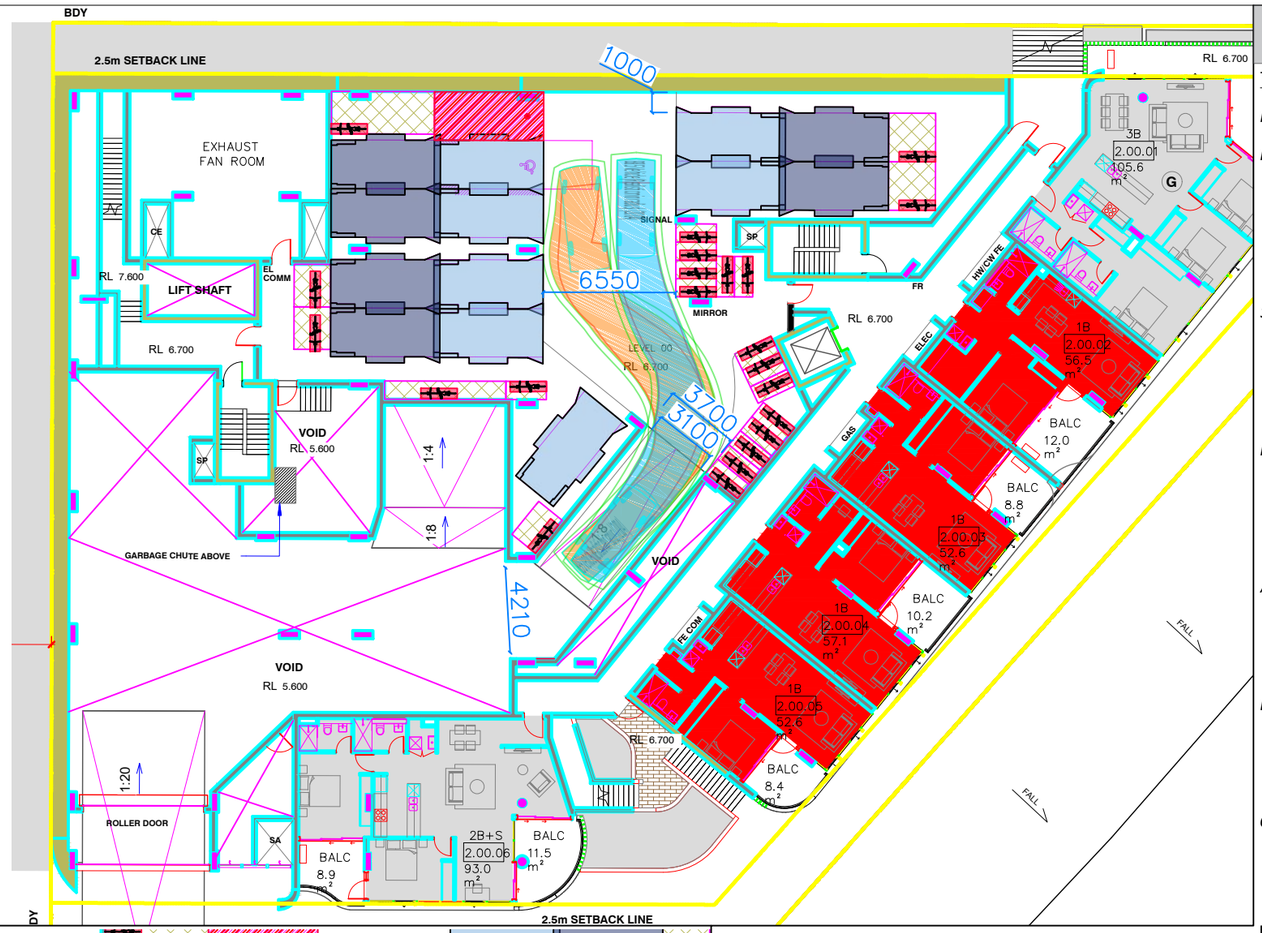
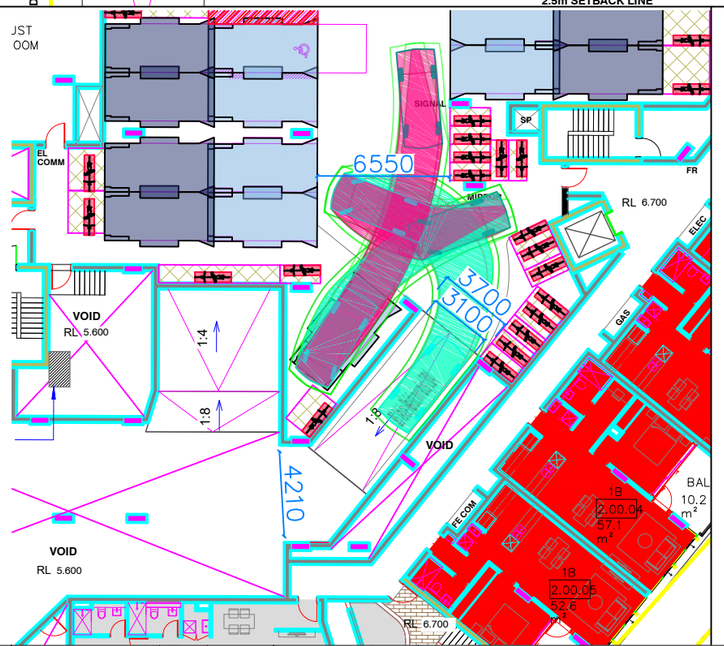


Ground Floor



Ground Floor
(Access to space adjacent to ramp)

COMMENTS

A3

TYPICAL

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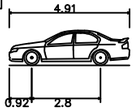

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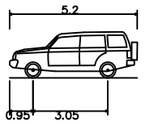

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8	23/10/18	Updated Layout	SW	AM

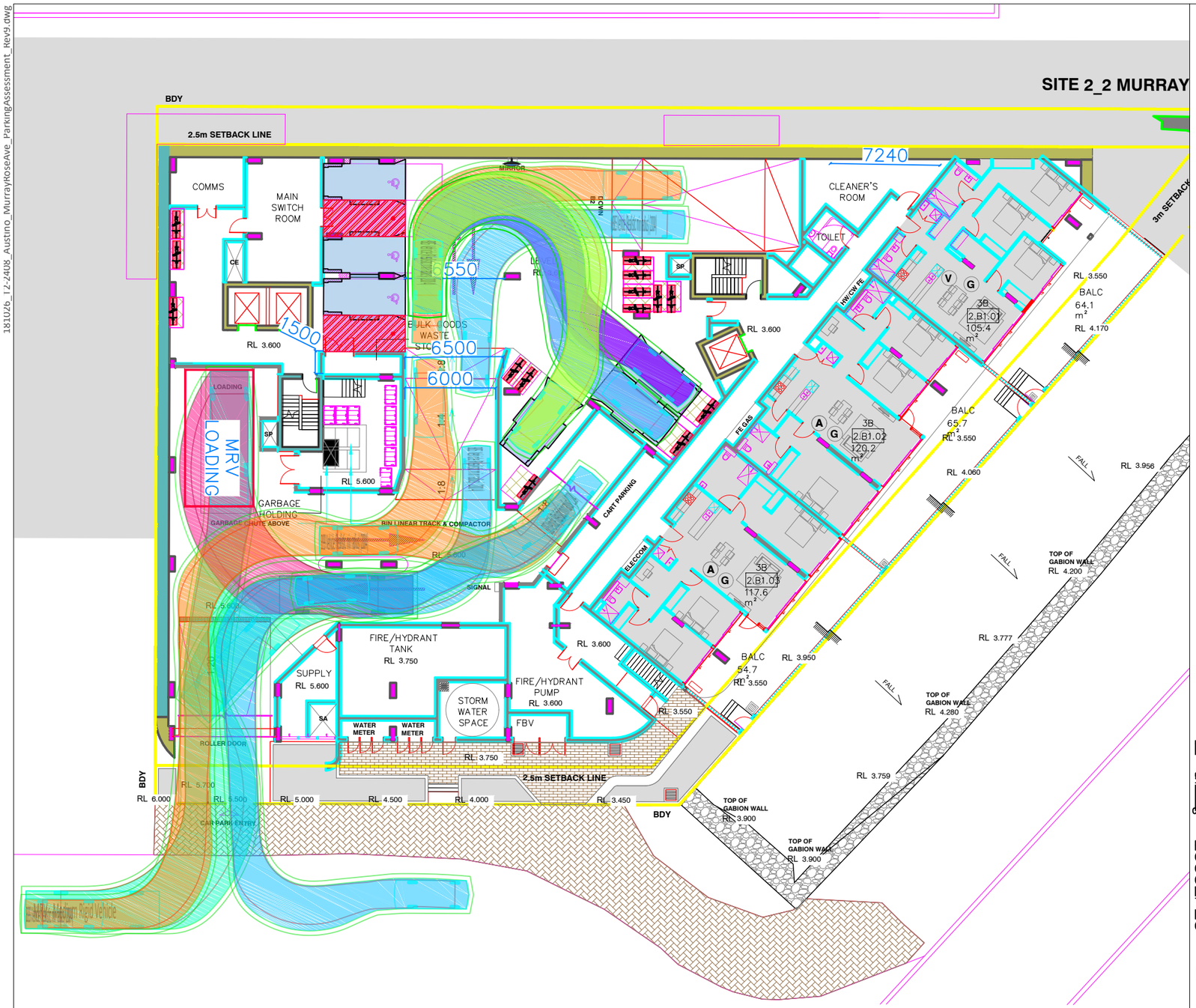
PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 2
Preliminary Parking and Access Assessment
Level 1 & Ground Floor

CLIENT:	Austino
DRG. #:	SK-B2-B001
PROJECT #:	T2-2408
SCALE:	1:300

REV: 9

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



TURNING PATH ASSESSMENT DEMONSTRATING A MEDIUM RIGID VEHICLE ENTERING THE LOADING AREA

COMMENTS

A3

TYPICAL

Please note the following compliance requirements:

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X wherever access is required for a refuse vehicle (and safety clearance envelope)

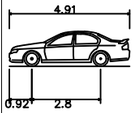
Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

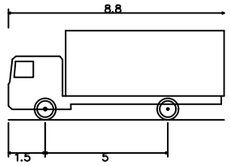
Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

Accessible Spaces: To be designed in accordance with AS2890.6. i.e, standard parking space with adjacent shared bay (2.4m x 5.4m), to be installed as per AS2890.6 requirements (bollard and markings).

Bicycle Parking: Bicycle spaces are to allow for a envelope of 500mm by 1800mm, with an aisle width of 2000mm for locker storage, or 1500mm for racks.

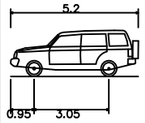
Control Measures: Please note recommended control measures, including line markings, signage, bollards, convex mirrors, lights etc.





B85 Vehicle (Realistic min radius) (2004)	
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m

MRV – Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



B99 Vehicle (Realistic min radius) (2004)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
7	27/08/18	Updated Layout	SW	AM					
6	06/08/18	Updated Layout	SW	AM					
5	27/06/18	Updated Layout Bldg 2 loading	SW	AM					
4	26/06/18	Updated Layout	SW	AM					
3	18/06/18	Revised Layout	SW	AM					
2	13/06/18	Revised Layout	SW	AM	9	26/10/18	Updated Layout	SW	AM
XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

PROJECT:

1 & 2 Murray Rose Ave
Sydney Olympic Park

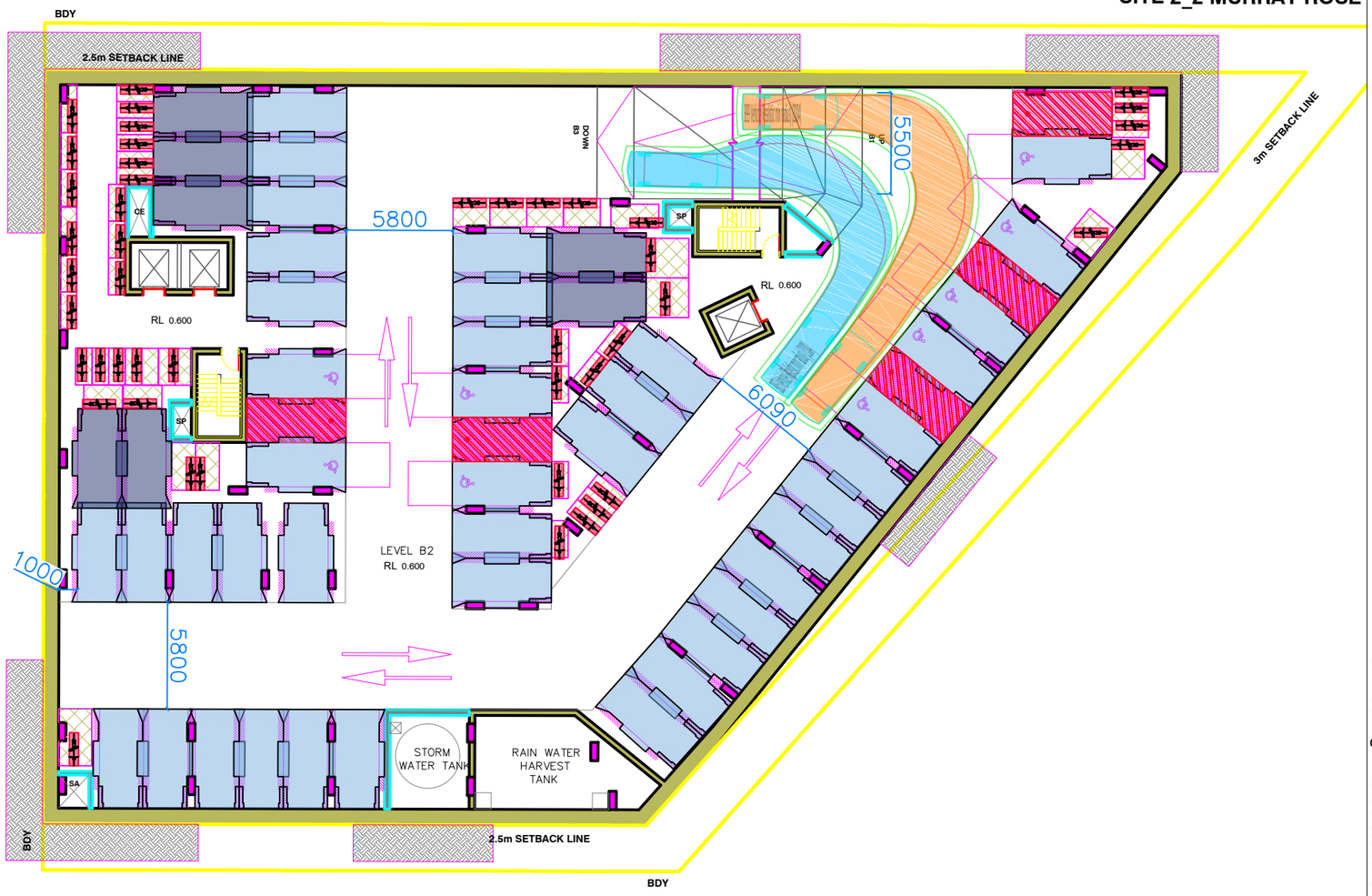
DRAWING TITLE:

Building 2
Preliminary Parking and Access Assessment
Basement 1

CLIENT:	Austino
DRG. #:	SK-B2-002
PROJECT #:	T2-2408
SCALE:	1:300

REV: 9

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



COMMENTS

A3

TYPICAL

Please note the following compliance requirements:

Height Clearance: **2.2m** (min) throughout all areas of the car park accessible to vehicles and bicycles.
2.5m above accessible and shared bays **X** wherever access is required for a refuse vehicle (and safety clearance envelope)

Sight Splays: Visibility splays in the form of a **2.5m x 2m** right-angled triangle to be provided (AS2890.1). Ensure design avoids visual obstructions in sight splay (i.e. dense landscaping, tall fencing/walls etc.)

Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

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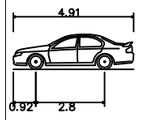

B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
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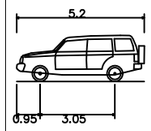
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	5.750m



B99 Vehicle (Realistic min radius) (2004)

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Lock–to–lock time	4.00s
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REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
7	27/08/18	Updated Layout	SW	AM					
6	06/08/18	Updated Layout	SW	AM					
5	27/06/18	Updated Layout Bldg 2 loading	SW	AM					
4	26/06/18	Updated Layout	SW	AM					
3	18/06/18	Revised Layout	SW	AM					
2	13/06/18	Revised Layout	SW	AM	9	26/10/18	Updated Layout	SW	AM
XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

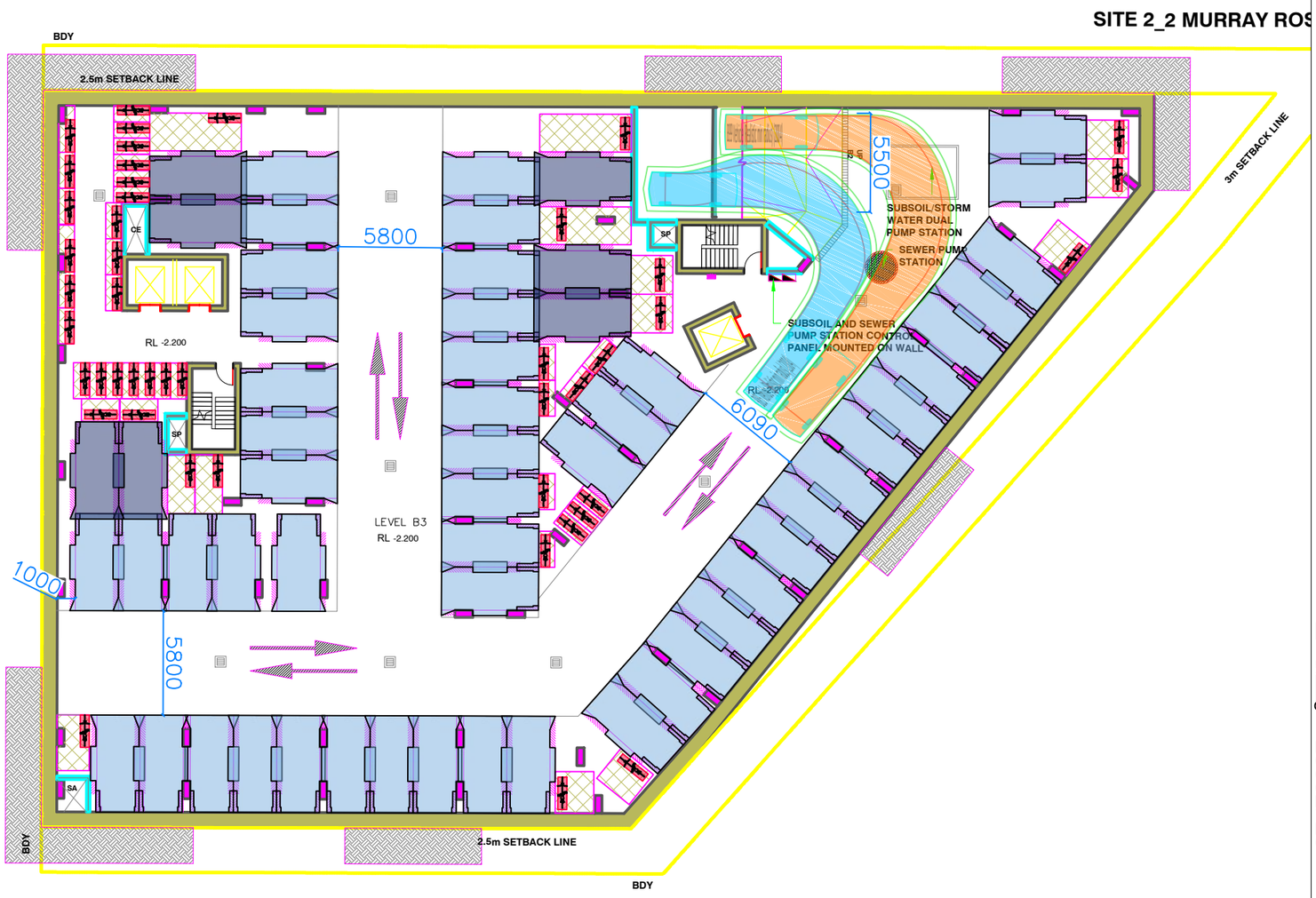
PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 2
Preliminary Parking and Access Assessment
Basement 2

CLIENT: Austino
DRG. #: SK-B2-003
PROJECT #: T2-2408
SCALE: 1:300

REV: 9

1810126_12-2408_Austino_MurrayRoseAve_ParkingAssessment_Rev9.dwg



COMMENTS

A3

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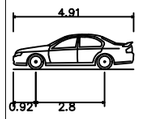

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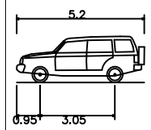

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Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock–to–lock time	4.00s
Curb to Curb Turning Radius	6.250m

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XXX	XXX	XXX	XXX	XXX	8	23/10/18	Updated Layout	SW	AM

PROJECT:
1 & 2 Murray Rose Ave
Sydney Olympic Park

DRAWING TITLE:
Building 2
Preliminary Parking and Access Assessment
Basement 3

CLIENT: Austino
DRG. #: SK-B2-004
PROJECT #: T2-2408
SCALE: 1:300

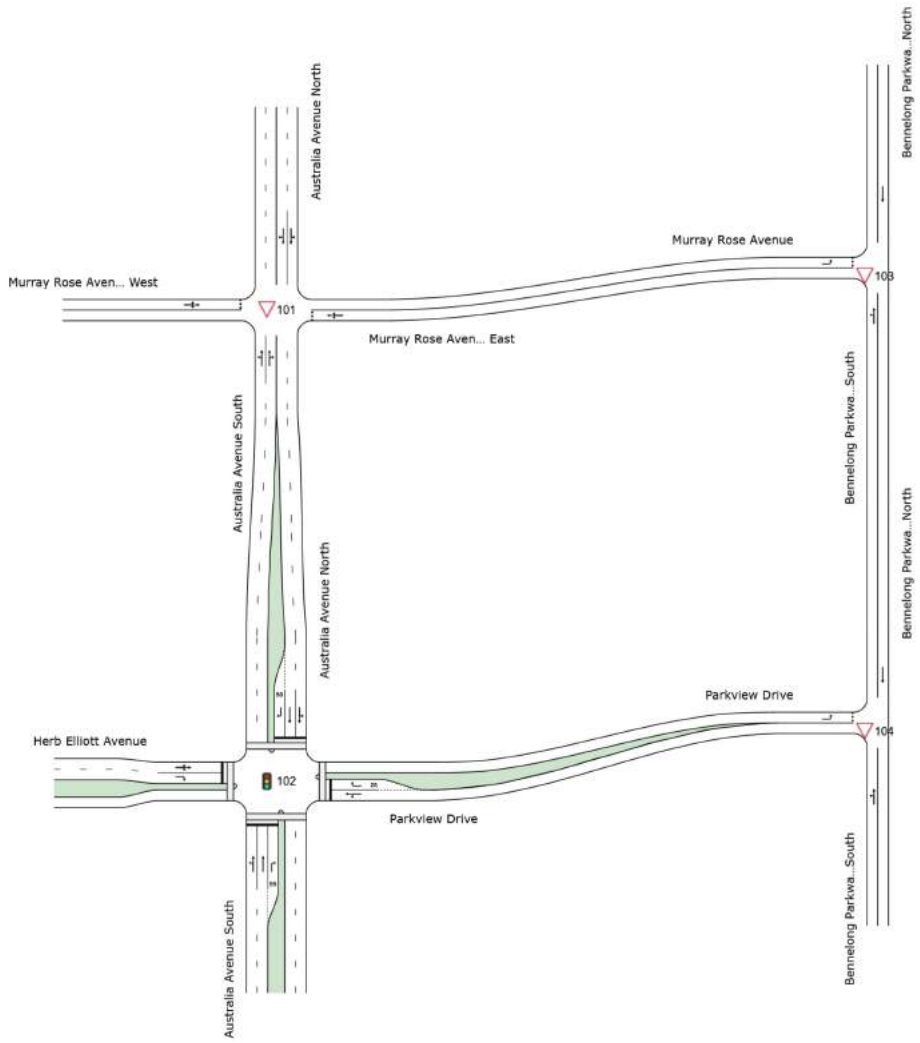
REV: 9

Attachment 2 SIDRA Outputs

NETWORK LAYOUT

Network: N101 [Existing Network AM]

14/06/2018 AM Peak
Network Category: Existing



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Intersection of Australia Avenue and Murray Rose Avenue Existing AM
102	NA	Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Existing AM
▽103	NA	Intersection of Bennelong Parkway and Murray Rose Avenue Existing AM
▽104	NA	Intersection of Bennelong Parkway and Parkview Drive Existing AM

Analysis.sip8

MOVEMENT SUMMARY

Site: 101 [Intersection of Australia Avenue and Murray Rose Avenue Existing AM]

Network: N101 [Existing Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	55	17.3	55	17.3	0.141	5.7	LOS A	0.0	0.0	0.00	0.12	0.00	53.8
2	T1	208	2.0	208	2.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	57.6
3	R2	180	0.0	180	0.0	0.198	7.9	LOS A	0.7	4.9	0.43	0.71	0.43	31.2
Approach		443	3.1	443	3.1	0.198	3.9	NA	0.7	4.9	0.17	0.36	0.17	49.1
East: Murray Rose Avenue East														
4	L2	23	18.2	23	18.2	0.040	3.8	LOS A	0.1	1.1	0.21	0.46	0.21	35.3
5	T1	5	0.0	5	0.0	0.040	10.4	LOS A	0.1	1.1	0.21	0.46	0.21	37.7
6	R2	2	0.0	2	0.0	0.040	12.9	LOS A	0.1	1.1	0.21	0.46	0.21	40.2
Approach		31	13.8	31	13.8	0.040	5.6	LOS A	0.1	1.1	0.21	0.46	0.21	36.3
North: Australia Avenue North														
7	L2	165	0.0	165	0.0	0.130	5.5	LOS A	0.0	0.0	0.00	0.40	0.00	48.8
8	T1	293	1.8	293	1.8	0.130	0.2	LOS A	0.3	1.8	0.07	0.15	0.07	54.5
9	R2	20	10.5	20	10.5	0.130	7.0	LOS A	0.3	1.8	0.09	0.05	0.09	45.5
Approach		478	1.5	478	1.5	0.130	2.3	NA	0.3	1.8	0.04	0.23	0.04	51.6
West: Murray Rose Avenue West														
10	L2	19	5.6	19	5.6	0.307	5.9	LOS A	1.3	12.0	0.64	0.79	0.76	33.5
11	T1	12	0.0	12	0.0	0.307	14.0	LOS A	1.3	12.0	0.64	0.79	0.76	27.3
12	R2	58	50.9	58	50.9	0.307	21.6	LOS B	1.3	12.0	0.64	0.79	0.76	27.3
Approach		88	34.5	88	34.5	0.307	17.2	LOS B	1.3	12.0	0.64	0.79	0.76	29.0
All Vehicles		1040	5.4	1040	5.4	0.307	4.4	NA	1.3	12.0	0.15	0.34	0.17	45.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Existing AM]

Network: N101 [Existing Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	209	2.0	209	2.0	0.718	22.6	LOS B	6.6	47.7	0.96	0.90	1.13	36.3
2	T1	455	7.4	455	7.4	0.718	17.2	LOS B	6.8	50.3	0.96	0.90	1.14	34.3
3	R2	120	1.8	120	1.8	0.416	22.8	LOS B	2.3	16.1	0.93	0.77	0.93	31.0
Approach		784	5.1	784	5.1	0.718	19.5	LOS B	6.8	50.3	0.96	0.88	1.10	34.7
East: Parkview Drive														
4	L2	53	0.0	53	0.0	0.239	20.8	LOS B	1.3	8.8	0.92	0.72	0.92	35.1
5	T1	15	0.0	15	0.0	0.239	17.4	LOS B	1.3	8.8	0.92	0.72	0.92	32.1
6	R2	19	0.0	19	0.0	0.068	20.1	LOS B	0.3	2.4	0.89	0.67	0.89	26.0
Approach		86	0.0	86	0.0	0.239	20.1	LOS B	1.3	8.8	0.91	0.71	0.91	33.0
North: Australia Avenue North														
7	L2	80	1.3	80	1.3	0.344	17.9	LOS B	2.9	21.5	0.82	0.72	0.82	22.0
8	T1	259	10.6	259	10.6	0.344	13.4	LOS A	2.9	21.5	0.85	0.70	0.85	41.4
9	R2	22	0.0	22	0.0	0.104	24.6	LOS B	0.4	3.0	0.94	0.69	0.94	29.7
Approach		361	7.9	361	7.9	0.344	15.1	LOS B	2.9	21.5	0.85	0.70	0.85	37.8
West: Herb Elliott Avenue														
10	L2	12	18.2	12	18.2	0.223	20.9	LOS B	1.1	8.3	0.91	0.71	0.91	27.9
11	T1	18	0.0	18	0.0	0.223	17.4	LOS B	1.1	8.3	0.91	0.71	0.91	27.9
12	R2	89	7.1	89	7.1	0.223	20.9	LOS B	1.1	8.3	0.91	0.72	0.91	35.3
Approach		119	7.1	119	7.1	0.223	20.3	LOS B	1.1	8.3	0.91	0.72	0.91	33.9
All Vehicles		1351	5.7	1351	5.7	0.718	18.4	LOS B	6.8	50.3	0.92	0.81	1.01	35.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P2	East Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P3	North Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P4	West Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		211	14.5	LOS B			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.

MOVEMENT SUMMARY

Site: 104 [Intersection of Bennelong Parkway and Parkview Drive Existing AM]

Network: N101 [Existing Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	60	7.0	60	7.0	0.223	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	57.1
2	T1	346	9.7	346	9.7	0.223	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	57.1
Approach		406	9.3	406	9.3	0.223	0.8	NA	0.0	0.0	0.00	0.09	0.00	57.1
North: Bennelong Parkway North														
8	T1	698	2.6	698	2.6	0.364	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		698	2.6	698	2.6	0.364	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	7	14.3	7	14.3	0.007	7.1	LOS A	0.0	0.2	0.32	0.57	0.32	47.0
Approach		7	14.3	7	14.3	0.007	7.1	LOS A	0.0	0.2	0.32	0.57	0.32	47.0
All Vehicles		1112	5.1	1112	5.1	0.364	0.4	NA	0.0	0.2	0.00	0.04	0.00	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
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SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Intersection of Bennelong Parkway and Murray Rose Avenue Existing AM]

Network: N101 [Existing Network AM]

14/06/2018 7:45-8:45
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

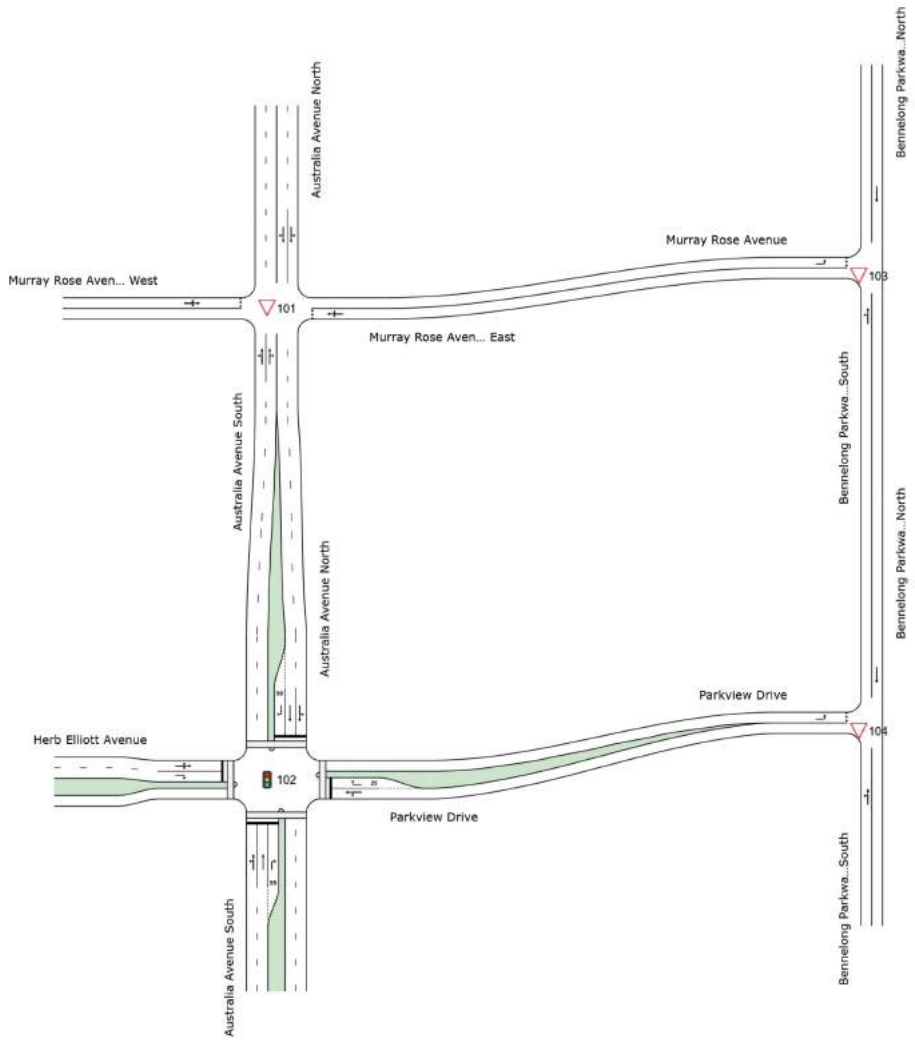
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	59	7.1	59	7.1	0.221	5.5	LOS A	0.0	0.0	0.00	0.09	0.00	52.7
2	T1	344	9.5	344	9.5	0.221	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	58.7
Approach		403	9.1	403	9.1	0.221	0.8	NA	0.0	0.0	0.00	0.09	0.00	58.5
North: Bennelong Parkway North														
8	T1	738	2.6	738	2.6	0.385	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		738	2.6	738	2.6	0.385	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	7	0.0	7	0.0	0.006	6.7	LOS A	0.0	0.2	0.39	0.57	0.39	52.3
Approach		7	0.0	7	0.0	0.006	6.7	LOS A	0.0	0.2	0.39	0.57	0.39	52.3
All Vehicles		1148	4.9	1148	4.9	0.385	0.4	NA	0.0	0.2	0.00	0.03	0.00	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N103 [Existing Network PM]

14/06/2018 PM Peak
Network Category: Existing



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Intersection of Australia Avenue and Murray Rose Avenue Existing PM
102	NA	Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Existing PM
▽103	NA	Intersection of Bennelong Parkway and Murray Rose Avenue Existing PM
▽104	NA	Intersection of Bennelong Parkway and Parkview Drive Existing PM

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MOVEMENT SUMMARY

Site: 101 [Intersection of Australia Avenue and Murray Rose Avenue Existing PM]

Network: N103 [Existing Network PM]

14/06/2018 17:00-18:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	29	39.3	29	39.3	0.100	6.0	LOS A	0.0	0.0	0.00	0.09	0.00	52.7
2	T1	323	0.7	323	0.7	0.100	0.1	LOS A	0.1	0.8	0.03	0.07	0.03	58.4
3	R2	14	0.0	14	0.0	0.100	7.1	LOS A	0.1	0.8	0.06	0.05	0.06	55.3
Approach		366	3.7	366	3.7	0.100	0.8	NA	0.1	0.8	0.03	0.07	0.03	57.7
East: Murray Rose Avenue East														
4	L2	93	0.0	93	0.0	0.197	4.2	LOS A	0.8	5.4	0.41	0.58	0.41	34.4
5	T1	8	0.0	8	0.0	0.197	9.8	LOS A	0.8	5.4	0.41	0.58	0.41	37.1
6	R2	36	0.0	36	0.0	0.197	12.5	LOS A	0.8	5.4	0.41	0.58	0.41	39.4
Approach		137	0.0	137	0.0	0.197	6.7	LOS A	0.8	5.4	0.41	0.58	0.41	36.2
North: Australia Avenue North														
7	L2	6	0.0	6	0.0	0.100	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
8	T1	331	0.6	331	0.6	0.100	0.2	LOS A	0.3	2.1	0.07	0.05	0.07	57.2
9	R2	28	3.7	28	3.7	0.100	7.0	LOS A	0.3	2.1	0.17	0.10	0.17	44.9
Approach		365	0.9	365	0.9	0.100	0.8	NA	0.3	2.1	0.08	0.06	0.08	54.6
West: Murray Rose Avenue West														
10	L2	20	0.0	20	0.0	0.279	5.1	LOS A	1.1	9.7	0.57	0.72	0.66	34.2
11	T1	8	0.0	8	0.0	0.279	10.4	LOS A	1.1	9.7	0.57	0.72	0.66	27.7
12	R2	54	37.3	54	37.3	0.279	21.4	LOS B	1.1	9.7	0.57	0.72	0.66	27.7
Approach		82	24.4	82	24.4	0.279	16.3	LOS B	1.1	9.7	0.57	0.72	0.66	29.7
All Vehicles		951	3.9	951	3.9	0.279	3.0	NA	1.1	9.7	0.15	0.19	0.16	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Intersection of Bennelong Parkway and Murray Rose Avenue Existing PM]

Network: N103 [Existing Network PM]

14/06/2018 16:30-17:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	6	0.0	6	0.0	0.278	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	59.3
2	T1	527	2.6	527	2.6	0.278	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		534	2.6	534	2.6	0.278	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Bennelong Parkway North														
8	T1	526	1.2	526	1.2	0.272	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		526	1.2	526	1.2	0.272	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	40	0.0	40	0.0	0.042	7.6	LOS A	0.2	1.1	0.49	0.68	0.49	52.0
Approach		40	0.0	40	0.0	0.042	7.6	LOS A	0.2	1.1	0.49	0.68	0.49	52.0
All Vehicles		1100	1.8	1100	1.8	0.278	0.3	NA	0.2	1.1	0.02	0.03	0.02	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 104 [Intersection of Bennelong Parkway and Parkview Drive Existing PM]

Network: N103 [Existing Network PM]

14/06/2018 16:15-7:15
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	36	2.9	36	2.9	0.278	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	58.6
2	T1	494	3.0	494	3.0	0.278	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.6
Approach		529	3.0	529	3.0	0.278	0.4	NA	0.0	0.0	0.00	0.04	0.00	58.6
North: Bennelong Parkway North														
8	T1	494	3.0	494	3.0	0.258	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		494	3.0	494	3.0	0.258	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	45	2.3	45	2.3	0.046	7.5	LOS A	0.1	1.0	0.41	0.66	0.41	46.1
Approach		45	2.3	45	2.3	0.046	7.5	LOS A	0.1	1.0	0.41	0.66	0.41	46.1
All Vehicles		1068	3.0	1068	3.0	0.278	0.5	NA	0.1	1.0	0.02	0.05	0.02	58.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Existing PM]

Network: N103 [Existing Network PM]

14/06/2018 16:45-17:45
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	55	1.9	55	1.9	0.417	19.8	LOS B	3.3	24.3	0.88	0.73	0.88	38.4
2	T1	335	6.3	335	6.3	0.417	14.3	LOS A	3.4	24.9	0.88	0.72	0.88	37.1
3	R2	56	1.9	56	1.9	0.230	23.1	LOS B	1.0	7.4	0.92	0.74	0.92	30.8
Approach		445	5.2	445	5.2	0.417	16.1	LOS B	3.4	24.9	0.88	0.73	0.88	36.6
East: Parkview Drive														
4	L2	139	0.0	139	0.0	0.553	22.1	LOS B	3.1	21.6	0.97	0.81	1.02	34.4
5	T1	16	0.0	16	0.0	0.553	18.7	LOS B	3.1	21.6	0.97	0.81	1.02	31.6
6	R2	58	0.0	58	0.0	0.208	20.7	LOS B	1.1	7.5	0.91	0.72	0.91	25.8
Approach		213	0.0	213	0.0	0.553	21.5	LOS B	3.1	21.6	0.95	0.78	0.99	32.4
North: Australia Avenue North														
7	L2	24	0.0	24	0.0	0.512	19.5	LOS B	4.3	31.3	0.89	0.74	0.89	22.3
8	T1	462	5.5	462	5.5	0.512	14.4	LOS A	4.3	31.3	0.90	0.74	0.90	41.2
9	R2	8	0.0	8	0.0	0.030	21.0	LOS B	0.1	1.0	0.85	0.66	0.85	31.1
Approach		495	5.1	495	5.1	0.512	14.7	LOS B	4.3	31.4	0.90	0.74	0.90	40.4
West: Herb Elliott Avenue														
10	L2	11	10.0	11	10.0	0.472	21.7	LOS B	2.6	18.1	0.96	0.77	0.96	27.3
11	T1	21	0.0	21	0.0	0.472	18.3	LOS B	2.6	18.1	0.96	0.77	0.96	27.3
12	R2	232	0.0	232	0.0	0.472	21.7	LOS B	2.6	18.1	0.96	0.77	0.96	35.1
Approach		263	0.4	263	0.4	0.472	21.4	LOS B	2.6	18.1	0.96	0.77	0.96	34.4
All Vehicles		1416	3.5	1416	3.5	0.553	17.4	LOS B	4.3	31.4	0.91	0.75	0.92	36.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

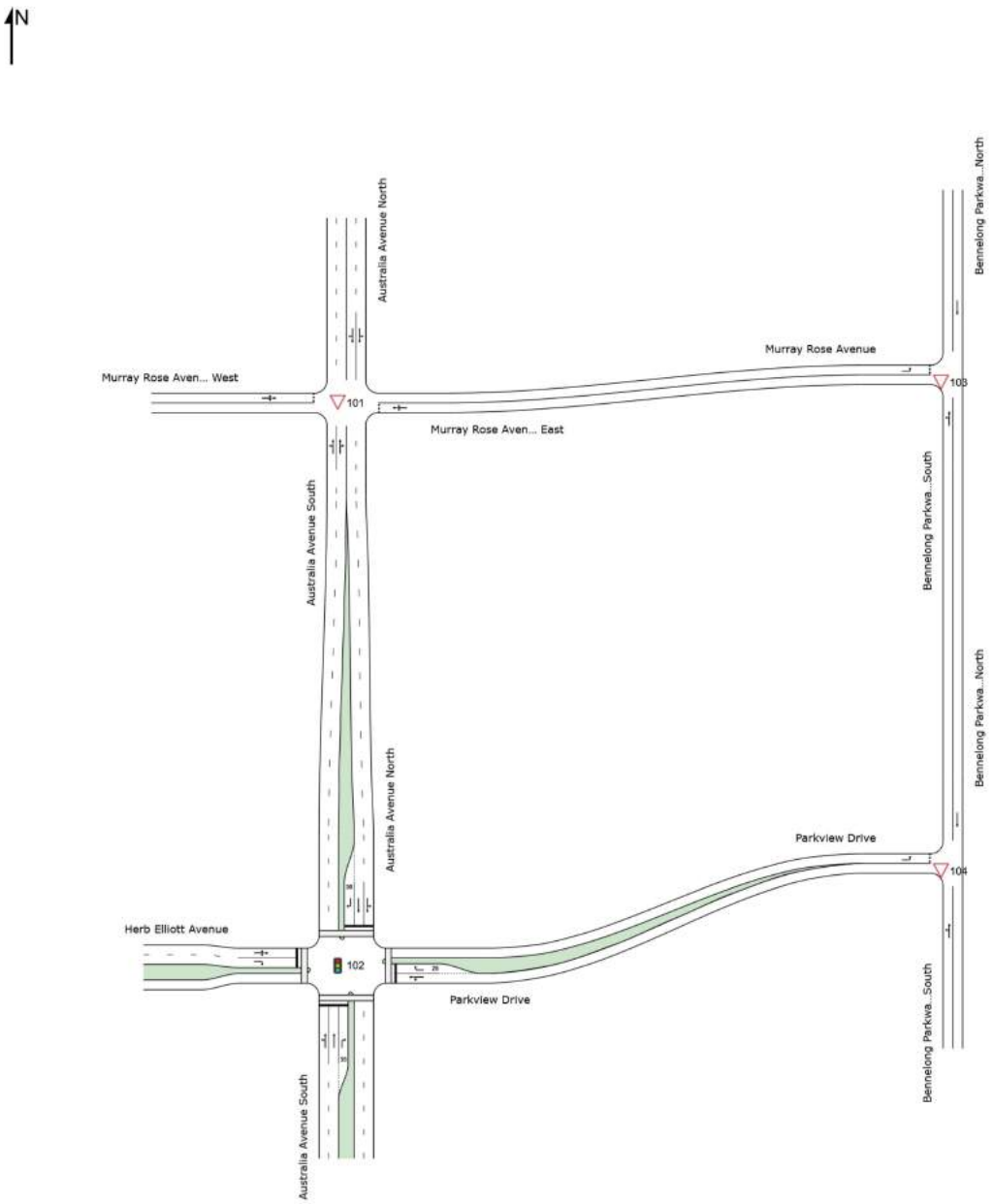
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P2	East Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P3	North Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P4	West Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		211	14.5	LOS B			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.

NETWORK LAYOUT

Network: N102 [Development Network AM]

14/06/2018 AM Peak
Network Category: Development



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Intersection of Australia Avenue and Murray Rose Avenue Development AM
102	NA	Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Development AM
▽103	NA	Intersection of Bennelong Parkway and Murray Rose Avenue Development AM
▽104	NA	Intersection of Bennelong Parkway and Parkview Drive Development AM

Analysis.sip8

MOVEMENT SUMMARY

Site: 101 [Intersection of Australia Avenue and Murray Rose Avenue Development AM]

Network: N102 [Development Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	55	17.3	55	17.3	0.141	5.7	LOS A	0.0	0.0	0.00	0.12	0.00	53.8
2	T1	208	2.0	208	2.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	57.6
3	R2	180	0.0	180	0.0	0.198	7.9	LOS A	0.7	4.9	0.43	0.71	0.43	31.2
Approach		443	3.1	443	3.1	0.198	3.9	NA	0.7	4.9	0.17	0.36	0.17	49.1
East: Murray Rose Avenue East														
4	L2	57	7.4	57	7.4	0.067	5.0	LOS A	0.2	1.8	0.18	0.52	0.18	42.8
5	T1	5	0.0	5	0.0	0.067	12.1	LOS A	0.2	1.8	0.18	0.52	0.18	42.0
6	R2	2	0.0	2	0.0	0.067	14.5	LOS A	0.2	1.8	0.18	0.52	0.18	46.1
Approach		64	6.6	64	6.6	0.067	5.9	LOS A	0.2	1.8	0.18	0.52	0.18	42.8
North: Australia Avenue North														
7	L2	165	0.0	165	0.0	0.130	5.5	LOS A	0.0	0.0	0.00	0.40	0.00	48.8
8	T1	293	1.8	293	1.8	0.130	0.2	LOS A	0.3	1.8	0.07	0.15	0.07	54.5
9	R2	20	10.5	20	10.5	0.130	7.0	LOS A	0.3	1.8	0.09	0.05	0.09	45.5
Approach		478	1.5	478	1.5	0.130	2.3	NA	0.3	1.8	0.04	0.23	0.04	51.6
West: Murray Rose Avenue West														
10	L2	19	5.6	19	5.6	0.326	6.4	LOS A	1.4	12.9	0.66	0.81	0.81	32.8
11	T1	12	0.0	12	0.0	0.326	14.5	LOS A	1.4	12.9	0.66	0.81	0.81	26.6
12	R2	58	50.9	58	50.9	0.326	23.6	LOS B	1.4	12.9	0.66	0.81	0.81	26.6
Approach		88	34.5	88	34.5	0.326	18.7	LOS B	1.4	12.9	0.66	0.81	0.81	28.2
All Vehicles		1074	5.2	1074	5.2	0.326	4.5	NA	1.4	12.9	0.16	0.35	0.17	45.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Development AM]

Network: N102 [Development Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	209	2.0	209	2.0	0.718	22.6	LOS B	6.6	47.7	0.96	0.90	1.13	36.3
2	T1	455	7.4	455	7.4	0.718	17.2	LOS B	6.8	50.3	0.96	0.90	1.14	34.3
3	R2	120	1.8	120	1.8	0.435	22.9	LOS B	2.3	16.2	0.93	0.77	0.93	30.9
Approach		784	5.1	784	5.1	0.718	19.5	LOS B	6.8	50.3	0.96	0.88	1.10	34.7
East: Parkview Drive														
4	L2	74	0.0	74	0.0	0.315	21.7	LOS B	1.7	11.7	0.93	0.74	0.93	36.4
5	T1	15	0.0	15	0.0	0.315	18.3	LOS B	1.7	11.7	0.93	0.74	0.93	33.1
6	R2	19	0.0	19	0.0	0.068	20.1	LOS B	0.3	2.4	0.89	0.67	0.89	26.0
Approach		107	0.0	107	0.0	0.315	20.9	LOS B	1.7	11.7	0.92	0.73	0.92	34.5
North: Australia Avenue North														
7	L2	80	1.3	80	1.3	0.380	18.1	LOS B	3.2	23.7	0.83	0.72	0.83	22.1
8	T1	293	9.4	293	9.4	0.380	13.5	LOS A	3.2	23.7	0.86	0.71	0.86	41.3
9	R2	22	0.0	22	0.0	0.104	24.6	LOS B	0.4	3.0	0.94	0.69	0.94	29.7
Approach		395	7.2	395	7.2	0.380	15.1	LOS B	3.2	23.7	0.86	0.71	0.86	38.1
West: Herb Elliott Avenue														
10	L2	12	18.2	12	18.2	0.223	20.9	LOS B	1.1	8.3	0.91	0.71	0.91	27.9
11	T1	18	0.0	18	0.0	0.223	17.4	LOS B	1.1	8.3	0.91	0.71	0.91	27.9
12	R2	89	7.1	89	7.1	0.223	20.9	LOS B	1.1	8.3	0.91	0.72	0.91	35.3
Approach		119	7.1	119	7.1	0.223	20.3	LOS B	1.1	8.3	0.91	0.72	0.91	33.9
All Vehicles		1405	5.5	1405	5.5	0.718	18.4	LOS B	6.8	50.3	0.92	0.81	1.00	35.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P2	East Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P3	North Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P4	West Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		211	14.5	LOS B			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.

MOVEMENT SUMMARY

Site: 104 [Intersection of Bennelong Parkway and Parkview Drive Development AM]

Network: N102 [Development Network AM]

14/06/2018 8:00-9:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	65	6.5	65	6.5	0.230	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	57.0
2	T1	355	9.5	355	9.5	0.230	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	57.0
Approach		420	9.0	420	9.0	0.230	0.9	NA	0.0	0.0	0.00	0.09	0.00	57.0
North: Bennelong Parkway North														
8	T1	698	2.6	698	2.6	0.364	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		698	2.6	698	2.6	0.364	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	7	14.3	7	14.3	0.007	7.1	LOS A	0.0	0.2	0.32	0.57	0.32	46.9
Approach		7	14.3	7	14.3	0.007	7.1	LOS A	0.0	0.2	0.32	0.57	0.32	46.9
All Vehicles		1125	5.1	1125	5.1	0.364	0.4	NA	0.0	0.2	0.00	0.04	0.00	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Intersection of Bennelong Parkway and Murray Rose Avenue Development AM]

Network: N102 [Development Network AM]

14/06/2018 7:45-8:45
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

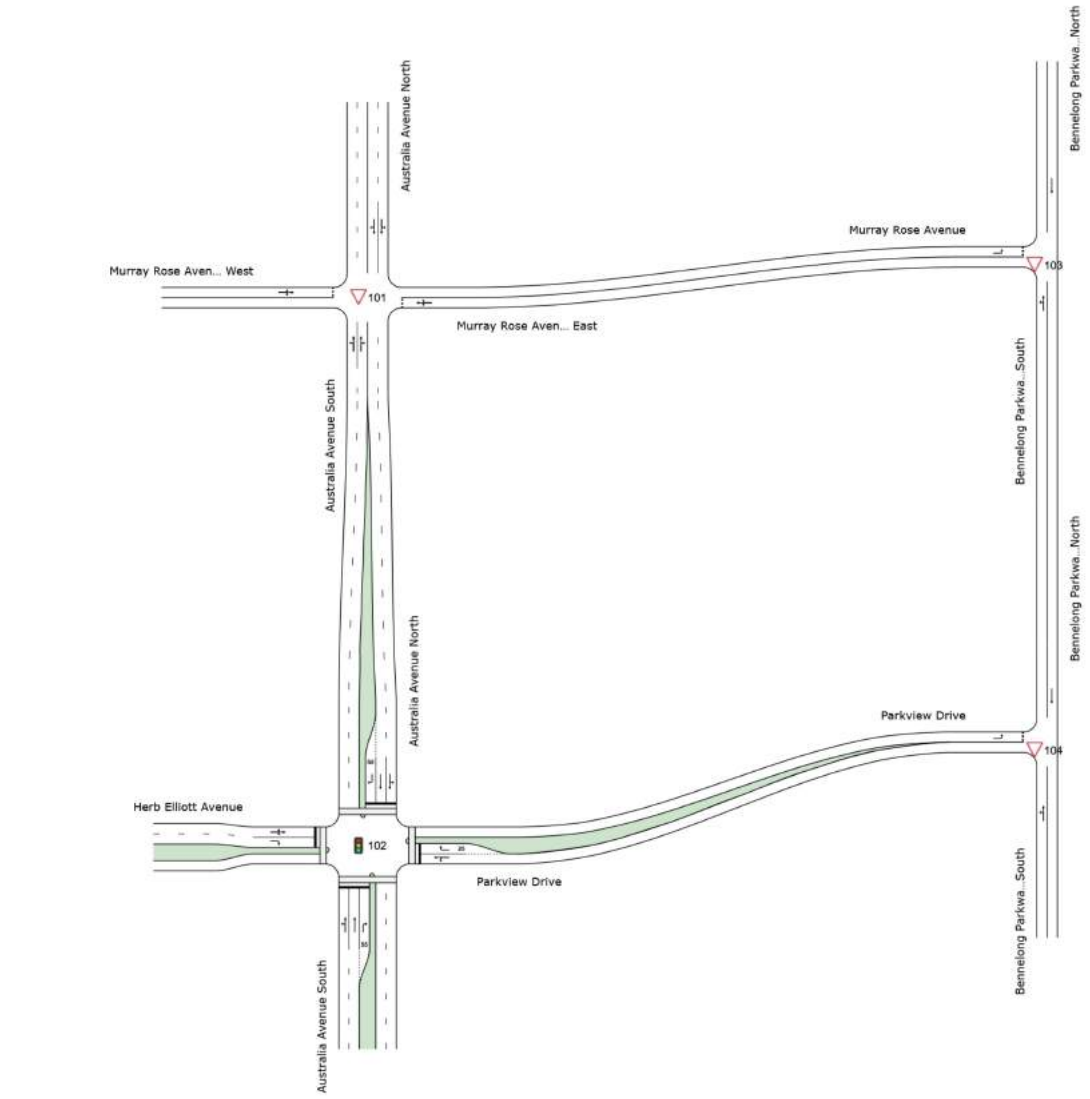
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	67	6.3	67	6.3	0.225	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	52.0
2	T1	344	9.5	344	9.5	0.225	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	58.6
Approach		412	9.0	412	9.0	0.225	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.3
North: Bennelong Parkway North														
8	T1	738	2.6	738	2.6	0.385	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		738	2.6	738	2.6	0.385	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	7	0.0	7	0.0	0.006	6.7	LOS A	0.0	0.2	0.39	0.57	0.39	52.3
Approach		7	0.0	7	0.0	0.006	6.7	LOS A	0.0	0.2	0.39	0.57	0.39	52.3
All Vehicles		1157	4.8	1157	4.8	0.385	0.4	NA	0.0	0.2	0.00	0.04	0.00	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N103 [Development Network PM]

14/06/2018 PM Peak
Network Category: Existing



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Intersection of Australia Avenue and Murray Rose Avenue Development PM
102	NA	Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Development PM
▽103	NA	Intersection of Bennelong Parkway and Murray Rose Avenue Development PM
▽104	NA	Intersection of Bennelong Parkway and Parkview Drive Development PM

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MOVEMENT SUMMARY

Site: 101 [Intersection of Australia Avenue and Murray Rose Avenue Development PM]

Network: N103 [Development Network PM]

14/06/2018 17:00-18:00
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	29	39.3	29	39.3	0.100	6.0	LOS A	0.0	0.0	0.00	0.09	0.00	52.7
2	T1	323	0.7	323	0.7	0.100	0.1	LOS A	0.1	0.8	0.03	0.07	0.03	58.4
3	R2	14	0.0	14	0.0	0.100	7.1	LOS A	0.1	0.8	0.06	0.05	0.06	55.3
Approach		366	3.7	366	3.7	0.100	0.8	NA	0.1	0.8	0.03	0.07	0.03	57.7
East: Murray Rose Avenue East														
4	L2	105	0.0	105	0.0	0.208	4.5	LOS A	0.8	5.8	0.40	0.58	0.40	35.6
5	T1	8	0.0	8	0.0	0.208	10.1	LOS A	0.8	5.8	0.40	0.58	0.40	37.9
6	R2	36	0.0	36	0.0	0.208	12.8	LOS A	0.8	5.8	0.40	0.58	0.40	40.4
Approach		149	0.0	149	0.0	0.208	6.8	LOS A	0.8	5.8	0.40	0.58	0.40	37.2
North: Australia Avenue North														
7	L2	6	0.0	6	0.0	0.100	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
8	T1	331	0.6	331	0.6	0.100	0.2	LOS A	0.3	2.1	0.07	0.05	0.07	57.2
9	R2	28	3.7	28	3.7	0.100	7.0	LOS A	0.3	2.1	0.17	0.10	0.17	44.9
Approach		365	0.9	365	0.9	0.100	0.8	NA	0.3	2.1	0.08	0.06	0.08	54.6
West: Murray Rose Avenue West														
10	L2	20	0.0	20	0.0	0.285	5.3	LOS A	1.2	10.0	0.58	0.73	0.67	34.0
11	T1	8	0.0	8	0.0	0.285	10.6	LOS A	1.2	10.0	0.58	0.73	0.67	27.4
12	R2	54	37.3	54	37.3	0.285	22.1	LOS B	1.2	10.0	0.58	0.73	0.67	27.4
Approach		82	24.4	82	24.4	0.285	16.8	LOS B	1.2	10.0	0.58	0.73	0.67	29.4
All Vehicles		963	3.8	963	3.8	0.285	3.1	NA	1.2	10.0	0.15	0.20	0.16	46.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Intersection of Australia Avenue / Herb Elliott Avenue / Parkview Drive Development PM]

Network: N103 [Development Network PM]

14/06/2018 16:45-17:45
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 40 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Australia Avenue South														
1	L2	55	1.9	55	1.9	0.417	19.8	LOS B	3.3	24.3	0.88	0.73	0.88	38.4
2	T1	335	6.3	335	6.3	0.417	14.3	LOS A	3.4	24.9	0.88	0.72	0.88	37.1
3	R2	56	1.9	56	1.9	0.233	23.2	LOS B	1.0	7.4	0.92	0.74	0.92	30.8
Approach		445	5.2	445	5.2	0.417	16.1	LOS B	3.4	24.9	0.88	0.73	0.88	36.6
East: Parkview Drive														
4	L2	146	0.0	146	0.0	0.579	22.4	LOS B	3.3	22.8	0.98	0.82	1.05	34.6
5	T1	16	0.0	16	0.0	0.579	19.0	LOS B	3.3	22.8	0.98	0.82	1.05	31.7
6	R2	58	0.0	58	0.0	0.208	20.7	LOS B	1.1	7.5	0.91	0.72	0.91	25.8
Approach		220	0.0	220	0.0	0.579	21.7	LOS B	3.3	22.8	0.96	0.80	1.01	32.6
North: Australia Avenue North														
7	L2	24	0.0	24	0.0	0.524	19.6	LOS B	4.4	32.2	0.89	0.75	0.89	22.3
8	T1	475	5.3	475	5.3	0.524	14.4	LOS A	4.4	32.2	0.90	0.75	0.90	41.1
9	R2	8	0.0	8	0.0	0.030	21.0	LOS B	0.1	1.0	0.85	0.66	0.85	31.1
Approach		507	5.0	507	5.0	0.524	14.8	LOS B	4.4	32.4	0.90	0.75	0.90	40.4
West: Herb Elliott Avenue														
10	L2	11	10.0	11	10.0	0.472	21.7	LOS B	2.6	18.1	0.96	0.77	0.96	27.3
11	T1	21	0.0	21	0.0	0.472	18.3	LOS B	2.6	18.1	0.96	0.77	0.96	27.3
12	R2	232	0.0	232	0.0	0.472	21.7	LOS B	2.6	18.1	0.96	0.77	0.96	35.1
Approach		263	0.4	263	0.4	0.472	21.4	LOS B	2.6	18.1	0.96	0.77	0.96	34.4
All Vehicles		1436	3.4	1436	3.4	0.579	17.5	LOS B	4.4	32.4	0.91	0.75	0.92	36.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P2	East Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P3	North Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
P4	West Full Crossing	53	14.5	LOS B	0.1	0.1	0.85	0.85
All Pedestrians		211	14.5	LOS B			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.

MOVEMENT SUMMARY

Site: 104 [Intersection of Bennelong Parkway and Parkview Drive Development PM]

Network: N103 [Development Network PM]

14/06/2018 16:15-7:15
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	65	1.6	65	1.6	0.319	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.9
2	T1	543	2.7	543	2.7	0.319	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	57.9
Approach		608	2.6	608	2.6	0.319	0.6	NA	0.0	0.0	0.00	0.06	0.00	57.9
North: Bennelong Parkway North														
8	T1	494	3.0	494	3.0	0.258	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		494	3.0	494	3.0	0.258	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	45	2.3	45	2.3	0.049	7.9	LOS A	0.2	1.1	0.44	0.68	0.44	45.7
Approach		45	2.3	45	2.3	0.049	7.9	LOS A	0.2	1.1	0.44	0.68	0.44	45.7
All Vehicles		1147	2.8	1147	2.8	0.319	0.6	NA	0.2	1.1	0.02	0.06	0.02	58.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [Intersection of Bennelong Parkway and Murray Rose Avenue Development PM]

Network: N103 [Development Network PM]

14/06/2018 16:30-17:30
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bennelong Parkway South														
1	L2	56	0.0	56	0.0	0.305	5.5	LOS A	0.0	0.0	0.00	0.06	0.00	55.0
2	T1	527	2.6	527	2.6	0.305	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.1
Approach		583	2.3	583	2.3	0.305	0.5	NA	0.0	0.0	0.00	0.06	0.00	59.0
North: Bennelong Parkway North														
8	T1	526	1.2	526	1.2	0.272	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		526	1.2	526	1.2	0.272	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	40	0.0	40	0.0	0.042	7.6	LOS A	0.2	1.1	0.49	0.68	0.49	52.0
Approach		40	0.0	40	0.0	0.042	7.6	LOS A	0.2	1.1	0.49	0.68	0.49	52.0
All Vehicles		1149	1.7	1149	1.7	0.305	0.6	NA	0.2	1.1	0.02	0.05	0.02	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.