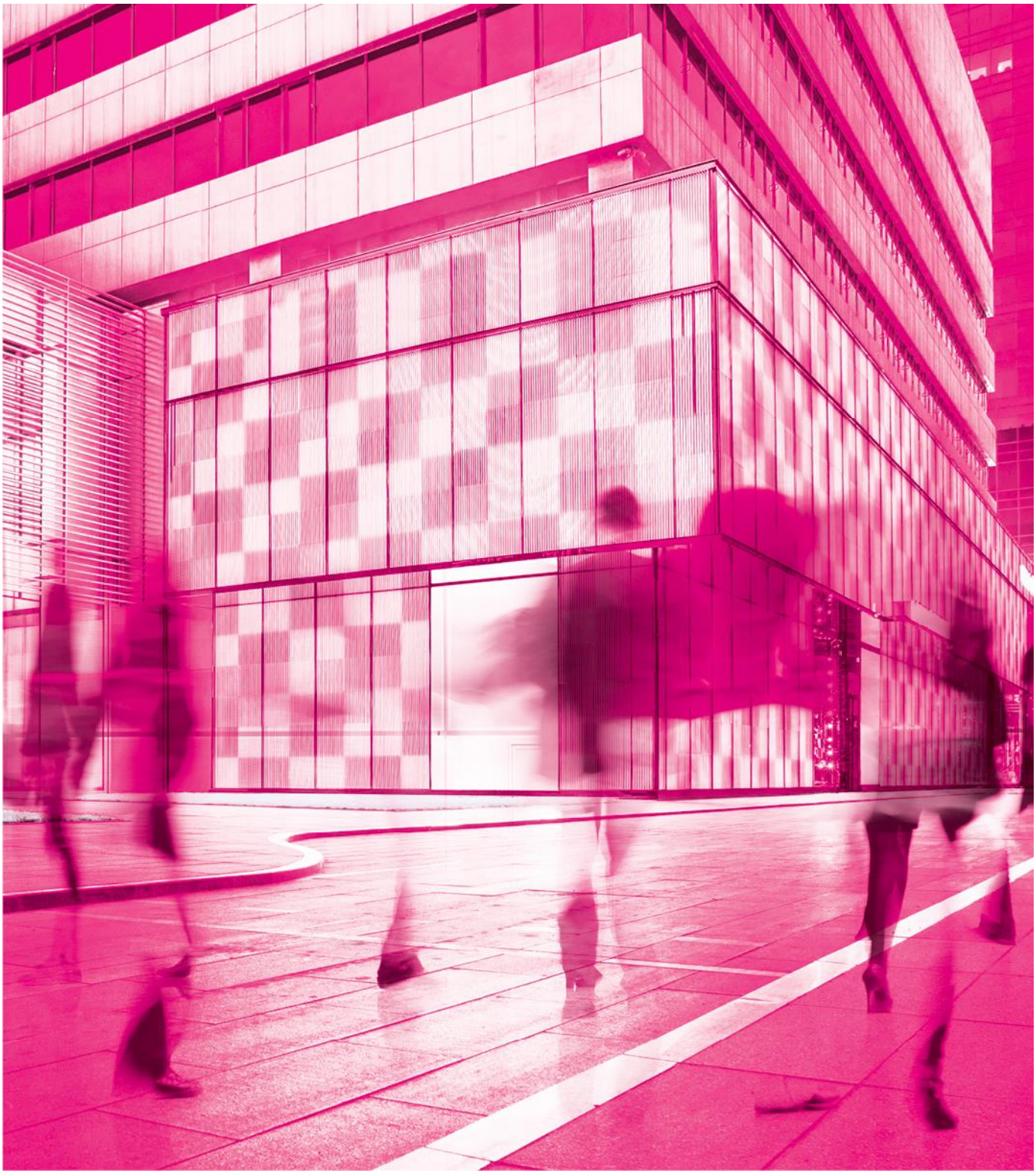


Traffic Impact Assessment;

Sites 2A and 2B, Sydney Olympic Park

For Ecove Group

15 August 2019

parking;
traffic;
civil design;
wayfinding;

ptc.

Document Control

Sites 2A and 2B, Sydney Olympic Park, Traffic Impact Assessment

Issue	Date	Issue Details	Author	Reviewed	For the attention of
1	14p/08/2019	For Information	EL	AU	Bassam Aflak
2	15/08/2019	Final Issue	EL	AU	Bassam Aflak
3					

Contact

Eric Lei
+61 2 8920 0800
+61 474 285 075
eric.lei@ptcconsultants.co

Abdullah Uddin
+61 2 8920 0800
+61 425 478 650
abdullah.uddin@ptcconsultants.co

ptc.
Suite 102, 506 Miller Street
Cammeray NSW 2062
info@ptcconsultants.co
t + 61 2 8920 0800
ptcconsultants.co

Contents

1. Introduction

1.1 Project Summary

ptc. has been engaged by Ecove Group (on Sydney Olympic Park Authority) 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 of the proposed mixed-use development located at Sites 2A and 2B in the corner of Murray Rose Avenue and Australia Avenue, Sydney Olympic Park, per Figure 1. The subject site is bounded by Murray Rose Avenue, Australia Avenue and Parkview Drive.

Figure 1 – Location of proposed Development

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

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

Table 1.1 – Secretary's Environmental Assessment Requirements (Dated 6 July 2018)

No. 12	SEARs Key Issues - Transport and Accessibility (Operations)	
12.1	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 and located adjacent to the proposed development;	The existing public transport, pedestrian and cycle options are outlined in **Section 3.2** and **Section 3.3**. The existing peak hour traffic volumes are presented in **Section 4.2.1**.
12.2	Traffic modelling and analysis of the future daily and peak hour vehicle, public transport, pedestrian and bicycle movements likely to be generated by the proposed development and assessment of the impacts on the local road network, including key intersection capacity and any potential need for upgrading or road works (if required)	SIDRA modelling has been carried out for both the existing and post development conditions to assess the impacts of the proposed development to the road network.
12.3	Assessment of the operation of existing and future transport networks including the rail, ferry and bus networks and their ability to accommodate the forecast number of trips to and from the development;	The train and bus networks in the vicinity of the development have been analysed, which provide frequent service to the development.
12.4	Assessment of the cumulative impacts of traffic volumes from the proposal together with existing and approved developments in the area and proposed measures to mitigate any associated impacts on public transport, pedestrian, cycle and traffic networks;	SOPA masterplan has already considered the traffic impact of this development along with the impacts of nearby developments when the masterplan was developed. Therefore, we have not included the cumulative traffic assessment for the purpose of this report.
12.5	Assessment of the adequacy of the proposal to meet the likely increase in pedestrian and cycle demands;	As outlined in **Section 3.2** and **Section 3.2.3**, 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 of staff in the commercial/retail/hotel area.
12.6	Measures, to promote travel choices for residents, employees and visitors, that support the achievement of State Plan targets, such as implementing a location-specific sustainable travel plan and provision of end of trip facilities;	As outlined in **Section 3.2** and **Section 3.2.3**, 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 of staff in the commercial/retail/hotel area.
12.7	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 having regard to the Sydney Olympic Park Masterplan 2030;	The access, car and cycle parking facilities proposed are outlined in **Section 5 and Section 6** and the provisions meet the requirements of the SOPA Masterplan and the layouts will meet the relevant Australian Standards.
12.8	Consideration of the proposed Parramatta Light Rail Stage 2 alignment along Australian Avenue	Details of the proposed Parramatta Light Rail Stage 2 are presented in **Section 3.2.3**.

	and Dawn Frazer Avenue, including proposed arrangements or development integration;	
12.9	Details of any access requirements for the hotel and serviced apartment components of the proposal, including pick up/drop off areas	Access of the porte cochere and loading docks has been analysed in **Section 6**.
12.10	Details of servicing vehicle movements and site access arrangements 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.	Details of service vehicles and coaches are provided in **Section 5**.

Item 14 – SEARs Key Issues - Major Events		
14.1	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 in **Section 7**.
14.2	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 management of major events are outlined in **Section 7**.

2. Background

2.1 Site Context

The subject site is bounded by Rose Murray Avenue (north), Australia Avenue (west) and Parkview Drive (south), currently zoned for B4 (Mixed Use) Land Use classified under the State Environmental Planning Policy (State Significant Precincts) 2005.

The subject sites comprise the following property:

- Herb Elliott Avenue: Lot 71 1134933

Figure 2 – Local Land Use Map (Source: NSW Planning Viewer)

2.2 Development Site

The subject sites are currently an at-grade off street car park. The development sites comprise the western portion of the city block with the frontages formed by Murray Rose Avenue, Australia Avenue and Parkview Drive, shown in Figure 3.

Figure 3 – Development Site viewed from Australia Avenue

Figure 4 - Development Site viewed from corner of Parkview Drive and Australia Avenue

2.3 Development Proposal

The total land area is 7,711m^2, with a permitted 6.05:1 FSR and a maximum 46,652m^2 GFA, both FSR and GFA are inclusive of Design bonus. The characteristics of each site are:

Table 2.1 - Sites 2A and 2B Land Area and GFA

	2A	2B
Land Area	**4,121m^2**	**3,590m^2**
Permitted GFA (Inclusive of Design Bonus)	**6.05:1**	**6.05:1**
Maximum GFA	**24,932 m^2**	**21,720 m^2**

The proposed development involves the construction of two multi-storey buildings (Tower 2A and Tower 2B), which will accommodate a hotel, commercial strata suites and retail.

In summary, the proposal comprises 24,500m^2 GFA of commercial and 800m^2 GFA of retail premises as well as 304 hotel rooms.

In addition, the proposed development will involve the construction of half of the new road along the eastern boundary of the site as well as Dawn Fraser Avenue east extension, as set out in Section 5.6 of the SOPA Masterplan 2030 (2018 Review). The new road along the site boundary will initially be one-way until the other part of the road is constructed by the neighbouring property and becomes a two-way road.

The proposed one-way laneway provides loading dock access for the development.

2.4 Stakeholder Consultation

The following stakeholders have been consulted in the process of preparing this report:

- Road and Maritime Services (RMS) – contacted by ptc. on 18/07/2019
- Transport for New South Wales (TfNSW) – contacted by ptc. on 19/07/2019
- Sydney Olympic Park Authority (SOPA) – contacted by the client

SOPA has advised that the proposed one-way laneway immediately east of the development will run northbound. This is to avoid vehicular conflict between the proposed light rail and northbound trucks on Australia Avenue wishing to access to the loading docks for the proposed development. SOPA has also advised that they are in support of using the kerbside to reverse into the loading docks.

3. Existing Transportation Facilities

3.1 Road Hierarchy

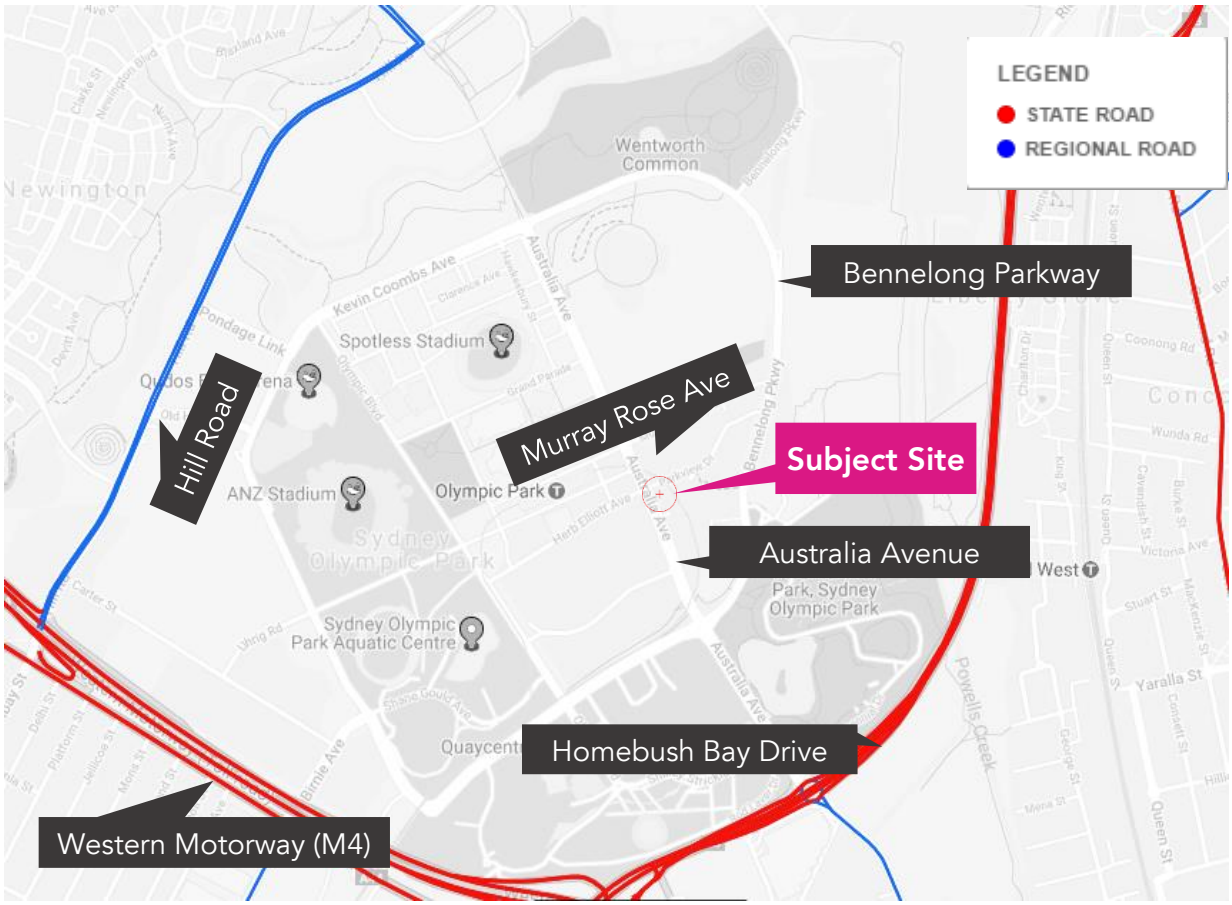


Figure 5 – Road Hierarchy (Source: RMS State and Regional Roads)

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).

Table 3.1 – 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	N/A
Forms Site Frontage	No

Figure 6 - Western Motorway M4 westbound near Bachell Avenue

Table 3.2 – 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 7 - Homebush Bay Drive northbound past Australia Avenue

Table 3.3 – Existing Road Network – Australia Avenue

Australia Avenue	
Road Classification	Collector Road
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

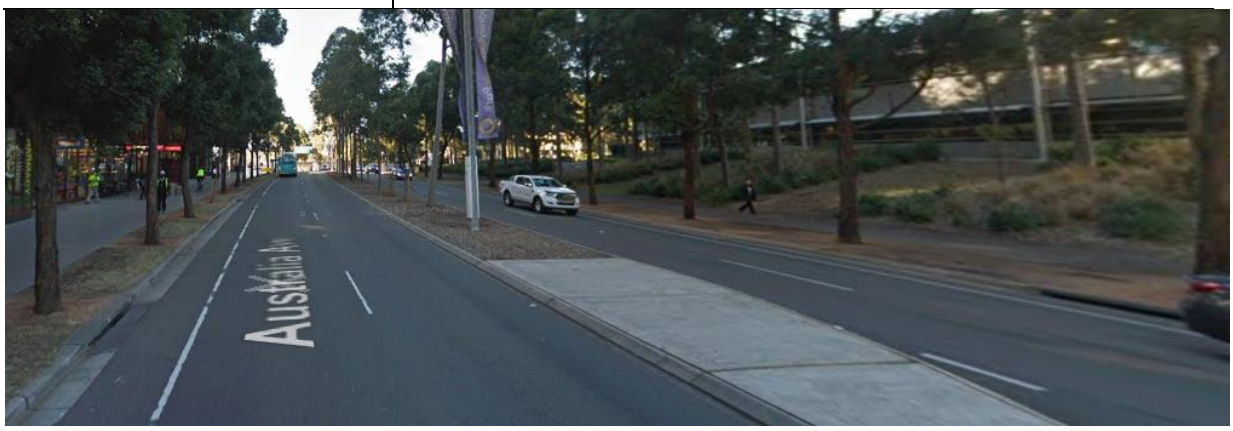


Figure 8 – Australia Avenue southbound towards Figtree Drive

Table 3.4 – 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	21 metres
Speed Limit	40 kph
School Zone	No
Parking Controls	P1, P30 min, P15 min
Forms Site Frontage	Yes

Figure 9 – Murray Rose Avenue eastbound towards Australia Avenue

Table 3.5 – 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
Carriage Width	7 metres
Speed Limit	40 kph
School Zone	No
Parking Controls	P1, P30 min, P15min
Forms Site Frontage	Yes

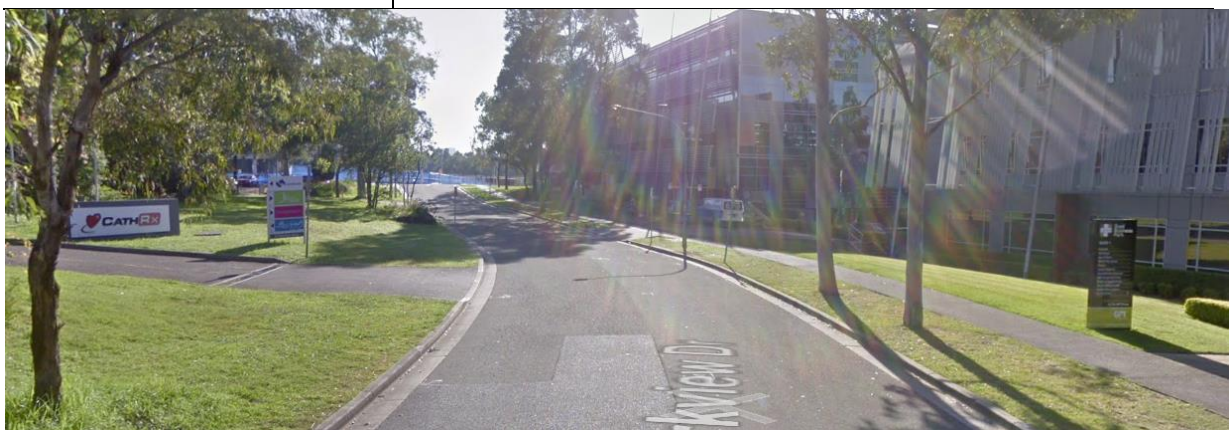


Figure 10 – Parkview Drive eastbound towards Bennelong Parkway

3.2 Public Transport

3.2.1 Trains

Olympic Park Station is located approximately 170m 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 11 shows the proximity of Olympic Park Station.

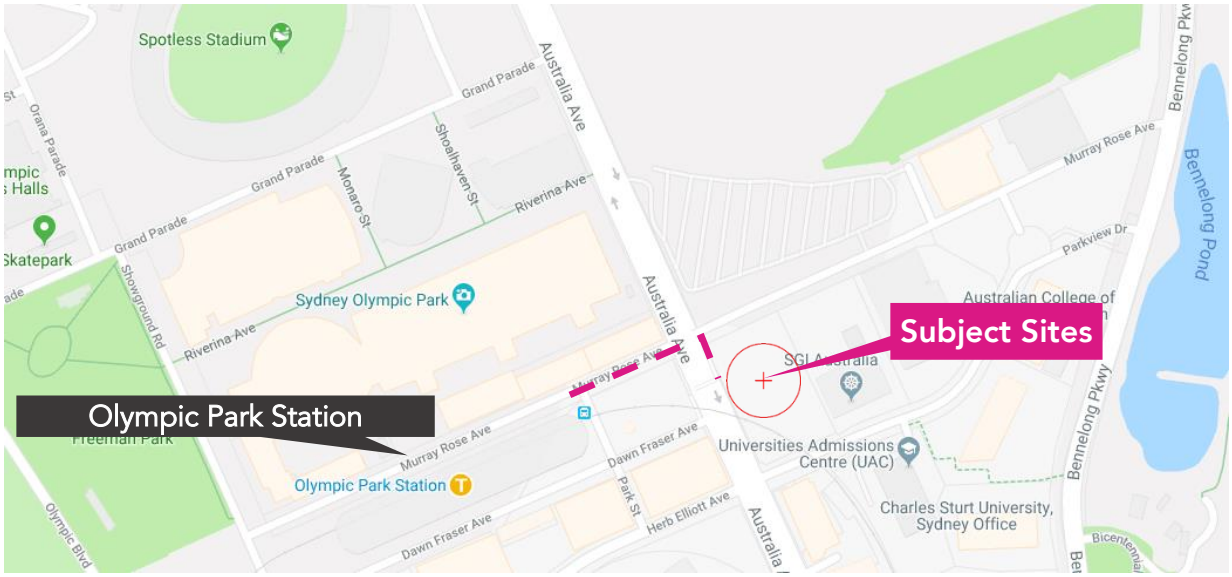


Figure 11 – Walking path from the Sites to Olympic Park Station

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 5am and 12am.

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.

3.2.2 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 12.

Figure 12 – 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 is summarised in Table 3.6 below.

Table 3.6 – 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

3.2.3 Light Rail

The preferred route of the proposed Parramatta Light Rail Stage 2 was announced in 2017, which will connect Stage 1 and Parramatta CBD to Ermington, Melrose Park, Wentworth Point and Sydney Olympic Park. It will feature a ten kilometre two-way track with 10-12 stops and a travel time of 33 minutes to Parramatta CBD. According to the preferred route, the light rail will travel along Australia Avenue and Dawn Frazer Avenue which is right next to the subject site.

3.3 Active Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective employees and customers. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggest that 400m-800m is a comfortable walking distance.

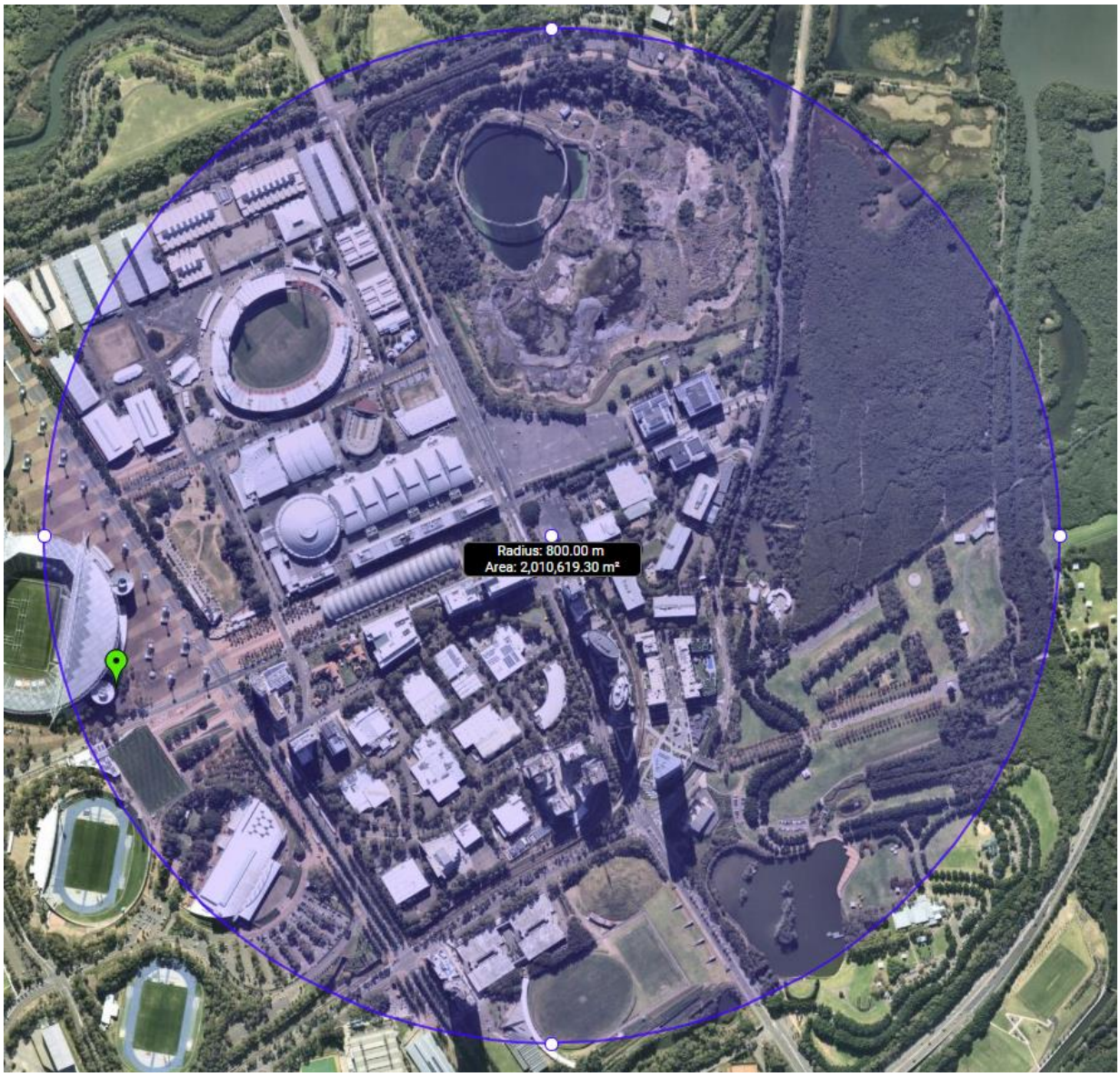


Figure 13: 800m radius of the subject site

3.3.1 Walking

In terms of public infrastructure, the local road network offers a high level of amenity and safety for pedestrians, providing footpaths on either side of most roadways and signalised pedestrian crossings on all major intersections on Australia Avenue (Parkview Drive and Sarah Durack Avenue).

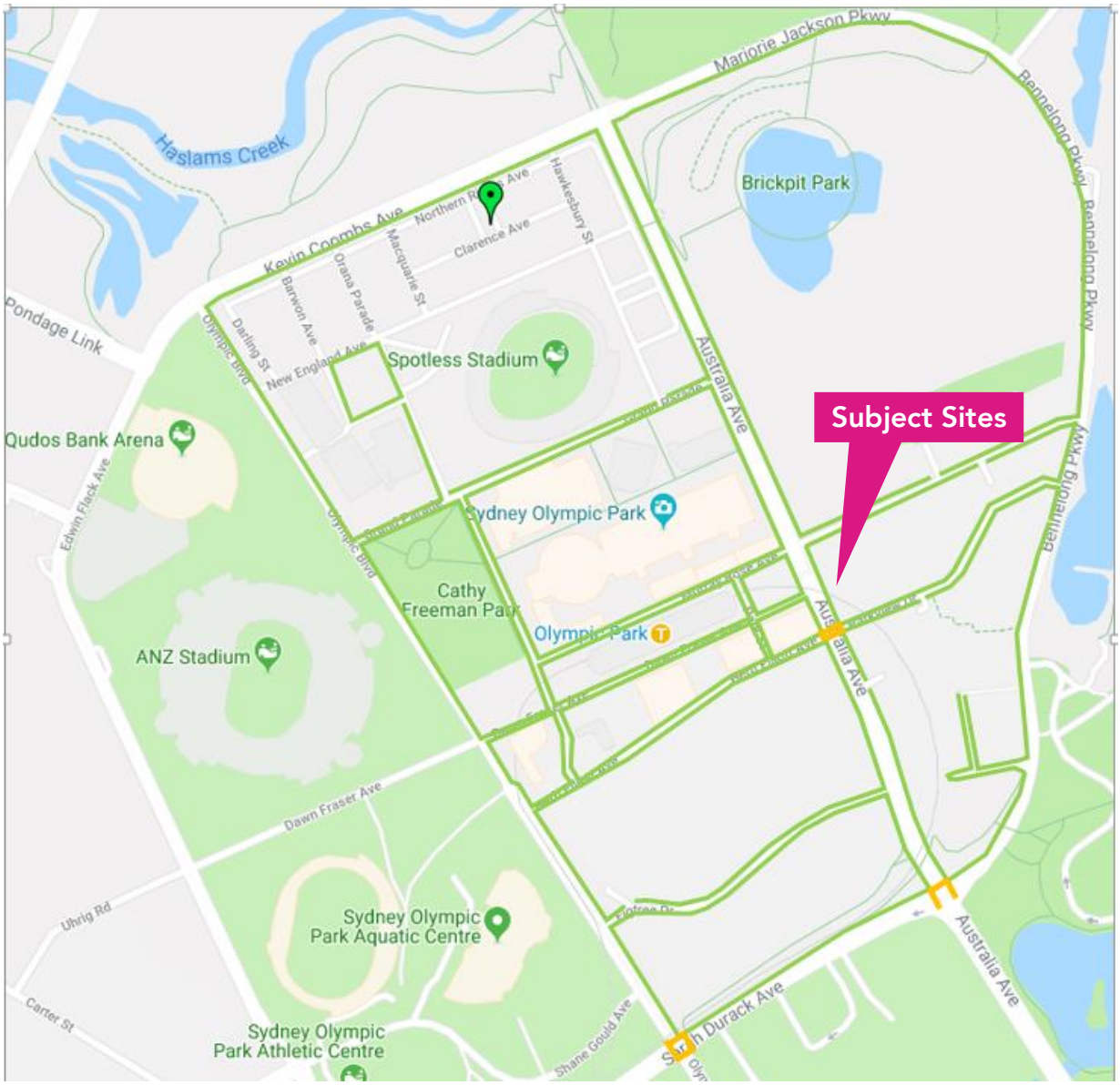


Figure 14 - Pedestrain pathways within the vicinity of the Site

3.3.2 Cycling

As shown in Figure 15, the site is well provided with bicycle lanes or bicycle friendly roads. The proposed development also includes extensive End-of-Trip facilities which should further encourage cycling as a viable mode share.

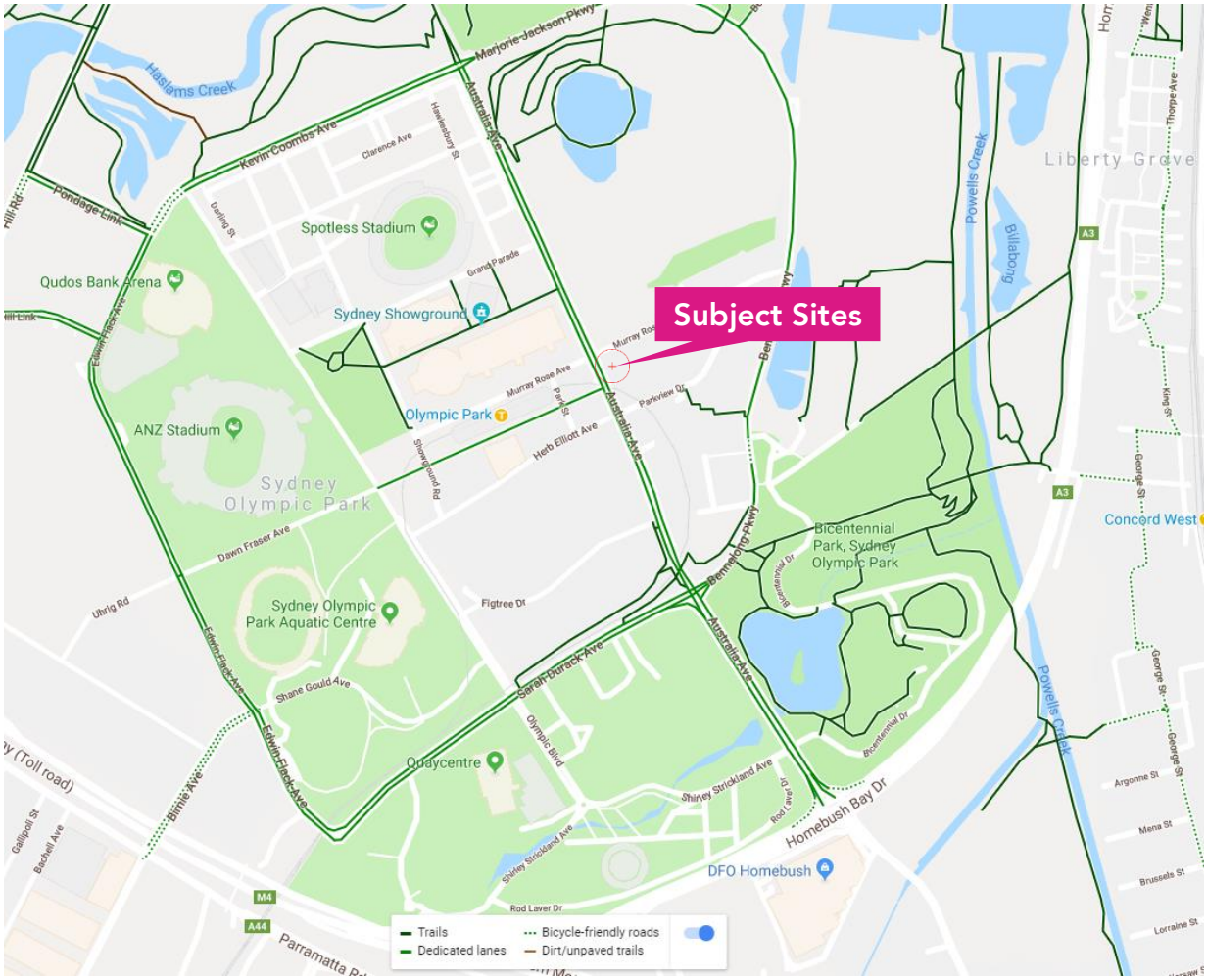


Figure 15 – Existing and proposed cycling network (Source: Google Maps)

4. Traffic Impact Assessment

Generally, the traffic activity associated with a particular type of land use can be determined through a number of approaches. For the purposes of this assessment, the traffic activity related to the existing land use for the existing and post-development traffic generation is determined with reference to the following documents:

- RMS Guide to Traffic Generating Developments 2002 (RMS Guide); and
- RMS Technical Direction 2013/04a (TDT).

The technical direction contains the most recent RMS survey data for various land uses.

4.1 Existing Traffic Generation

The site is currently a SOPA car park with 222 car spaces.

4.2 Existing Network Performance

4.2.1 Existing Traffic Volumes

To determine the current traffic volumes within the vicinity of the development site, intersection surveys were conducted on Thursday, 14th June 2018, between 7am – 9am and 4pm – 6pm at the following intersections:

- Australia Avenue / Murray Rose Avenue
- Australia Avenue / Herb Elliott Avenue / Parkview Drive
- Bennelong Parkway / Parkview Drive
- Bennelong Parkway / Murray Rose Avenue

The intersection location surveys are shown in Figure 16.

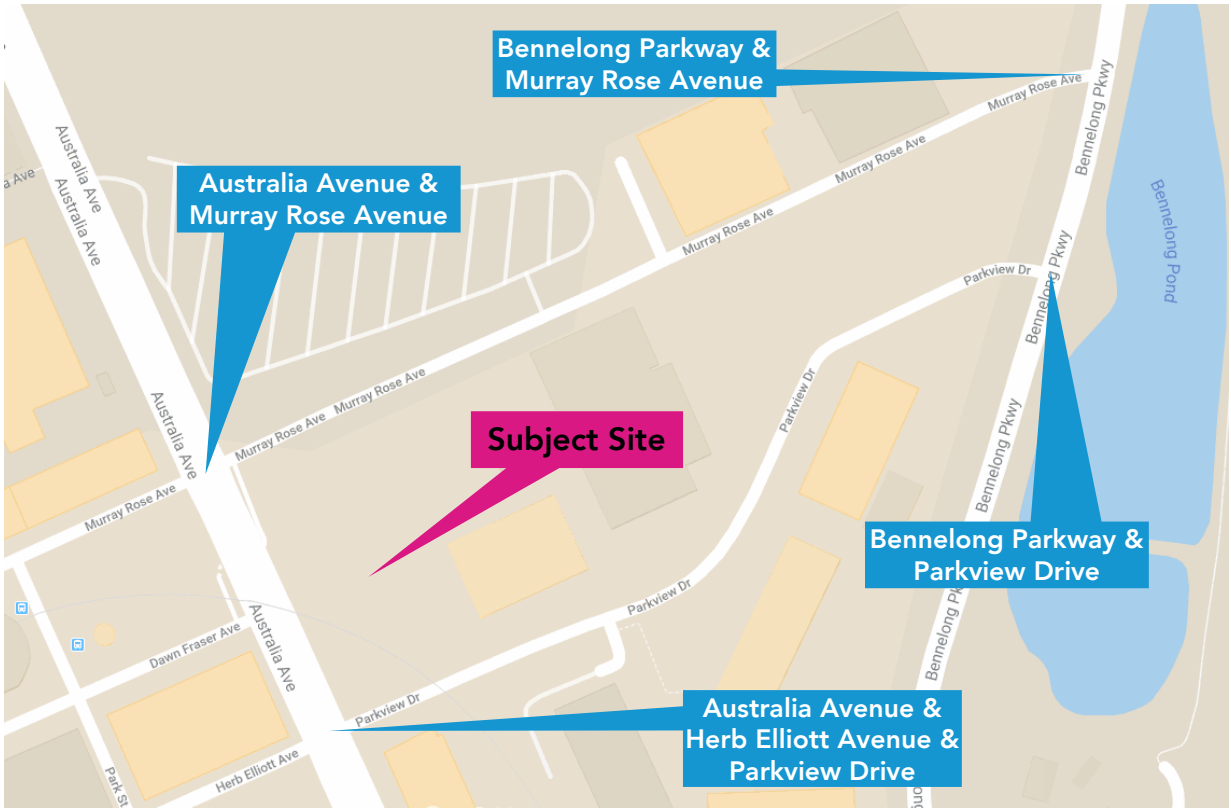


Figure 16 – Location of Intersction Surveys.

It was determined from the survey that the weekday AM and PM peak hours were 8:00am – 9:00am and 4:45pm – 5:45pm respectively. The peak hour traffic volumes are presented in Figure 17 and Figure 18.

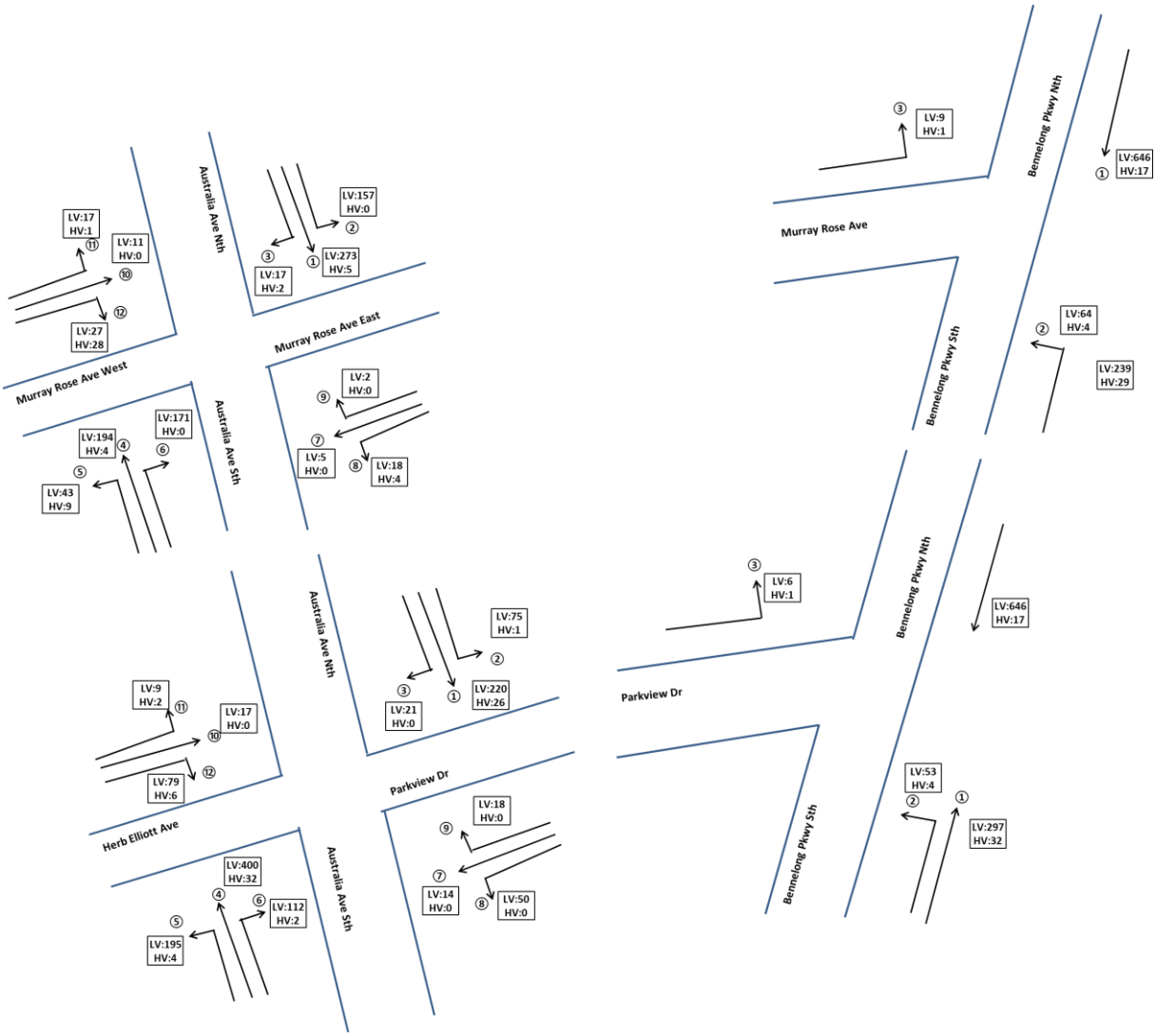


Figure 17 – Existing AM Peak Hour Traffic Volumes

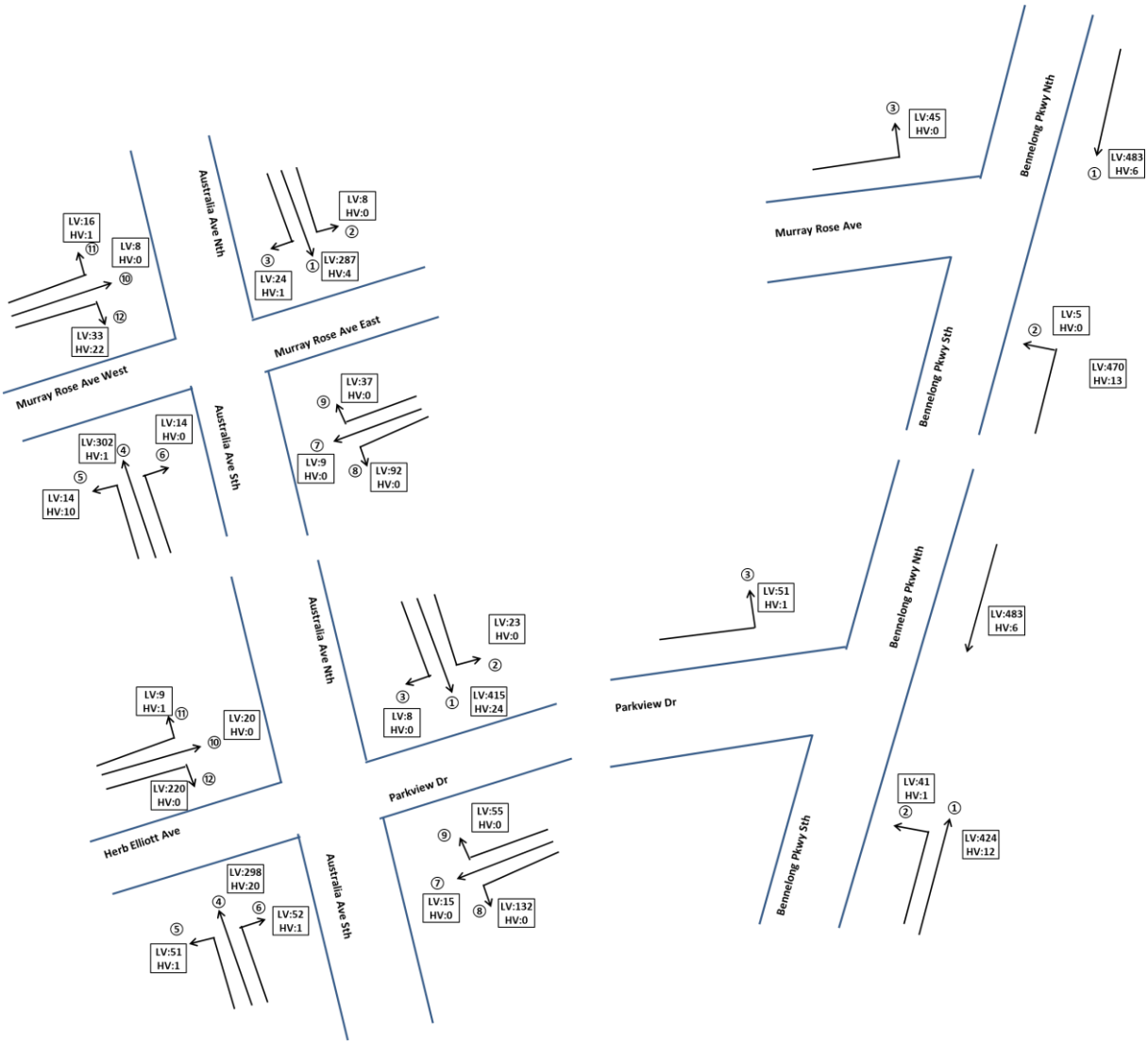


Figure 18 – Existing PM Peak Hour Traffic Volumes

4.2.2 Existing Network Operation

From the survey data, a volume analysis was performed using SIDRA Intersection 8.0 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 4.1.

Table 4.1 – 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 4.2.

Table 4.2 – Summary of Existing Intersection Modelling

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Australia Avenue / Murray Rose Avenue	AM Peak	LOS B	17.2	0.307	12.0
	PM Peak	LOS A	16.7	0.290	10.6
Australia Avenue / Herb Elliott Avenue / Parkview Drive	AM Peak	LOS B	18.4	0.718	50.3
	PM Peak	LOS B	17.4	0.553	31.4
Bennelong Parkway / Murray Rose Avenue	AM Peak	LOS A	6.7	0.009	0.3
	PM Peak	LOS A	7.6	0.048	1.3
Bennelong Parkway / Parkview Drive	AM Peak	LOS A	7.1	0.007	0.2
	PM Peak	LOS A	7.4	0.053	1.2

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

4.3 Proposed Development Traffic Generation

4.3.1 Commercial

The RMS Technical Direction (TDT) publishes the trip generation rate for office blocks in Sydney Olympic Park as follows:

- 1.48 trips per 100m^2 GFA in the weekday AM peak hour
- 1.41 trips per 100m^2 GFA in the weekday PM peak hour

The development provides a total of 24,500m^2 GFA commercial/office space which would generate 24500*1.48/100=362.6 trips in the AM peak hour and 24500*1.41/100=345.5 trips in the PM peak hour.

4.3.2 Public Car Park

There are 290 commercial car spaces in the basement car parks. The 363 office trips in the AM peak would therefore take up 73 public car spaces leaving 77 car spaces to be parked by the public. Similarly, the 56 trips parking in the public car park would leave 94 car spaces for the public.

The development is within close proximity to Sydney Olympic Park train station where the existing and proposed public car parks are likely used by commuters. Assuming 80% of the public car spaces will generate trips during the peak hours (inbound/outbound), the trip summary is presented in Table 4.3.

Table 4.3 – Public Car Park Trip Summary

Peak Hour	Public Car Park	Available Car Spaces	Trip Generation	Net Trip Generation
AM	Existing	222	178	-116
	Proposed	77	62	
PM	Existing	222	178	-103

	Proposed	94	75	

It is noted that the existing car park has two driveways – one on Murray Rose Avenue and the other on Parkview Drive, while the proposed basement car park will have access on Parkview Drive only.

From observation, the two existing driveways have similar level of traffic accessing the car park. Hence, it is assumed that there are 178/2=89 trips via each driveway.

4.3.3 Hotel

It is noted that the occupancy of the hotel is event based, thus it is not expected to generate much traffic on a regular basis. It is also important to note that the arrival and departure trips will likely not align with the network peak hours.

The hotel staff traffic is not expected to create any significant impact in the peak hours and is therefore omitted for the purpose of this report.

4.3.4 Retail

The development provides 800m^2 GFA of retail space. The retail component is intended to service the office and hotel; hence, it is not expected to attract destination trips.

4.3.5 Summary of Proposed Traffic Generation

The net traffic generation of the proposed development is summarised in Table 4.4.

Table 4.4 – Net Trip Generation

Peak Hour	Commercial	Public Car Park	Hotel	Retail	Net Trips
AM	363	-116	0	0	247
PM	346	-103	0	0	243

4.4 Proposed Traffic Distribution

The trip distributions have been assumed for the commercial and public land uses as follows:

- 80% inbound and 20% outbound in the AM peak
- 20% inbound and 80% outbound in the PM peak

The net trip distribution of the two driveways are summarised in Table 4.5 for the weekday peak hours.

Table 4.5 – Net Trip Distribution

Land Uses	Murray Rose Avenue		Parkview Drive	
	AM	PM	AM	PM
Existing Public Car Park Trips	89	89	89	89
Proposed Public Car Park Trips	0	0	70	83
Proposed Office Trips	0	0	363	346

Net Trips	-89	-89	344	340

These net trips are distributed, based on the proportions of the existing traffic volumes, onto the road network in Figure 19 and Figure 20.

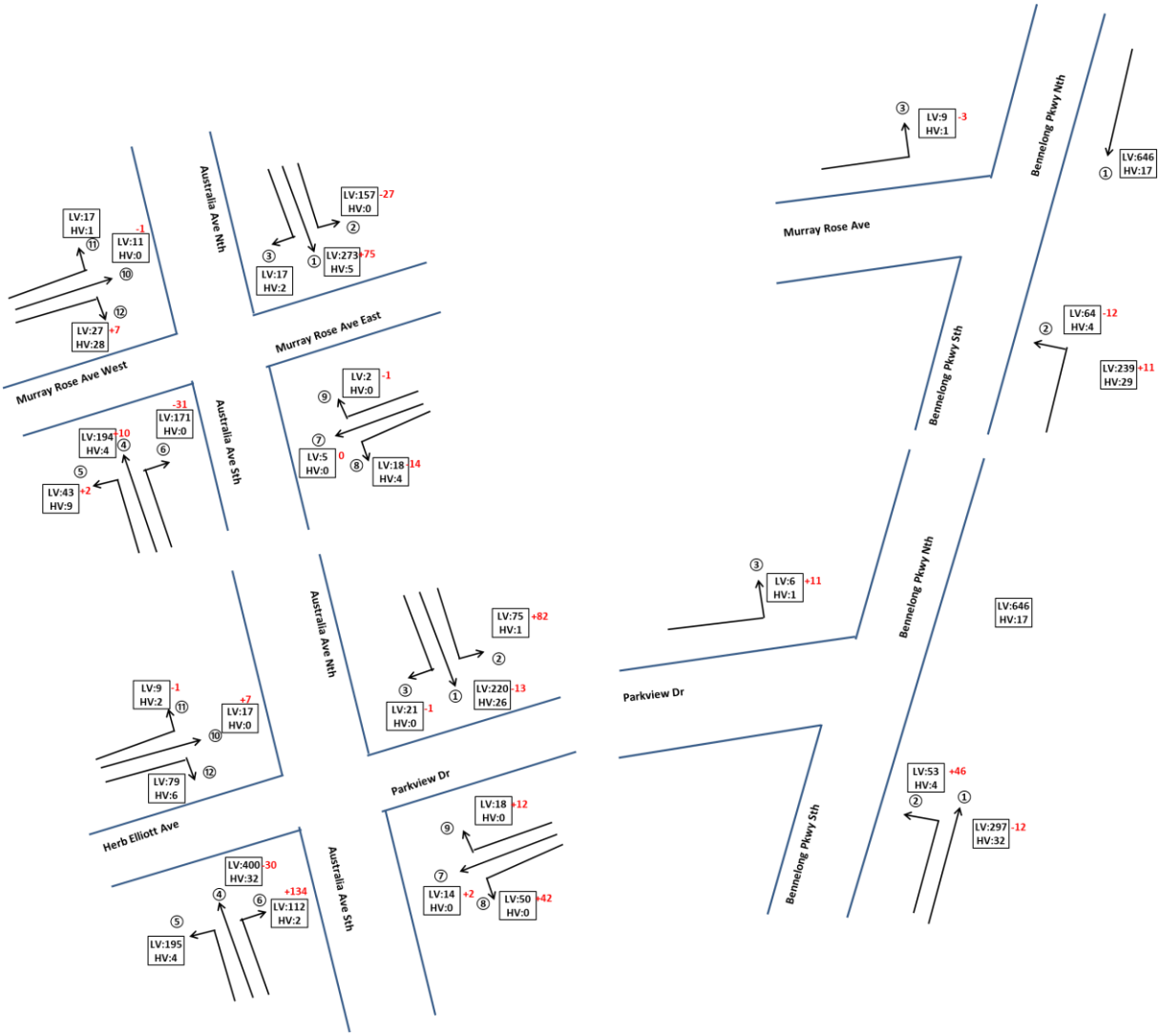


Figure 19 – Proposed Traffic Distribution AM Peak Hour

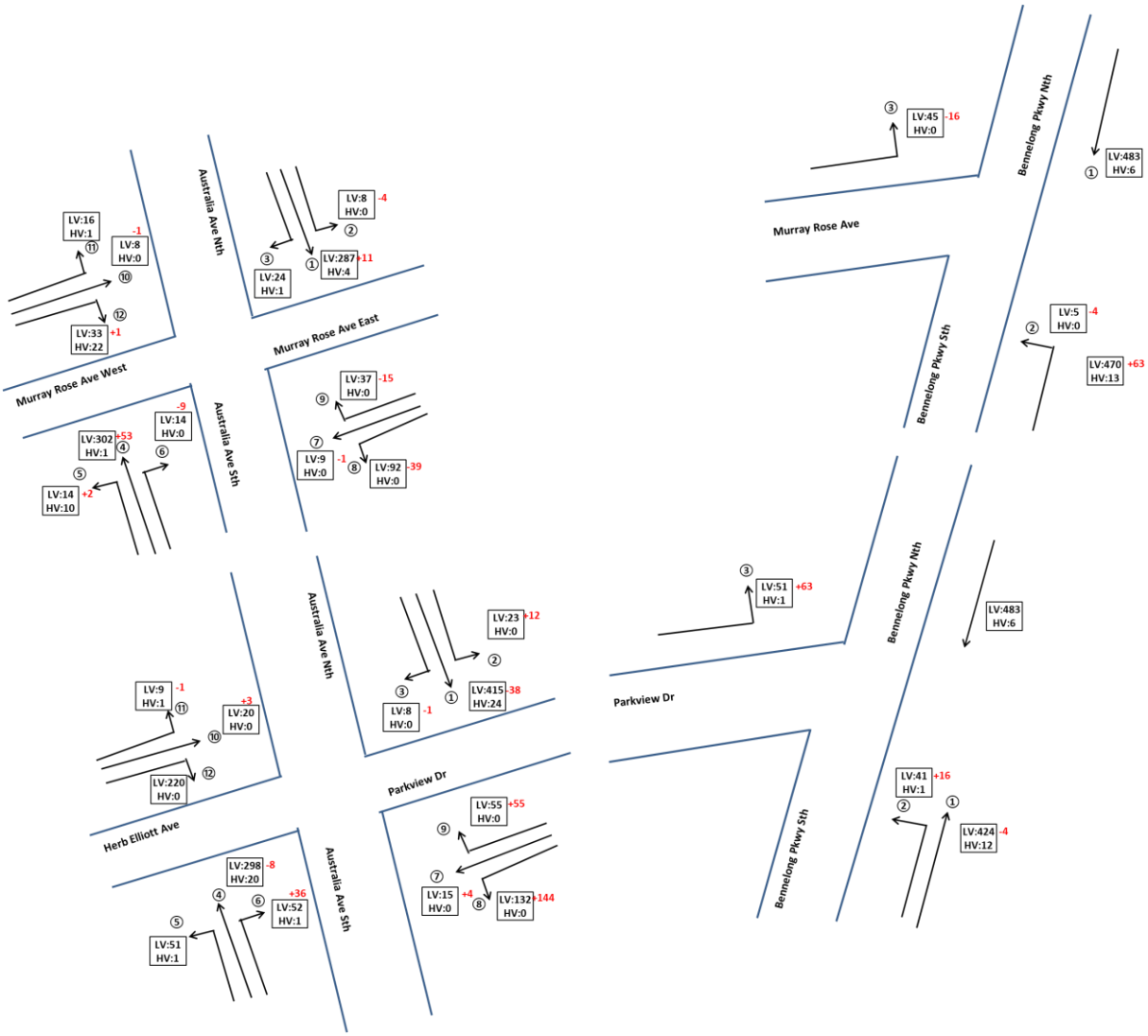


Figure 20 – Proposed Traffic Distribution PM Peak Hour

4.5 Proposed Network Operation

The projected traffic generations and distribution have been applied to the four surveyed intersections and intersection modelling has undertaken using SIDRA 8.0 and the results are summarised in Table 4.6.

Table 4.6 – Summary of Proposed Intersection Modelling

Intersection	Period	Level of Service	Average Delay (sec)	Degree of Saturation	95% Queue Length (m)
Australia Avenue / Murray Rose Avenue	AM Peak	LOS B	20.8	0.373	15.0
	PM Peak	LOS B	17.0	0.293	10.8
Australia Avenue / Herb Elliott Avenue / Parkview Drive	AM Peak	LOS B	18.4	0.742	48.2
	PM Peak	LOS B	21.2	0.801	47.1
Bennelong Parkway / Murray Rose Avenue	AM Peak	LOS A	6.8	0.007	0.2
	PM Peak	LOS A	7.9	0.034	0.9

Bennelong Parkway / Parkview Drive	AM Peak	LOS A	6.8	0.018	0.4
	PM Peak	LOS A	7.4	0.118	2.7

The intersection modelling indicates that, during both the morning and afternoon peak periods, the four intersections will continue to operate similarly 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 are presented in Attachment 2.

5. Parking Provision Assessment

The parking provision assessment has been undertaken in accordance with Sydney Olympic Park Authority Master Plan 2030 (SOPA Master Plan), Sydney Olympic Park Authority Access Guidelines (Access Guidelines) and Building Code of Australia (BCA) 2006.

5.1 Car Parking

The SOPA Master Plan outlines the maximum parking rates for the respective land uses as follows:

- Commercial – 1 space per 80m^2
- Retail – 1 space per 50m^2
- Hotel
    - 1 space per room
    - 1 space per 2 staff

The proposal comprises 24,500m^2 GFA of commercial and 800m^2 GFA of retail premises as well as 304 hotel rooms, permitting a maximum of 24,500/80+800/50+304=626 car spaces (omitting the staff spaces).

The development provides 516 car spaces and therefore complies with SOPA Master Plan maximum car parking requirement.

5.2 Accessible Car Parking

The Access Guidelines outlines the requirements for accessible car spaces as the greater of:

- BCA Section D3.5 Accessible Parking and Table D3.5 Car Parking Spaces for People with a Disability
- 2% of the car spaces

The BCA specifies the accessible car parking provision for the respective land uses as follows:

- Commercial – 1%
- Hotel – percentage of accessible rooms to the total number of rooms
- Retail – 2%
- Public Car Park – 1%

The development provides 516 car spaces with 13 accessible spaces (overall 2.5%), thereby meeting the Access Guidelines accessible car parking requirement.

5.3 Service Vehicle Parking

The SOPA Master Plan does not stipulate the requirements of service vehicle parking.

5.4 Motorbike Parking

The SOPA Master Plan does not stipulate the requirements of motorcycle parking.

5.5 Bicycle Parking

The bicycle parking provision rates as per the SOPA Master Plan are as follows:

- Commercial
    - Permanent spaces (long-term use) – 1 space per 150m^2 GFA
    - Visitor bicycle storage (short-term use) – 1 space per 750m^2 GFA

The development has a total of 24,500m^2 GFA of commercial space, thereby requiring 24,500/150=164 permanent spaces and 24,500/750=33 visitor spaces.

It is noted that the development type is predominantly commercial and hotel, with the staff and visitors of the commercial/hotel portion of the development utilising the retail area. It is therefore expected that the retail element should not require any additional bicycle parking.

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 as follows:

- Public – Class 2 Facilities
- Hotel – Class 2 Facilities
- Commercial – Class 1A Facilities

The use of the public car park is primarily event based and hence it is not envisaged to attract short term trips.

The parking space dimensions and associated aisle widths for each classification are presented in Table 2.2 of AS 2890.1, as follows:

- 90-degree Class 1A Facilities
    - Dimensions: 2.4m x 5.4m
    - Aisle Width: 5.8m
- 90-degree Class 2 Facilities
    - Dimensions: 2.5m x 5.4m
    - Aisle Width: 5.8m

The proposed car park has been designed to accommodate the dimensional and aisle width requirements.

Column locations and blind aisle extensions will comply with AS2890.1.

The gradients of the car parking module will have a maximum of 5 percent throughout.

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, the driveway will be classified as a Category 4 as the total car parking provision is between 301 and 600 spaces, with the driveway located on a local road. According to Table 3.2, the width of a Category 4 driveway should be within the range of 6.0m to 8.0m for combined driveways.

The proposed vehicular driveway width is 6.8m wide therefore meeting the requirements of the standard.

The service bay driveways provide access for vehicles up to 8.8m 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 5.6m is able to accommodate the movements and is fit for purpose and therefore, meets the intent of the Standards.

In terms of ramp gradients, reference has been made to Section 2.5.3 of AS2890.1 which states the following for straight ramps:

- Maximum Gradient (Public Car Park)

    - Longer than 20m – 16.7% maximum
    - Up to 20m long – 20% maximum
- Maximum Gradient (Private Car Park)
    - Longer than 20m – 20% maximum
    - Up to 20m long – 25% maximum
- Change in Grade
    - Summit grade changes – 12.5% maximum over 2m
    - Sag grade changes – 15% maximum over 2m

The basement ramps will comply with the gradient requirement.

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 Parkview Drive, is 40km/hr.

According to Figure 3.2 of AS 2890.1, a property on a 40km/hr road must provide a minimum sight distance of 39m and a desirable distance of 55m. It was noted that the proposed driveway will meet these requirements, being located on a straight alignment.

6.4 Bicycle Parking

The bicycle parking arrangements have been designed in accordance with the requirements of AS2890.3, which states the following:

- 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

Bicycle parking are provided in the form of horizontal spaces and vertical spaces. An assessment of the bicycle spaces, 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 10.3 by 6.9m 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.

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 three modes:

- Normal Operation
- Royal Easter Show Operation
- Stadium Events

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 lasts 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 21 – 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.

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 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 the staff as necessary,
- Coordinate with relevant authorities as required,
- Provision of staff access passes / identification if required for certain tenants / staff,
- Encourage staff 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 Site 2A and 2B development would still be available via Australia Avenue, Parkview Drive and Murray Rose Avenue.

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 Qudos bank 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 the 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 the staff as necessary;

- Coordinate with relevant authorities as required;
- Regular communication between Building Manager 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 Site 2A and 2B development would still be available via Australia Avenue, Parkview Drive and Murray Rose Avenue.

8. Indicative Construction Traffic Management

8.1 Objective

The traffic management plan associated with the construction activity aims to ensure the safety of all workers and road users within the vicinity of the construction site and the following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network;
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers;
- Installation of appropriate advance warning signs to inform users of the changed traffic conditions;
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site;
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles including the construction vehicles accessing the site; and
- Establishment of a safe pedestrian environment in the vicinity of the site.

8.2 General Requirements

In accordance with Road and Maritime Services (RMS) requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the site.

All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

Vehicles operating to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

8.3 Hours of Work

All works, associated with the project will be restricted to the time periods by the Conditions of Consent. As the conditions of consent have not yet been issued, the development is proposing the following working hours to be associated with the construction activity;

- Monday to Friday 07:00am to 05.30pm;
- Saturdays 08:00am to 12.00pm;
- Sunday or public holidays No works to be undertaken without prior approval

8.4 Indicative Construction Vehicle Routes

The site is located in Sydney Olympic Park and the proposed construction vehicle routes have regard for the surrounding traffic arrangements within the vicinity of the site, as shown in Figure 22.

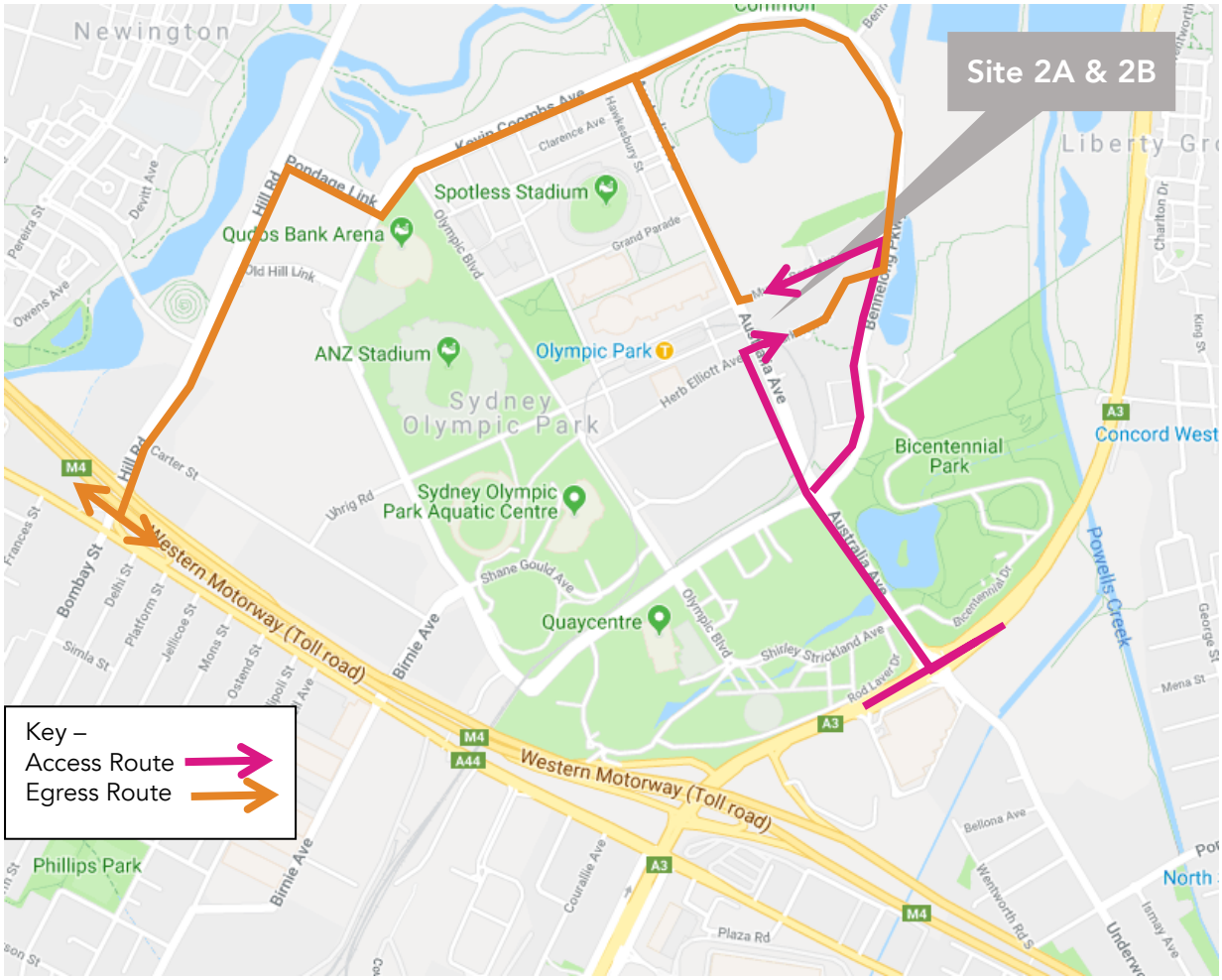


Figure 22 – Construction Vehicle Routes

No queuing or marshalling of trucks is permitted on any public road.

All vehicle routes are constrained to existing public roads that have the physical geometry to accommodate the turning movements.

All access gates to the site will be managed by gate controllers to ensure the safe management of the access and egress to the site and its interaction with non-construction traffic on the road network.

Swept path analysis has been undertaken utilising the largest expected vehicle type on the key intersections to confirm that the exiting intersections can accommodate these vehicles.

The swept path analysis for each intersection can be found in Figure 23 and Figure 25.

Figure 23 – Swept Path Analysis – Australia Ave/Murray Rose Avenue

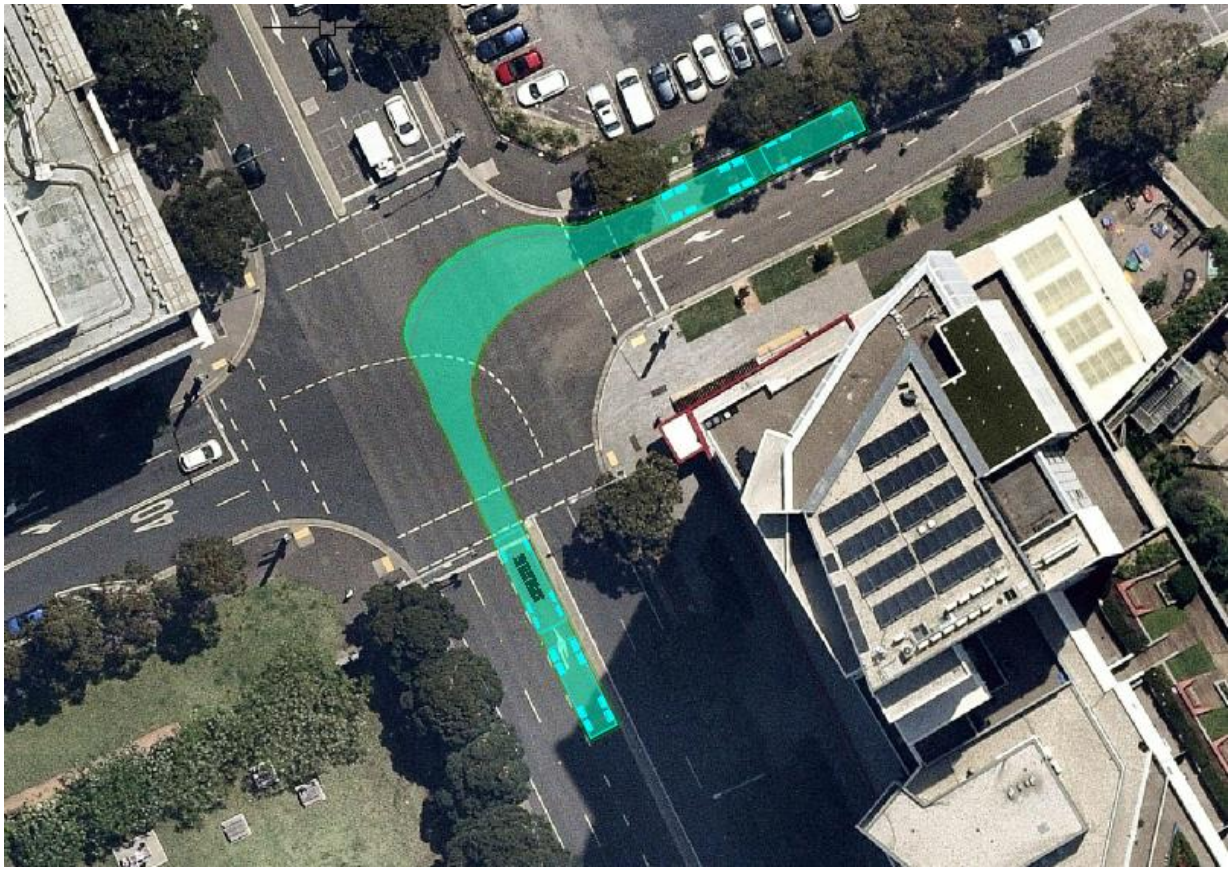


Figure 24 – Swept Path Analysis – Australia Ave/Parkview Drive

Figure 25 – Swept Path Analysis – Bennelong Parkway/Parkview Drive and Bennelong Parkway/Murray Rose Avenue

8.5 Construction Vehicle Site Access and Egress

The construction vehicle will access the site via either Parkview Drive or Murray Rose Avenue.

Details of the work zones will be finalised in the Detail Construction Traffic Management Plan.

8.6 Pedestrian Access

Pedestrian access to and around the site is to be maintained at all times. To provide segregation and protection for pedestrians, it is proposed a 2.4m high Class A hoarding is to be erected along the site boundary. This fencing will define the extent of the works site.

Pedestrian access to the site will be via two designated pedestrian gates and the exact location of these gates will be determined during the CC process.

All access points are to be securely locked when construction activities are not in progress.

The exact location of this fence is to be agreed on site, prior to commencement of the works.

Sections of the footway along the development frontages may be require short term closure during the construction process. The extent and timings will be determined during the CC process and traffic control, in accordance with the RMS Traffic Control at Works Sites, will be provided accordingly.

8.7 Special Deliveries

Whilst not anticipated, any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to and subsequent approval by SOPA prior to any delivery. Requests shall be submitted 28 days prior to the scheduled date of use of an oversized vehicle.

8.8 Staff Parking

Due to site constraint, there will be no parking available to site personnel on site. All site personnel are to be advised that they are not to park in the on street parking in the vicinity of the development site. To minimise the required parking, the contractor will be encouraged to assist in the transportation of workers to the site. Also, site personnel will be advised to car pool (where ever practicable) and site personal will be informed of the public transport options available in the vicinity of the site and advised to utilise these facilities (where ever practicable).

A public transport pack information is to be provided to all staff and contractors, advising them of the public transport options available.

8.9 Work Site Security

As discussed in Section 8.6, to provide security to the works site and protection to the general public, it is proposed that a 2.4m high, Type A hoarding is to be erected along the development site boundary. This fencing will define the extent of the works site. All access points are to be securely locked when construction activities are not in progress. The exact location of this fence is to be agreed on site, prior to commencement of the works.

8.10 Staff Induction

All staff and subcontractors engaged on site will be required to undergo a site induction. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard

environmental, OH&S, driver protocols and emergency procedures. Additionally, the lead contractor will discuss TMP requirements regularly as a part of toolbox talks and advise workers of public transport and car-pooling opportunities.

8.11 Emergency Vehicle Access

The proposed traffic control arrangements do not propose closure of any local roads.

Any emergency vehicles requiring access to the project site will do so via the site access on Murray Rose Avenue.

8.12 Access to adjoining properties

Access to all adjoining properties will be maintained throughout the works.

8.13 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold RMS accreditation in accordance with Section 8 of Traffic Control at Worksites.

8.14 Method of Communicating Traffic Changes

Traffic control plans in accordance with Australian Standards (AS 1742.3 – Traffic Control Devices for Works on Roads) and RMS Traffic Control at Worksites manual will advise motorist of upcoming changes in the road network.

During construction the contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TCP and clearly visible. Each evening, upon completion of work, the contractor is to ensure signage is either covered or removed as required. Sign size is to be size "A".

No deviation from the approved TCP shall be permitted, unless otherwise approved by Council and certified by an RMS accredited personnel.

The associated TCP road signage will inform drivers of works activities in the area including truck movements in operation.

The TCP's will be formalised in the Detail Construction Traffic Management Plan.

Prior to commencement of works on site the contractor is to inform neighbouring properties of proposed works and provide site contact information by means of a letter box distribution.

8.15 Contact Details for On-Site Enquiries and Site Access

The principal contractor for the development has not yet been engaged and the contact and telephone number will be confirmed prior to commencement on site.

9. Conclusion

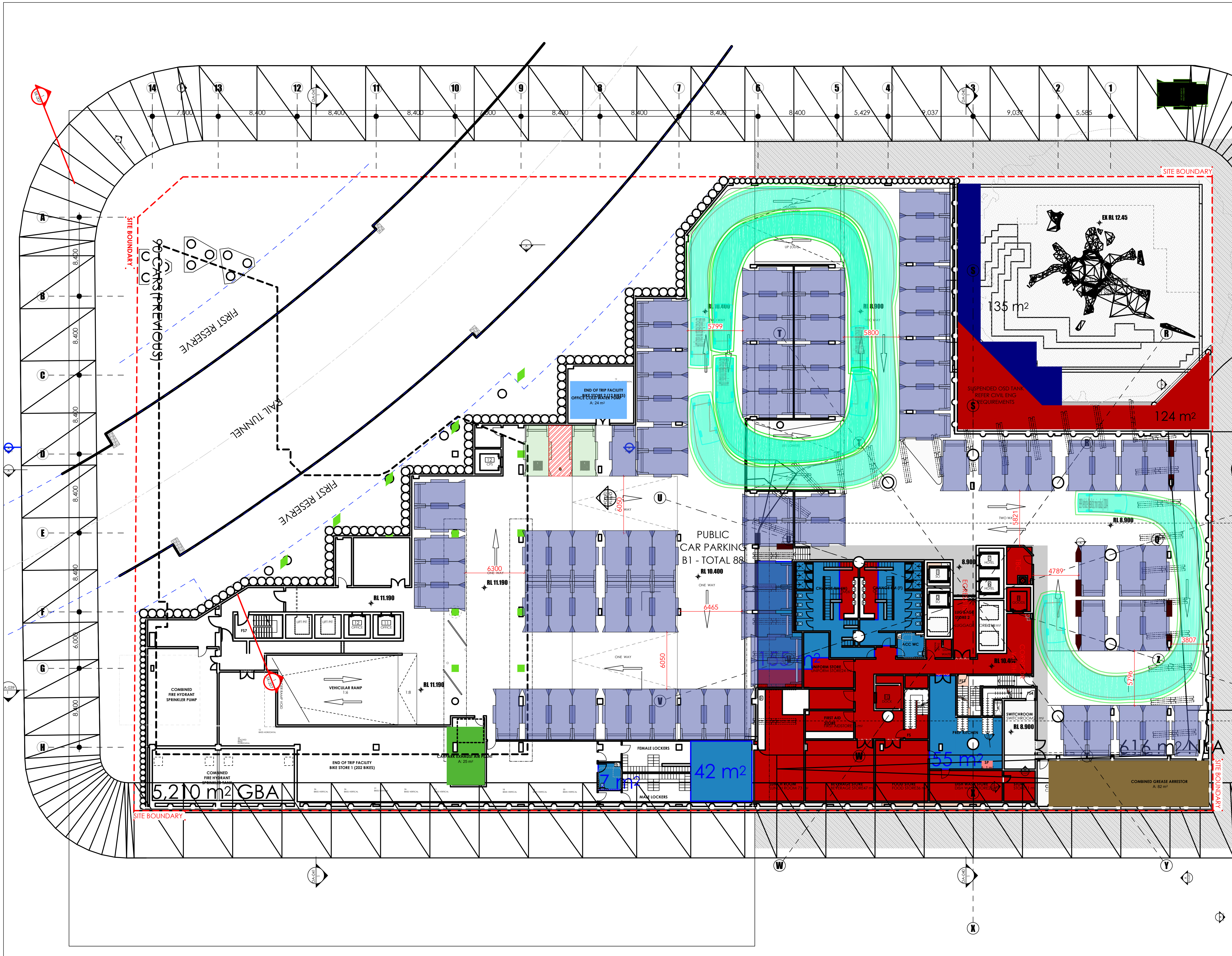
The development proposes to develop a multi storey building development incorporating hotel, retail, and commercial use. The basement car parks will dedicate some public car parking spaces to mitigate the loss of an existing public car park. The development meets the criteria for State Significant Development (SSD).

The assessment of the traffic activity has established that the development is likely to have a minor increase in traffic activity and will have minimal impact on the surrounding road network.

The car park aligns with the expected car parking demand and is considered suitable in the context of the DCP requirements and is unlikely to increase the demand for on-street parking.

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

Attachment 1 Car Park Assessment



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).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

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.

5.4m x 2.5m Parking Envelope

5.4m x 2.4m Parking Envelope

5.0m x 2.3m Parking Envelope

ptc.

Suite 102, 506 Miller Street,
Cammeray NSW 2062

t +61 2 8920 0800

ptcconsultants.co

REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
2	14/08/19	FOR INFORMATION	EL	AU					
1	11/07/19	FOR INFORMATION	EL	AU					

PROJECT: Site 2A And Site 2B

DRAWING TITLE: Car Park Design Assessment - B1

CLIENT: Ecove

DRG. #: TP-101

PROJECT #: 2489

SCALE: 1 : 400

REV: 2

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).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

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.

5.4m x 2.5m Parking Envelope

5.4m x 2.4m Parking Envelope

5.0m x 2.3m Parking Envelope

ptc.
Suite 102, 506 Miller Street, Cammeray NSW 2062
t +61 2 8920 0800
ptcconsultants.co

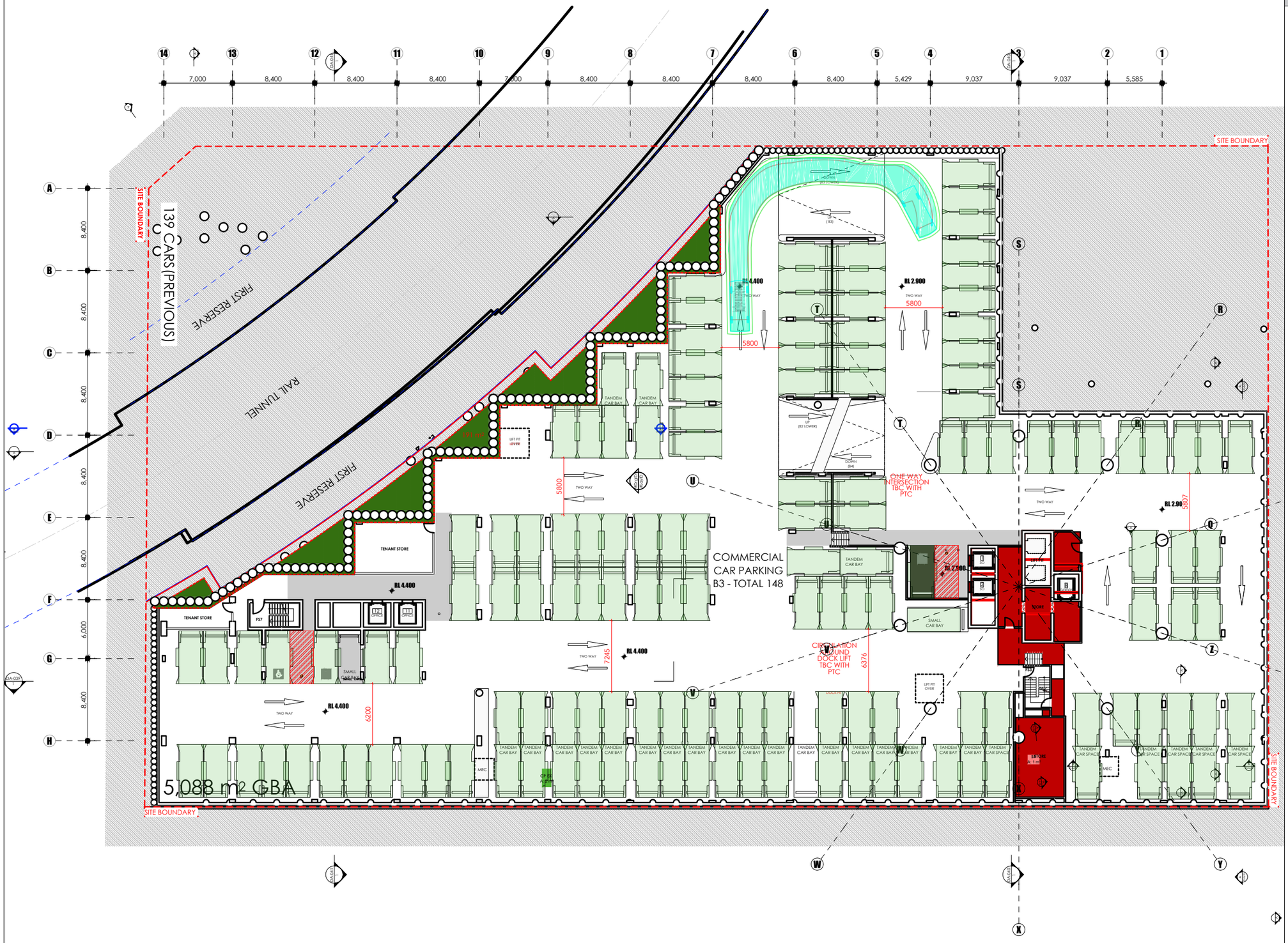
REV	DATE	COMMENT	DRAWN	REVIEWED
2	14/08/19	FOR INFORMATION	EL	AU
1	11/07/19	FOR INFORMATION	EL	AU

PROJECT: Site 2A And Site 2B

DRAWING TITLE: Car Park Design Assessment - B2

CLIENT:	Ecove
DRG. #:	TP-102
PROJECT #:	2489
SCALE:	1 : 400

REV: 2



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).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

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.

5.4m x 2.5m Parking Envelope

5.4m x 2.4m Parking Envelope

5.0m x 2.3m Parking Envelope

ptc.
Suite 102, 506 Miller Street, Cammeray NSW 2062
t +61 2 8920 0800
ptcconsultants.co

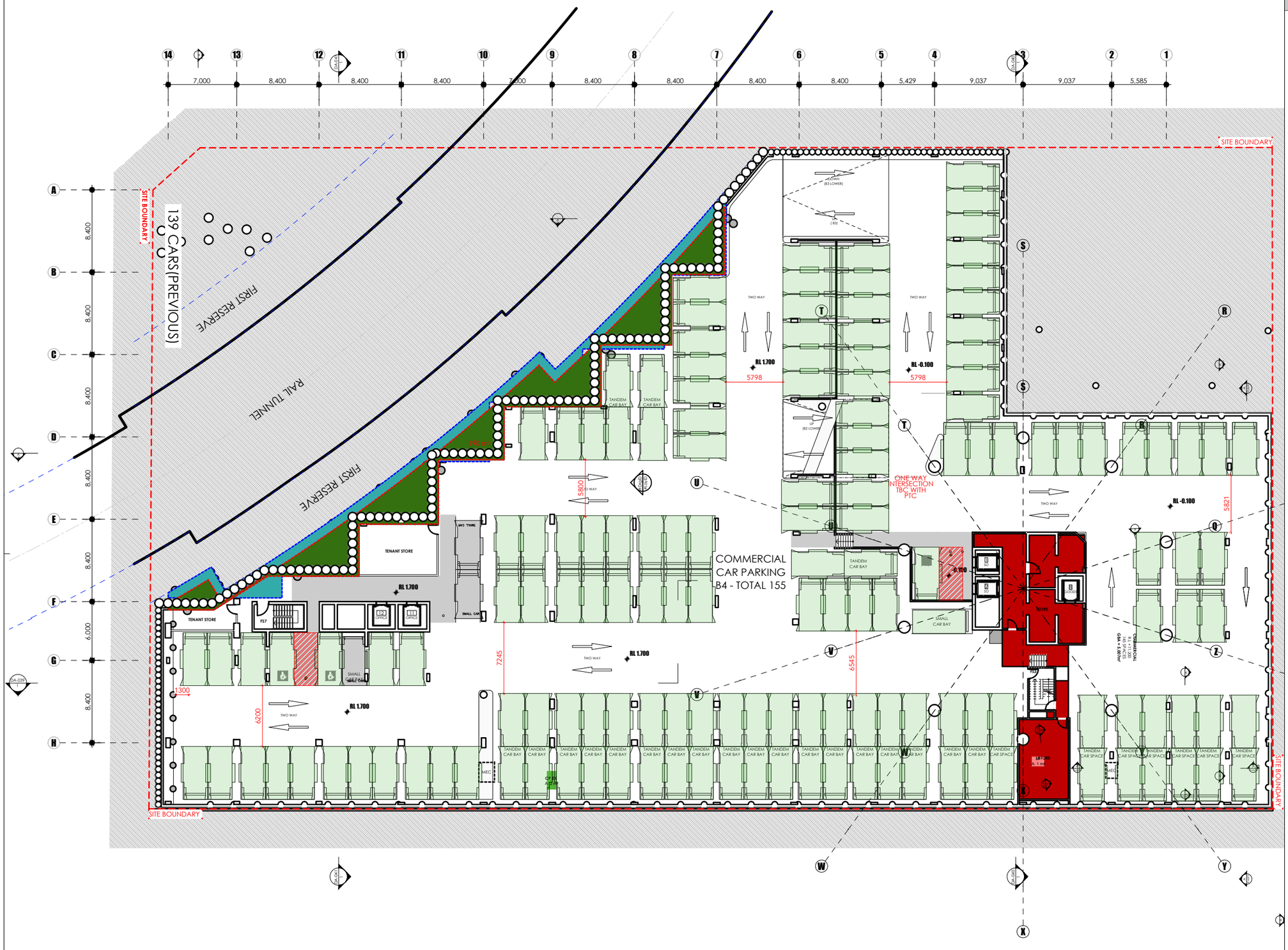
REV	DATE	COMMENT	DRAWN	REVIEWED
2	14/08/19	FOR INFORMATION	EL	AU
1	11/07/19	FOR INFORMATION	EL	AU

PROJECT: Site 2A And Site 2B

DRAWING TITLE: Car Park Design Assessment - B3

CLIENT:	Ecove
DRG. #:	TP-103
PROJECT #:	2489
SCALE:	1 : 400

REV: 2



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.)

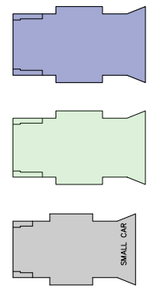
Parking Spaces: The parking envelopes shown, must be kept clear of all physical obstructions, including height clearance reductions. Ensure that grades within the parking module do not exceed 1:20 (1:40 for accessible bays).

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).

Motorcycle Parking: Motorcycle bays to be designed as a 2.5m x 1.2m envelope (AS2890.1).

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.



5.4m x 2.5m Parking Envelope

5.4m x 2.4m Parking Envelope

5.0m x 2.3m Parking Envelope

ptc.
Suite 102, 506 Miller Street,
Cammeray NSW 2062
t +61 2 8920 0800
ptcconsultants.co

REV	DATE	COMMENT	DRAWN	REVIEWED	REV	DATE	COMMENT	DRAWN	REVIEWED
2	14/08/19	FOR INFORMATION	EL	AU					
1	11/07/19	FOR INFORMATION	EL	AU					

PROJECT:
Site 2A And Site 2B

DRAWING TITLE:
Car Park Design Assessment - B4

CLIENT:	Ecove
DRG. #:	TP-104
PROJECT #:	2489
SCALE:	1 : 400

REV: 2

Attachment 2 SIDRA Outputs

Table 9.1 – Intersection Performance of Australia Avenue with Murray Rose Avenue Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				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	8.0	LOS A	0.7	4.9	0.43	0.70	0.43	31.4
Approach		443	3.1	443	3.1	0.198	3.9	NA	0.7	4.9	0.17	0.36	0.17	49.2
East: Murray Rose Avenue East														
4	L2	23	18.2	23	18.2	0.020	3.8	LOS A	0.1	0.6	0.17	0.44	0.17	36.4
5	T1	5	0.0	5	0.0	0.020	10.1	LOS A	0.1	0.5	0.66	0.70	0.66	35.4
6	R2	2	0.0	2	0.0	0.020	12.4	LOS A	0.1	0.5	0.66	0.70	0.66	37.2
Approach		31	13.8	31	13.8	0.020	5.5	LOS A	0.1	0.6	0.29	0.50	0.29	36.2
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	0.16	0.34	0.17	45.4

Table 9.2 – Intersection Performance of Australia Avenue with Murray Rose Avenue Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Australia Avenue South														
1	L2	25	41.7	25	41.7	0.098	6.0	LOS A	0.0	0.0	0.00	0.08	0.00	52.6
2	T1	319	0.3	319	0.3	0.098	0.1	LOS A	0.1	0.9	0.03	0.07	0.03	58.5
3	R2	15	0.0	15	0.0	0.098	7.0	LOS A	0.1	0.9	0.06	0.05	0.06	55.1
Approach		359	3.2	359	3.2	0.098	0.8	NA	0.1	0.9	0.03	0.07	0.03	57.8
East: Murray Rose Avenue East														
4	L2	97	0.0	97	0.0	0.085	4.1	LOS A	0.3	2.2	0.27	0.49	0.27	36.0
5	T1	9	0.0	9	0.0	0.119	8.6	LOS A	0.4	3.1	0.62	0.79	0.62	35.5
6	R2	39	0.0	39	0.0	0.119	11.0	LOS A	0.4	3.1	0.62	0.79	0.62	37.2
Approach		145	0.0	145	0.0	0.119	6.3	LOS A	0.4	3.1	0.39	0.59	0.39	36.4
North: Australia Avenue North														
7	L2	8	0.0	8	0.0	0.094	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	59.0
8	T1	306	1.4	306	1.4	0.094	0.2	LOS A	0.3	2.0	0.07	0.06	0.07	57.0
9	R2	26	4.0	26	4.0	0.094	6.9	LOS A	0.3	2.0	0.16	0.10	0.16	44.9
Approach		341	1.5	341	1.5	0.094	0.8	NA	0.3	2.0	0.08	0.06	0.08	54.6
West: Murray Rose Avenue West														
10	L2	18	5.9	18	5.9	0.290	5.4	LOS A	1.2	10.6	0.59	0.75	0.69	33.6
11	T1	8	0.0	8	0.0	0.290	10.1	LOS A	1.2	10.6	0.59	0.75	0.69	27.5
12	R2	58	40.0	58	40.0	0.290	21.1	LOS B	1.2	10.6	0.59	0.75	0.69	27.5
Approach		84	28.8	84	28.8	0.290	16.7	LOS B	1.2	10.6	0.59	0.75	0.69	29.2
All Vehicles		929	4.4	929	4.4	0.290	3.1	NA	1.2	10.6	0.15	0.21	0.16	46.3

Table 9.3 – Intersection Performance of Australia Avenue with Herb Elliott Avenue and Parkview Drive Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				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

Table 9.4 – Intersection Performance of Australia Avenue with Herb Elliott Avenue and Parkview Drive Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				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

Table 9.5 – Intersection Performance of Bennelong Parkway with Murray Rose Avenue Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	72	5.9	72	5.9	0.195	5.5	LOS A	0.0	0.0	0.00	0.12	0.00	50.3
2	T1	282	10.8	282	10.8	0.195	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.2
Approach		354	9.8	354	9.8	0.195	1.1	NA	0.0	0.0	0.00	0.12	0.00	57.9
North: Bennelong Parkway North														
8	T1	698	2.6	698	2.6	0.364	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		698	2.6	698	2.6	0.364	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	11	10.0	11	10.0	0.009	6.7	LOS A	0.0	0.3	0.36	0.56	0.36	52.0
Approach		11	10.0	11	10.0	0.009	6.7	LOS A	0.0	0.3	0.36	0.56	0.36	52.0
All Vehicles		1062	5.1	1062	5.1	0.364	0.5	NA	0.0	0.3	0.00	0.05	0.00	59.1

Table 9.6 – Intersection Performance of Bennelong Parkway with Murray Rose Avenue Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	5	0.0	5	0.0	0.268	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
2	T1	508	2.7	508	2.7	0.268	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		514	2.7	514	2.7	0.268	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Bennelong Parkway North														
8	T1	515	1.2	515	1.2	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		515	1.2	515	1.2	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	47	0.0	47	0.0	0.048	7.6	LOS A	0.2	1.3	0.48	0.68	0.48	52.0
Approach		47	0.0	47	0.0	0.048	7.6	LOS A	0.2	1.3	0.48	0.68	0.48	52.0
All Vehicles		1076	1.9	1076	1.9	0.268	0.4	NA	0.2	1.3	0.02	0.03	0.02	59.3

Table 9.7 – Intersection Performance of Bennelong Parkway with Parkview Drive Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				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

Table 9.8 – Intersection Performance of Bennelong Parkway with Parkview Drive Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	44	2.4	44	2.4	0.264	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	58.3
2	T1	459	2.8	459	2.8	0.264	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	58.3
Approach		503	2.7	503	2.7	0.264	0.5	NA	0.0	0.0	0.00	0.05	0.00	58.3
North: Bennelong Parkway North														
8	T1	515	1.2	515	1.2	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		515	1.2	515	1.2	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	55	1.9	55	1.9	0.053	7.4	LOS A	0.2	1.2	0.38	0.65	0.38	46.4
Approach		55	1.9	55	1.9	0.053	7.4	LOS A	0.2	1.2	0.38	0.65	0.38	46.4
All Vehicles		1073	2.0	1073	2.0	0.266	0.6	NA	0.2	1.2	0.02	0.06	0.02	58.2

Table 9.9 – Intersection Performance of Australia Avenue with Murray Rose Avenue Weekday AM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Australia Avenue South														
1	L2	53	18.0	53	18.0	0.146	5.8	LOS A	0.0	0.0	0.00	0.11	0.00	53.9
2	T1	220	1.9	220	1.9	0.146	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	57.8
3	R2	147	0.0	147	0.0	0.173	8.2	LOS A	0.6	4.2	0.46	0.72	0.46	30.9
Approach		420	3.3	420	3.3	0.173	3.6	NA	0.6	4.2	0.16	0.33	0.16	50.2
East: Murray Rose Avenue East														
4	L2	8	50.0	8	50.0	0.009	4.4	LOS A	0.0	0.3	0.25	0.44	0.25	36.1
5	T1	5	0.0	5	0.0	0.018	11.2	LOS A	0.1	0.5	0.69	0.72	0.69	35.1
6	R2	1	0.0	1	0.0	0.018	13.8	LOS A	0.1	0.5	0.69	0.72	0.69	36.7
Approach		15	28.6	15	28.6	0.018	7.5	LOS A	0.1	0.5	0.44	0.56	0.44	35.6
North: Australia Avenue North														
7	L2	137	0.0	137	0.0	0.143	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	51.2
8	T1	373	1.4	373	1.4	0.143	0.1	LOS A	0.3	1.8	0.05	0.14	0.05	54.9
9	R2	20	10.5	20	10.5	0.143	7.1	LOS A	0.3	1.8	0.08	0.05	0.08	45.6
Approach		529	1.4	529	1.4	0.143	1.8	NA	0.3	1.8	0.04	0.18	0.04	53.0
West: Murray Rose Avenue West														
10	L2	19	5.6	19	5.6	0.373	7.3	LOS A	1.7	15.0	0.70	0.87	0.92	31.9
11	T1	11	0.0	11	0.0	0.373	16.7	LOS B	1.7	15.0	0.70	0.87	0.92	25.6
12	R2	66	44.4	66	44.4	0.373	25.2	LOS B	1.7	15.0	0.70	0.87	0.92	25.6
Approach		96	31.9	96	31.9	0.373	20.8	LOS B	1.7	15.0	0.70	0.87	0.92	27.1
All Vehicles		1060	5.3	1060	5.3	0.373	4.3	NA	1.7	15.0	0.15	0.30	0.17	45.9

Table 9.10 – Intersection Performance of Australia Avenue with Murray Rose Avenue Weekday PM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Australia Avenue South														
1	L2	28	37.0	28	37.0	0.109	6.0	LOS A	0.0	0.0	0.00	0.08	0.00	53.0
2	T1	376	0.3	376	0.3	0.109	0.0	LOS A	0.0	0.3	0.01	0.05	0.01	59.1
3	R2	5	0.0	5	0.0	0.109	7.1	LOS A	0.0	0.3	0.02	0.02	0.02	58.4
Approach		409	2.8	409	2.8	0.109	0.5	NA	0.0	0.3	0.01	0.05	0.01	58.5
East: Murray Rose Avenue East														
4	L2	56	0.0	56	0.0	0.049	4.1	LOS A	0.2	1.2	0.27	0.48	0.27	36.0
5	T1	8	0.0	8	0.0	0.082	9.1	LOS A	0.3	2.1	0.64	0.79	0.64	35.3
6	R2	23	0.0	23	0.0	0.082	11.7	LOS A	0.3	2.1	0.64	0.79	0.64	37.0
Approach		87	0.0	87	0.0	0.082	6.6	LOS A	0.3	2.1	0.41	0.59	0.41	36.2
North: Australia Avenue North														
7	L2	4	0.0	4	0.0	0.097	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
8	T1	319	1.3	319	1.3	0.097	0.2	LOS A	0.3	2.1	0.08	0.05	0.08	57.3
9	R2	26	4.0	26	4.0	0.097	7.2	LOS A	0.3	2.1	0.18	0.10	0.18	44.9
Approach		349	1.5	349	1.5	0.097	0.8	NA	0.3	2.1	0.08	0.05	0.08	54.8
West: Murray Rose Avenue West														
10	L2	18	5.9	18	5.9	0.293	5.5	LOS A	1.2	10.8	0.61	0.76	0.72	33.5
11	T1	7	0.0	7	0.0	0.293	10.9	LOS A	1.2	10.8	0.61	0.76	0.72	27.4
12	R2	59	39.3	59	39.3	0.293	21.3	LOS B	1.2	10.8	0.61	0.76	0.72	27.4
Approach		84	28.8	84	28.8	0.293	17.0	LOS B	1.2	10.8	0.61	0.76	0.72	29.0
All Vehicles		931	4.4	931	4.4	0.293	2.7	NA	1.2	10.8	0.13	0.17	0.14	48.2

Table 9.11 – Intersection Performance of Australia Avenue with Herb Elliott Avenue and Parkview Drive Weekday AM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Australia Avenue South														
1	L2	209	2.0	209	2.0	0.476	19.1	LOS B	6.0	43.7	0.81	0.76	0.81	37.7
2	T1	423	8.0	423	8.0	0.476	13.7	LOS A	6.2	46.2	0.82	0.71	0.82	37.4
3	R2	264	0.8	264	0.8	0.742	26.7	LOS B	6.8	48.2	0.96	0.93	1.18	28.6
Approach		897	4.5	897	4.5	0.742	18.8	LOS B	6.8	48.2	0.86	0.79	0.92	35.1
East: Parkview Drive														
4	L2	97	0.0	97	0.0	0.434	26.2	LOS B	2.7	19.1	0.96	0.76	0.96	32.9
5	T1	17	0.0	17	0.0	0.434	22.8	LOS B	2.7	19.1	0.96	0.76	0.96	30.4
6	R2	33	0.0	33	0.0	0.126	24.9	LOS B	0.7	5.2	0.91	0.70	0.91	24.1
Approach		146	0.0	146	0.0	0.434	25.5	LOS B	2.7	19.1	0.95	0.75	0.95	31.1
North: Australia Avenue North														
7	L2	168	0.6	168	0.6	0.278	14.7	LOS B	3.6	25.7	0.66	0.69	0.66	23.7
8	T1	245	11.2	245	11.2	0.278	11.7	LOS A	3.6	25.7	0.73	0.64	0.73	42.9
9	R2	21	0.0	21	0.0	0.075	22.2	LOS B	0.4	2.9	0.80	0.70	0.80	30.6
Approach		435	6.5	435	6.5	0.278	13.4	LOS A	3.6	25.7	0.70	0.66	0.70	37.3
West: Herb Elliott Avenue														
10	L2	11	20.0	11	20.0	0.250	25.6	LOS B	1.5	10.9	0.93	0.72	0.93	26.2
11	T1	25	0.0	25	0.0	0.250	22.1	LOS B	1.5	10.9	0.93	0.72	0.93	26.2
12	R2	89	7.1	89	7.1	0.250	25.5	LOS B	1.5	10.9	0.93	0.73	0.93	33.6
Approach		125	6.7	125	6.7	0.250	24.8	LOS B	1.5	10.9	0.93	0.73	0.93	31.9
All Vehicles		1603	4.8	1603	4.8	0.742	18.4	LOS B	6.8	48.2	0.83	0.74	0.87	34.5

Table 9.12 – Intersection Performance of Australia Avenue with Herb Elliott Avenue and Parkview Drive Weekday PM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Australia Avenue South														
1	L2	55	1.9	55	1.9	0.584	23.4	LOS B	3.7	27.1	0.96	0.80	1.02	36.8
2	T1	326	6.5	326	6.5	0.584	17.9	LOS B	3.8	27.8	0.96	0.80	1.02	34.0
3	R2	94	1.1	94	1.1	0.475	26.7	LOS B	1.9	13.8	1.00	0.75	1.00	28.6
Approach		475	4.9	475	4.9	0.584	20.3	LOS B	3.8	27.8	0.97	0.79	1.02	33.4
East: Parkview Drive														
4	L2	294	0.0	294	0.0	0.772	22.7	LOS B	6.7	47.1	0.99	1.00	1.28	34.1
5	T1	20	0.0	20	0.0	0.772	19.3	LOS B	6.7	47.1	0.99	1.00	1.28	31.4
6	R2	118	0.0	118	0.0	0.282	18.0	LOS B	2.0	14.1	0.87	0.74	0.87	27.0
Approach		432	0.0	432	0.0	0.772	21.3	LOS B	6.7	47.1	0.95	0.93	1.16	32.6
North: Australia Avenue North														
7	L2	38	0.0	38	0.0	0.801	26.8	LOS B	6.2	45.2	1.00	0.99	1.40	16.8
8	T1	502	5.0	502	5.0	0.801	21.5	LOS B	6.2	45.2	1.00	0.99	1.40	35.7
9	R2	7	0.0	7	0.0	0.035	24.2	LOS B	0.1	1.0	0.93	0.65	0.93	29.8
Approach		547	4.6	547	4.6	0.801	21.9	LOS B	6.2	45.2	1.00	0.98	1.39	34.8
West: Herb Elliott Avenue														
10	L2	9	11.1	9	11.1	0.475	21.7	LOS B	2.6	18.2	0.96	0.77	0.96	27.4
11	T1	24	0.0	24	0.0	0.475	18.3	LOS B	2.6	18.2	0.96	0.77	0.96	27.4
12	R2	232	0.0	232	0.0	0.475	21.7	LOS B	2.6	18.2	0.96	0.77	0.96	35.1
Approach		265	0.4	265	0.4	0.475	21.4	LOS B	2.6	18.2	0.96	0.77	0.96	34.3
All Vehicles		1719	2.9	1719	2.9	0.801	21.2	LOS B	6.7	47.1	0.97	0.88	1.16	33.7

Table 9.13 – Intersection Performance of Bennelong Parkway with Murray Rose Avenue Weekday AM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	59	7.1	59	7.1	0.195	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	51.8
2	T1	295	10.4	295	10.4	0.195	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	58.5
Approach		354	9.8	354	9.8	0.195	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.3
North: Bennelong Parkway North														
8	T1	698	2.6	698	2.6	0.364	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		698	2.6	698	2.6	0.364	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	7	14.3	7	14.3	0.007	6.8	LOS A	0.0	0.2	0.37	0.56	0.37	51.8
Approach		7	14.3	7	14.3	0.007	6.8	LOS A	0.0	0.2	0.37	0.56	0.37	51.8
All Vehicles		1059	5.1	1059	5.1	0.364	0.4	NA	0.0	0.2	0.00	0.04	0.00	59.3

Table 9.14 – Intersection Performance of Bennelong Parkway with Murray Rose Avenue Weekday PM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	1	0.0	1	0.0	0.300	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
2	T1	576	2.4	576	2.4	0.300	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		577	2.4	577	2.4	0.300	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bennelong Parkway North														
8	T1	515	1.2	515	1.2	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		515	1.2	515	1.2	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Murray Rose Avenue														
10	L2	31	0.0	31	0.0	0.034	7.9	LOS A	0.1	0.9	0.51	0.69	0.51	51.7
Approach		31	0.0	31	0.0	0.034	7.9	LOS A	0.1	0.9	0.51	0.69	0.51	51.7
All Vehicles		1122	1.8	1122	1.8	0.300	0.2	NA	0.1	0.9	0.01	0.02	0.01	59.5

Table 9.15 – Intersection Performance of Bennelong Parkway with Parkview Drive Weekday AM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	109	3.8	109	3.8	0.243	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	55.2
2	T1	334	10.1	334	10.1	0.243	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	55.2
Approach		443	8.6	443	8.6	0.243	1.4	NA	0.0	0.0	0.00	0.15	0.00	55.2
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	20	5.3	20	5.3	0.018	6.8	LOS A	0.1	0.4	0.31	0.59	0.31	47.1
Approach		20	5.3	20	5.3	0.018	6.8	LOS A	0.1	0.4	0.31	0.59	0.31	47.1
All Vehicles		1161	4.9	1161	4.9	0.364	0.7	NA	0.1	0.4	0.01	0.07	0.01	58.0

Table 9.16 – Intersection Performance of Bennelong Parkway with Parkview Drive Weekday PM Peak Hour Existing Conditions with Development Traffic

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Bennelong Parkway South														
1	L2	61	1.7	61	1.7	0.271	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
2	T1	455	2.8	455	2.8	0.271	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
Approach		516	2.7	516	2.7	0.271	0.7	NA	0.0	0.0	0.00	0.07	0.00	57.7
North: Bennelong Parkway North														
8	T1	515	1.2	515	1.2	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		515	1.2	515	1.2	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Parkview Drive														
10	L2	122	0.9	122	0.9	0.118	7.4	LOS A	0.4	2.7	0.39	0.67	0.39	46.3
Approach		122	0.9	122	0.9	0.118	7.4	LOS A	0.4	2.7	0.39	0.67	0.39	46.3
All Vehicles		1153	1.8	1153	1.8	0.271	1.1	NA	0.4	2.7	0.04	0.10	0.04	56.9