PROPOSED MIXED-USE DEVELOPMENT
BLOCKS 2, 7 & 8, SECTION 5, CANBERRA

TRAFFIC IMPACT ASSESSMENT

PROPOSED MIXED-USE DEVELOPMENT BLOCKS 2, 7 & 8, SECTION 5, CANBERRA
Client: **Bulum Group**
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MELBOURNE Level 3, 51 Queen Street, Melbourne VIC 3000
+61 3 9020 4225

SYDNEY Suite 303/61 Marlborough Street, Surry Hills NSW 2010
+61 2 9068 7995

HOBART Level 4, 116 Bathurst Street, Hobart TAS 7000
+61 400 535 634

CANBERRA 45 West Row, Canberra ACT 2601
+61 2 9068 7995

www.salt3.com.au

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1 INTRODUCTION

SALT has been engaged by Bulum Group to prepare the following Traffic Impact Assessment for a proposed mixed-use development on land at Block 2 (17-21 University Avenue) and Block 7 (3 Farrell Place / 24 Marcus Clarke Street) in Canberra.

The above two (2) land parcels are distinct and separated by landscaped crown land (Block 8, Section 5). Together, these three blocks form a combined subject site of 2,423m^2 that is located on the southern corner of the University Avenue and Marcus Clarke Street intersection in Canberra.

It is proposed to demolish the existing office buildings upon Blocks 2 and 7, to allow for the construction of new residential apartment buildings with activated land uses at ground level.

A five level basement car park is proposed to be constructed across the wider site beneath the three land parcels, and the landscaped crown land reinstated at ground level.

In the course of preparing this report SALT has inspected the site and its surrounding environs, assessed the proposal against the statutory car parking requirements outlined in the Parking and Vehicular Access General Code, and reviewed the architectural plans prepared by KUD Architecture.

2 EXISTING CONDITIONS

2.1 SITE LOCATION

The subject site is located on the southern corner of University Avenue and Marcus Clarke Street in Canberra, as shown in the locality plan at Figure 1, below.

Figure 1 Site Locality Plan

The site comprises three (3) blocks of land as follows:

- The northern block (17-21 University Avenue – City Block 2, Section 5) is located on the south-eastern corner of University Avenue and Marcus Clarke Street and currently accommodates a multi-storey office building with ground level retail. No on-site car parking is provided

  The rear of the northern block abuts Darwin Place, which provides a 'loop' connection to/from University Parade.

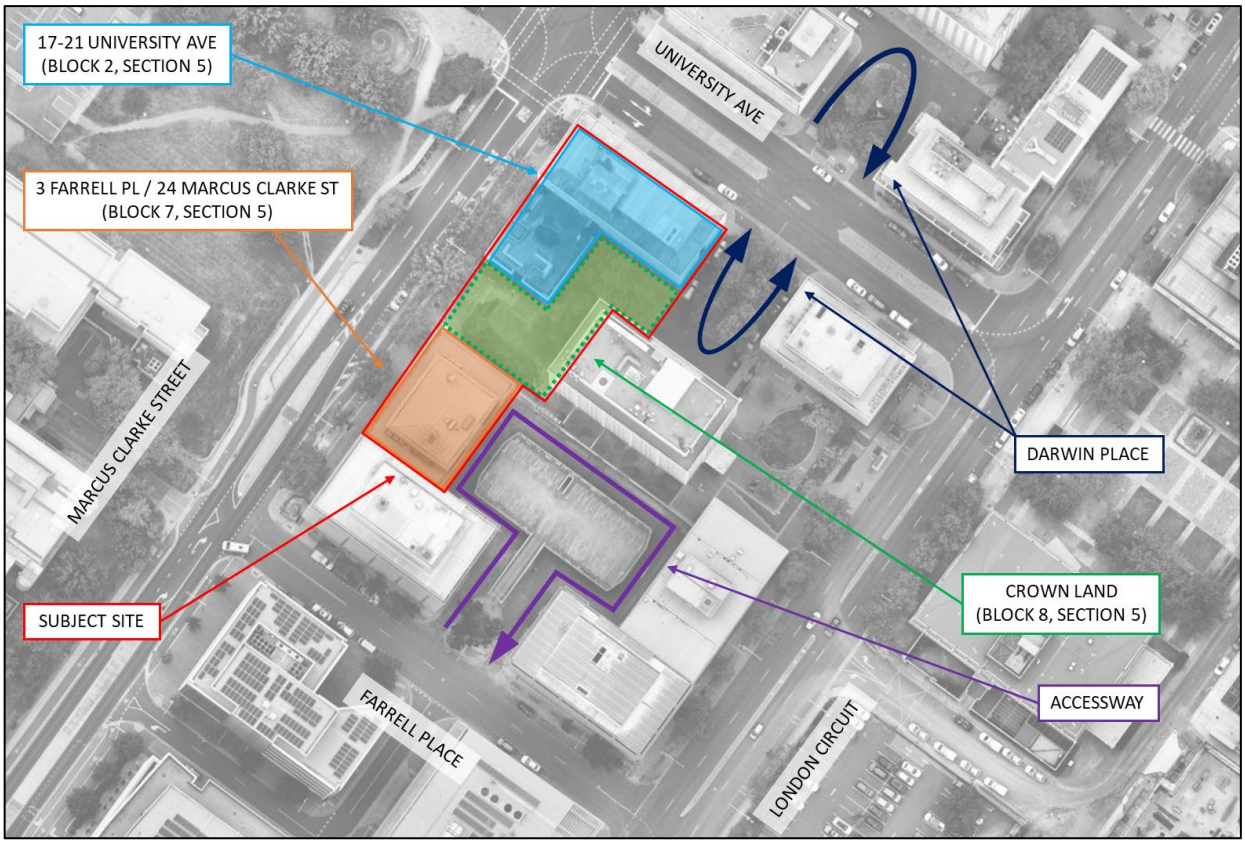
  The loop on the northern side of University Parade is signed and line-marked to allow one-way (clockwise) flow to/from University Parade. The loop on the southern side of University Parade, which abuts the rear of the northern parcel, is not signed or line-marked however observations at the site indicate that the loop operates in a one-way (clockwise) arrangement only;.
- The southern block (3 Farrell Place / 24 Marcus Clarke Street – City Block 7, Section 5) is located on the south-eastern side of Marcus Clarke Street and currently accommodates a multi-storey office building.

  The rear of the southern block abuts an accessway that provides a 'loop' connection to/from Farrell Place. The accessway circulates around a double-storey car parking structure and is signed and line-marked to allow one-way (clockwise) flow to/from Farrell Place.

  Four (4) double width garages are provided beneath the building, which are accessed from the above accessway; and
- The central block (City Block 8, Section 5) is crown land, which currently accommodates landscaped areas and provide pedestrian thoroughfare from Marcus Clarke Street to Darwin Place, London Circuit and a the accessway to/from Farrell Place.

The existing layout of the site is shown in the aerial photograph at Figure 2.

Figure 2 Existing Site Layout



The site is located in the Canberra City Centre and is surrounded by a mixture of commercial, retail, educational, legal and residential land uses.

Notable land uses in the vicinity of the site include the Australian National University to the immediate west of the site, Canberra City Police Station and Courts approximately 100 metres east of the site, and Lake Burley Griffin approximately 600 metres south of the site.

2.2 PLANNING ZONES

Figure 3 shows the location of the site as defined by the ACT Territory Plan zoning maps.

Figure 3 ACT Territory Plan Zoning Map

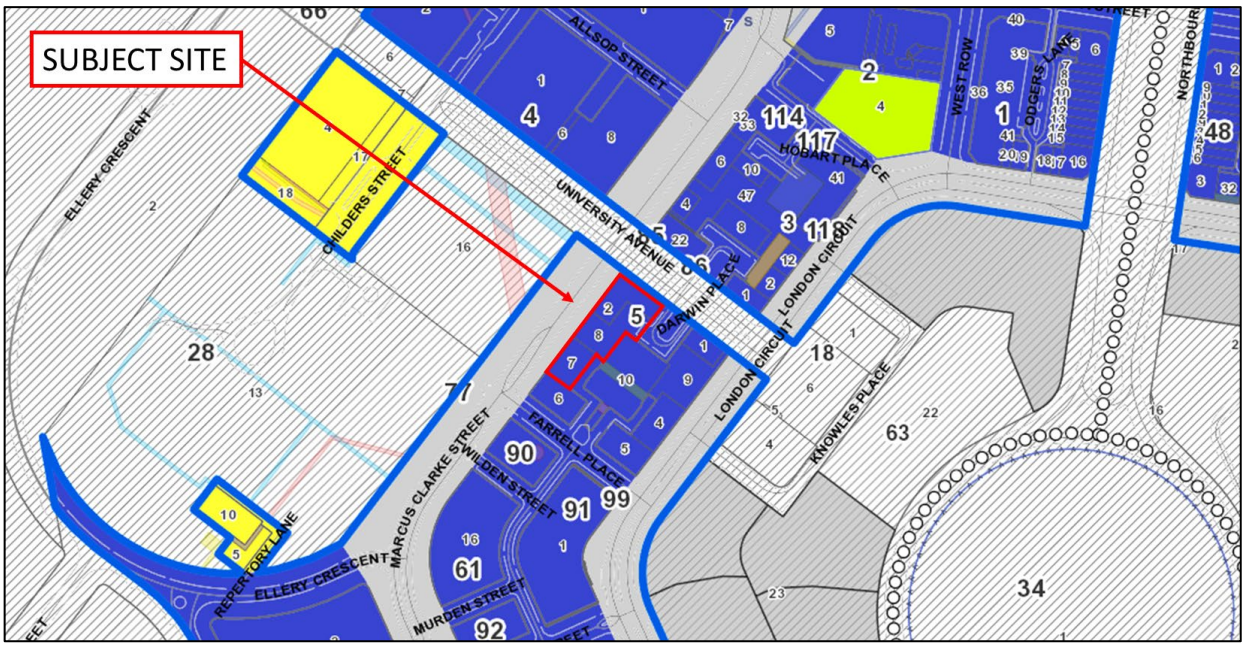


Figure 3 identifies the site as being zoned for commercial (CZ1: Core Zone) use.

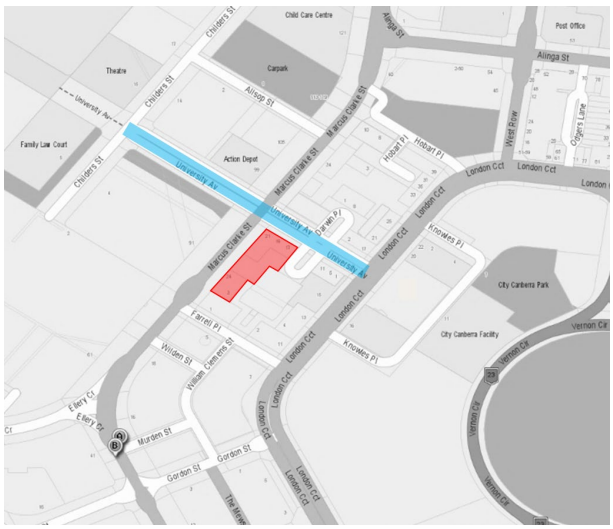
The *City Centre Development Code* states that:

> *"This Zone is the main business core of higher order commercial centres and is the primary location of shops, non-retail commercial uses, restaurants, commercial accommodation, and indoor entertainment facilities. Residential and community uses are also permissible, subject to design and siting to minimise incompatibility with primary uses."*

2.3 SURROUNDING ROAD NETWORK

2.3.1 UNIVERSITY AVENUE

University Avenue is classified as a 'main avenue' in the ACT Road Hierarchy. It forms the north-eastern boundary of the northern land parcel and extends in a southeast-northwest alignment from London Circuit at its eastern end to Childers Street within the ANU University Grounds at its western end.



University Avenue at the site frontage has a reservation width of approximately 30 metres which accommodates dual carriageways separated by a central median of 3.5 metres width.

Each carriageway typically accommodates a central travel lane and a parallel kerbside parking lane. A break in the median to the immediate east of the site allows for turning movements to/from Darwin Place in all directions.

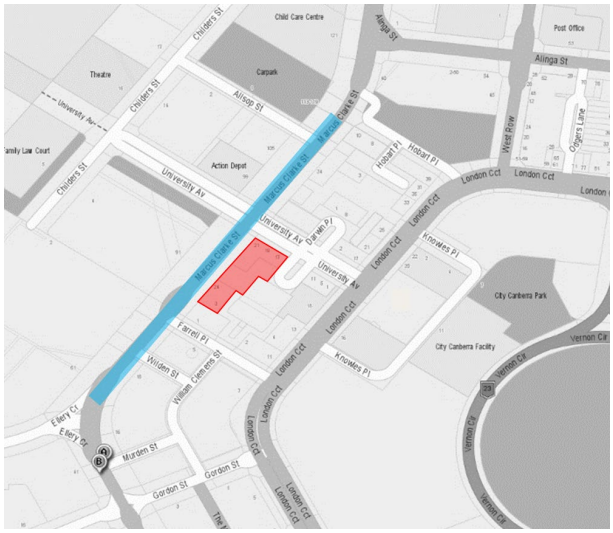
Pedestrian footpaths are provided along both sides of the reservation and an area wide 40km/h speed limit applies.

Figure 4 shows the existing configuration of University Avenue along the site frontage.

Figure 4 University Avenue, looking southeast towards break in median opposite Darwin Place

2.3.2 MARCUS CLARKE STREET

Marcus Clarke Street is a classified as a 'major collector road' in the ACT Road Hierarchy. It forms the north-western boundary of the subject site and extends in a generally north to south alignment from Barry Drive at its northern end to Edinburgh Avenue at its southern end.



Marcus Clarke Street at the site frontage has a reservation width of approximately 40 metres, which typically accommodates dual carriageways separated by a central median of 3.5 metres width.

The central median is removed along the site frontage to provide a right-tun lane onto University Avenue.

Each carriageway provides a single vehicular travel lane in each direction, with parallel kerbside parking provided along the south-westbound (site frontage) carriageway and indented parallel car parking spaces provided along the north-eastbound carriageway in locations.

Dedicated and/or raised bicycle lanes are provided on both sides of the carriageway adjacent to the footpaths, which form part of the 'C8' bicycle route through central Canberra.

An area wide 40km/h speed limit applies.

Figure 5 shows the existing configuration of Marcus Clarke Place along the site frontage.

Figure 5 Marcus Clarke Place, looking southwest along site frontage from the corner of University Avenue

2.3.3 FARRELL PLACE

Farrell Place forms the south-western boundary of the southern land parcel and extends in a southeast-northwest alignment from London Circuit at its eastern end to Marcus Clarke Street at its western end.

Farrell Place has a reservation width of approximately 20 metres which accommodates a single two-way carriageway of approximately 11.5 metres width.

Each side of the carriageway comprises a central travel lane and kerbside parking lane.

Footpaths are provided on both sides of the reservation and an area wide speed limit of 40km/h applies.

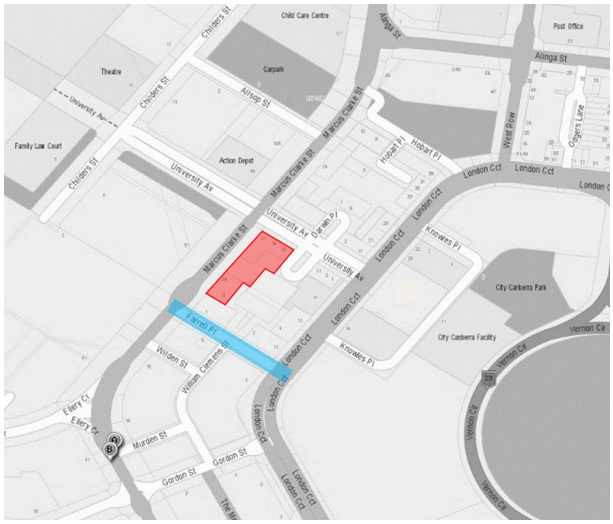


Figure 6 Farrell Place, looking northwest from accessway at rear of site

2.3.4 FARRELL PLACE ACCESSWAY

The rear of the southern block abuts an accessway that provides a 'loop' connection to/from Farrell Place as shown at Figure 2. The accessway circulates around a double-storey car parking structure and is signed and line-marked to allow one-way (clockwise) flow to/from Farrell Place.

Vehicular access to the upper level of the car park is provided from a vehicular ramp to/from Farrell Place, which is flanked to north and south by the respective ingress and egress to the accessway.

Each of the abutting properties, including the subject site and lower level of the central car park, is provided with various points of vehicular and pedestrian access from the laneway.

The photographs at Figure 7 and Figure 8 show the existing configuration of the Farrell Place accessway and the existing vehicular access points to the garages on the site.

Figure 7 Accessway near intersection with Farrell Place

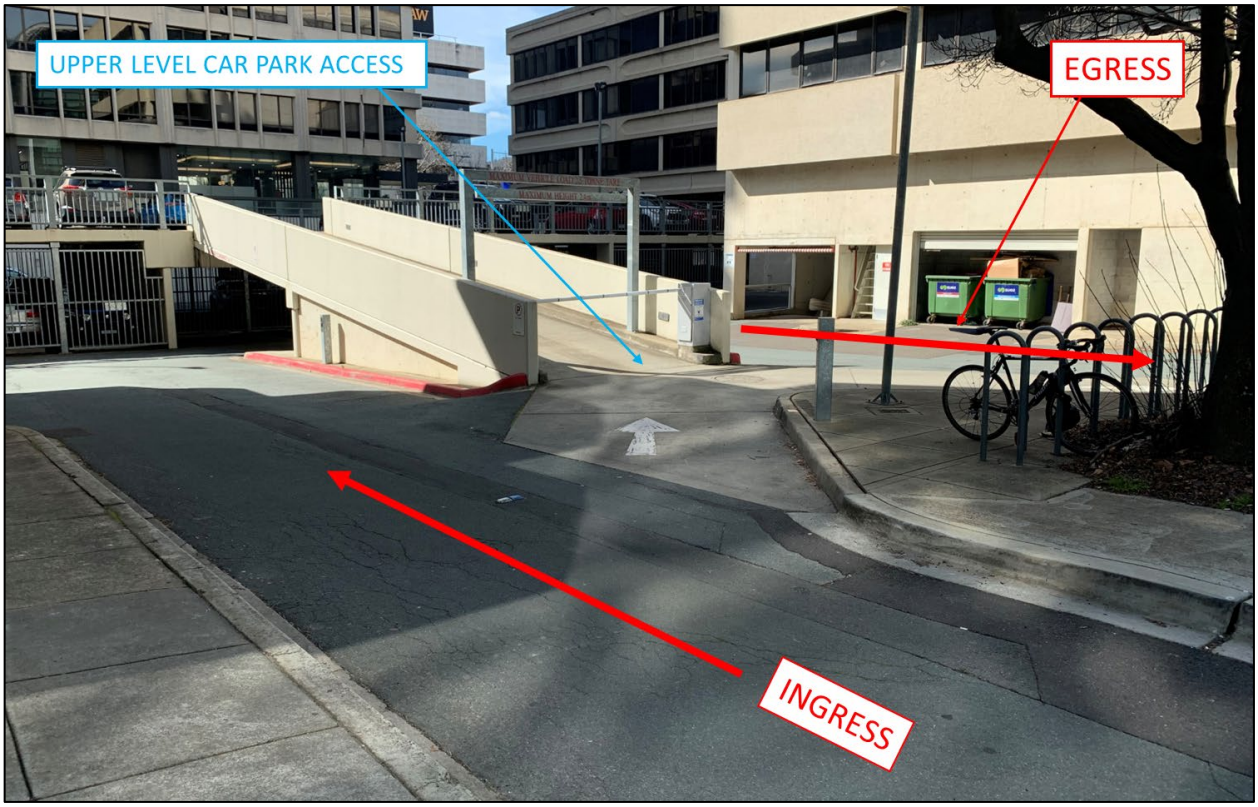
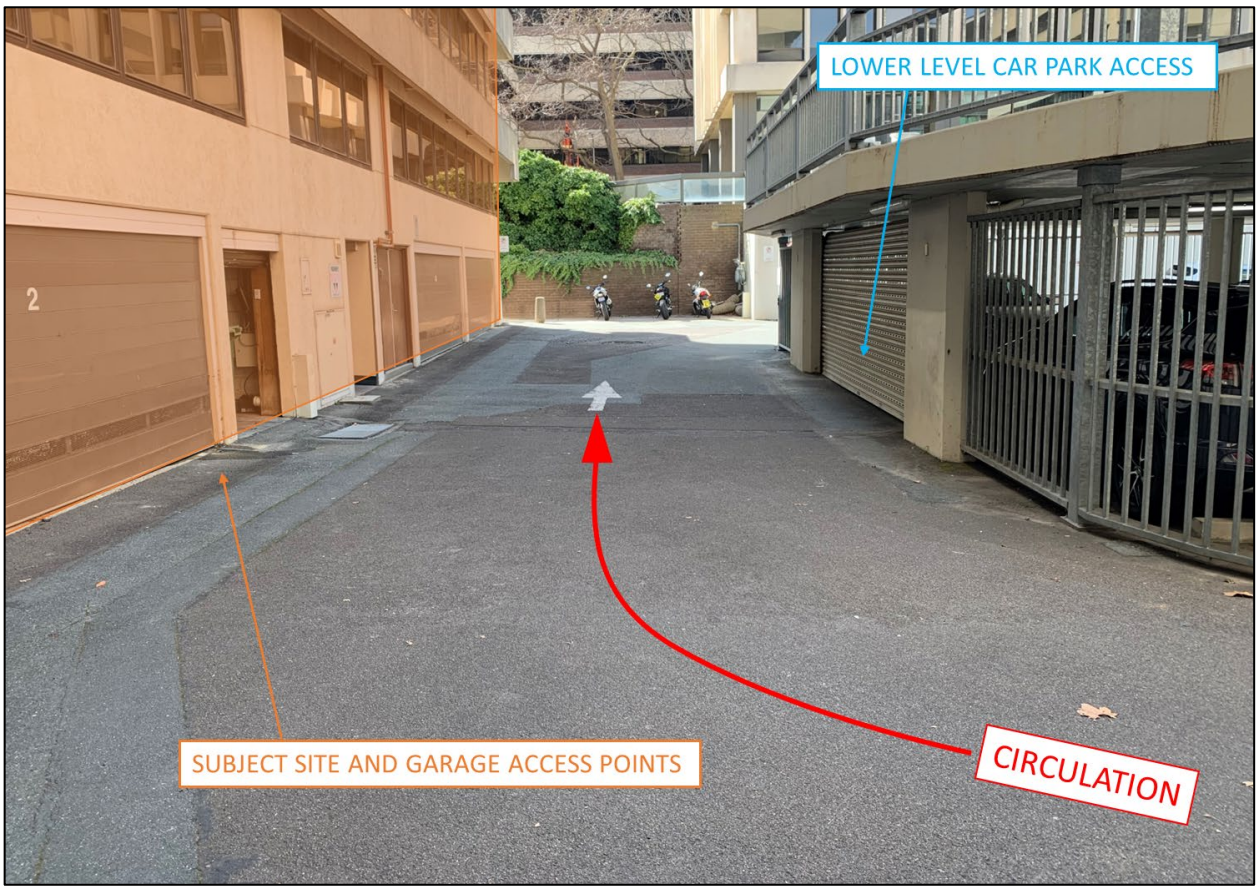


Figure 8 Vehicular Access to site from Farrell Place Accessway



2.3.5 DARWIN PLACE

Darwin Place forms a 'loop' connection on either side of University Parade. The loop on the northern side of University Parade is signed and line-marked to allow one-way (clockwise) flow to/from University Parade. The loop on the southern side of University Parade, which abuts the rear of the northern parcel, is not signed or line-marked, however observations at the site indicate that the loop operates in a one-way (clockwise) arrangement only.

The Darwin Place loop at the rear of the site provides a carriageway width of approximately 4.8 metres and permits parallel kerbside parking on the outer side of the carriageway only. The parking is subject to 'Loading Zone' parking controls between 7:30am and 6:00pm, Monday to Friday.

A further two (2) DDA Accessible spaces are located in a 90-degree parking arrangement at the southwest of the loop opposite the landscaped area.

The aerial image at Figure 9 shows the existing configuration of Darwin Place relative to the subject site and the photograph at Figure 10 shows Darwin Place as viewed from University Avenue.

Figure 9 Darwin Place Configuration adjacent to Subject Site

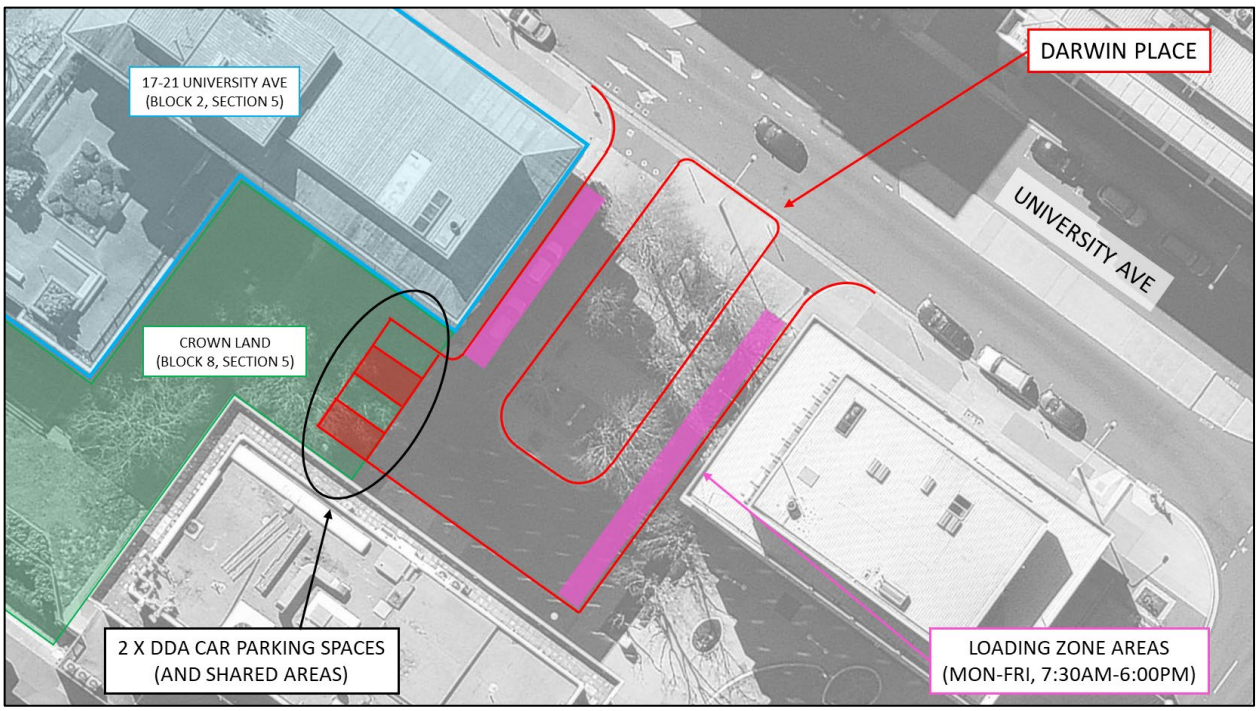


Figure 10 Darwin Place, as viewed from University Avenue

2.4 INTERSECTIONS

The following intersections are located within close proximity of the site:

- *University Avenue intersects Marcus Clarke Street* at a four leg signalised intersection. Each leg provides a shared left/through and shared through/right approach lane.
- *University Avenue intersects London Circuit* at a stop-controlled T-intersection at which London Circuit forms the priority route.

  University Avenue provides a single approach and departure lane which are separated by a central median.

  London Circuit provides two lanes in each direction that are separated by a central median, with turning movements accommodated from shared turning/through lanes.
- *Farrell Place intersects Marcus Clarke Street* at a stop controlled T-intersection at which Marcus Clarke Street forms the priority route.

  Farrell Place provides a single approach and departure lane. Marcus Clarke Street provides a single travel lane in each direction and a break in the central median that accommodates a short right turn treatment. The break is of insufficient width to accommodate a stored right-turning vehicle from Farrell Place, which needs to undertake this movement in one manoeuvre.
- *Farrell Place intersects London Circuit* at a stop controlled T-intersection at which London Circuit forms the priority route.

  Farrell Place provides a single approach and departure lane. London Circuit provides two lanes in each direction that are separated by a central median, with turning movements accommodated from shared turning/through lanes.

The layout of the above intersections are shown in the aerial photographs at Figure 11 and Figure 12, below

Figure 11 University Ave / Marcus Clarke St (L) and University Ave / London Cct (R)

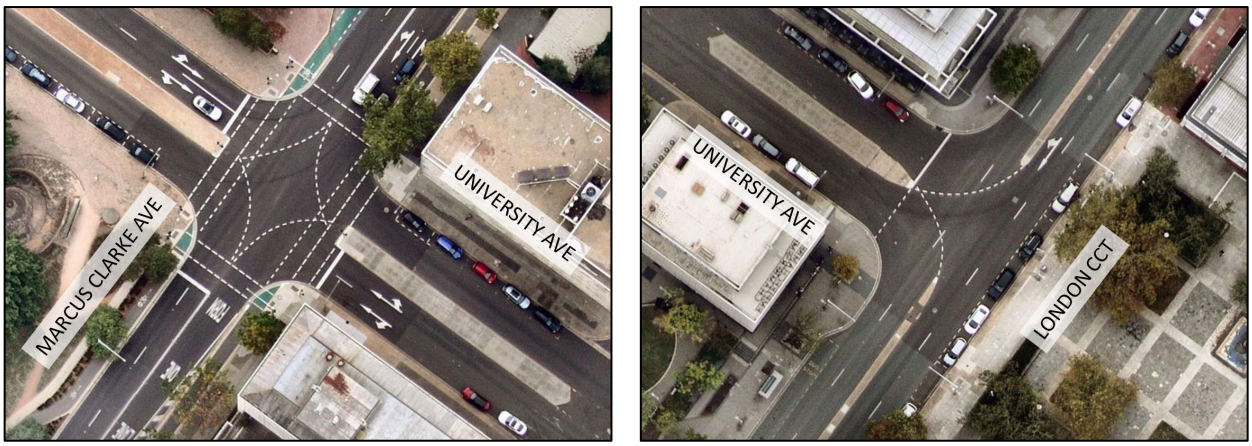
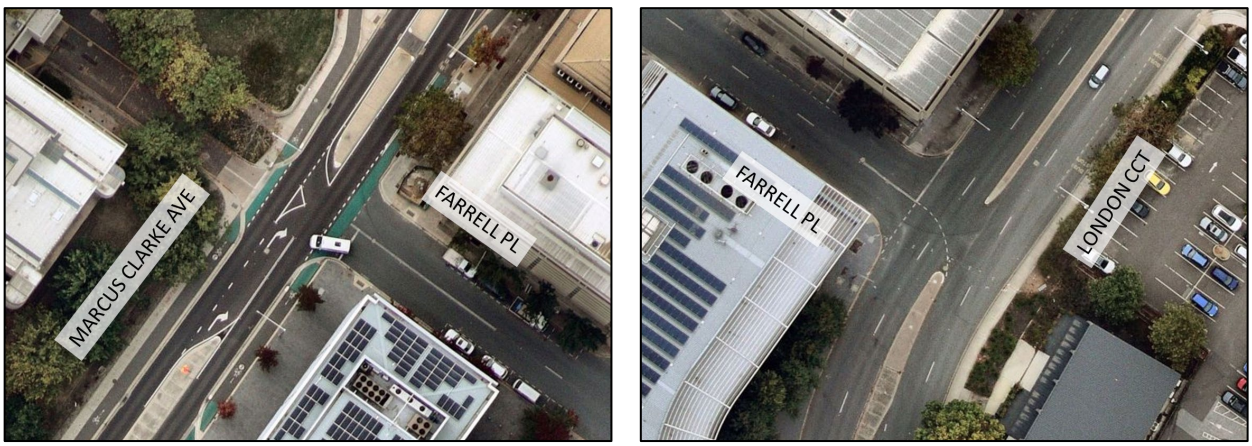


Figure 12 Marcus Clarke St / Farrell Pl (L) and Farrell Place / London Cct (R)



2.5 SUSTAINABLE TRANSPORT

2.5.1 WALKABILITY

The location of the site within central Canberra is well located to take advantage of the public transport, commercial, retail and recreational uses that are located within convenient walking distance, such as the light rail service and subsequent connections provided from Northbourne Avenue; the retail, food & beverage, services and facilities located along Lonsdale Street; and the recreational facilities at Haig Park.

In the area surrounding the subject site, pedestrians are primarily accommodated by standard concrete or asphalt footpaths within the road reserve.

The location of the site has been assessed using the 'Walkscore' performance tool, which is a web based assessment tool developed in 2007 using Google maps tools. The tool takes into account the number of facilities within close proximity and provides a numerical score between 0 and 100, with a score near 100 indicating that numerous services and amenities are easily accessible to the site.

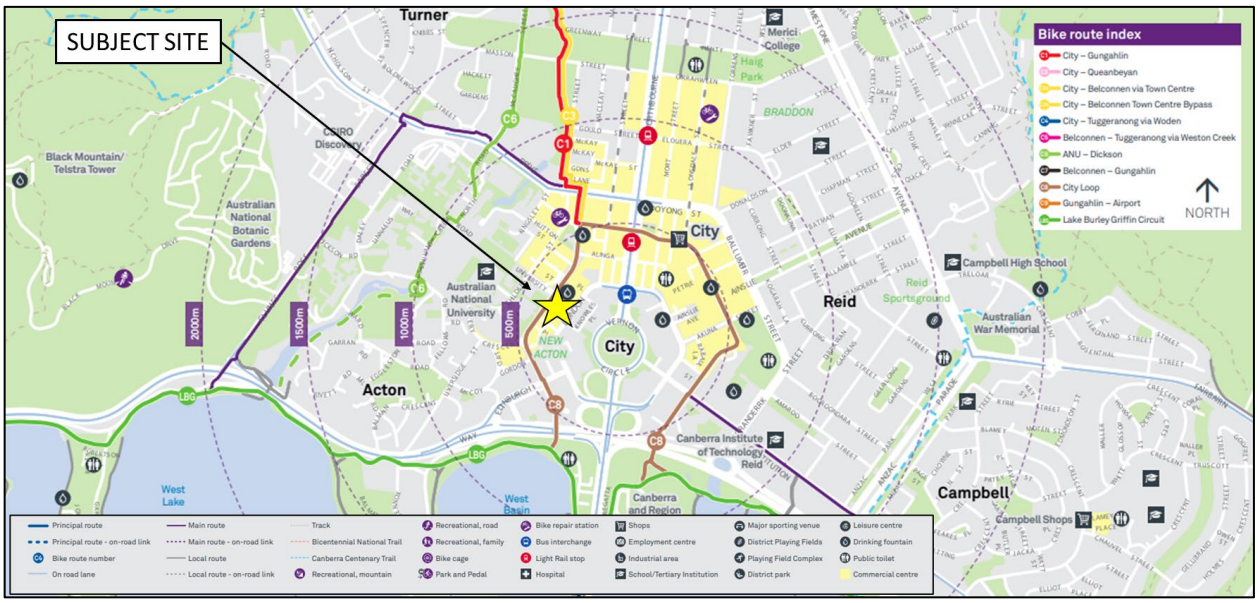
The 'Walkscore' for the subject site of 97 out of 100 indicates that the subject site is a 'walkers paradise', where 'daily errands do not require a car'.

2.5.2 CYCLING FACILITIES

The subject site is well located to the walking and cycling facilities provided throughout the city centre and the connections that they provided to the wider Canberra area.

The City Centre Walking and Cycling Map in the immediate vicinity of the site is presented at Figure 13, below.

Figure 13 Proximate Cycling Facilities



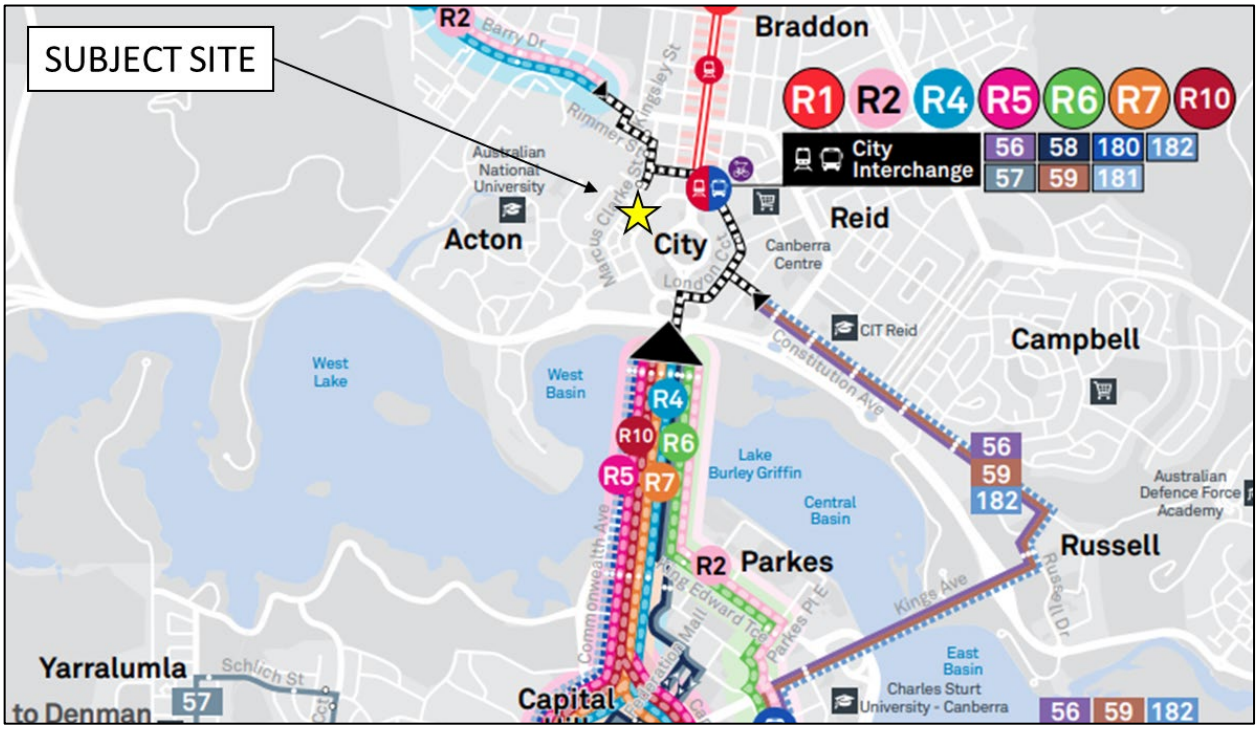
The C8 (City Loop) bike route passes along the Marcus Clarke Street frontage of the site, providing a connection to the C1 (City – Gungahlin) bike route to the north of the site and the Lake Burnley Griffin Circuit to the south of the site.

Several bicycle rails were observed at or along the site frontages on University Avenue, Marcus Clarke Street and Farrell Place in the immediate vicinity of the site which appeared to be underutilised at the time of our inspection..

2.5.3 PUBLIC TRANSPORT

The site has excellent public transport accessibility, with the services identified at Figure 14 located within close proximity of the site.

Figure 14 Public Transport Provision (Map)



The 'City West' bus stop (ID 1821) is located on the northern corner of University Avenue and Marcus Clarke Street opposite the site and caters to nine (9) bus routes.

The site is also located within a convenient walking distance of the Canberra Light Rail (R1) service at the intersection of Northbourne Avenue and Elouera Street approximately 550 metres northeast of the site, and the City Interchange from where all citybound bus services throughout the Canberra can be accessed.

The full public transport services proximate to the site are summarised at Table 1.

Table 1 Proximate Public Transport Services

Service	Route	Route Description	Nearest Stop	Approx. Distance (Walking Time)
Light Rail	R1	Gungahlin Place – Alinga Street (City)	N'bourne Ave	550 metres (8 mins)
Bus	R5	City West, City Interchange, Woden Interchange, Wanniassa, Erindale Interchange, Calwell, Lanyon Marketplace	Marcus Clarke Street	90 metres (< 1 min)
	R6	City West, City Interchange, Parkes, Barton, Kingston, Griffith, Narrabundah, Garran, Woden		
	R7	City West, City Interchange, Weston Creek, Cooleman Court, Duffy		
	R10	Denman Prospect, Coombs, Wright, City Interchange		
	53	Dickson, Dickson Interchange, Hackett, Ainslie, City Interchange, Acton		
	59	Woden Interchange, Forrest, Barton Bus Station, Russell, City Interchange		
	180	City Interchange, Lanyon Marketplace, Conder, Banks		
	181	City Interchange, Gordon, Banks, Conder, Lanyon Market Place		
	182	City West, City Interchange, Reid, Russell, Barton, Kingston, Chisholm, Calwell Conder, Lanyon Market Place		
All other Rapid Bus Services & citybound bus services			City Interchange	350–700 metres (4 to 9 mins)

2.6 EXISTING TRAFFIC AND CAR PARKING CONDITIONS

2.6.1 SURVEYED CAR PARKING DEMANDS

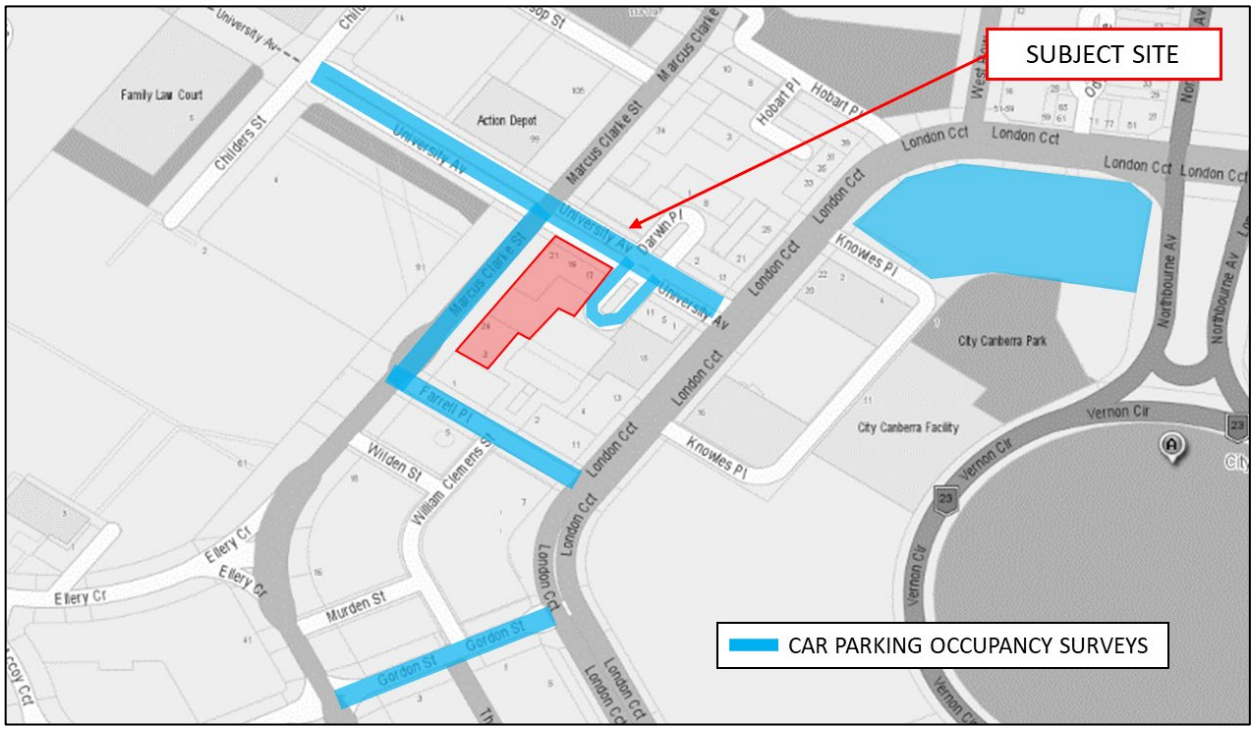
SALT commissioned Trans Traffic Surveys to undertake car parking occupancy surveys within close proximity of the site to determine the existing demand for publicly available car parking spaces in the area.

The surveys were undertaken at hourly intervals across the following times:

- *Saturday 10th September, 2022* *11:00am–7:00pm*
- *Tuesday 13th September, 2022* *11:00am–7:00pm*

The car parking areas captured in the survey are illustrated at Figure 15.

Figure 15 Surveyed Car Parking Areas



The surveys identified a total of 374 car parking spaces within the survey area, of which most were located within the publicly available off-street car park on the southern side of London Circuit.

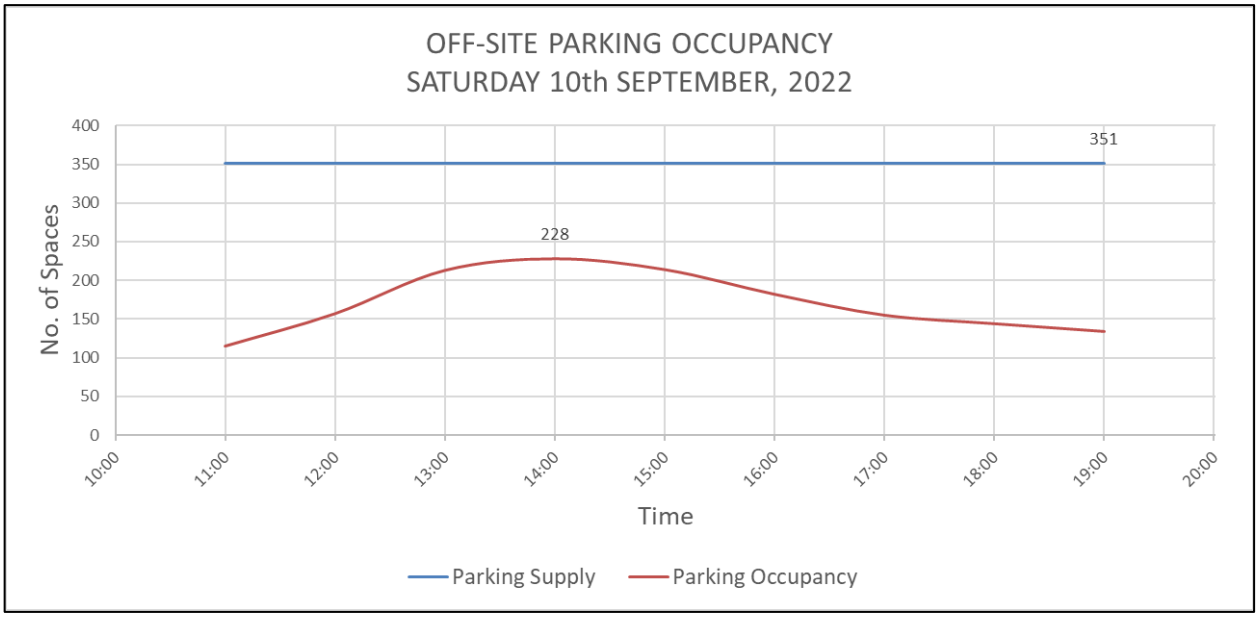
In total, there were between 338 and 351 car parking spaces that allowed a stay of half an hour or more which were available for public use depending on the time of day and week (due to loading and time based parking controls).

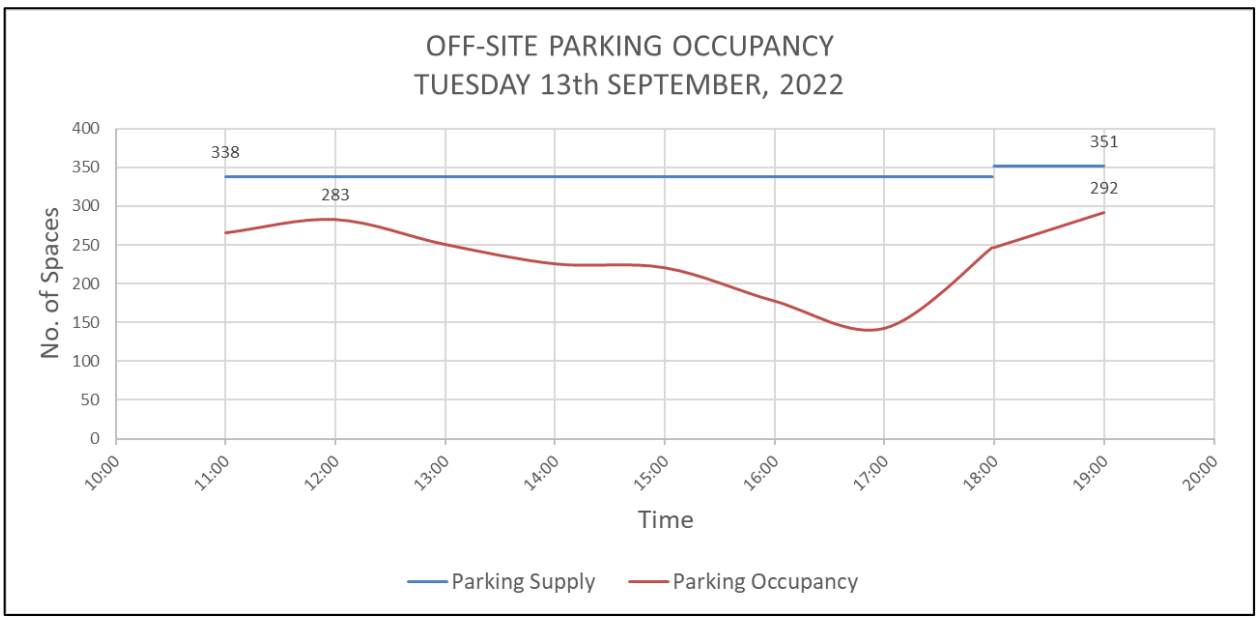
- The Tuesday survey identified:
  - A peak afternoon car parking demand for 283 spaces at 12:00pm midday. This equates to an occupancy of 84% of the available car parking supply, and at which time there were 55 car parking spaces available; and
  - A peak evening car parking demand for 292 spaces at 7:00pm. This equates to an occupancy of 84% of the available car parking supply and at which time there were 59 car parking spaces available
- The Saturday survey identified a peak car parking demand for 228 spaces at 2:00pm in the afternoon. This equates to an occupancy of 65% and at which time there were 123 car parking spaces available.

The utilisation of surveyed car parking spaces across the two surveyed periods are illustrated in the graphs at

The full car parking survey data is attached at Appendix 1.

Figure 16 Utilisation of Surveyed Car Parking Spaces – Tuesday 13th and Saturday 10th September, 2022





2.6.2 EXISTING TRAFFIC CONDITIONS

SALT commissioned Trans Traffic Surveys to undertake turning volume counts at the following intersections:

- University Avenue / Marcus Clarke Street; and
- University Avenue / London Circuit..

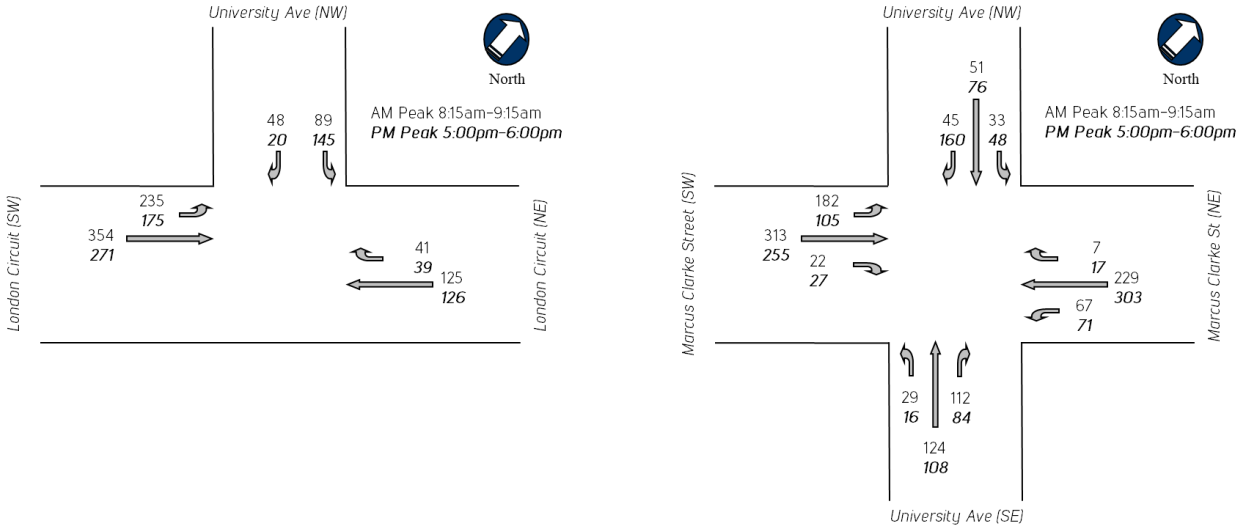
The surveys were undertaken on Tuesday 13th September, 2022 across the following time periods:

- 6:30am–9:30am; and
- 3:30pm–6:30pm

The peak hours of vehicular activity at both intersections were recorded between 8:15am and 9:15am in the morning, and between 5:00pm and 6:00pm in the evening.

These traffic volumes are presented at Figure 17.

Figure 17 Surveyed Peak Hour Turning Volumes



2.6.3 SIDRA ANALYSIS

SALT has reviewed the operation of the intersections under 'base case' conditions using SIDRA9 Intersection software. This computer package measures the performance of an intersection using a range of parameters, as described below:

Degree of Saturation (D.O.S.) is the ratio of the volume of traffic observed making a particular movement compared to the maximum capacity for that movement. Where an intersection is oversaturated, this indicates that not all traffic can pass through the control mechanism. Under such conditions, the degree of saturation would be greater than 1.0 (100%).

AustRoads *"Guide to Traffic Management Part 3: Transport Study and Analysis Methods* (AGTM3)" states that

> *"In practice the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to.*
>
> *These are usually called 'practical degrees of saturation'."*

The *95th Percentile (95%ile) Queue* represents the maximum queue length, in metres, that could be expected to be observed on 95% of occasions during the analysis period. (i.e. it is the queue length that only has a 5% chance of being exceeded during the analysis time period).

Level of Service (L.O.S.) is a qualitative measure which can be based on various traffic factors such as speed, volume of traffic, degree of saturation, delays and freedom to manoeuvre.

AustRoads *"Guide to Traffic Management Part 3: Transport Study and Analysis Methods* (AGTM3)" states that the performance measure for defining LOS at sign controlled and signalised intersections is delay.

The TCCS document *"Guidelines for Transport Impact Assessment (2020)"* states that the 'Delay RTA NSW method' is to be used when defining levels of service, which are reproduced at Table 2, below.

Table 2 Level of Service Ratings (RTA Method)

L.O.S.	*Average Delay per Vehicle (secs/veh)* *Unsignalised Intersections*
A	*d ≤ 14*
B	*15 < d ≤ 28*
C	*29 < d ≤ 42*
D	*43 < d ≤ 56*
E	*57 < d ≤ 70*
F	*70 < d*

SIDRA does note however that 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. This is due to zero delays associated with major road movements.

For the signalised intersection at University Avenue and Marcus Clarke Street, SALT has sourced the phasing diagram and timing history from Transport Canberra and City Services (TCCS) for the peak commuter periods on the day of the survey.

The data indicates that the intersection operated with an average cycle time of approximately 100 seconds during both peak periods.

Based on the above, the key outputs from the SIDRA analysis for the two (2) intersections are produced at Table 3, below.

Table 3 SIDRA Intersection Summary – Existing Farrer Street / Fawkner Street Intersection Operation

Approach	AM Peak Period				PM Peak Period			
	D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S	D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S
London Circuit (NE)	0.063	1.9	2.4	-	0.058	1.8	2.1	-
University Avenue (NW)	0.205	5.3	11.0	A	0.175	4.6	8.9	A
London Circuit (SW)	0.168	0.0	2.3	-	0.126	0.0	2.2	-
Intersection	*0.205*	*5.3*	*3.6*	*-*	*0.175*	*4.6*	*3.6*	*-*
University Avenue (SE)	0.406	65.9	31.9	C	0.508	58.3	42.0	C
Marcus Clarke Street (NE)	0.376	64.4	26.1	B	0.511	91.4	27.3	B
University Avenue (NW)	0.409	36.4	47.1	D	0.524	74.7	39.0	C
Marcus Clarke Street (SW)	0.418	73.2	28.2	B	0.332	57.4	27.7	B
Intersection	*0.418*	*73.2*	*30.5*	*C*	*0.524*	*91.4*	*32.5*	*C*

The analysis indicates that the University Avenue / London circuit intersection currently operates below capacity with minimal delay and queue lengths on all approaches.

The University Avenue / Marcus Clarke Street intersect ion operates below capacity with a Level of Service 'C'.

The full SIDRA Movement Summaries are attached at Appendix 2.

3 PROPOSED DEVELOPMENT

3.1 GENERAL

Bulum Group proposes to demolish the existing buildings upon the site to allow for the development of two (2) distinct buildings atop the respective northern and southern blocks.

The building at the north of the site (Building A) is proposed to provide commercial tenancies at ground level fronting University Avenue and Marcus Clarke Street, with 13 levels of apartments constructed above.

The building at the south of the site (Building B) is proposed to provide commercial tenancies at ground level fronting Marcus Clarke Street and on a mezzanine level, with 13 levels of apartments constructed above

A common basement arrangement is proposed to be constructed beneath the buildings, which is proposed to also encompass the subterranean land below the landscaped crown land separating the two blocks.

Due to the natural fall of the land, the basement will be 5 levels deep beneath Building A at the north of the site and 4 levels deep beneath Building B at the south of the site.

New landscaping is proposed to be reinstated at ground level across the crown land between the constructed buildings.

The Development Schedule for the subject proposal is provided at Table 4, below.

Table 4 Indicative Development Schedule

Land Use	Yield.
Building A (Northern Block)	
Commercial	357m² (4 tenancies)
Apartments – *2 bedroom* – *3 bedroom*	***(91 no.)*** 78 no. 13 no.
Building A (Northern Block)	
Commercial	459m² (3 tenancies)
Apartments – *Studio* – *1 bedroom* – *2 bedroom* – *3 bedroom*	***(64 no.)*** 9 no. 30 no. 17 no. 8 no.
Common Basement Levels	
Car Parking Spaces – *B1 Level* – *B2 Level* – *B3 Level* – *B4 Level* – *B5 Level*	***(223 no.)*** 11 no. (including 6 DDA spaces) 39 no. (including 12 DDA spaces and 7 'tandem pairs') 53 no. (including 7 'tandem pairs') 58 no. (including 7 'tandem pairs') 62 no. (including 9 'tandem pairs')
Bicycle Parking Spaces	***(227 no.)*** 197 storage lockers (basement) 6 secured bicycle lockers (basement) 24 at-grade spaces (verge)
Motorcycle Parking Spaces	***6 no.***

It is proposed that 17 of the 3-bedroom apartments will be designed as adaptable units.

3.2 CAR PARKING

A total of 223 car parking spaces are proposed across the five (5) basement levels as outlined in the table above.

It is proposed that 7 car parking spaces be allocated to the commercial tenancies (at a rate of 1 space per tenancy) and the remaining 216 spaces be allocated to residents.

The proposed allocation of car parking spaces is discussed at Section 4.1.

3.3 SITE ACCESS

Vehicular access to the site is proposed via the construction of a new two-way vehicle crossing to the Darwin Place frontage of Building A (northern block).

The access will service a two-way vehicular ramp that will descend to the upper (B1) basement level. Vehicular movement between the basement levels is then proposed via inter-level vehicular ramps.

Pedestrian access to the residential lobby of Building A is proposed from Marcus Clarke Street. Pedestrian access to the Building B residential lobby is proposed from both Marcus Clarke Street and Farrell Place.

Each of the commercial tenancies will front onto University Avenue or Marcus Clarke Street and will be provided pedestrian access directly from the abutting street network.

3.4 BICYCLE PARKING

Each of the residential apartments is proposed to be provided with a storage locker that will have suitable dimensions to accommodate a bicycle.

Six (6) bicycle lockers are proposed in the basement (B1 level) for commercial staff use and a further 24 at-grade bicycle parking spaces are proposed to be provided in the University Avenue and Marcus Clarke Street verges for the use of the commercial and resident visitors.

3.5 LOADING & WASTE COLLECTION

A new loading bay is proposed to be constructed through kerb modifications to the western edge of Darwin Place, to the south of Building A.

The modifications will reconfigure the existing DDA Accessible spaces to the south of the building to allow the establishment of an independent loading bay suitable to accommodate a Medium Rigid Vehicle.

The two (2) existing DDA Accessible spaces will be reconfigured to comply with the latest Australian Standard for Parking Spaces for People with Disabilities (AS2890.6:2022) and retained.

4 PARKING CONSIDERATIONS

4.1 PROPOSED ALLOCATION OF CAR PARKING SPACES

The on-site car parking provision is proposed in a secured basement arrangement and is intended to be for the use of residents and employees only.

The subject proposal includes provision for 223 car parking spaces which are proposed to be allocated as follows:

- Seven (7) spaces are proposed to be allocated to the commercial tenancies at the site for employee use (at a rate of 1 space per tenancy). This includes one (1) DDA Accessible (adaptable) space; and
- The remaining 216 spaces are proposed to be allocated to the apartments for residential use. This provision includes:
  - The 30 'tandem pairs', which will be allocated in pairs to individual apartments; and
  - Seventeen (17) of the DDA Accessible (adaptable) spaces, which will each be allocated to an individual adaptable dwelling.

On this basis, all 155 apartments and each tenancy will be provided with an on-site car parking provision.

4.2 CAR PARKING REQUIREMENT

The ACT *Parking and Vehicular Access General Code* outlines car parking requirement rates for a variety of different land uses across various land zonings.

The subject site is located within the City Centre Core Zone (CZ1) as defined by the ACT Territory Plan map at Figure 3. Therefore:

- There is no minimum car parking requirement for residential land use; and
- The commercial tenancies are subject to minimum car parking requirement rates.

  For assessment purposes:
  - The single storey ground level commercial tenancies in Building A (Northern Block) are likely to be occupied by 'shop' land uses, which have a car parking requirement for 4 spaces to every 100m^2 gross floor area; and
  - The two-storey tenancies in Building B (Southern Block) are likely to be occupied by 'office' land uses, which have a car parking requirement for 1 space to every 100m^2 gross floor area.

Based on the above, the minimum statutory car parking requirement rate for the subject proposal is summarised at Table 5 below.

Table 5 Minimum Car Parking Requirement

Apartments	No.	Car Parking Rate	Car Parking Spaces
Apartments	155 no.	nil.	0
Shop	357 m^2	4 spaces per 100m^2 gross floor area	15 spaces
Office	459 m^2	1 space per 100m^2 gross floor area	5 spaces
Total			***20 spaces***

4.3 SUITABILITY OF PROPOSED CAR PARKING PROVISION

The *Parking and Vehicular Access General Code* outlines a statutory car parking requirement for 20 spaces, which is intended to accommodate the staff and customer car parking requirements of the shop land use.

The subject proposal includes provision for seven (7) staff car parking spaces, which is (20-7) 13 spaces less than the combined shop and office car parking requirements at Table 5.

Notwithstanding the above, the *Parking and Vehicular Access Code* outlines the following locational requirements for the provision of long-stay, short-stay, operational and visitor parking for all developments in the CZ1: Core Zone.

Table 6 Locational Requirements for Car Parking Spaces

Development	*Long stay parking*	*Short stay parking*	*Operational parking*	*Visitor parking*
All development in the CZ1 : City Core Zone	*On-site or in publicly available car parks up to 1km distant*	*On-site or within 400m*	*On-site or immediately adjacent*	*On-site or within 400m*

Based on the above, the remaining requirement for 13 car parking spaces can be accommodated within 1 kilometre for staff and 400 metres for customers.

A review of the parking survey data at Section 2.6.1 indicates there were a minimum 55 and 123 car parking spaces available in the surveyed areas during the respective Tuesday and Saturday survey periods.

This availability is suitable to offset the 13 further spaces associated with the commercial land use.

Furthermore, there are additional car parking opportunities available outside the survey area within a 1 kilometre radius (staff) and 400 metre radius (customers) of the site that would be suitable to accommodate commercial car parking demands.

Based on the above, the subject proposal satisfies the statutory car parking requirement.

4.3.1 POTENTIAL IMPACTS ON PROXIMATE CAR PARKING CONDITIONS

The previous section indicates that the statutory car parking requirement for the proposal is met through the combination of on-site and publicly available car parking spaces proximate to the site as is permitted by the Estate Development Code.

Notwithstanding the above, it is important to note that the existing use of the site would generate a car parking requirement that is currently being accommodated off-site, and is likely to offset the estimated demand for 13 off-site car parking spaces associated with the subject proposal.

Based on a review of the subject site:

- The northern block accommodates an office building with a footprint of approximately 850 metres. The northern section of the building (approximately 550m^2) has eight levels and the southern section of the building (300m^2) has three levels; and
- The southern block accommodates a four level office building with a footprint of approximately 580m^2.

On the rough basis that around 60% of the building floor area is tenable, then the existing use of the site provides in the order of (0.6 x 7,620) 4,572m^2 of office floor area.

If the office car parking requirement rate outlined in the *Parking and Vehicular Access General Code* (1 space per 100m^2 of GFA) were used to estimate the car parking demand generated by this approximate floor area, the existing use of the site would generate a car parking demand for (45.72 x 1) 46 car parking spaces.

Eight (8) car parking spaces are currently provided beneath the southern block which are accessed from the Farrell Place accessway. On this basis, the existing use of the site would generate a demand for in the order of (46-8) 38 off-site car parking spaces, noting that this does not account for the higher car parking requirement rates that would be applicable to the existing retail land use at ground level of the northern block.

Therefore, the proposed car parking provision at the site is considered to both satisfy the requirements of the *Parking and Vehicular Access Code* and have a lesser impact on surrounding proximate parking conditions than the existing use of the site.

4.4 BICYCLE PARKING

4.4.1 BICYCLE PARKING REQUIREMENT

Variation to the Territory plan 357 came into effect on November 30th, 2022 and the new bicycle parking provisions apply to development applications submitted for completeness check on or after that date.

Based on the above, the ACT Bicycle Parking General Code requires that bicycle spaces be provided in residential apartment and retail developments as per the rates at Table 7, below.

Table 7 Car Parking Requirement Rates for Shop and Apartment Land Uses

Land Use	No.	Employees and Residents		Visitors and Shoppers	
		Rate	No.	Rate	No.
Shop	357 m²	1 per 250m² GFA	2 no.	1 per 100m² GFA	4 no.
Office	459 m²	1 space per 200m² NLA	3 no.	1 space per 400m² NLA	2 no.
Apartments – Studio – 1 Bedroom – 2 Bedroom – 3 Bedroom	*(155 no)* 9 no.* 30 no. 95 no. 21 no.	1 space per one or two bedroom dwelling, 2 spaces per three or more bedroom dwelling with a car parking space AND 1 space per bedroom for dwellings not allocated a car parking space	9 no. 30 no. 95 no. 42 no.	1 space per 10 dwellings	16 no.
Total			*181 no.*		*22 no.*

* Studio apartments have been assessed as 1-bedroom apartments

Application of the above rates suggests there is a requirement to provide 176 bicycle parking spaces for residents, 5 spaces for staff members and 22 spaces for visitors and shop customers.

In addition to the above, the requirement for 5 staff bicycle parking spaces triggers a further requirement for a shower to be provided.

4.4.2 BICYCLE PARKING LAYOUT

Bulum Group has advised SALT that the Environment, Planning and Sustainable Development Directorate (EPSDD) has accepted the use of storage lockers to accommodate the resident bicycle parking requirement.

The subject proposal includes 197 storage lockers across the five basement levels, all of which are intended to be allocated to the residential apartments. Each locker is proposed to have suitable internal dimensions for bicycle storage as per the Australian Standard (i.e. 1.8m long x 0.7m wide x 1.1m high), thereby providing a secured option for residents to store a bicycle in the basement level should they choose to do so.

This exceeds the resident bicycle parking requirement of 176 spaces.

The commercial staff bicycle parking requirement (5 spaces) is proposed to be accommodated through the installation of secured 'Class A' bicycle lockers in the basement (B1) level, which also exceeds the statutory requirement for six (6) spaces.

Two (2) showers with attached change rooms and lockers are provided opposite the bicycle lockers, thereby exceeding the end-of-trip facility requirement outlined in the code.

Cyclist access to the basement can be provided via the ramp from Darwin Place or alternatively via the vehicular lifts, which have been provided with an internal length of at least 2 metres to allow a cyclist travel between levels alongside a bicycle.

The resident and shop customer requirement (22 spaces) is to be accommodated through the installation of double sided horizontal bicycle rails in the Marcus Clarke Street and University Avenue verges. All spaces will be installed at 1 metre centres and allow the storage of 1.8 metre long bicycles, whilst maintaining a 4 metre offset from the building form to allow both cyclist access and the unimpeded movement of pedestrians along the site frontages.

The architectural plans indicate 24 spaces will be provided along the verges, thereby exceeding the staff requirement.

Based on the above, the provision of bicycle parking spaces exceeds the minimum statutory requirements and have been designed appropriately.

5 DESIGN CONSIDERATIONS

5.1 CAR PARKING LAYOUT

The car parking levels have been assessed against the design criteria outlined for User Class 1A (Residential, Domestic and Employee) Parking Spaces in the Australian Standard for Off-Street Car Parking (AS2890.1:2004) and the ACT *Parking and Vehicular Access Code* where applicable.

The proposal comprises 223 car parking spaces. Of these:

- 142 spaces are proposed in a conventional 90-degree arrangement;
- 60 spaces are proposed in tandem 90-degree arrangements (i.e. 30 tandem pairs);
- 18 spaces are proposed to be constructed in a 90-degree 'DDA Accessible' arrangement; and
- 3 spaces are provided in a parallel parking arrangement.

Each conventional and tandem 90-degree space is 2.4 metres wide by 5.4 metres long and accessed from a parking aisle of at least 5.8 metres width. Spaces provided adjacent to walls have been provided with an additional 300mm clearance and columns have been located to maintain the door opening zones around the spaces as per the clearance envelope in the Australian Standard.

Each DDA Accessible space is also proposed with the above dimensions, and is located adjacent to a shared zone with the same dimensions to accord with the design criteria outlined in the Australian Standard for Off-Street Car Parking for People with Disabilities (AS2890.6:2022).

Each of the parallel car parking spaces is 2.1 metres wide by 6.8 metres long and located adjacent to a parking aisle of 5.7 metres width, which exceeds the minimum dimension criteria for spaces obstructed at both ends as outlined in AS2890.1:2004.

A number of blind aisles are provided throughout the car park, however this is acceptable given that the car park will be for private use and all car parking spaces will be allocated to a particular dwelling or tenancy.

Swept path diagrams have been prepared for several car parking spaces located at the southern end of the basement levels and are attached at Appendix 3, confirming that the car parking layout has been designed appropriately.

A floor to floor height of 3.0 metres is provided throughout the basement levels, which should allow a minimum overhead clearance of 2.2 metres to be achieved in accordance with the Australian Standard once overhead structure has been considered.

5.2 SITE ACCESS ARRANGEMENTS

Vehicular access to the site is proposed via the construction of a new two-way vehicle crossing to the Darwin Place frontage of Building A (northern block).

The crossing will provide vehicular access to the basement level via a 6.1 metre wide double width vehicle ramp, which will have a carriageway width of 5.5 metres between optional 300mm kerbs in accordance with the Australian Standard.

The proposed site access arrangements will allow concurrent opposing vehicle movements to/from Darwin Place, as per the swept path diagrams attached at Appendix 3.

The security door should be placed 6 metres within the site boundary to allow inbound queueing to occur internal to the site without impact on pedestrian or vehicular movements along Darwin Place. The proposed setback is suitable to accommodate the anticipated queueing associated with the development of the site as discussed at Section 6.4.

A pedestrian sight triangle measuring 2.0 metres along the property frontage and 2.5 metres along the accessway is provided on the departure side of the site access to ensure motorist-pedestrian sightlines are provided across the footpath in accordance with the standard.

The proposed site access will result in a loss of two (2) on-street loading spaces from the site frontage to allow access to the site, which will in part be offset by the proposed new loading area at the south of Darwin Place as discussed at Section 5.5.

5.3 RAMP GRADES

The G-B1 ramp provides a grade no steeper than 1:20 for the first 6 metres inside the property boundary in accordance with the Australian Standard.

Internally, all ramps provide a grade no steeper than 1:5 (20%) with adequate transitions at the top and bottom to avoid vehicular scraping or bottoming out.

The overhead height clearances above the ramps should be reviewed at the detailed design stage to ensure that a minimum 2.2 metres height clearance is maintained above all ramps and trafficable areas once structure has been determined in accordance with AS2890.1:2004.

5.4 INTERNAL CIRCULATION

Vehicular circulation throughout the car parking levels is generally accommodated by two-way parking or circulation aisles that have a width no less than 5.8 metres. This is appropriate for two-way vehicular flow as outlined by the Australian Standard.

At 90-degree bends in alignment, it may be required for one vehicle to yield to allow another vehicle to pass, which is typical for a residential basement car park arrangement.

Convex mirrors are shown at bends in alignment to assist motorist sightlines.

Swept path diagrams are attached at Appendix 3 which demonstrate passing opportunities are available for vehicles circulating throughout the car park, confirming that the proposed car parking layout is suitable for a development of this nature.

5.5 WASTE COLLECTION & LOADING ARRANGEMENTS

A new loading bay is proposed to be constructed through kerb modifications to the western edge of Darwin Place, to the south of Building A.

The modifications are sought to allow an appropriate waste collection service to occur at the site, as both University Avenue and Marcus Clarke Street are intended to provide activated ground level uses and are not suitable to provide vehicular access to/from the abutting road network. The only other frontages provided by the consolidated site are to Darwin Place (where the basement site access is proposed) and to the Farrell Place accessway, from which it would appear impractical to provide Medium Rigid Vehicle (MRV) access.

Given the above, and to retain a usable floorplate in the northern block that would be unachievable if used for both vehicular and loading access, it is proposed to modify the kerb at the south of Building A to allow the establishment of an independent loading bay that is 3.5 metres wide by 8.8 metres long in accordance with the minimum dimensions required for an MRV Loading Bay in the Australian Standard for Commercial Vehicle Facilities (AS290.2:2018).

The two (2) existing DDA Accessible spaces will be retained and provided with dimensions that accord with the Australian Standard for Off-Street Car parking for People with Disabilities (AS280.2:2009), being 2.4 metres wide by 2.4 metres long and located adjacent to a shared are with the same dimensions.

A concept layout plan is attached at Appendix 3 which demonstrates the modifications that would be required to allow the establishment of the bay.

Swept path diagrams have also been prepared atop the plan using an MRV which demonstrates the bay has been designed appropriately to allow ingress and egress, noting that the existing loading bays on the south-eastern side of Darwin Place would need to be vacant to allow vehicular access to and from the bay.

This could be achieved through the installation of time-based car parking controls at times when waste collections are scheduled to occur, or alternatively the collections could be scheduled to occur at off-peak times of day when the spaces are expected to be vacant.

Bins would then be transferred to the bay from the basement storage area for collection and returned once completed.

The sought modifications are considered reasonable given the building envelope applicable to a development upon the site, and the impracticality of accommodating waste collection on-site with a vehicle of this size.

Further, the loading bay will provide an opportunity for all vehicles of this size to park within Darwin Place whilst entering and exiting to/from University Avenue in a forward direction, not just vehicles associated with the subject site.

The concept layout plan should be updated upon feature survey once available to confirm the extent of works that is required.

6 TRAFFIC CONSIDERATIONS

6.1 TRAFFIC GENERATION

6.1.1 SITE-GENERATED TRAFFIC VOLUME ESTIMATE

The ACT Estate Development Code suggests that a trip generation rate of 6 vehicle movements per dwelling per day be used to assess multi-unit developments. However, Transport Canberra and City Services (TCCS) and the Environment Planning and Sustainable Development Directorate (EPSDD) reviewed the application of this trip generation rate in 2019 and found it not to be appropriate.

Accordingly, for High Density Residential Development (HDRD) in Town Centres and adjacent to Northbourne Avenue, it was determined that a single traffic generation rate of 3.37 trips per dwelling per day should be applied.

For the commercial component of the development each tenancy will be allocated one space each. Conservatively it has been assumed that each space will turn over twice a day and generate an inbound movement during the AM peak period and an outbound movement during the PM peak period.

It is commonly accepted that residential peak hour traffic generation accounts for around 10% of the daily traffic stream, with residential traffic generally split 80% outbound / 20% inbound during the morning commuter peak and 40% outbound / 60% inbound during the afternoon commuter peak.

Based on the above, the daily and peak hour traffic volumes anticipated to be generated by the proposal are estimated at Table 8, below.

Table 8 Site-Generated Traffic Volume Estimate

Land Use	No.	Daily	AM Peak (10%)			PM Peak (10%)		
			Inbound	Outbound	Total	Inbound	Outbound	Total
Commercial	7 spaces	28 vpd	7 vph	0 vph	7 vph	0 vph	7 vph	7 vph
Apartments	155 no.	522 vpd	10 vph	42 vph	52 vph	31 vph	21 vph	52 vph
Total		**550 vpd**	**17 vph**	**42 vph**	**59 vph**	**31 vph**	**28 vph**	**59 vph**

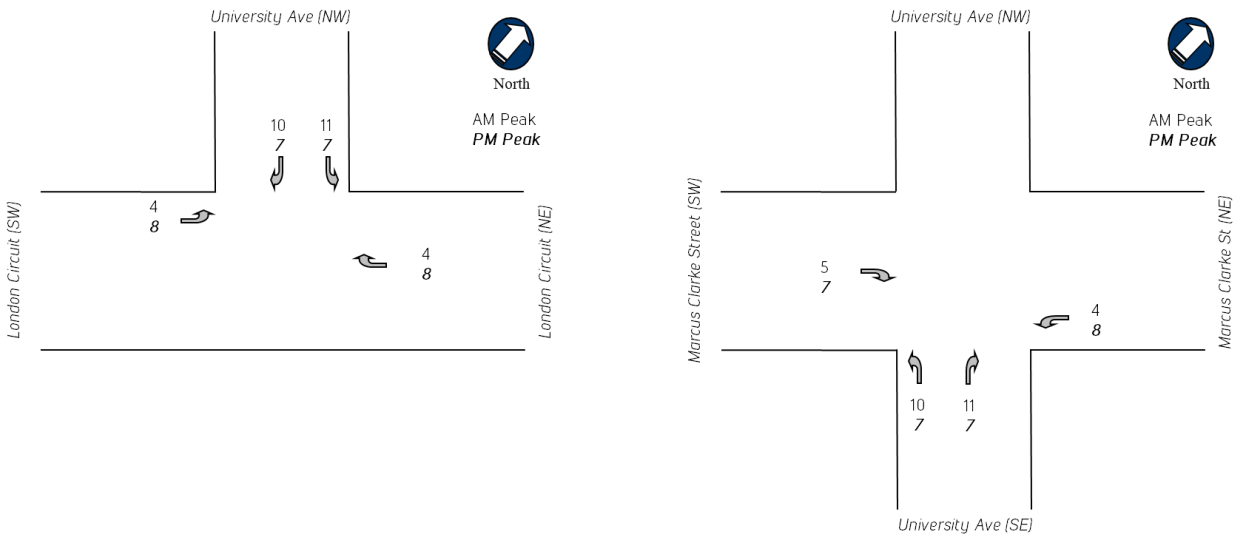
Based on the above, the subject proposal is anticipated to generate in the order of 550 vehicle movements per day, inclusive of 59 vehicular movements during each of the AM and PM peak periods.

6.2 TRAFFIC DISTRIBUTION

For assessment purposes it has been assumed that site-generated traffic will be distributed evenly to/from both Marcus Clarke Street and London Circuit, where traffic will also be distributed evenly to/from the northeast and southwest.

On this basis, the additional traffic generated by the site is illustrated at Figure 18, below.

Figure 18 Site Generated Traffic Estimate



6.3 POST-DEVELOPMENT TRAFFIC CONDITIONS

6.3.1 TURNING VOLUMES

The additional traffic generated by development of the subject site to the abovementioned intersections is presented against the existing peak hour traffic volumes at Table 9, below.

Table 9 Net Increase in Approach Volumes

Traffic Volumes	University Avenue / London Circuit		University Avenue / Marcus Clarke Street	
	AM Peak	PM Peak	AM Peak	PM Peak
Existing Volumes	892 vph	776 vph	1,214 vph	1,270 vph
Additional Site Traffic (% increase)	29 vph (+3.3%)	30 vph (+3.9%)	30 vph (+2.5%)	29 vph (+2.3%)

The additional traffic generated by the site is considered relatively low in traffic engineering terms and represents around a 2-4% increase in approach traffic volumes at the University Avenue intersections with London Circuit and Marcus Clarke Street.

6.3.2 SIDRA ANALYSIS

SALT has reviewed the operation of the two (2) intersections previously assessed at Section 2.6.3 under post-development conditions using SIDRA9 Intersection software.

The key outputs are presented against the base case outputs at Table 10 and Table 11.

Table 10 SIDRA Intersection Summary – Post-Development Operation

Approach		Existing Conditions				Post-Development			
		D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S	D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S
AM Peak	London Circuit (NE)	0.063	1.9	2.4	-	0.066	1.9	2.5	-
	University Ave (NW)	0.205	5.3	11.0	A	0.241	6.4	11.2	A
	London Circuit (SW)	0.168	0.0	2.3	-	0.169	0.0	2.3	-
	Intersection	*0.205*	*5.3*	*3.6*	*-*	*0.241*	*6.4*	*3.9*	*-*
PM Peak	London Circuit (NE)	0.058	1.8	2.1	-	0.062	1.9	2.3	-
	University Ave (NW)	0.175	4.6	8.9	A	0.196	5.2	9.1	A
	London Circuit (SW)	0.126	0.0	2.2	-	0.128	0.0	2.3	-
	Intersection	*0.175*	*4.6*	*3.6*	*-*	*0.196*	*5.2*	*3.8*	*-*

Table 11 SIDRA Intersection Summary – Post-Development Operation

Approach		Existing Conditions				Post-Development			
		D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S	D.O.S	95th%ile Queue Length (m)	Average Delay (s)	L.O.S
AM Peak	University Ave (SE)	0.406	65.9	31.9	C	0.437	71.9	32.3	C
	Marcus Clarke St (NE)	0.376	64.4	26.1	B	0.376	64.4	26.2	B
	University Ave (NW)	0.409	36.4	47.1	D	0.409	36.4	47.1	D
	Marcus Clarke St (SW)	0.418	73.2	28.2	B	0.427	75.2	28.4	B
	Intersection	*0.418*	*73.2*	*30.5*	*C*	*0.437*	*75.2*	*30.7*	*C*
PM Peak	University Ave (SE)	0.508	58.3	42.0	C	0.515	61.8	41.4	C
	Marcus Clarke St (NE)	0.511	91.4	27.3	B	0.534	93.3	28.3	B
	University Ave (NW)	0.524	74.7	39.0	C	0.524	74.7	39.0	C
	Marcus Clarke St (SW)	0.332	57.4	27.7	B	0.360	62.3	29.3	C
	Intersection	*0.524*	*91.4*	*32.5*	*C*	*0.534*	*93.3*	*33.2*	*C*

The analysis indicates that there will be incremental increases to degree of saturation, queue lengths and average delay at both intersections that will have no perceptible impacts on their existing operations.

6.4 QUEUING AT SITE ACCESS

Based on the previous section, the peak inbound traffic volume is estimated at 31 vehicle movements during the afternoon peak. Based on a typical roller door being installed at the site access which requires in the order of 15 seconds to raise and for an inbound vehicle to pass beneath, the inbound capacity at the access would be 240 vehicles per hour (noting that this is likely to be an underestimate as a second inbound vehicle would typically pass beneath the door without requiring it to reopen).

Based on standard queueing theory, the 98th percentile queue (that is, a queue that would only be expected to be exceeded on less than 2% of occasions during the peak periods) would be one (1) vehicle.

On this basis, the roller door would need to be set back 6 metres from the property boundary to allow an inbound vehicle queue on the site without blocking the Darwin Place footpath.

The Australian Standard for Off-Street Car Parking (AS2890.1:2004) requires that queueing at a control point occur on a grade no steeper than 1:20. The architectural plans indicate that this grade is achieved.

As the basement car parking levels are proposed to be secured, all residents and tenants will be provided with a remote / key fob that will allow them to raise the roller door when approaching the ramp, such that the door is raised prior to the outbound vehicle approaching the roller door and negating the need to queue on a grade steeper than 1:20.

7 CONCLUSION

Bulum Group is proposing to construct a mixed-use development on land at Block 2 (17-21 University Avenue) and Block 7 (3 Farrell Place / 24 Marcus Clarke Street) in Canberra.

The above two (2) land parcels are distinct and separated by landscaped crown land at Block 8, Section 5.

It is proposed to demolish the existing office buildings upon Blocks 2 and 7, to allow for the construction of new residential apartment buildings with activated land uses at ground level. A multi-storey basement car park is proposed to be constructed across the wider site beneath the three land parcels, and the landscaped crown land reinstated at ground level.

Based on the foregoing analysis, it is concluded that:

- The *Parking and Vehicular Access General Code* outlines a statutory car parking requirement for 20 spaces, which is intended to accommodate the staff and customer car parking demands generated by the commercial land use:
  - It is understood that seven (7) on-site car parking spaces will be allocated to the commercial tenancies (at a rate of 1 space per tenancy) which are intended for employee use;
  - The remaining requirement for 13 spaces can be accommodated in publicly accessible car parking spaces within 1 kilometres of the site (additional staff demands) or 400 metres of the site (customer demands) as outlined by the *Parking and Vehicular Access General Code;*
  - Based on the above the statutory car parking requirement is satisfied; and
  - In practice, the existing use of the site as office buildings with some ground level retail is estimated to generate a higher off-site car parking demand than the proposed use of the site, therefore the subject proposal is expected to have a lesser impact on surrounding proximate traffic conditions than the existing use of the site.
- The design of the car parking areas satisfies the design criteria outlined in the Australian Standard for Off-Street Car Parking (AS2890.1:2004);
- The site access and internal vehicular ramping arrangements accord with the Australian Standard for Off-Street Car Parking (AS2890.1:2004);
- The proposed modifications to the Darwin Place kerb alignment to allow the establishment of an on-street loading zone suitable for refuse collection are considered reasonable given the building envelope applicable to a development upon the site and the impracticality of accommodating waste collection on-site with a vehicle of this size; and
- The additional traffic generated by the site is considered low in the context of existing peak hour traffic volumes, and will have no significant impacts on saturation levels, queue lengths and delays when compared to the existing weekday peak hour volumes.

APPENDIX 1 PARKING SURVEYS

Copy of Parking Canberra ACT EDIT

Car Parking Occupancy - Saturday 10th & Tuesday 13th September, 2022

TRANS TRAFFIC SURVEY

Street	Section	Side	Restriction	Capacity	Saturday 10th September									Tuesday 13th September								
					11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
London Circuit	Knowles Pl - North to Northbourne Ave (Knowles Pl - North Carpark)	S	4P Ticket 8:30am-5:30pm Mon-Thu; 8:30am-9pm Fri; 8:30am-12Noon Sat	238	68	94	124	133	126	111	93	88	82	181	196	169	141	135	102	85	180	218
			Permit Zone	21	8	11	11	11	12	10	8	7	6	13	13	12	11	12	10	9	9	10
			Disabled	4	0	0	0	0	0	0	0	0	0	3	4	3	2	2	2	1	1	0
			1/2P Ticket 8:30am-5:30pm Mon-Thu; 8:30am-9pm Fri; 8:30am-12Noon Sat; Electric Vehicle Only	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2
	Knowles Pl - South to Edinburgh Ave (Carpark)	W	Closed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gordon St	London Circuit to The Mews	S	P Disabled	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
			2P Ticket 8:30am-5:30pm Mon-Fri	8	3	5	7	8	8	6	5	3	3	5	6	7	8	8	7	5	5	6
	The Mews to Marcus Clarke St	N	2P Ticket 8:30am-5:30pm Mon-Fri	11	5	7	10	11	9	7	6	6	6	8	10	9	10	9	7	4	5	7
			Loading Zone 30 mins 7:30am-6pm Mon-Fri	2	0	0	0	0	0	0	0	0	0	2	2	1	1	2	1	0	0	0
		S	2P Ticket 8:30am-5:30pm Mon-Fri	14	4	10	12	13	12	8	8	9	8	11	13	12	11	11	9	4	7	13
Farrell Pl	Marcus Clarke St to William Clemens St	S	1P Ticket 8:30am-5:30pm Mon-Fri	4	2	2	2	3	3	2	2	2	2	3	4	4	3	4	4	3	3	3
		N	1/2P Ticket 8:30am-5:30pm Mon-Fri	4	1	2	4	3	4	4	3	4	4	4	4	3	3	4	4	3	2	1
	William Clemens St to London Circuit	S	1P Ticket 8:30am-5:30pm Mon-Fri	2	1	1	1	2	1	1	1	1	0	2	2	2	2	2	2	2	2	2
		N	Loading Zone 30 mins 7:30am-6pm Mon-Fri	2	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2
			P 5 mins	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0
University Ave	London Circuit to Darwin Pl	N	1/2P Ticket 8:30am-5:30pm Mon-Thu; 8:30am-9pm Fri; 8:30am-12Noon Sat; Taxi Zone All Other Times	3	3	3	3	3	3	2	2	2	2	3	3	2	2	3	2	1	1	1
			P 5 mins 7:30am-6pm Mon-Fri	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1
		S	1/2P Ticket 8:30am-5:30pm Mon-Thu; 8:30am-9pm Fri; 8:30am-12Noon Sat	3	2	2	3	3	3	2	2	2	2	3	2	2	3	3	3	3	2	2
	Darwin Pl to Marcus Clarke St	N	1/2P Ticket 8:30am-5:30pm Mon-Thu; 8:30am-9pm Fri; 8:30am-12Noon Sat	5	2	3	4	5	5	3	3	3	3	5	5	4	4	5	5	4	4	5
		S	1/2P 7:30am-6pm Mon-Fri; 7:30am-12Noon Sat	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2
	Marcus Clarke St to Childers St	N	Bus Zone	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
			1P Ticket 8:30am-5:30pm Mon-Fri	8	6	7	8	6	6	6	4	3	3	8	7	7	7	8	7	6	6	7
		S	1P Ticket 8:30am-5:30pm Mon-Fri	18	7	8	17	16	14	12	9	8	6	18	16	16	17	14	13	11	12	14
Darwin Pl	University Ave to End	W	Loading Zone 30 mins 7:30am-6pm Mon-Fri	4	3	3	3	4	4	4	4	3	3	4	4	4	4	2	2	3	2	1
		E	Loading Zone 30 mins 7:30am-6pm Mon-Fri	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2
			2P Disabled	2	1	2	2	2	2	2	1	0	0	2	1	1	2	2	2	1	1	0
Marcus Clarke St	University Ave to Farrell Pl	W	1/2P	5	1	1	2	5	3	3	3	2	2	5	5	5	5	5	4	4	3	1
		E	1/2P 8:30am-5:30pm Mon-Fri	3	2	3	3	3	3	3	3	2	2	3	3	3	3	3	2	1	1	2
			Loading Zone 30 mins 7:30am-6pm Mon-Fri	2	0	0	2	1	2	0	0	0	0	2	1	1	1	1	1	1	0	0

No. Parking Spaces Available (>30mins) at Time of Survey				***374***	***351***	***351***	***351***	***351***	***351***	***351***	***351***	***351***	***351***	***338***	***338***	***338***	***338***	***338***	***338***	***338***	***351***	***351***
No. Occupied Car Parking Spaces					***115***	***157***	***213***	***228***	***214***	***182***	***155***	***144***	***134***	***266***	***283***	***251***	***226***	***221***	***178***	***143***	***247***	***292***
No. Availabl Car Parking Spaces					***236***	***194***	***138***	***123***	***137***	***169***	***196***	***207***	***217***	***72***	***55***	***87***	***112***	***117***	***160***	***195***	***104***	***59***
Utilisation					***33%***	***45%***	***61%***	***65%***	***61%***	***52%***	***44%***	***41%***	***38%***	***79%***	***84%***	***74%***	***67%***	***65%***	***53%***	***42%***	***70%***	***83%***

APPENDIX 2 SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

Site: 101 [UnLo AM Ex (Site Folder: General)]

Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: London Circuit (NE)														
8	T1	125	2	132	1.6	0.063	0.3	LOS A	0.3	1.9	0.04	0.05	0.04	59.4
9	R2	41	5	43	12.2	0.063	8.9	LOS A	0.3	1.9	0.47	0.55	0.47	46.6
Approach		166	7	175	4.2	0.063	2.4	NA	0.3	1.9	0.15	0.17	0.15	56.8
NorthWest: University Avenue (NW)														
10	L2	89	8	94	9.0	0.205	8.6	LOS A	0.7	5.3	0.13	0.96	0.13	44.6
12	R2	48	0	51	0.0	0.205	15.5	LOS B	0.7	5.3	0.13	0.96	0.13	44.9
Approach		137	8	144	5.8	0.205	11.0	LOS A	0.7	5.3	0.13	0.96	0.13	44.7
SouthWest: London Circuit (SW)														
1	L2	235	9	247	3.8	0.168	5.6	LOS A	0.0	0.0	0.00	0.48	0.00	29.8
2	T1	354	9	373	2.5	0.168	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		589	18	620	3.1	0.168	2.3	NA	0.0	0.0	0.00	0.23	0.00	46.2
All Vehicles		892	33	939	3.7	0.205	3.6	NA	0.7	5.3	0.05	0.33	0.05	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [UnLo PM Ex (Site Folder: General)]

Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: London Circuit (NE)														
8	T1	126	1	133	0.8	0.058	0.3	LOS A	0.2	1.8	0.06	0.07	0.06	59.1
9	R2	39	4	41	10.3	0.058	7.8	LOS A	0.2	1.8	0.38	0.41	0.38	48.6
Approach		165	5	174	3.0	0.058	2.1	NA	0.2	1.8	0.14	0.15	0.14	57.1
NorthWest: University Avenue (NW)														
10	L2	145	2	153	1.4	0.175	8.3	LOS A	0.7	4.6	0.10	0.95	0.10	46.7
12	R2	20	0	21	0.0	0.175	13.6	LOS A	0.7	4.6	0.10	0.95	0.10	46.7
Approach		165	2	174	1.2	0.175	8.9	LOS A	0.7	4.6	0.10	0.95	0.10	46.7
SouthWest: London Circuit (SW)														
1	L2	175	1	184	0.6	0.126	5.6	LOS A	0.0	0.0	0.00	0.47	0.00	29.9
2	T1	271	4	285	1.5	0.126	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.2
Approach		446	5	469	1.1	0.126	2.2	NA	0.0	0.0	0.00	0.23	0.00	46.4
All Vehicles		776	12	817	1.5	0.175	3.6	NA	0.7	4.6	0.05	0.36	0.05	48.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [MCUn AM Ex (Site Folder: General)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: University Avenue (SE)														
4	L2	29	1	31	3.4	0.081	31.7	LOS C	1.6	11.6	0.74	0.66	0.74	32.4
5	T1	124	0	131	0.0	* 0.406	29.1	LOS C	9.0	65.9	0.82	0.74	0.82	19.3
6	R2	112	13	118	11.6	0.406	35.0	LOS C	9.0	65.9	0.84	0.75	0.84	31.0
Approach		265	14	279	5.3	0.406	31.9	LOS C	9.0	65.9	0.82	0.74	0.82	26.9
NorthEast: Marcus Clarke Street (NE)														
7	L2	67	1	71	1.5	0.105	27.7	LOS B	2.2	15.9	0.69	0.72	0.69	33.0
8	T1	229	7	241	3.1	0.376	25.5	LOS B	9.0	64.4	0.79	0.67	0.79	42.2
9	R2	7	0	7	0.0	0.376	31.0	LOS C	9.0	64.4	0.79	0.67	0.79	35.3
Approach		303	8	319	2.6	0.376	26.1	LOS B	9.0	64.4	0.76	0.68	0.76	40.4
NorthWest: University Avenue (NW)														
10	L2	33	25	35	75.8	0.204	49.4	LOS D	1.6	18.2	0.92	0.74	0.92	25.1
11	T1	51	9	54	17.6	* 0.409	43.7	LOS D	4.7	36.4	0.96	0.77	0.96	14.7
12	R2	45	4	47	8.9	0.409	49.4	LOS D	4.7	36.4	0.96	0.77	0.96	26.8
Approach		129	38	136	29.5	0.409	47.1	LOS D	4.7	36.4	0.95	0.76	0.95	22.5
SouthWest: Marcus Clarke Street (SW)														
1	L2	182	2	192	1.1	0.418	31.0	LOS C	10.3	73.2	0.79	0.76	0.79	33.6
2	T1	313	6	329	1.9	0.418	26.3	LOS B	10.3	73.2	0.80	0.71	0.80	41.3
3	R2	22	0	23	0.0	* 0.418	32.3	LOS C	9.7	68.8	0.81	0.70	0.81	33.3
Approach		517	8	544	1.5	0.418	28.2	LOS B	10.3	73.2	0.80	0.73	0.80	38.6
All Vehicles		1214	68	1278	5.6	0.418	30.5	LOS C	10.3	73.2	0.81	0.72	0.81	35.4

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

MOVEMENT SUMMARY

Site: 101 [MCUn PM Ex (Site Folder: General)]

MCUn AM Ex
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: University Avenue (SE)														
4	L2	16	0	17	0.0	0.102	41.8	LOS C	1.5	10.6	0.86	0.68	0.86	28.6
5	T1	108	0	114	0.0	* 0.508	39.3	LOS C	8.1	58.3	0.93	0.77	0.93	15.8
6	R2	84	5	88	6.0	0.508	45.5	LOS D	8.1	58.3	0.95	0.79	0.95	27.2
Approach		208	5	219	2.4	0.508	42.0	LOS C	8.1	58.3	0.93	0.77	0.93	22.4
NorthEast: Marcus Clarke Street (NE)														
7	L2	71	1	75	1.4	0.109	27.1	LOS B	2.3	16.6	0.68	0.72	0.68	33.3
8	T1	303	4	319	1.3	0.511	27.1	LOS B	12.9	91.4	0.84	0.73	0.84	41.4
9	R2	17	0	18	0.0	* 0.511	32.6	LOS C	12.9	91.4	0.84	0.73	0.84	34.4
Approach		391	5	412	1.3	0.511	27.3	LOS B	12.9	91.4	0.81	0.73	0.81	40.0
NorthWest: University Avenue (NW)														
10	L2	48	36	51	75.0	0.165	38.7	LOS C	2.0	22.7	0.82	0.74	0.82	28.3
11	T1	76	1	80	1.3	* 0.524	35.3	LOS C	10.6	74.7	0.92	0.80	0.92	16.7
12	R2	160	1	168	0.6	0.524	40.9	LOS C	10.6	74.7	0.92	0.80	0.92	29.4
Approach		284	38	299	13.4	0.524	39.0	LOS C	10.6	74.7	0.90	0.79	0.90	26.7
SouthWest: Marcus Clarke Street (SW)														
1	L2	105	0	111	0.0	0.332	29.3	LOS C	8.1	57.4	0.75	0.70	0.75	35.0
2	T1	255	8	268	3.1	0.332	26.4	LOS B	8.1	57.4	0.79	0.70	0.79	41.1
3	R2	27	0	28	0.0	0.332	34.3	LOS C	6.5	46.8	0.81	0.69	0.81	32.1
Approach		387	8	407	2.1	0.332	27.7	LOS B	8.1	57.4	0.78	0.70	0.78	39.2
All Vehicles		1270	56	1337	4.4	0.524	32.5	LOS C	12.9	91.4	0.84	0.74	0.84	34.4

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

MOVEMENT SUMMARY

Site: 101 [UnLo AM Post (Site Folder: General)]

Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: London Circuit (NE)														
8	T1	125	2	132	1.6	0.066	0.2	LOS A	0.3	1.9	0.02	0.03	0.02	59.6
9	R2	45	5	47	11.1	0.066	8.9	LOS A	0.3	1.9	0.48	0.61	0.48	46.1
Approach		170	7	179	4.1	0.066	2.5	NA	0.3	1.9	0.14	0.19	0.14	56.6
NorthWest: University Avenue (NW)														
10	L2	100	8	105	8.0	0.241	8.6	LOS A	0.9	6.4	0.13	0.96	0.13	44.4
12	R2	58	0	61	0.0	0.241	15.9	LOS B	0.9	6.4	0.13	0.96	0.13	44.7
Approach		158	8	166	5.1	0.241	11.2	LOS A	0.9	6.4	0.13	0.96	0.13	44.5
SouthWest: London Circuit (SW)														
1	L2	239	9	252	3.8	0.169	5.6	LOS A	0.0	0.0	0.00	0.48	0.00	29.8
2	T1	354	9	373	2.5	0.169	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		593	18	624	3.0	0.169	2.3	NA	0.0	0.0	0.00	0.23	0.00	46.0
All Vehicles		921	33	969	3.6	0.241	3.9	NA	0.9	6.4	0.05	0.35	0.05	47.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [UnLo PM Post (Site Folder: General)]

Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: London Circuit (NE)														
8	T1	126	1	133	0.8	0.062	0.2	LOS A	0.3	1.9	0.04	0.05	0.04	59.3
9	R2	47	4	49	8.5	0.062	7.8	LOS A	0.3	1.9	0.39	0.50	0.39	47.9
Approach		173	5	182	2.9	0.062	2.3	NA	0.3	1.9	0.14	0.18	0.14	56.8
NorthWest: University Avenue (NW)														
10	L2	152	2	160	1.3	0.196	8.3	LOS A	0.7	5.2	0.09	0.95	0.09	46.6
12	R2	27	0	28	0.0	0.196	13.9	LOS A	0.7	5.2	0.09	0.95	0.09	46.5
Approach		179	2	188	1.1	0.196	9.1	LOS A	0.7	5.2	0.09	0.95	0.09	46.5
SouthWest: London Circuit (SW)														
1	L2	183	1	193	0.5	0.128	5.6	LOS A	0.0	0.0	0.00	0.48	0.00	29.9
2	T1	271	4	285	1.5	0.128	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		454	5	478	1.1	0.128	2.3	NA	0.0	0.0	0.00	0.23	0.00	46.1
All Vehicles		806	12	848	1.5	0.196	3.8	NA	0.7	5.2	0.05	0.38	0.05	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [MCUn AM Post (Site Folder: General)]

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: University Avenue (SE)														
4	L2	39	1	41	2.6	0.087	31.7	LOS C	1.7	12.4	0.74	0.69	0.74	31.9
5	T1	124	0	131	0.0	* 0.437	29.6	LOS C	9.8	71.9	0.84	0.76	0.84	19.0
6	R2	123	13	129	10.6	0.437	35.4	LOS C	9.8	71.9	0.85	0.76	0.85	30.9
Approach		286	14	301	4.9	0.437	32.3	LOS C	9.8	71.9	0.83	0.75	0.83	27.0
NorthEast: Marcus Clarke Street (NE)														
7	L2	71	1	75	1.4	0.112	27.8	LOS B	2.4	16.8	0.69	0.72	0.69	33.0
8	T1	229	7	241	3.1	0.376	25.5	LOS B	9.0	64.4	0.79	0.67	0.79	42.2
9	R2	7	0	7	0.0	0.376	31.0	LOS C	9.0	64.4	0.79	0.67	0.79	35.3
Approach		307	8	323	2.6	0.376	26.2	LOS B	9.0	64.4	0.76	0.68	0.76	40.3
NorthWest: University Avenue (NW)														
10	L2	33	25	35	75.8	0.204	49.4	LOS D	1.6	18.2	0.92	0.74	0.92	25.1
11	T1	51	9	54	17.6	* 0.409	43.7	LOS D	4.7	36.4	0.96	0.77	0.96	14.7
12	R2	45	4	47	8.9	0.409	49.4	LOS D	4.7	36.4	0.96	0.77	0.96	26.8
Approach		129	38	136	29.5	0.409	47.1	LOS D	4.7	36.4	0.95	0.76	0.95	22.5
SouthWest: Marcus Clarke Street (SW)														
1	L2	182	2	192	1.1	0.427	31.2	LOS C	10.6	75.2	0.80	0.76	0.80	33.5
2	T1	313	6	329	1.9	0.427	26.4	LOS B	10.6	75.2	0.81	0.72	0.81	41.2
3	R2	27	0	28	0.0	* 0.427	32.4	LOS C	9.7	68.8	0.81	0.70	0.81	33.1
Approach		522	8	549	1.5	0.427	28.4	LOS B	10.6	75.2	0.80	0.73	0.80	38.5
All Vehicles		1244	68	1309	5.5	0.437	30.7	LOS C	10.6	75.2	0.82	0.73	0.82	35.2

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

MOVEMENT SUMMARY

Site: 101 [MCUn PM Post (Site Folder: General)]

MCUn AM Ex
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: University Avenue (SE)														
4	L2	23	0	24	0.0	0.103	40.9	LOS C	1.6	11.1	0.85	0.69	0.85	28.6
5	T1	108	0	114	0.0	* 0.515	38.7	LOS C	8.6	61.8	0.93	0.78	0.93	16.0
6	R2	91	5	96	5.5	0.515	44.7	LOS D	8.6	61.8	0.94	0.79	0.94	27.4
Approach		222	5	234	2.3	0.515	41.4	LOS C	8.6	61.8	0.93	0.77	0.93	23.0
NorthEast: Marcus Clarke Street (NE)														
7	L2	79	1	83	1.3	0.124	28.0	LOS B	2.7	18.8	0.69	0.73	0.69	32.9
8	T1	303	4	319	1.3	0.534	28.1	LOS B	13.2	93.3	0.85	0.74	0.85	41.0
9	R2	17	0	18	0.0	* 0.534	33.6	LOS C	13.2	93.3	0.85	0.74	0.85	33.9
Approach		399	5	420	1.3	0.534	28.3	LOS B	13.2	93.3	0.82	0.74	0.82	39.4
NorthWest: University Avenue (NW)														
10	L2	48	36	51	75.0	0.165	38.7	LOS C	2.0	22.7	0.82	0.74	0.82	28.3
11	T1	76	1	80	1.3	* 0.524	35.3	LOS C	10.6	74.7	0.92	0.80	0.92	16.7
12	R2	160	1	168	0.6	0.524	40.9	LOS C	10.6	74.7	0.92	0.80	0.92	29.4
Approach		284	38	299	13.4	0.524	39.0	LOS C	10.6	74.7	0.90	0.79	0.90	26.7
SouthWest: Marcus Clarke Street (SW)														
1	L2	105	0	111	0.0	0.360	30.3	LOS C	8.8	62.3	0.77	0.71	0.77	34.5
2	T1	255	8	268	3.1	0.360	27.9	LOS B	8.8	62.3	0.81	0.72	0.81	40.3
3	R2	34	0	36	0.0	0.360	36.9	LOS C	6.6	47.2	0.85	0.72	0.85	30.8
Approach		394	8	415	2.0	0.360	29.3	LOS C	8.8	62.3	0.80	0.72	0.80	38.3
All Vehicles		1299	56	1367	4.3	0.534	33.2	LOS C	13.2	93.3	0.85	0.75	0.85	34.0

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

APPENDIX 3 SWEPT PATH DIAGRAMS & LOADING CONCEPT LAYOUT PLAN

KERB MODIFICATIONS

SUBJECT SITE
17-21 UNIVERSITY AVE

INDICATIVE DDA ACCESSIBLE SPACE PRAM RAMP

MATCH KERB INTO EXISTING

5.4

2.4

2.4

2.4

3.5

8.8

DARWIN PLACE

MATCH KERB INTO EXISTING

BULUM GROUP

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17-21 UNIVERSITY AVENUE, CANBERRA

CONCEPT KERB MODIFICATIONS

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Email: salt@salt3.com.au
ABN: 18 439 813 274
Ph: 03 9020 4225

Melbourne: Level 3, 51 Queen St Melbourne VIC 3000
Sydney: Coca-Cola Place, Level 17, 40 Mount St North Sydney NSW 2060
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0 0.5 1 2

SCALE: 1:100 @ A3

DRAWN / CHECKED	DATE	SIZE
MD / EC	24-10-2023	A3
DRAWING NUMBER		REVISION
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INBOUND LOADING MOVEMENT

OUTBOUND LOADING MOVEMENT

UNIVERSITY AVENUE

DARWIN PLACE

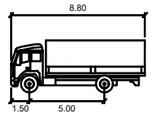
SUBJECT SITE
17-21 UNIVERSITY AVE

PARKING AT SITE FRONTAGE TO BE REMOVED TO ALLOW VEHICULAR ACCESS TO SITE

MEDIUM RIGID VEHICLE SWEPT PATH
(0.6m CLEARANCE SHOWN)

PARKING RESTRICTIONS ALONG EASTERN LEG OF DARWIN PLACE DURING NOMINATED COLLECTION TIMES TO BE REVIEWED

DESIGN VEHICLE



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

BULUM GROUP

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17-21 UNIVERSITY AVENUE, CANBERRA
PROPOSED WASTE COLLECTION ARRANGEMENTS

0 1.25 2.5 5
SCALE: 1:250 @ A3

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Email: salt@salt3.com.au
ABN: 18 439 813 274
Ph: 03 9020 4225
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Sydney: Coca-Cola Place, Level 17, 40 Mount St North Sydney NSW 2060
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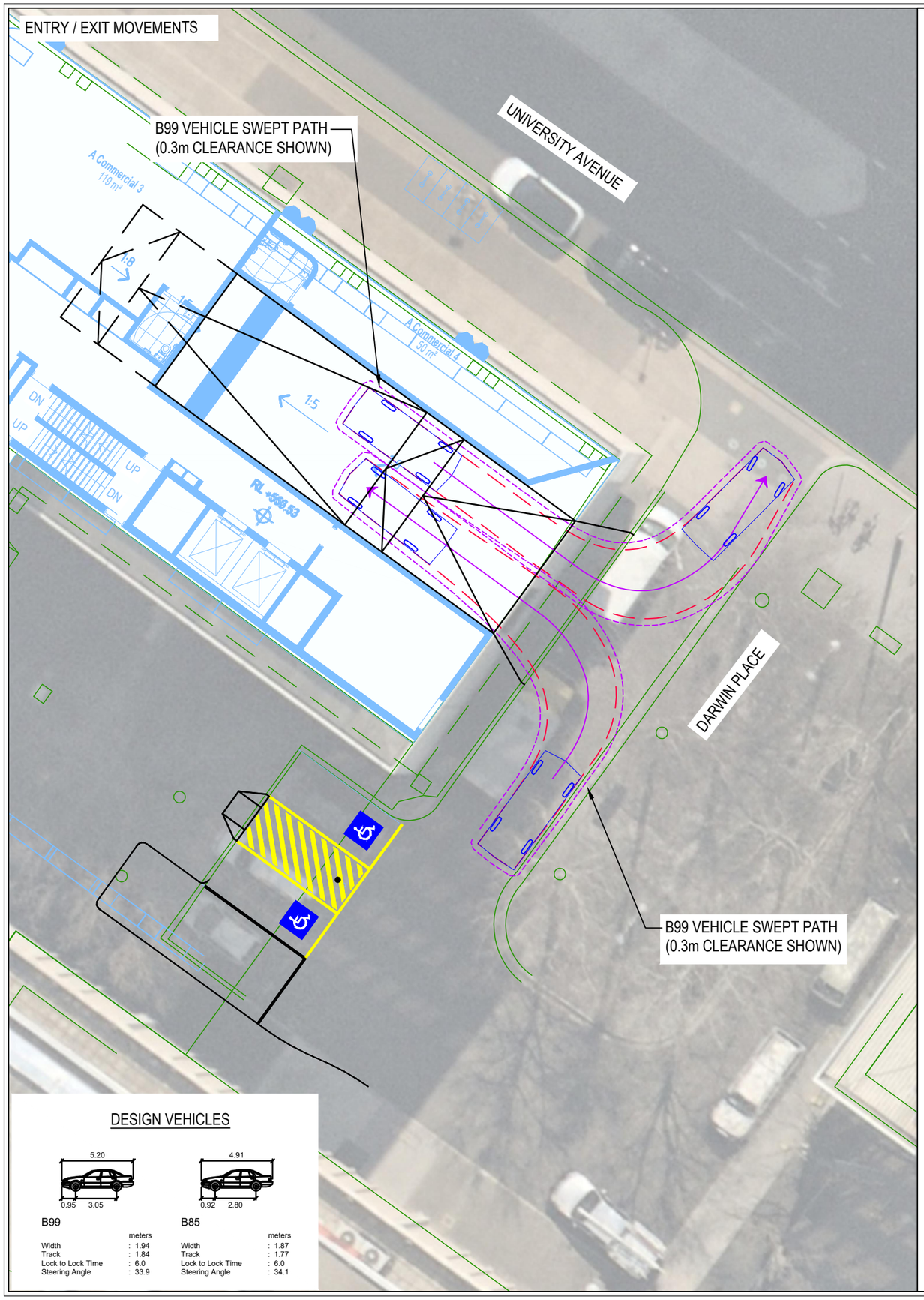
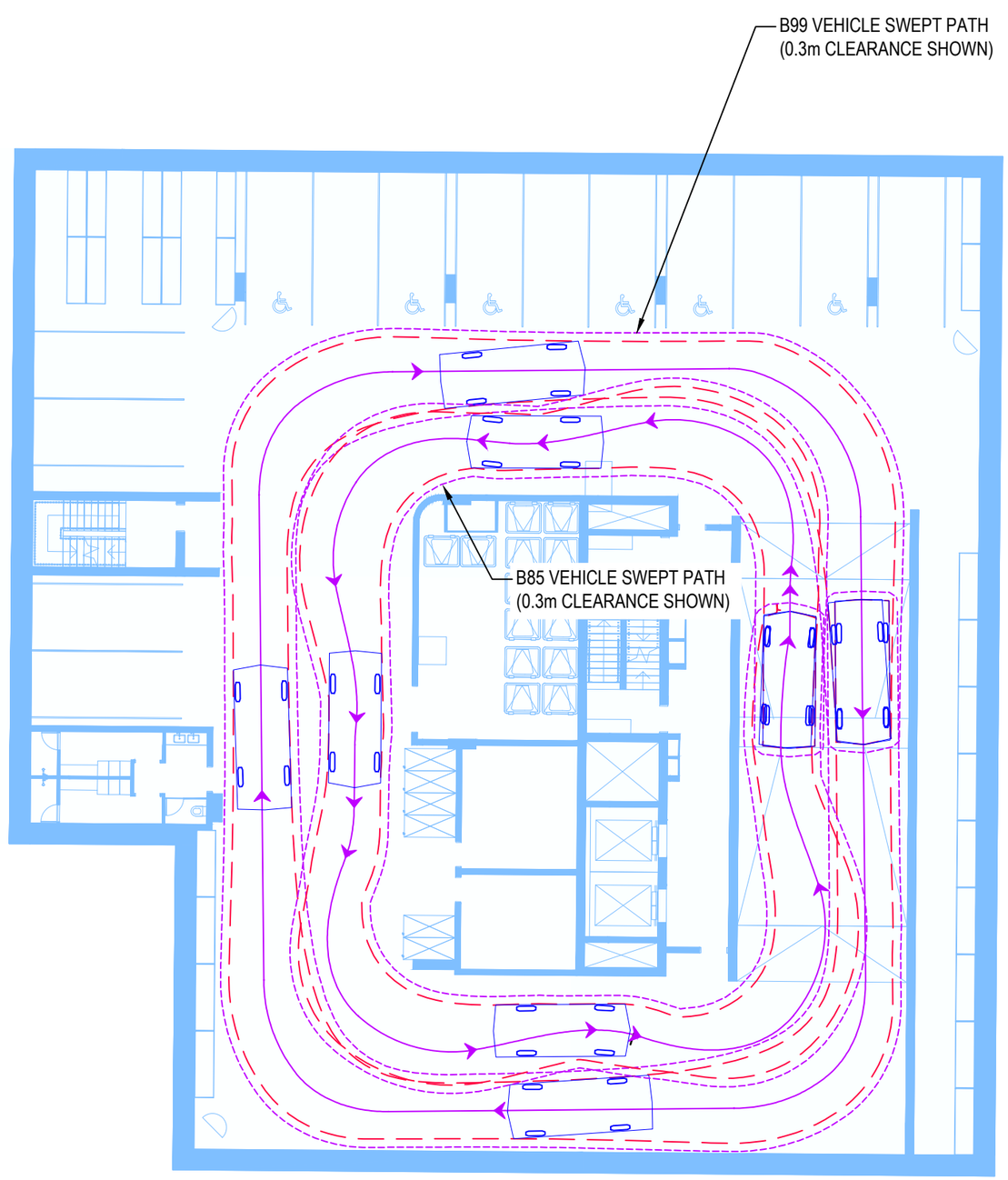
MD / EC	24-10-2023	A3
DRAWING NUMBER		REVISION
SALT-22304-SK-008		7

ENTRY / EXIT MOVEMENTS



INTER LEVEL CIRCULATION



DESIGN VEHICLES

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

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ENTRY / EXIT & INTER LEVEL CIRCUALTION SWEPT PATHS

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Email: salt@salt3.com.au
ABN: 18 439 813 274
Ph: 03 9020 4225

Melbourne: Level 3, 51 Queen St Melbourne VIC 3000
Sydney: Coca-Cola Place, Level 17, 40 Mount St North Sydney NSW 2060
Hobart: Level 4, 116 Bathurst St Hobart TAS 7000
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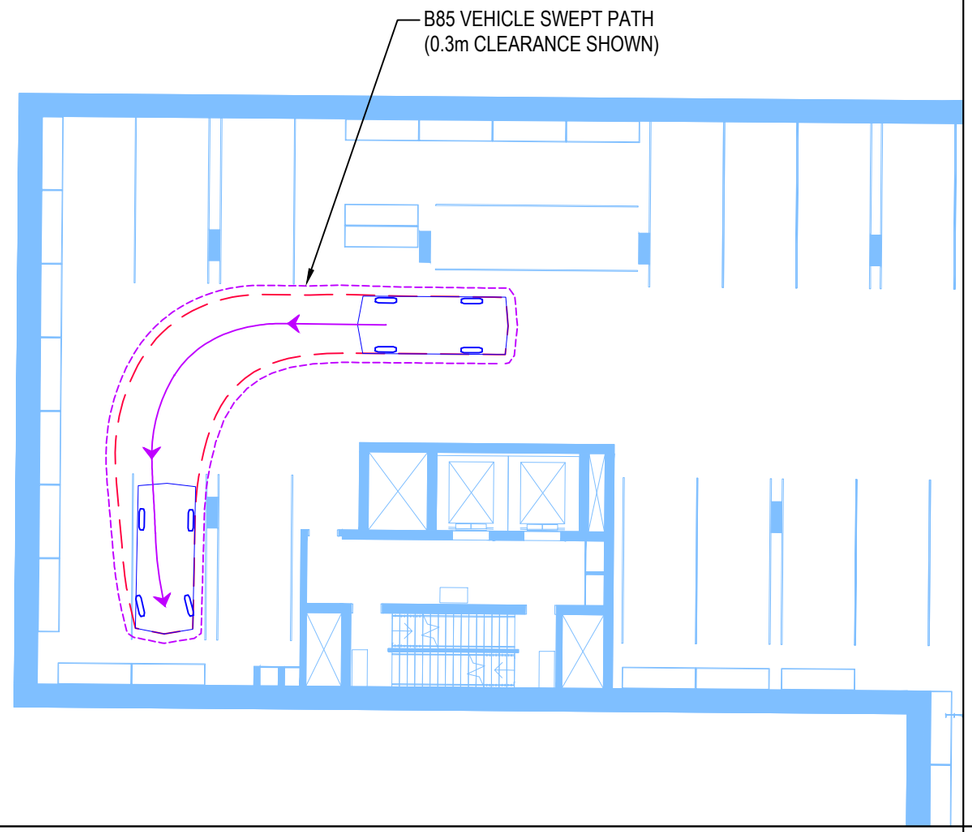
0 1 2 4

SCALE: 1:200 @ A3

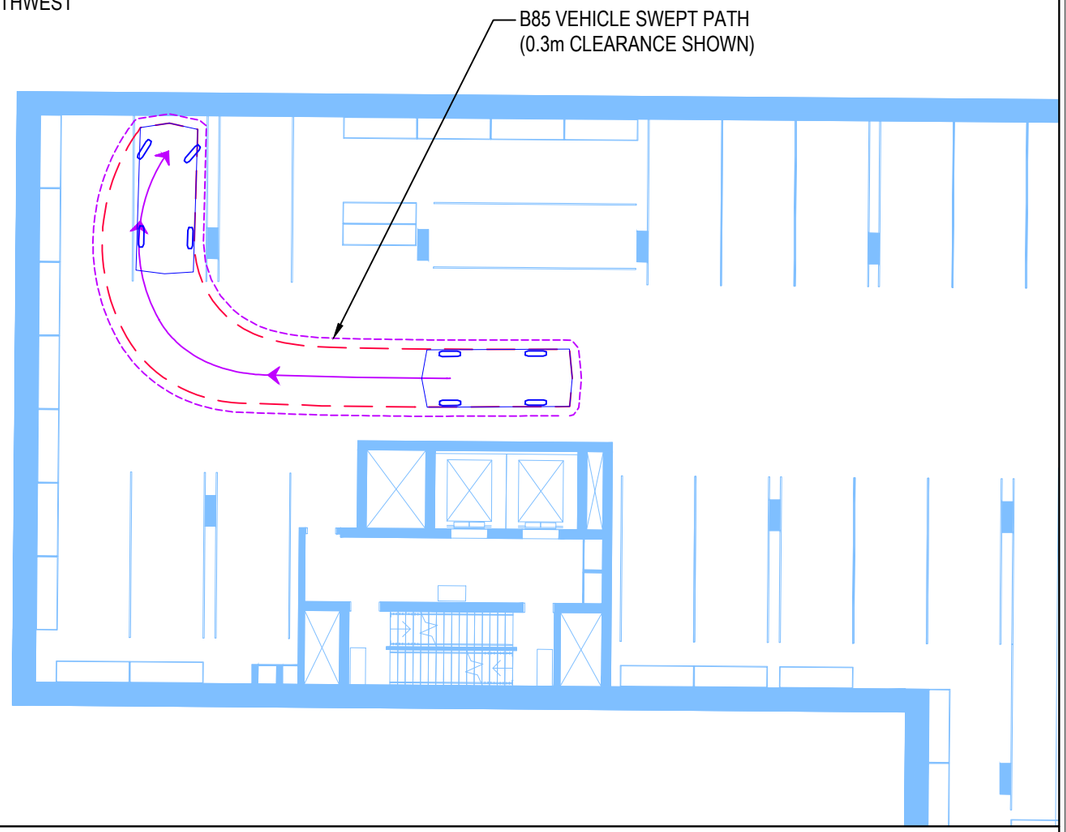
DRAWN / CHECKED	DATE	SIZE
MD / EC	24-10-2023	A3

DRAWING NUMBER	REVISION
SALT-22304-SK-025	3

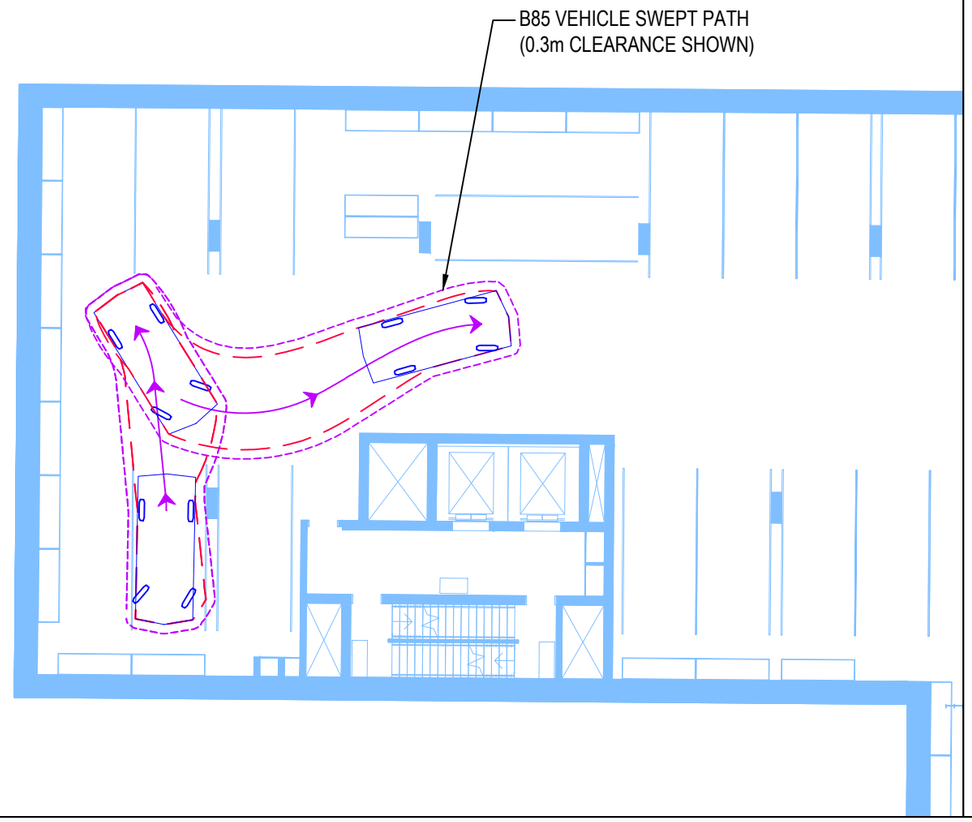
INBOUND SOUTHEAST



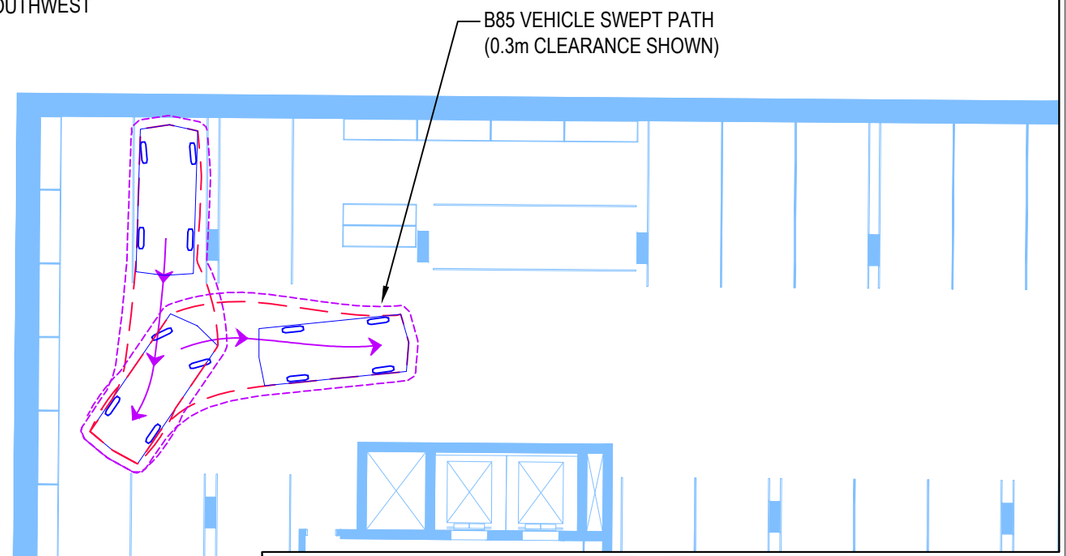
INBOUND SOUTHWEST



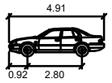
OUTBOUND SOUTHEAST



OUTBOUND SOUTHWEST



DESIGN VEHICLE



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

BULUM GROUP

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SWEPT PATH DIAGRAMS - END SPACES

B3 / B4 / B5 LEVELS

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ABN: 18 439 813 274
Ph: 03 9020 4225

Melbourne: Level 3, 51 Queen St Melbourne VIC 3000
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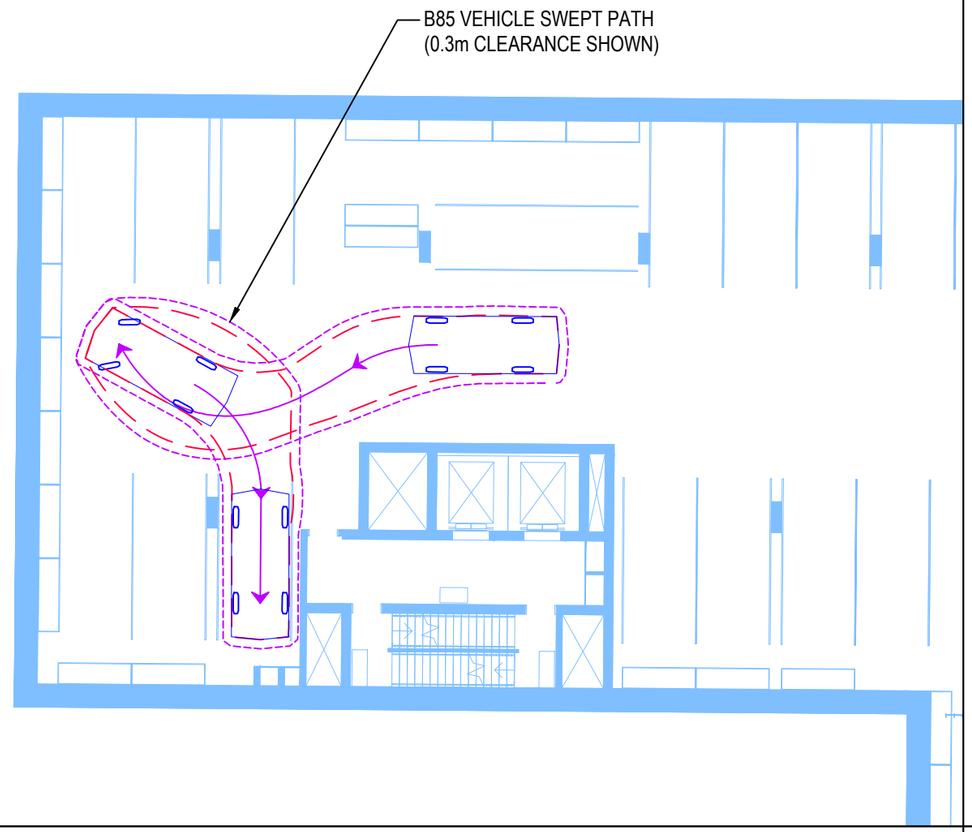
0 1 2 4

SCALE: 1:200 @ A3

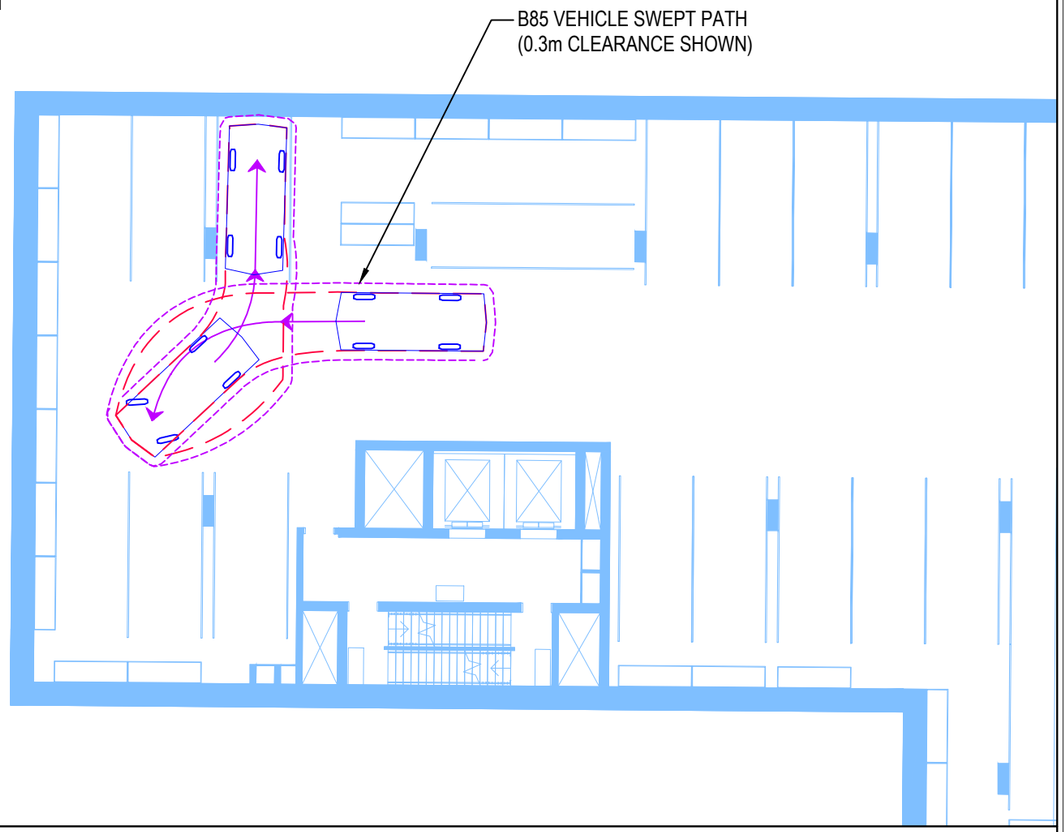
DRAWN / CHECKED	DATE	SIZE
MD / EC	24-10-2023	A3

DRAWING NUMBER	REVISION
SALT-22304-SK-021	4

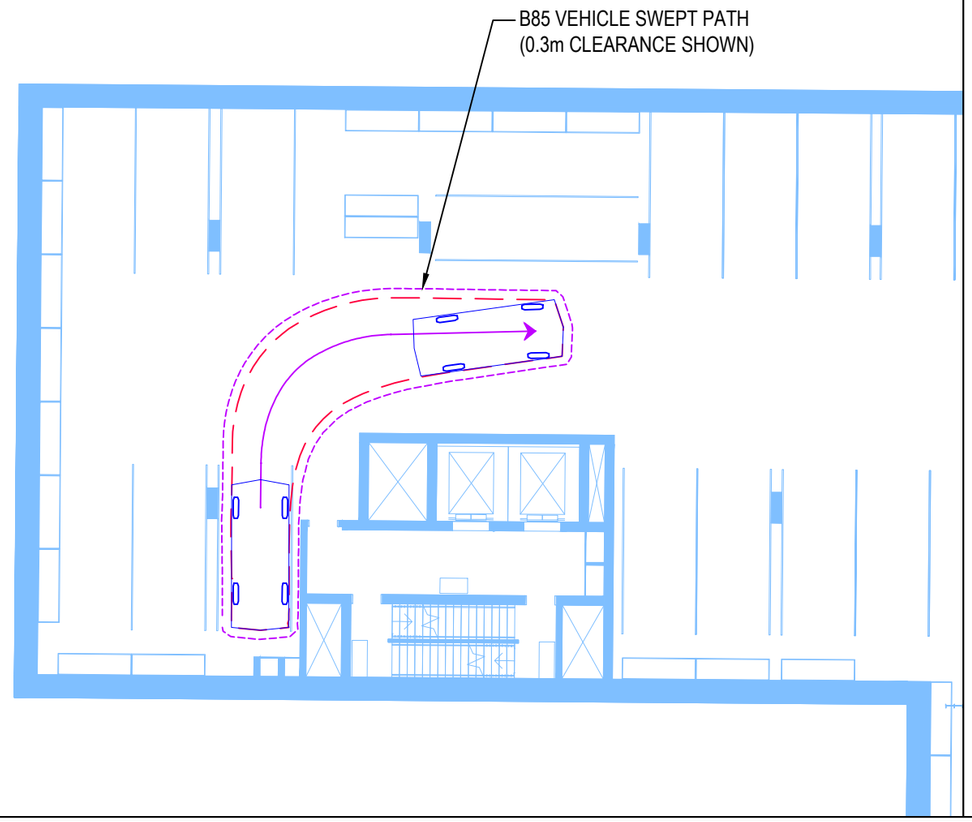
INBOUND EAST



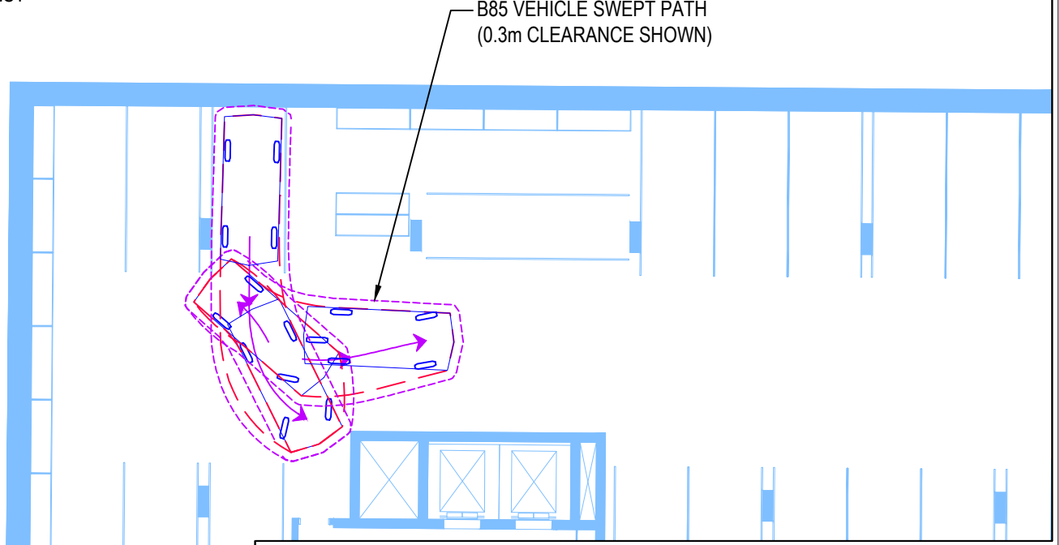
INBOUND WEST



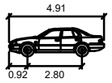
OUTBOUND EAST



OUTBOUND WEST



DESIGN VEHICLE



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

BULUM GROUP

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SWEPT PATH DIAGRAMS - END SPACES

B3 / B4 / B5 LEVELS

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ABN: 18 439 813 274
Ph: 03 9020 4225

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0 1 2 4

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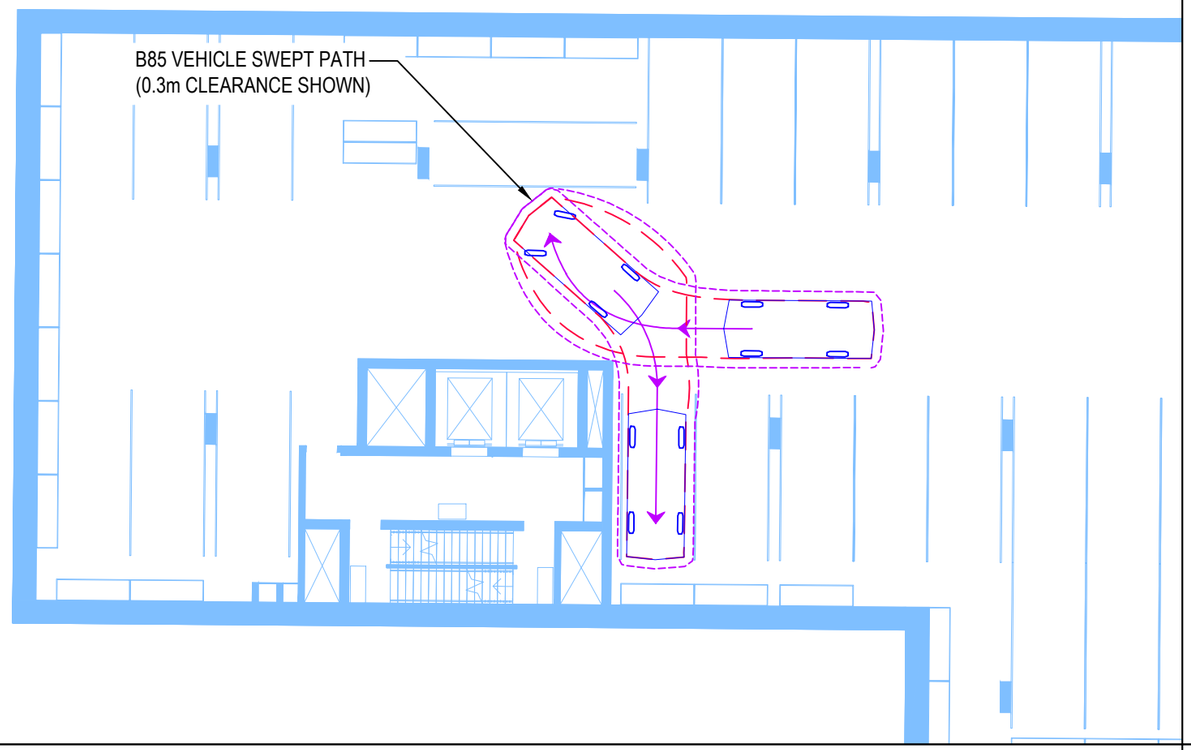
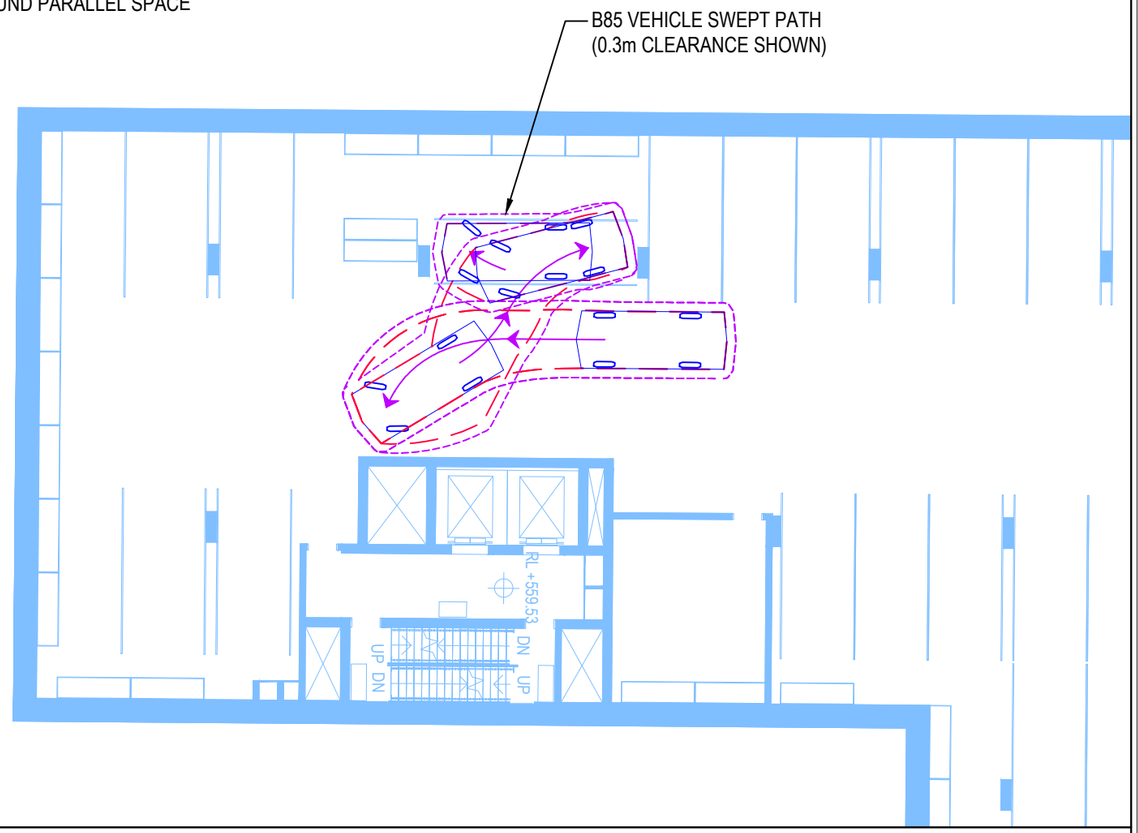
SALT-22304-SK-022	4

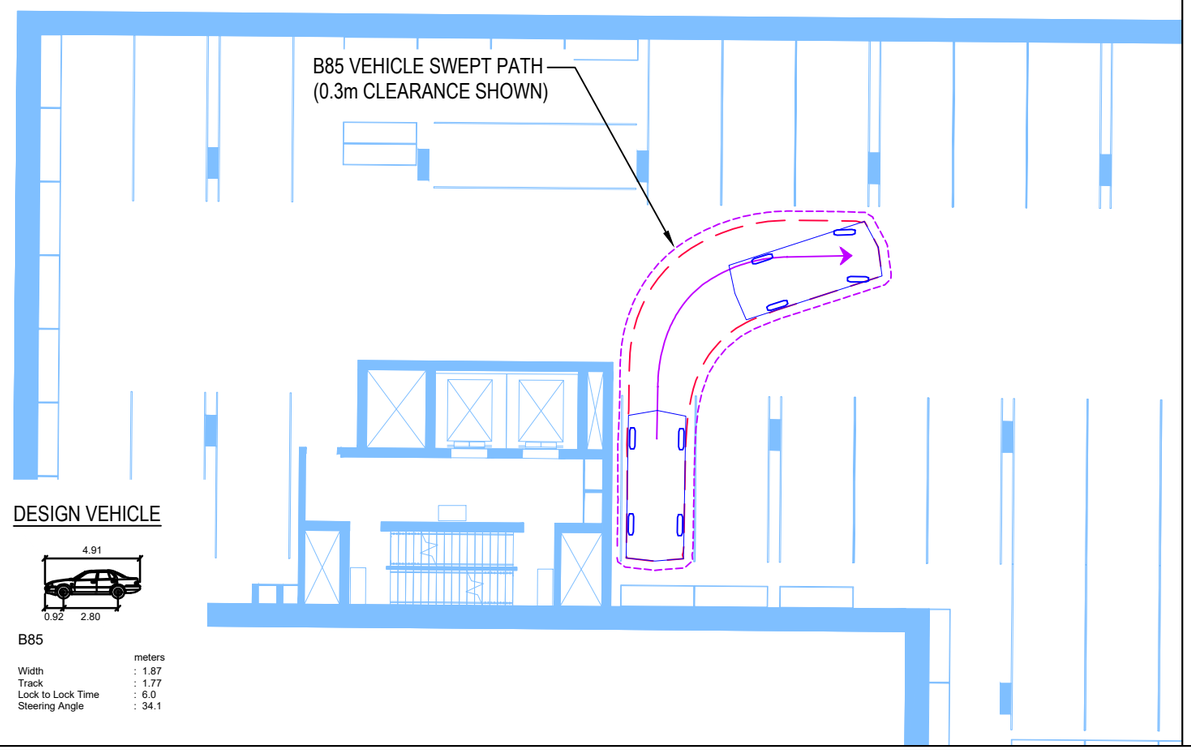
INBOUND EAST



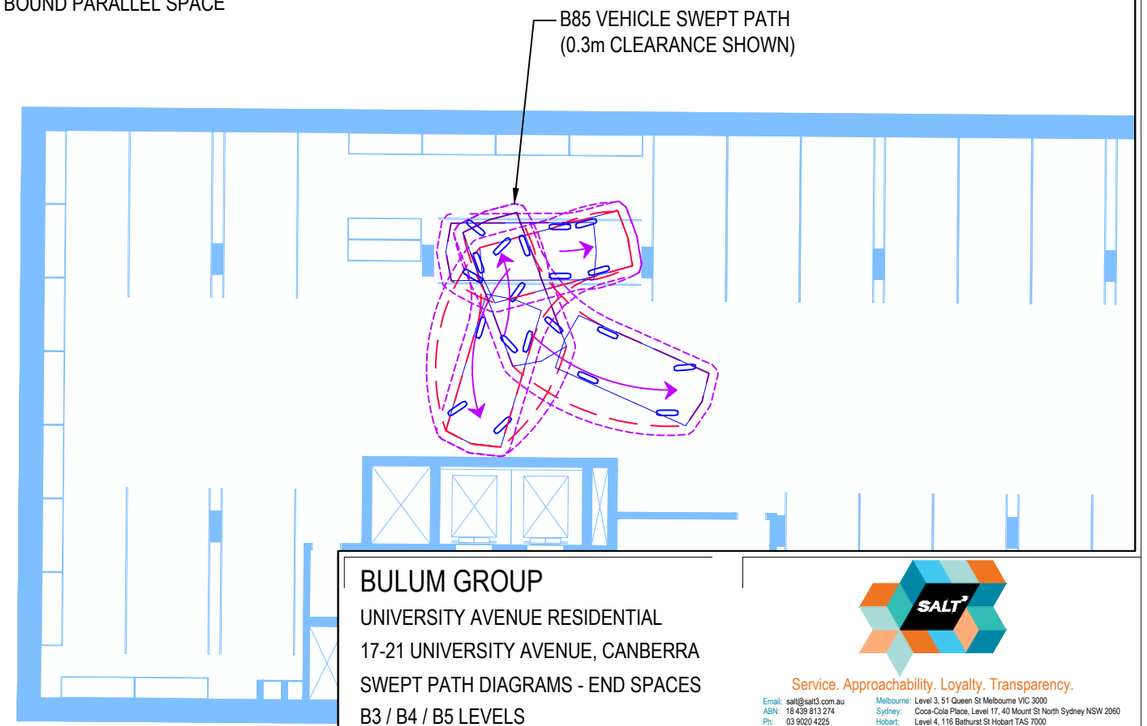
INBOUND PARALLEL SPACE



OUTBOUND EAST



OUTBOUND PARALLEL SPACE



DESIGN VEHICLE

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

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SWEPT PATH DIAGRAMS - END SPACES

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ABN: 18 439 813 274
Ph: 03 9020 4225

Melbourne: Level 3, 51 Queen St Melbourne VIC 3000
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MELBOURNE Level 3, 51 Queen Street, Melbourne VIC 3000
+61 3 9020 4225

SYDNEY Suite 303/61 Marlborough Street, Surry Hills NSW 2010
+61 2 9068 7995

HOBART Level 4, 116 Bathurst Street, Hobart TAS 7000
+61 400 535 634

CANBERRA 45 West Row, Canberra ACT 2601
+61 2 9068 7995

www.salt3.com.au