Attachment A7

Transport impact assessment
Life sciences development

ARUP

Wentworth Capital

88-94 Parramatta Road, Camperdown

Transport Impact Assessment – Life Sciences

Reference: 304985-00

Rev 03 | 24 September 2026



This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 304985-00

Arup Australia Pty Ltd | ABN 76 625 912 665

Arup Australia Pty Ltd
Level 5
151 Clarence Street
Sydney
NSW, 2000
Australia
arup.com

ARUP

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		Name	Luca Welfare	Bryony Dalton	Eric Rivers
		Signature			
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		Name	Luca Welfare	Bryony Dalton	Eric Rivers
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		Name	Jack Gelabert	Sharif Hasan	Sharif Hasan
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1. Introduction

1.1 Background

This Transport Impact Assessment is submitted to the City of Sydney on behalf of University of Sydney / Wentworth Capital in support of a Planning Proposal for an amendment to the *Sydney Local Environmental Plan 2012* for the introduction of a new site-specific Floor Space Ratio (FSR) and Height of Buildings development standard to enable up to 6.5:1 floor space ratio for non-residential uses, for the purpose of a life sciences research facility and ancillary uses at 88–94 Parramatta Road, Camperdown.

1.2 Proposal overview

This Planning Proposal seeks approval for amendments to the Floor Space Ratio (FSR) and Height of Buildings development standards under the Sydney Local Environmental Plan 2012 to facilitate a life sciences development at 88–94 Parramatta Road, Camperdown (the Site).

The Proposal includes a purpose-built life sciences research facility and ancillary uses, supported by life science office space, conference and retail uses. The Proposal also includes retention and adaptive reuse of the existing warehouse at 88–90 Parramatta Road and site-specific amendments to the Sydney Development Control Plan 2012 to guide future built form and public domain outcomes.

1.3 Purpose of this report

The purpose of this report is to support the Planning Proposal. The report summarises the existing transport conditions and assesses the likely traffic on the surrounding road network during the operation of the Proposal.

This report also assesses the internal traffic network within the Site, including access arrangements, internal circulation and loading dock operations. In addition, an outline Framework Travel Plan (FTP) and a framework Construction Traffic Management Plan (CTMP) will also be included as individual chapters in this report. The FTP is provided to support sustainable travel behaviours to and from the Proposal. The CTMP will establish the objectives and principles of traffic management during construction.

2. Existing transport environment

This section of the report details the existing transport network surrounding the development Site.

2.1 Site location

The Site is located at 88-94 Parramatta Road, Camperdown within the City of Sydney (CoS) Local Government Area (LGA). The site is situated on the traditional land of the Gadigal people.

The land is owned by the University of Sydney and is located on the opposite side of Parramatta Road from the main University of Sydney Camperdown/Darlington campus. The site fronts Parramatta Road along its southern boundary and is bounded by a mixture of uses to the north, east, and west of the site. The site is located just 4km south-west of the Sydney CBD, and 2.5km west of Central Station, and is currently largely used by the University of Sydney for university purposes. The site's locational context is shown at Figure 1.

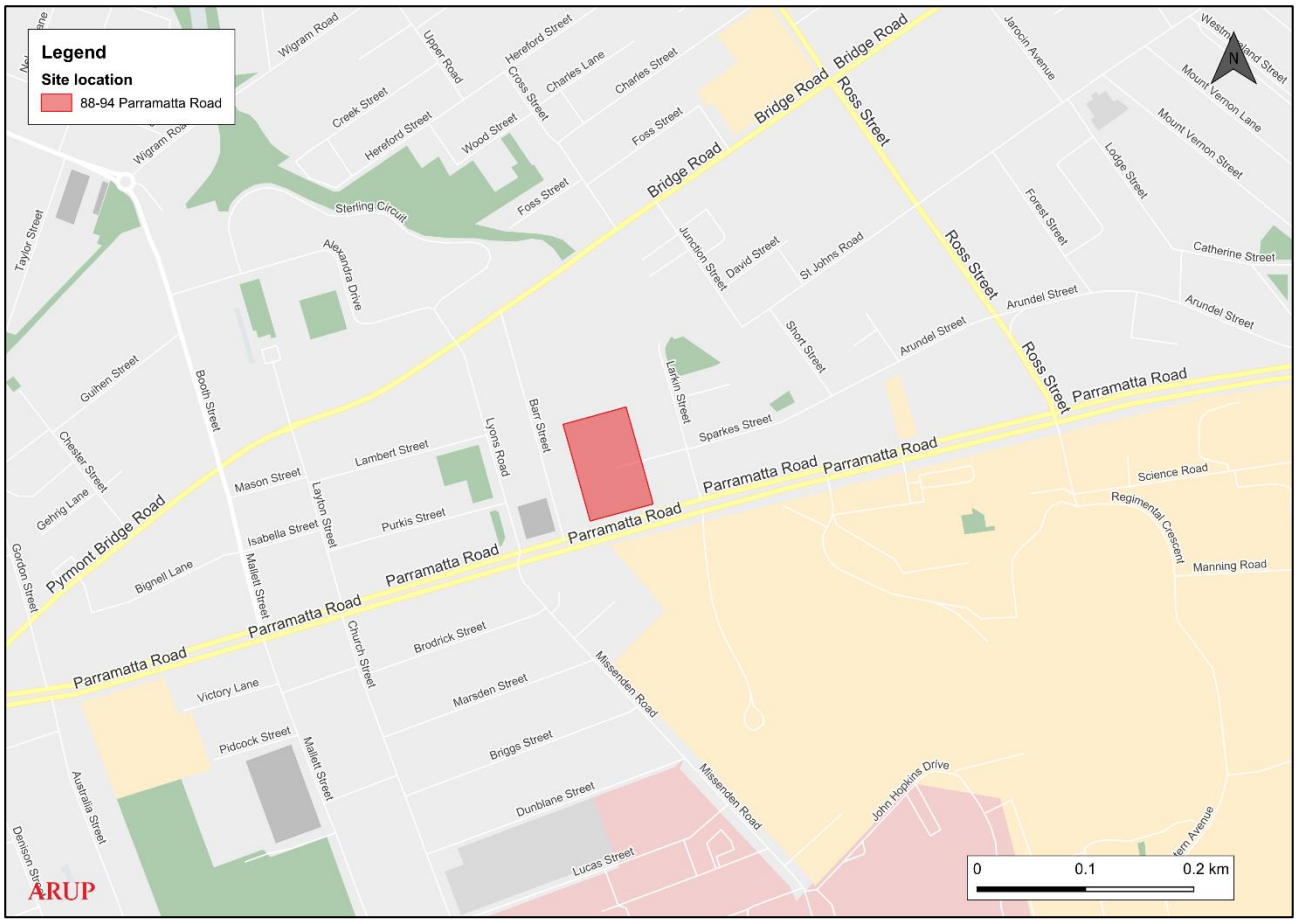


Figure 1: Site location

2.2 Road network

2.2.1 Parramatta Road

Parramatta Road is a major arterial road that runs in an east-west direction along the southern boundary of the Site. It is a two-way road generally configured with three lanes in each direction inclusive of kerbside bus lanes. The section of Parramatta Road that runs past the Site is subject to a posted speed limit of 60km/h and has parking restrictions during bus lanes hours of operation from 6am to 10am and 3pm and 7pm weekdays.

2.2.2 Ross Street

Ross Street runs in a north-south direction approximately 350m to the east of the Site. It is a two-way road generally configured with one lane in each direction with kerbside car parking provided for permit holders

on the eastern side of the road between Parramatta Road and St Johns Road and both sides of the road between St Johns Road and Bridge Road. This section of Ross Street provides a highway frontage to residential and commercial properties and is subject to a 50km/h posted speed limit.

2.2.3 Bridge Road

Bridge Road is a two-way road that runs in a northeast to southwest direction approximately 130m to the north of the Site. The section of road that runs to north of the Site is generally configured with one lane in each direction with on-street segregated cycle lanes on both sides of the road. This section of Bridge Road is a designated clearway with parking restrictions on both sides of the road and a posted speed limit of 40km/h.

2.2.4 Sparkes Street

The existing vehicular access to the Site is from Sparkes Street. Sparkes Street is a local road that runs in an east-west direction between the eastern boundary of the Site and Short Street. Sparkes Street is intersected by Larkin Street. The section of Sparkes Street between the Site access and Larkin Street is a two-way road with parking and stopping restrictions on the southern side of the road. On-street parking on the northern side of the road reduces the effective carriageway width to approximately 3.5 metres, which limits the ability for two vehicles to pass simultaneously.

2.3 Traffic survey and data

Comprehensive and extensive traffic survey data were collated and analysed as part of the study, which are summarised in Table 1.

Table 1: Traffic survey and data summary

#	Data type	Specification	From	Use case
1	Intersection turn count	• Intersection: (1) Parramatta Road / Missenden Road / Lyons Road intersection (2) Parramatta Road / Western Avenue / Ross Street intersection (3) Bridge Road / Ross Street intersection • Date: 26 November 2024 • Time: o AM (7:00 am - 10:00 am), o PM (4:00 pm - 7:00 pm) • Vehicle type: cars, rigid trucks, articulated trucks, buses, and pedestrians • Data interval: 15-minute	Matrix	Identify peak hours, and traffic volume inputs into SIDRA modelling
		• Intersection: (4) Parramatta Road / Larkin Street intersection (5) Sparkes Street / Larkin Street intersection (6) Ross Street / Arundel Street intersection • Date: 2 July 2026 • Time: o AM (6:00 am - 10:00 am), o PM (3:00 pm - 7:00 pm) • Vehicle type: cars, rigid trucks, articulated trucks, buses, and pedestrians • Data interval: 15-minute	Trans Traffic Survey	Identify peak hours and traffic volume inputs into SIDRA modelling. Additional intersections as requested by CoS.
2	Crash history data	Vehicle crashes during 2020–2024 within the study area	TfNSW Open Data Hub	Review road safety aspects and identify crash trends

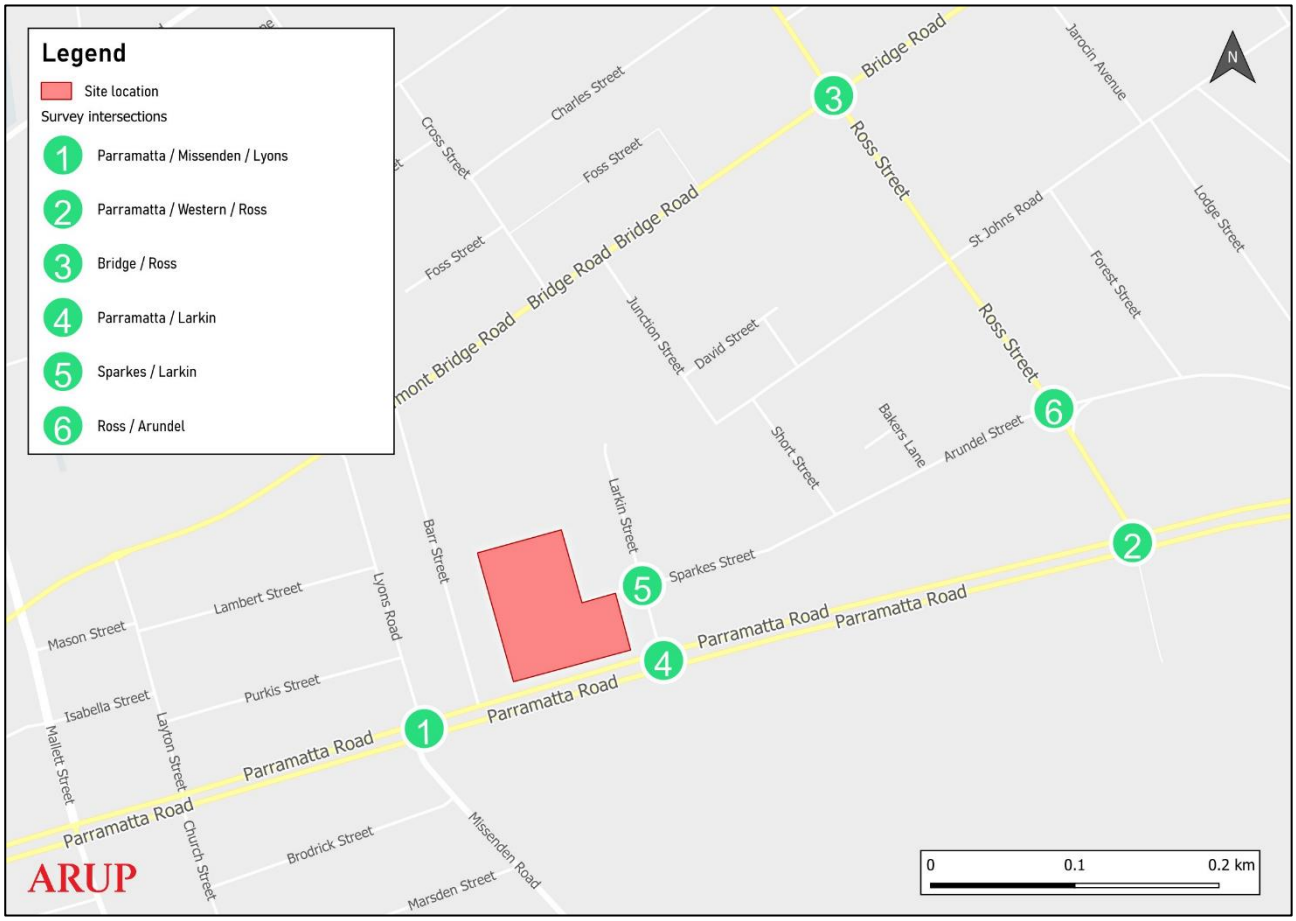


Figure 2: Key intersections surveyed

2.4 Traffic demand profile

The hourly traffic volumes for the three signalised surveyed intersections, gathered from the turn count survey, are summarised in Figure 3 for the morning (AM) and evening (PM) survey periods.

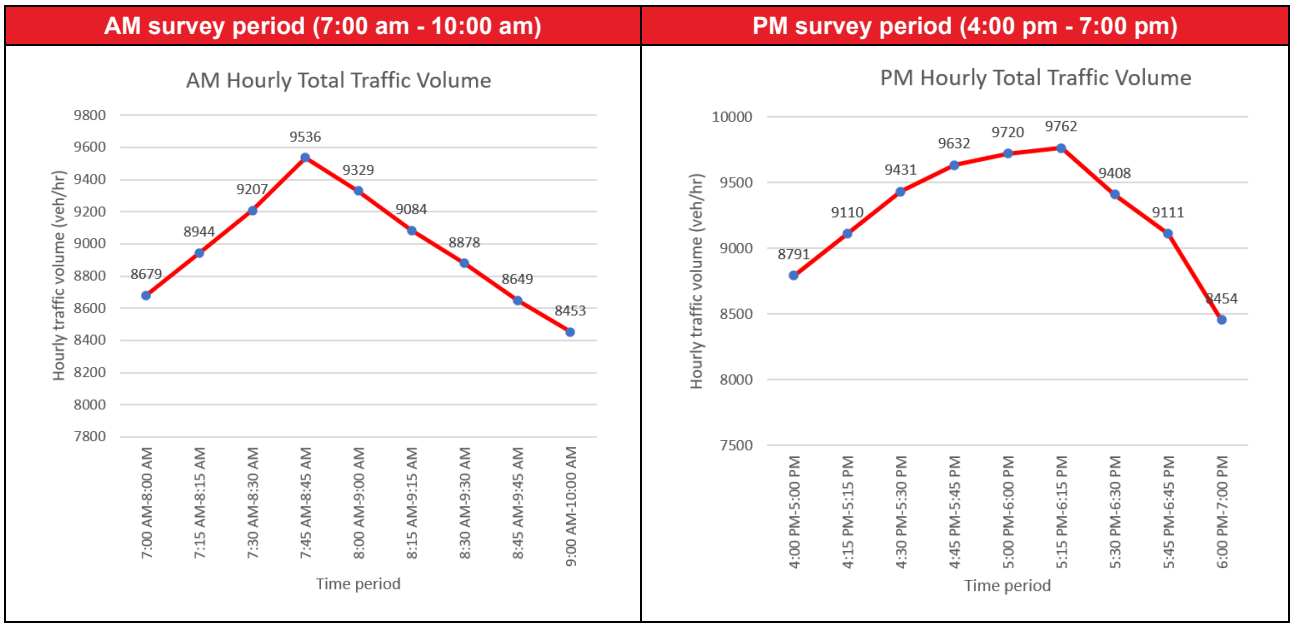


Figure 3: Hourly traffic demand profile

2.5 Peak hour

Based on the traffic demand profiles in Figure 3, the weekday peak hours were identified as:

- AM peak hour: 7:45 am – 8:45 am,
- PM peak hour: 5:15 pm – 6:15 pm.

SIDRA models were developed for these hours as they represent the critical network delay and degree of saturation (DoS) mainly with respect to the dominant through movements on Parramatta Road.

The associated total traffic volumes for each intersection are summarised in Table 2.

Table 2: Weekday peak hours and traffic demand at intersections

Intersection		Total traffic volume at intersection	
		AM (7:45 am – 8:45 am)	PM (5:15 pm – 6:15 pm)
(1)	Parramatta Road / Missenden Road / Lyons Road intersection	3,883 vehicles	3,758 vehicles
(2)	Parramatta Road / Western Avenue / Ross Street intersection	3,586 vehicles	3,741 vehicles
(3)	Bridge Road / Ross Street intersection	2,067 vehicles	2,263 vehicles
(4)	Parramatta Road / Larkin Street intersection	3,183 vehicles	3,165 vehicles
(5)	Sparkes Street / Larkin Street intersection	87 vehicles	79 vehicles
(6)	Ross Street / Arundel Street intersection	774 vehicles	885 vehicles

2.6 2026 survey factoring up

The July 2026 traffic surveys were undertaken during the NSW school holiday period. To account for potentially lower traffic volumes, the eastbound and westbound through movements along the Parramatta Road were compared between the 2026 data Parramatta Road / Larkin Street and the 2024 data at Parramatta Road / Missenden Road and Parramatta Road / Ross Street.

The comparison confirmed that 2026 school holiday traffic volumes were lower than the 2024 school-day traffic volumes. Accordingly, the following weighted average uplift factors were derived and applied to the July 2026 survey data to better represent typical weekday traffic conditions and maintain consistency with the November 2024 survey dataset.

- AM peak uplift factor: +11%
- PM peak uplift factor: +12%

2.7 Walking environment

The walking accessibility of the Site is very good due to its location in an urban setting close to Sydney CBD. Most roads in the surrounding area have footpaths on both sides, and intersections have pedestrian facilities for crossing.

A walking accessibility assessment for the 10, 15 and 20-minute walking catchments has been undertaken and is shown in Figure 4. Within the 10-minute catchment, there are ten bus routes, with eight of them stopping on Parramatta Road, at the bus stop directly outside the Site. One additional bus route is accessible within the 15-minute walking catchment. To the north two light rail stops along the L1 line are accessible within the 20-minute walking catchment, as well as an additional seven bus routes. The train stations that service the T2 and T3 lines are just outside the 20-minute walking catchment.

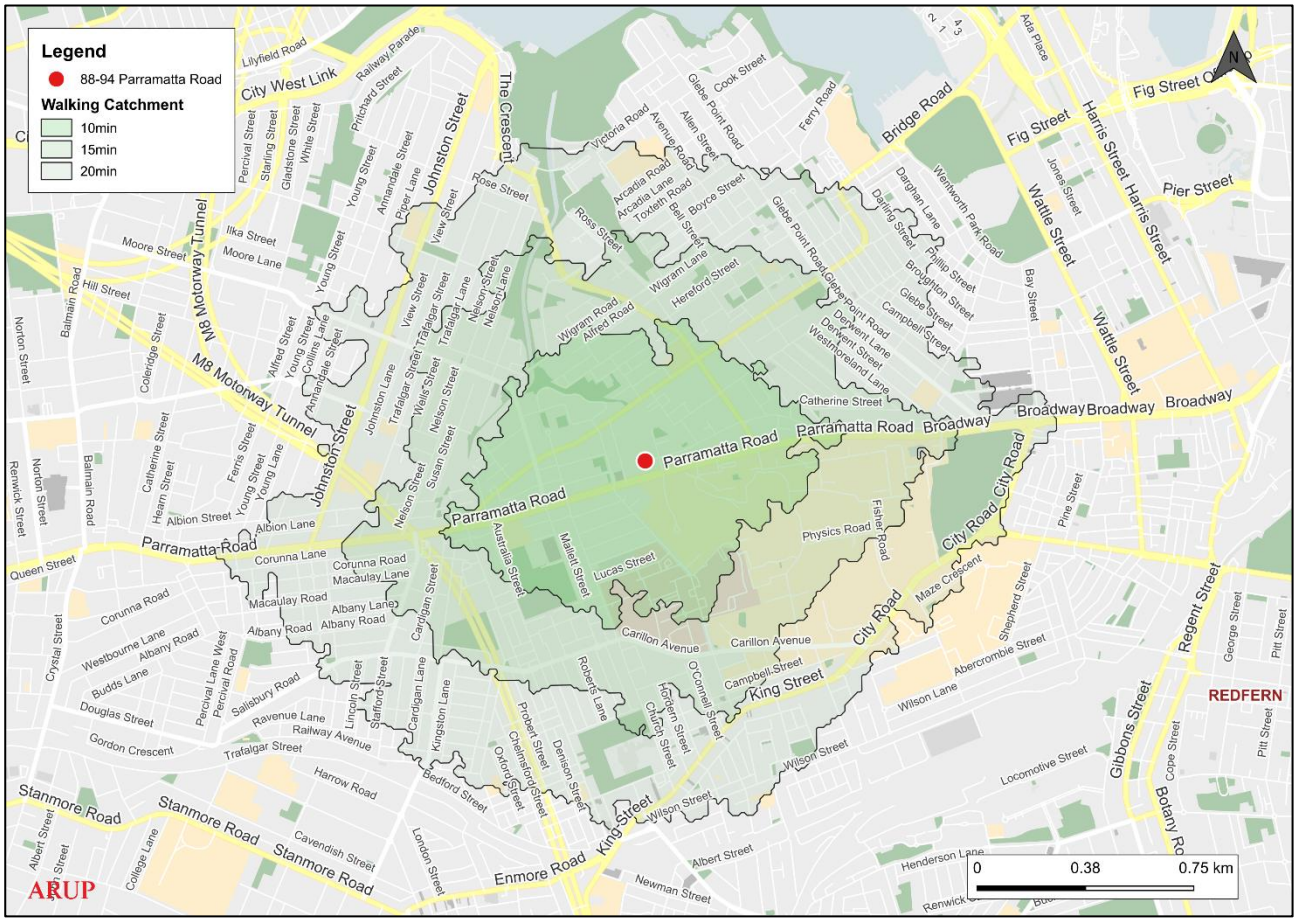


Figure 4: Walking accessibility

2.8 Cycling environment

The cycling accessibility of the Site is good due to its location in an urban setting and the presence of separated and shared use cycleways and paths as shown in Figure 5. Parramatta Road does not have any cycling infrastructure located along it. However, Bridge Road to the north has a separated off-road cycleway which connects into a network of off-road shared paths to the north of the Site.

A cycling accessibility assessment has been undertaken for the 10, 20 and 30-minute cycling catchments as shown in Figure 6. Four train stations and three light rail stops are located within the 10-minute cycling catchment. These train stations service the T2 and T3 rail lines and offer connections to the Sydney CBD and other key centres within Greater Sydney. The light rail stops services the L1 line connecting the Central Station to Dulwich Hill. Leichhardt, Chippendale and Stanmore are also a 10-minute cycle from the Site. Within the 20-minute catchment, additional train lines are accessible, such as the T1, T4, T8 and T9 as well as the new Metro line. Surry Hills, Balmain, Alexandria and Ashfield are all reachable within a 20-minute cycle. The Sydney CBD, Rosebery, Ashbury and Drummoyne are within a 30-minute cycle from the Site.

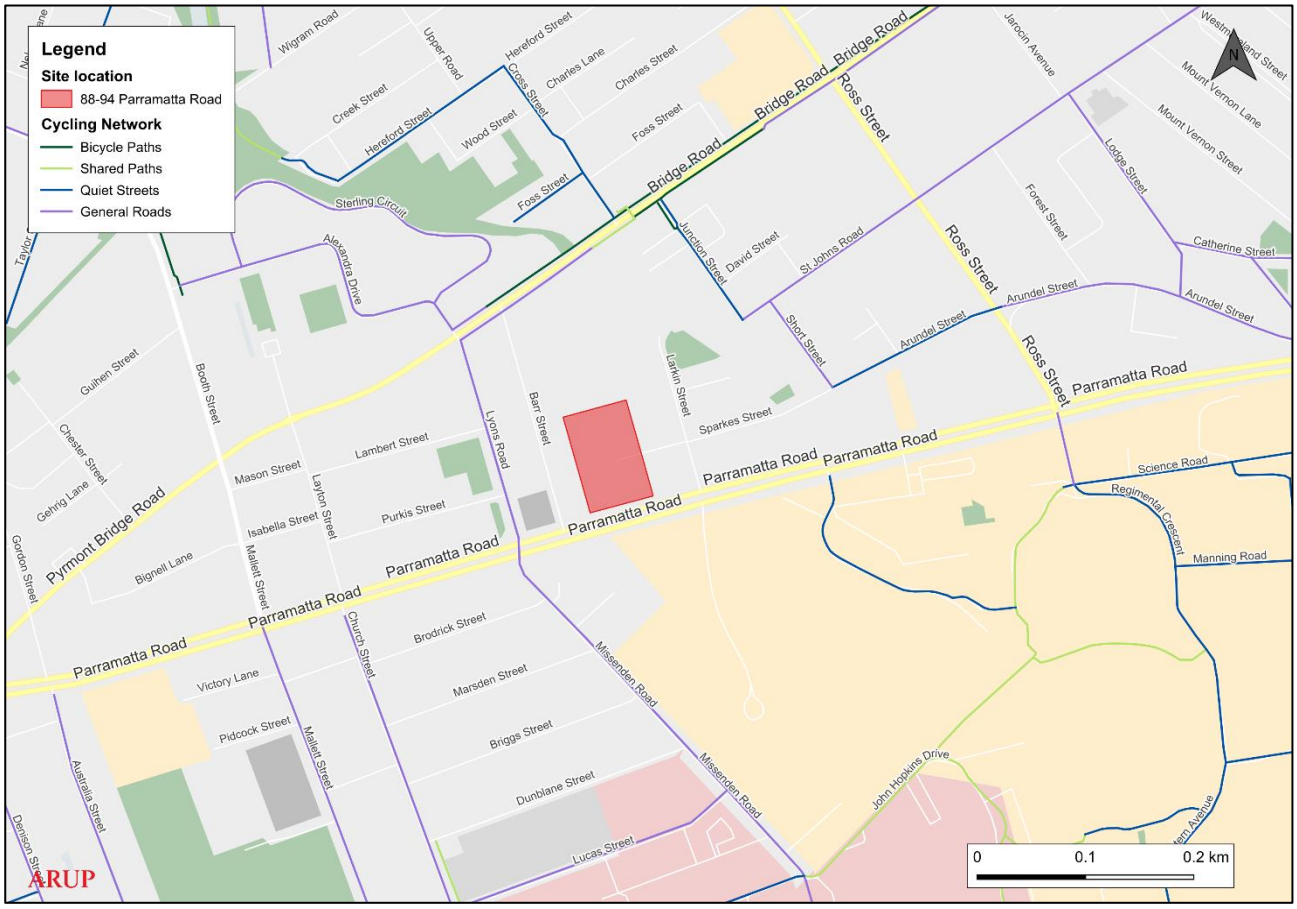


Figure 5: Cycling network (source: City of Sydney)

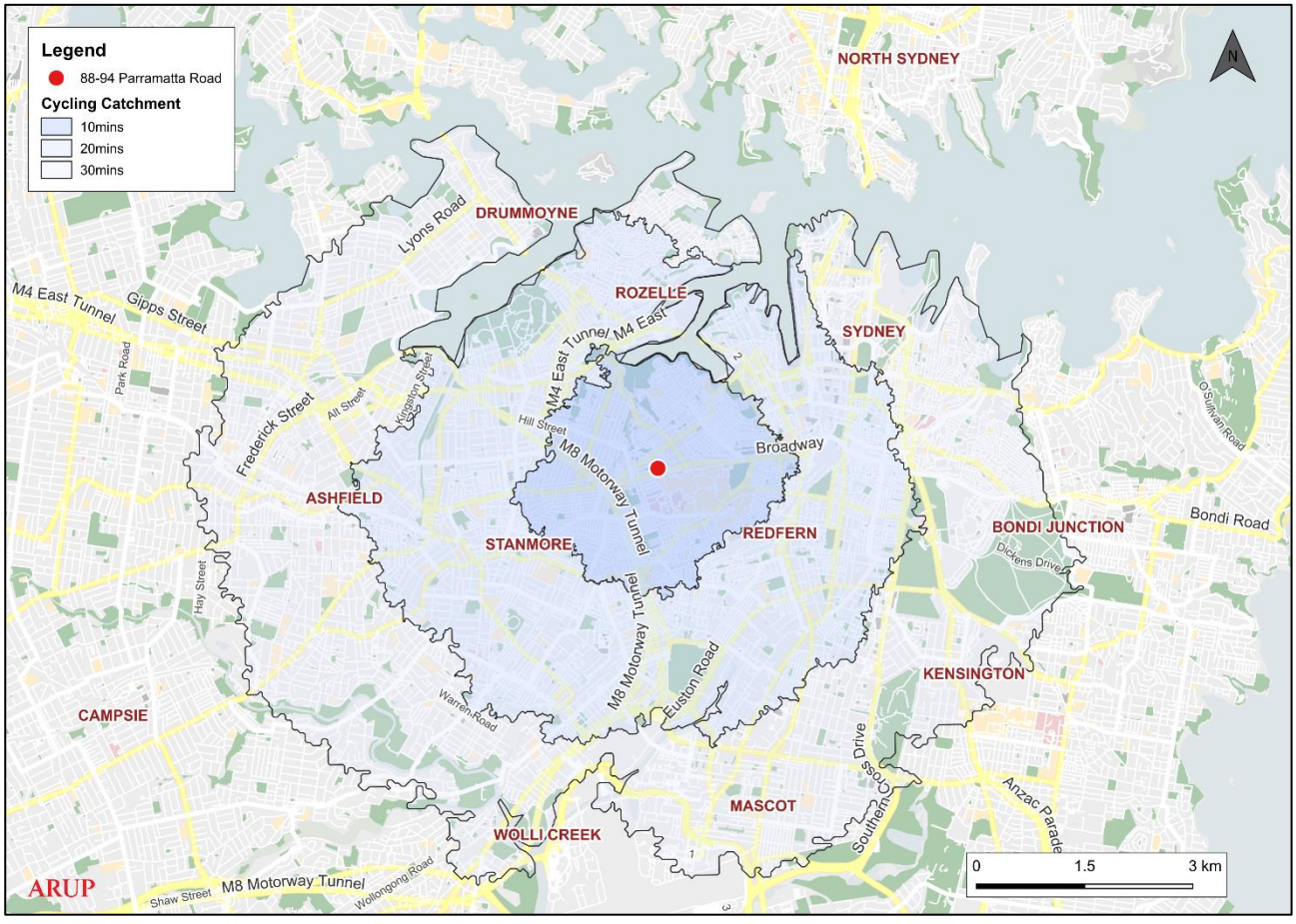


Figure 6: Cycling accessibility

2.9 Public transport

The Site is well connected to metropolitan Sydney as well as Greater Sydney via public transport. City of Sydney has categorised the Site's public transport accessibility as Category D, which is the highest level of accessibility. The train routes that service nearby stations mentioned in Section 2.7 and Section 2.8, stop at many stations around Sydney and most train lines are accessible with just one transfer. Bus services available on Parramatta Road and King Street connect the Site with other inner-city regions of Sydney.

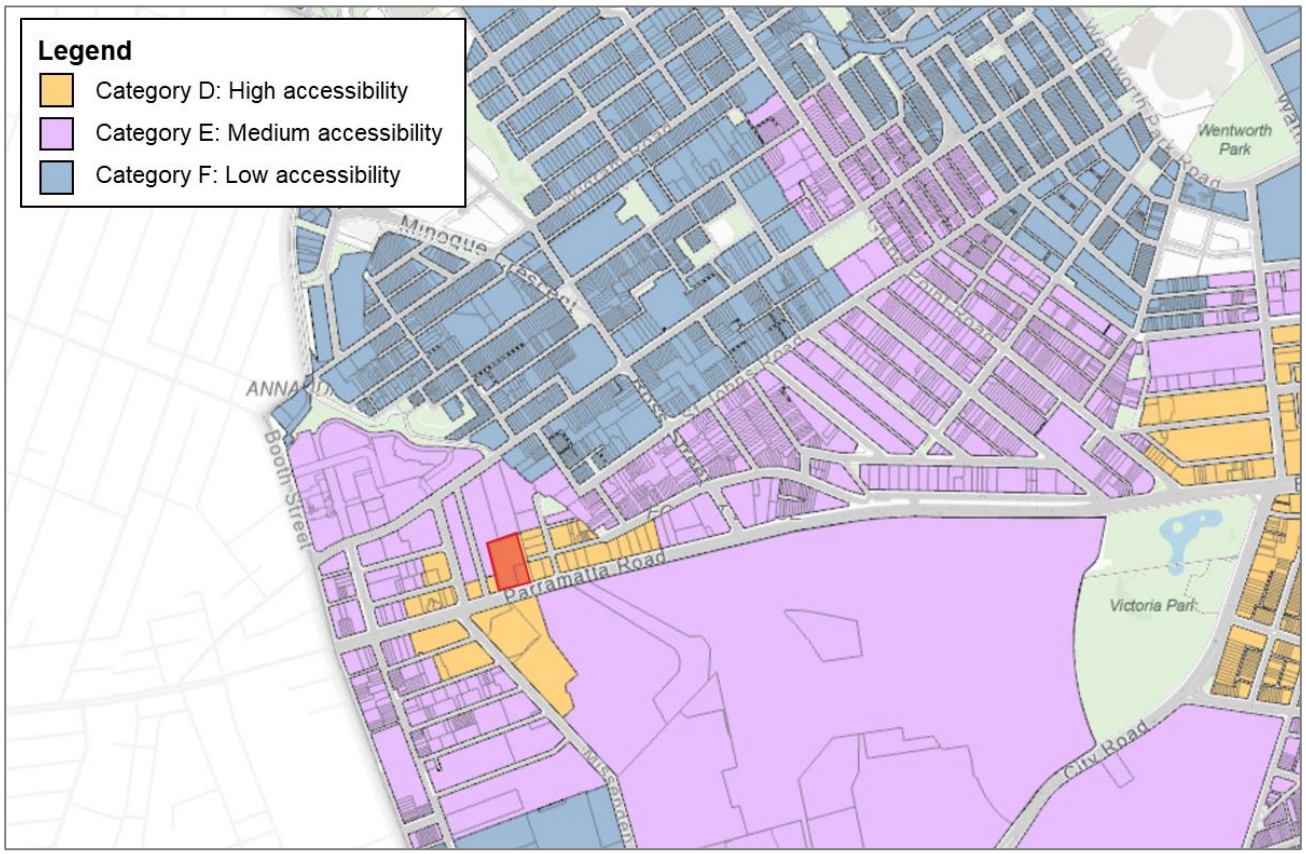


Figure 7: Public transport accessibility (source: City of Sydney LEP)

A public transport accessibility assessment has been undertaken for the AM (arriving at 9:00 am) and PM (departing at 5:30 pm) for the 15, 30, 45 and 60-minute catchments as shown in Figure 8 and Figure 9.

Public transport options available allow users to travel to/from as far as the likes of Parramatta, Chatswood and Revesby within 60 minutes. The inner city is mostly within the 45-minute catchment.

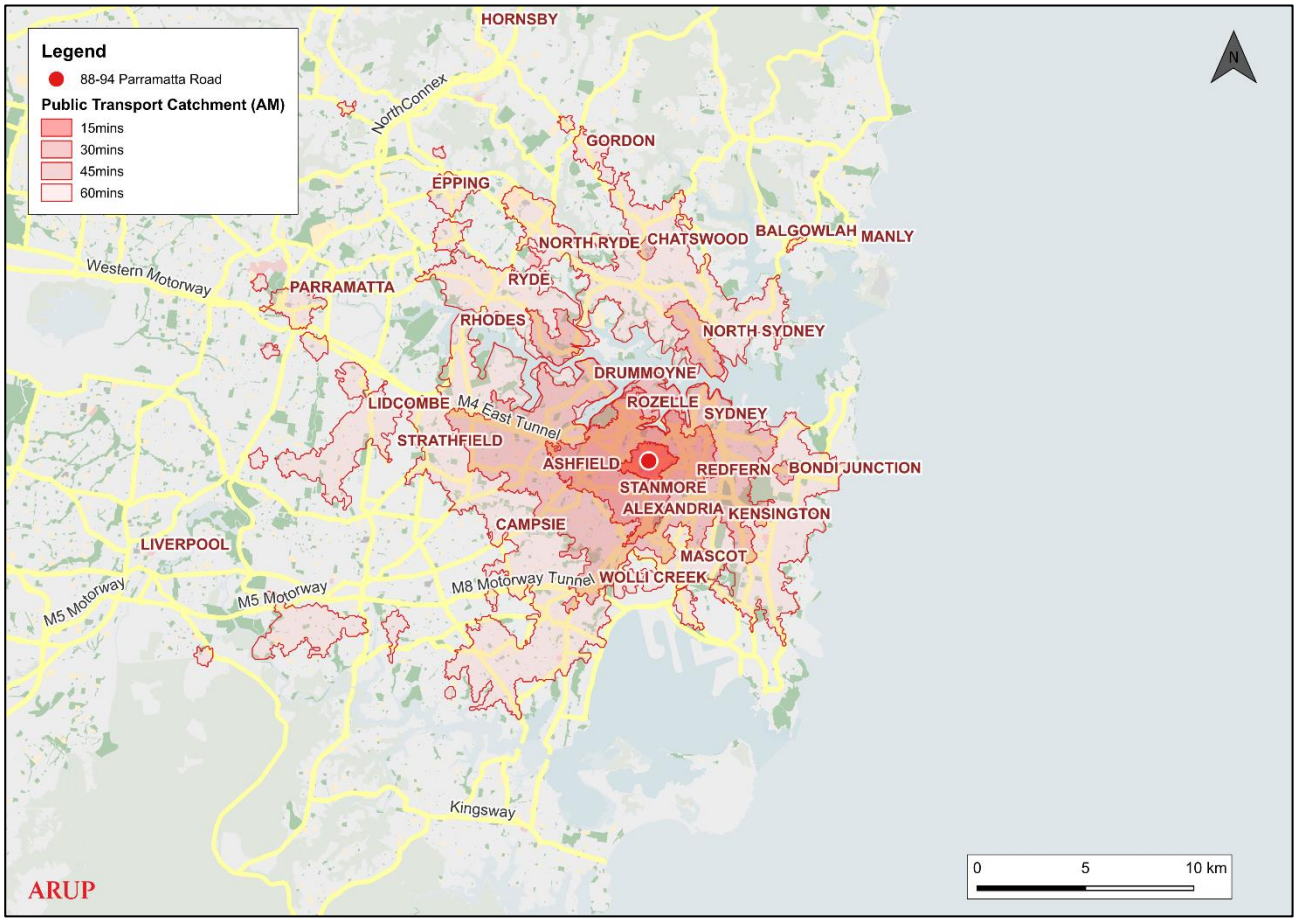


Figure 8: Public transport accessibility – AM (Arriving at the Site at 9am)

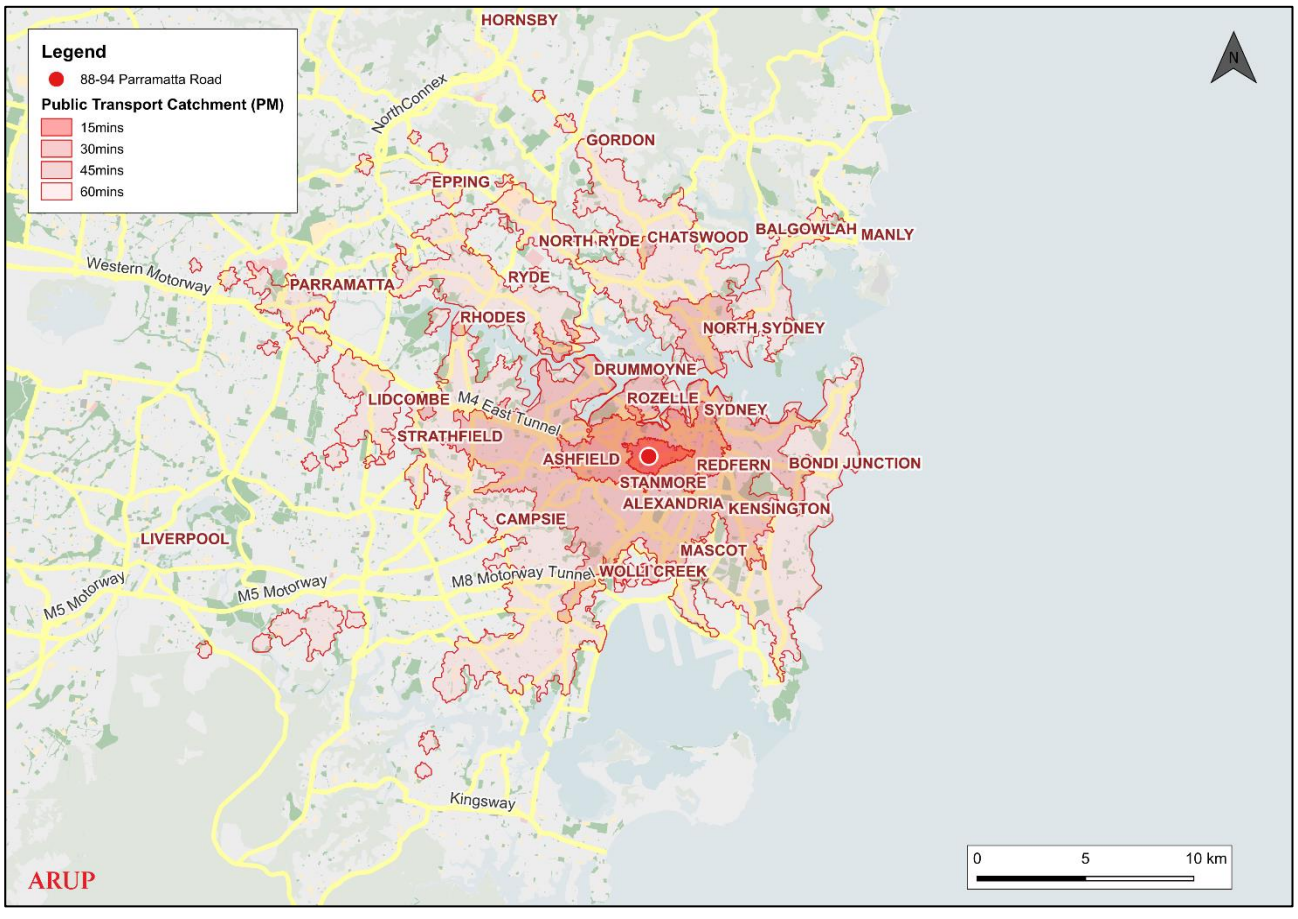


Figure 9: Public transport accessibility – PM (Departing from the Site at 5:30pm)

2.9.1 Bus

The Transdev John Holland bus routes service the roads surrounding the Site with the main routes located on Parramatta Road, King Street and Glebe Point Road. These services are shown in Figure 10 and summarised in Table 3.



Figure 10: Bus routes

Bus routes located within a 20-minute walk of the Site are summarised in Table 3, together with their respective service frequencies. These routes typically operate at least hourly between 6am and 9pm on weekdays and between 8am and 6pm on Saturdays and Sundays.

Table 3: Bus routes and frequency

Route	Description	Closest stop	Walk time to stop	AM Peak Frequency	PM Peak Frequency
352	Marrickville Metro to Bondi Junction	King Street	15 mins	2 Inbound 2 Outbound	2 inbound 3 Outbound
370	Coogee to Glebe Point	King Street/Glebe Point Road	15 mins	6 Inbound 9 Outbound	12 Inbound 7 Outbound
412	Campsie to City Martin Place via Earlwood & Dulwich Hill	Parramatta Road	5 mins	3 Inbound 4 Outbound	2 Inbound 3 Outbound
413	Campsie and Central Pitt Street	Parramatta Road	5 mins	5 Inbound 2 Outbound	3 Inbound 4 Outbound

Route	Description	Closest stop	Walk time to stop	AM Peak Frequency	PM Peak Frequency
422	Kogarah to Central Pitt Street	Parramatta Road	5 mins	4 Inbound 4 Outbound	4 Inbound 4 Outbound
423	Kingsgrove to City Martin Place	King Street	15 mins	6 Inbound 5 Outbound	14 Inbound 10 Outbound
423X	Earlwood Shops to Martin Place	King Street	15 mins	1 Inbound	2 Outbound
426	Dulwich Hill to City Martin Place	King Street	15 mins	4 Inbound 2 Outbound	4 Inbound 4 Outbound
428	Canterbury to City Martin Place	King Street	15 mins	6 Inbound 4 Outbound	4 Inbound 6 Outbound
428X	Canterbury Station to Martin Place	King Street	15 mins	3 Inbound	3 Outbound
430	Sydenham to Central Railway Square (Loop Service)	King Street	15 mins	3 Inbound	3 Inbound
431	Glebe Point to City Martin Place	Glebe Point Road	15 mins	6 Inbound 6 Outbound	5 Inbound 6 Outbound
433	Balmain Gladstone Park to Central Pitt Street	Minogue Crescent	12 mins	8 Inbound 5 Outbound	5 Inbound 6 Outbound
438X	Canterbury to City Martin Place	Parramatta Road	5 mins	10 Inbound 6 Outbound	6 Inbound 9 Outbound
440	Bondi Junction to Rozelle	Parramatta Road	5 mins	10 Inbound 5 Outbound	6 Inbound 5 Outbound
461X	Burwood to City Domain	Parramatta Road	5 mins	6 Inbound 5 Outbound	4 Inbound 6 Outbound
469	Marketplace Leichhardt to Glebe (Loop Service)	Ross Street	10 mins	3 Inbound	3 Inbound
470	Lilyfield to City Martin Place	Ross Street	10 mins	10 Inbound 6 Outbound	7 Inbound 8 Outbound
480	Strathfield to Central Pitt Street via Homebush Road	Parramatta Road	5 mins	3 Inbound 3 Outbound	2 Inbound 8 Outbound
483	Strathfield to Central Pitt Street via South Strathfield	Parramatta Road	5 mins	4 Inbound 2 Outbound	4 Inbound 3 Outbound

2.9.2 Light Rail

The Site is not currently served directly by light rail. The closest light rail station is Glebe Station located 1.5km (a 20-minute walk) northeast from the Site. Glebe Station is part of the L1 light rail line which connects Dulwich Hill and Central Station at a service frequency of every 6 minutes during the weekday peak, 10 minutes during weekday off peak and 15 minutes on Saturdays.

Glebe Station is accessible from the Site via the 440 and 469 bus routes which both stop on Glebe Point Road within 260m walk from the light rail station.

The ALTRAC consortium has proposed a new light rail line from Parramatta Road to Green Square via Central Station. The proposed 11km route would run along Parramatta Road and Broadway, passing through Central Station and various stops along the route, before terminating at Green Square Station. If delivered, the project would significantly improve public transport within the local area and provide an alternative option to access the Site from Sydney CBD.

On 24 June 2024, City of Sydney confirmed its support for the project and committed to working with the NSW Government and other stakeholders to accelerate the planning, consultation and delivery of the project as soon as possible[1].

2.9.3 Train

The nearest train station to the Site is Macdonaldtown Station which is located approximately 1.6km (a 23-minute walk) south of the Site, or a 10-minute cycle. Macdonaldtown Station is served by T2 train services which connect Parramatta to Sydney CBD via Strathfield every 8-15 minutes during peak hours. The Station is also served infrequently by T3 Liverpool and Inner West Line services.

Further from the Site, there are options for alternative rail lines. Erskineville Station is located approximately 400m south of Macdonaldtown Station and 2km south of the Site. This station is served by Sydney Trains T8 Airport and South services which connect Sydenham and Campbeltown to Sydney CBD every 15 minutes during peak hours.

2.9.4 Metro

While the Site is not directly served by Sydney Metro, Metro services can be accessed from Central Station approximately 2.3km to the east of the Site (10-minute cycle). Central Station is served by the Metro M1 line which connects Tallawong to Sydenham via Sydney's CBD with services running every 4 minutes during peak hours. This line will eventually continue directly to Bankstown via the converted T3 line to metro services.

Central Station is accessible from the Site via multiple bus routes that operate along Parramatta Road and Broadway, including the 422, 412, 413 and 483. These services stop on Pitt Street within 150m of Central Station.

2.10 Travel behaviour

Australian Bureau of Statistics (ABS) 2016 Census data has been used to understand travel. The existing mode share for the Site was calculated using the 2016 Journey to Work Census data for two Statistical Area Level 2 (SA2) Glebe/Forest Lodge and Newtown/Camperdown/Darlington, with resultant mode shares presented below in Table 4.

2016 Census data was used to approximate the existing mode share. The more recent 2021 Census data was not used due to the significant impact on movement during the COVID-19 pandemic.

[1] https://meetings.cityofsydney.nsw.gov.au/ieDecisionDetails.aspx?AIId=17932

Table 4: Existing mode share for SA2 (Glebe/Forest Lodge and Newtown/Camperdown/Darlington)

Mode	Mode share 2016
Private vehicle	44%
Rail	24%
Bus	14%
Walk	13%
Bicycle	3%
Motorcycle	1%
Ferry	<1%
Other	<1%

The most common mode of transport is private vehicle followed by public transport. Due to the large area of the two SA2s used the mode share may not be exactly representative of the Site. The Site has a Public Transport Accessibility Level Category D, as shown in Figure 7, which is the highest level. The surrounding area surrounding the Site is Category E or F. This would indicate that the Site has better access to Public Transport than the rest of the SA2's and the public transport mode share is likely higher than what is shown in Table 4.

3. Proposed development

This section describes the proposed development including proposals for pedestrian, cycle and vehicular access as well as cycle and car parking facilities.

3.1 Site layout

With regard for the increased floor space ratio and height, the reference scheme considers a new life science and life science education buildings the Planning Proposal intends to increase floor space ratio and height to enable a new Life Science Hub.

The Proposal involves the construction of a new Life Science building and Life Science Office and Education building, and a small amount of retail. The Proposal includes three basement levels, two for parking and one loading dock. The Site will be accessed from the east via Sparkes Street.

The Site is currently zoned for mixed use - MU1. The area surrounding the Site is zone for infrastructure – SP2 to the south and mostly residential - R1 to the north. The Site is currently a university building with research labs and workspaces. A schedule of the proposed land uses and floor areas can be seen in Table 5.

Table 5: Proposed Area Schedule (Gross Floor Area [GFA])

Level	Office	Life Science
	GFA	GFA
Ground	550m^2	2,205m^2
Level 1	1476m^2	1,280m^2
Level 2	1116m^2	1,600m^2
Level 3	922.5m^2	1,200m^2
Level 4	765m^2	1,600m^2
Level 5	765m^2	1,800m^2
Level 6	765m^2	1,800m^2
Level 7	287.5m^2	1,800m^2
Level 8	-	1,800m^2
Level 9	-	1,800m^2
Level 10	-	1,800m^2
Level 11	-	1,800m^2
Level 12	-	1,800m^2
Level 13	-	1,800m^2
Level 14	-	1,800m^2
Level 15	-	1,800m^2
Total	**6,647m2**	**27,685m^2**

The proposed layout for the Site is shown in Figure 11.

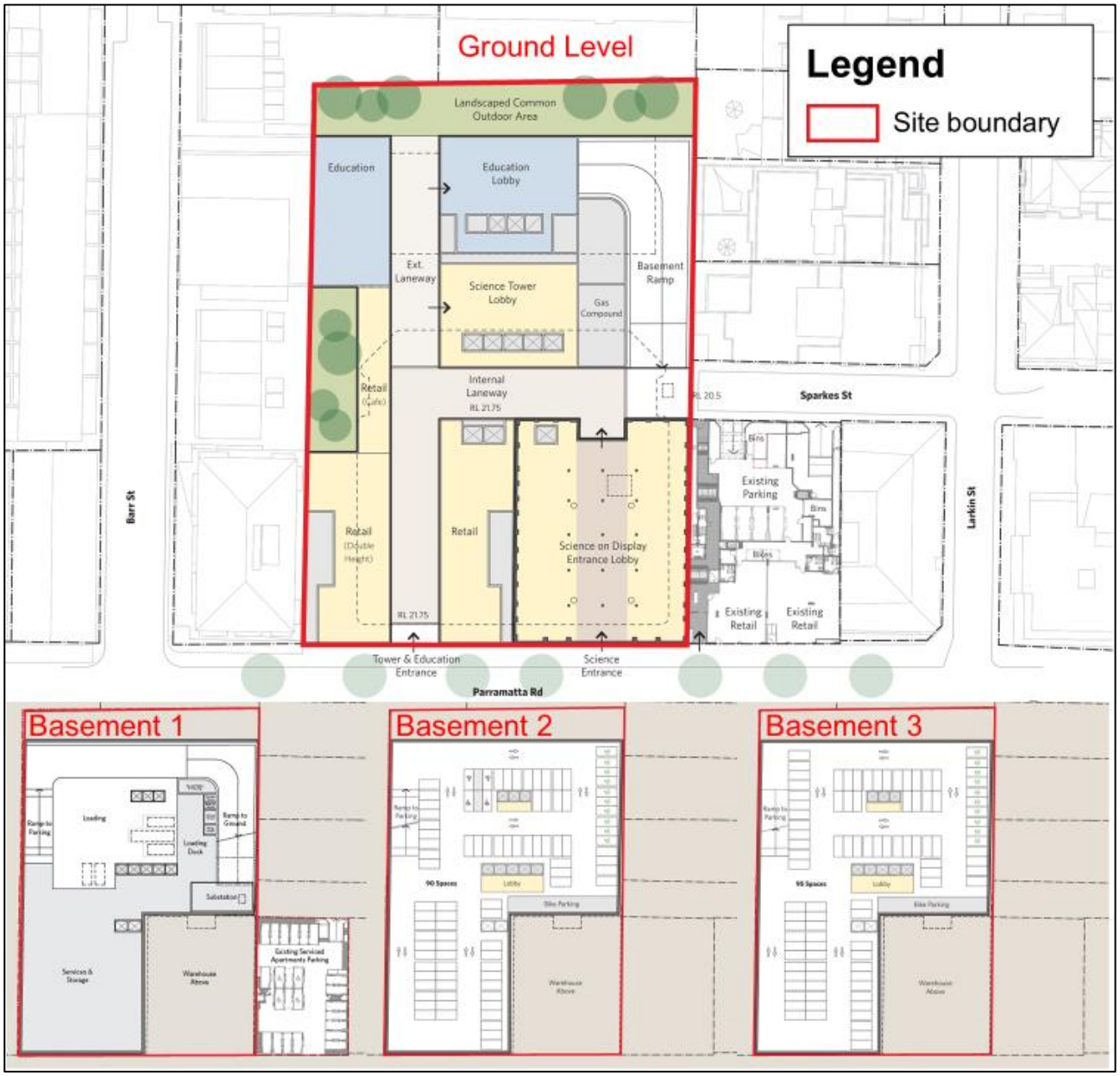


Figure 11: Proposed site layout

3.2 Site access

The following sub-sections detail the key principles of the pedestrian, cycling and vehicular movement and access strategy for the proposed development.

3.2.1 Pedestrian and cycling access

The pedestrian and cyclist access points for the Site are shown in Figure 12.

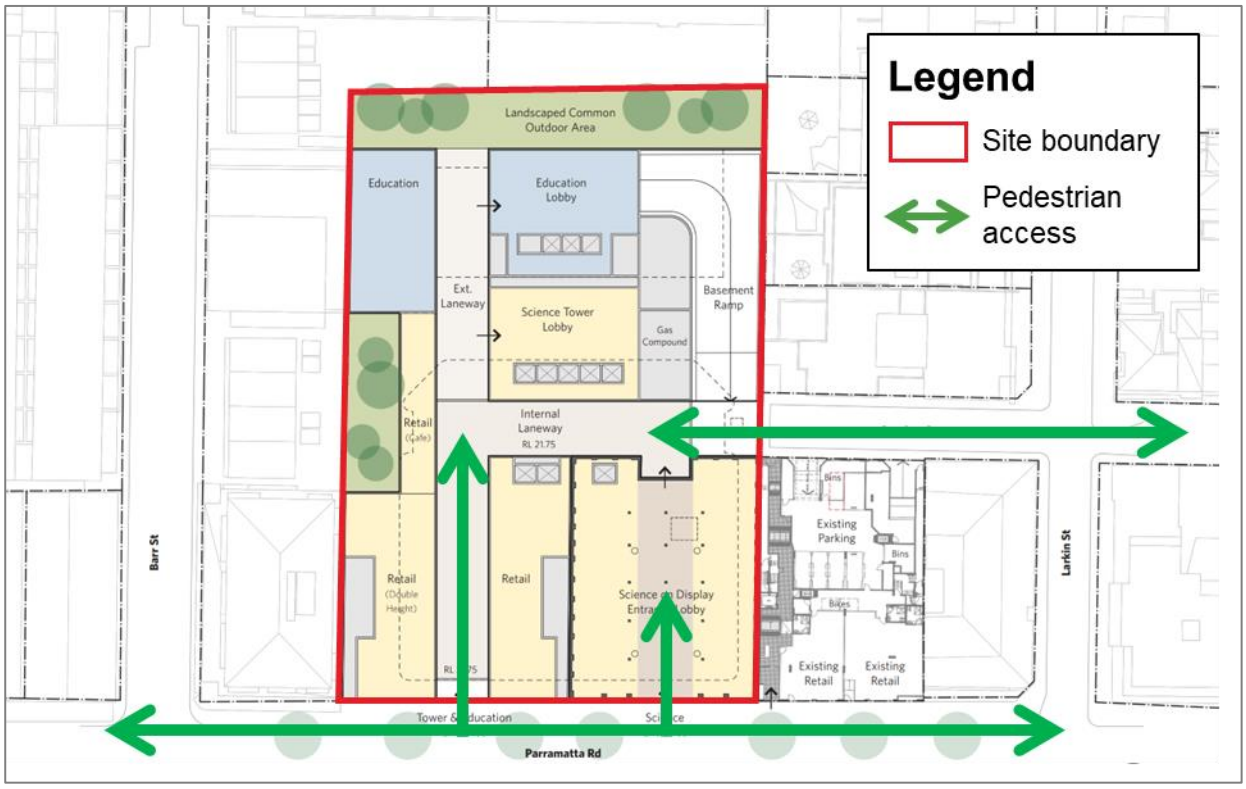


Figure 12: Pedestrian and cycling access

The main pedestrian access points to the Site are proposed from Parramatta Road with an entrance that provides access to the education building via an internal laneway and a dedicated science entrance that facilitates access to the lobby for the life sciences building.

3.2.2 Vehicle access

The proposed development site has been designed to accommodate vehicle movements associated with car parking, delivery and servicing activities. Access to basement level car parking and loading dock is proposed to be from Sparkes Street, as shown in Figure 13.

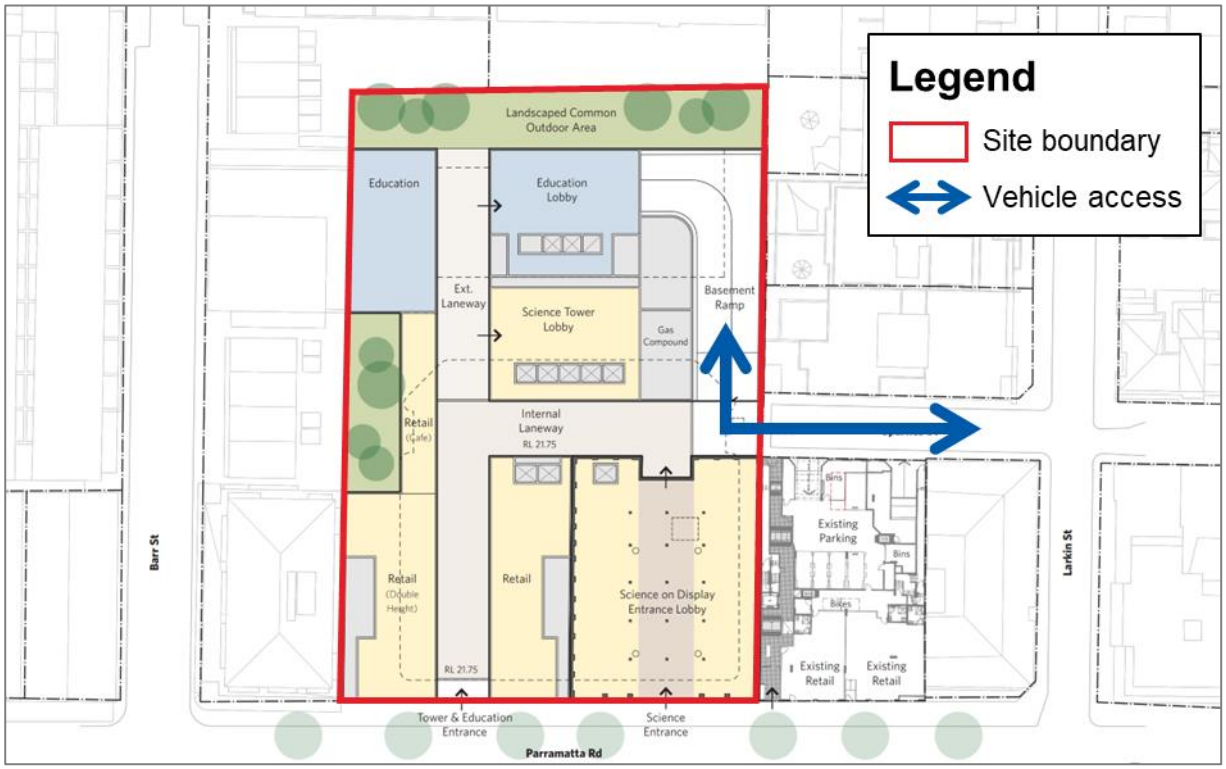


Figure 13: Vehicle access

3.2.3 Utilities access

3.2.3.1 Laboratory gases

Cryogenic gas is required for laboratory activities at the proposed development. Delivery and servicing activities associated with laboratory gases are proposed to take place on Sparkes Street adjacent to the proposed basement ramp access.

Laboratory gas deliveries would be undertaken using an 8.8 m Medium Rigid Vehicle (MRV).

BOC has confirmed that the proposed liquid nitrogen and liquid carbon dioxide storage vessels can be serviced using its smaller delivery vehicles. BOC has also confirmed that an 8.8 m entrance allowance would accommodate the vehicle used to deliver gas cylinders. Further details regarding the proposed storage volumes, delivery vehicles and BOC correspondence are provided in the *Utility Services Review – Technical Memo, Rev F*, dated 15 September 2026.

Delivery and servicing activities associated with laboratory gases would occur from Sparkes Street. Swept-path analysis that demonstrates the vehicle movements through the surrounding street network and at the site access for the 8.8 m MRV is provided in Appendix C, whereas the key findings of the analysis are discussed in Section 4.5.

This will need to be managed in liaison with the 84 Parramatta Road serviced apartments where possible.

Basement access is expected to be unavailable during delivery periods and therefore traffic management will be required.

3.2.3.2 Electrical services

A 3x1500kVA triplex transformer chamber substation is to be installed to supply the proposed development in consultation with local power supply authority Ausgrid. The substation is proposed to be installed at basement level with equipment access from ground level via an equipment access hatch, as shown in Figure 14 and Figure 15. Traffic management will be required on Sparkes Street to manage vehicle movements to and from the Site during the servicing and replacement of substation equipment. As the replacement of substation equipment occurs infrequently, the impact is deemed to be insignificant.

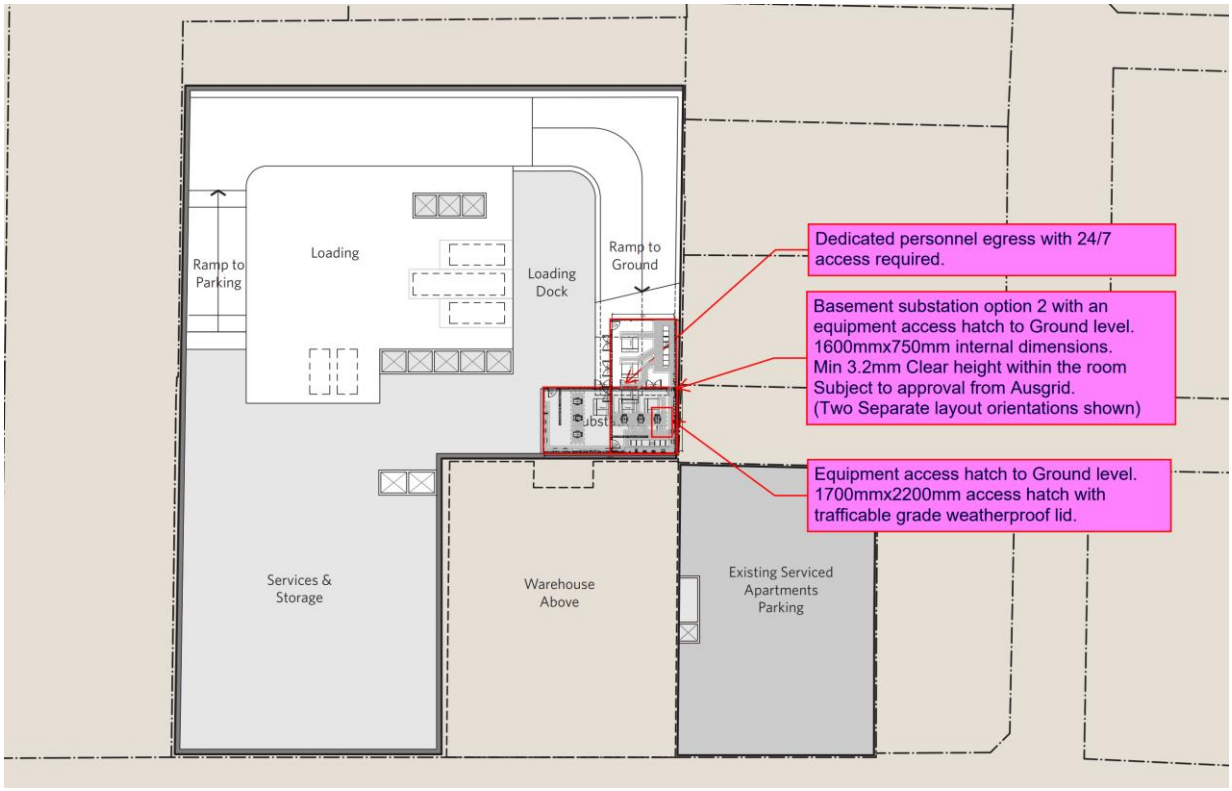


Figure 14: Basement Substation with Access Hatch (Extracts from Basement)

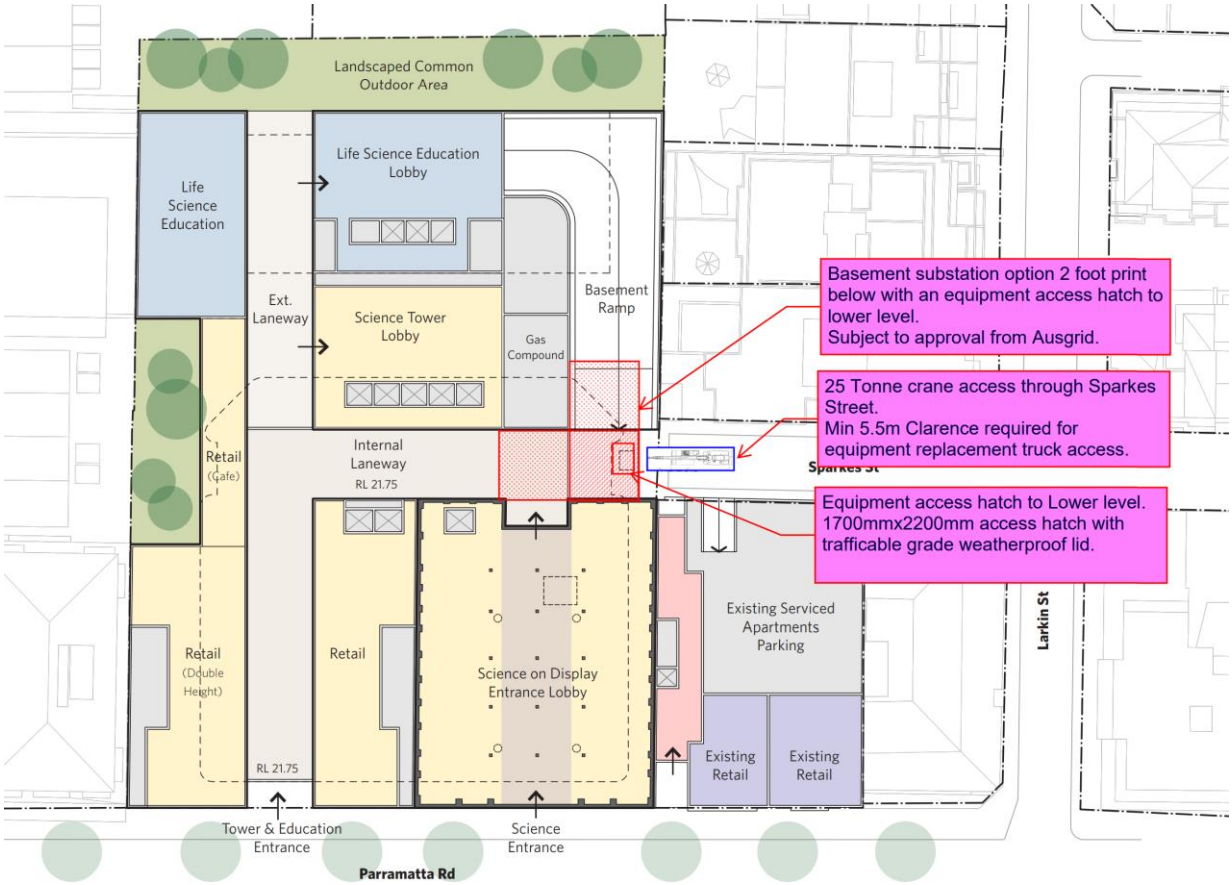


Figure 15: Basement Substation with Access Hatch and Crane Access (Extracts from Ground)

3.3 Vehicle parking

CoS Local Environmental Plan (LEP) sets out car parking rates for developments within CoS Local Government Area (LGA), within Appendix C – Parking Rates Update (December 2024).

A parking rate for Life Sciences is not provided in the LEP. Therefore, it has been assumed that the industrial rate applies, given that life sciences is a form of high technology industry. It is important to note that the rate for industrial is also being updated as part of the amendments. The maximum parking provision for the development has been calculated using both sets of rates and is detailed in the Table 6.

Table 6: Maximum car parking

Land use	GFA (m2)	CoS LEP Amendments	
		Rate	Spaces
Life Science (Industrial)	27,685m^2	1 per 150m^2	185 spaces
Life Science (Office)	6,647m^2	M=(GxA)/(75xT)	14 spaces
	Total	**199 spaces**	

A total of 185 car parking spaces is proposed to be provided over two basement levels, as shown on Figure 16. The proposed basement level car parking will replace 77 existing car parking spaces associated with the University life sciences buildings. The net increase in proposed car parking at the Site is therefore 108 spaces.

As the proposed 185 car parking spaces have not been assigned to specific land uses yet, these spaces have been pro-rated to land uses based on CoS LEP Amendments maximum car parking in Table 6.

A total of 10 EV spaces has been provided on basement level 2.

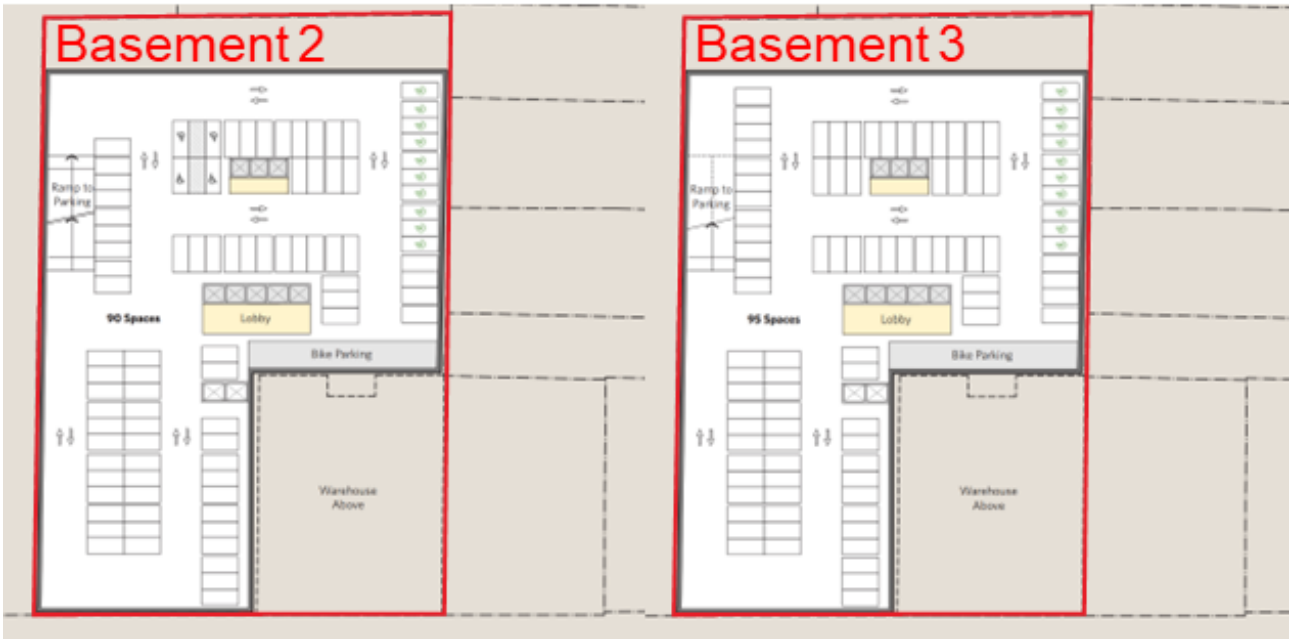


Figure 16: Proposed basement level car parking

3.4 Loading dock

It is proposed that delivery and servicing activities for the development will take place within the Basement 1 loading dock, accessed from Sparkes Street.

The loading dock is proposed to contain five loading bays, comprising one bay suitable for a 9.8 m waste vehicle, two bays suitable for 8.8 m Medium Rigid Vehicles (MRVs), and two bays suitable for 6 m Small Rigid Vehicles (SRVs).

A 9.8 m rear-lift waste collection vehicle was adopted as it represents a common commercial waste vehicle type, specifications were taken from Veolia's brochure[2].

City of Sydney DCP (2012) requires the following minimum servicing requirements for service vehicle parking for new developments:

- Commercial premises
  - 1 space per 3,300sqm GFA, or part thereof, for the first 50,000sqm
- The total requirement identified above may be reduced for developments with GFAs in excess of 50,000sqm where it can be demonstrated to the satisfaction of the consent authority that:
  - The proposed uses are complementary in terms of servicing demand; and
  - At least one space per tenancy for business owners is provided.

Five servicing bays are provided in total, with at least one space per tenancy for business owners is provided. Detailed servicing trip generation is provided in Section 4.2 to support the provision of 5 bays.

The loading dock has been designed such that vehicles will be able to access and exit in forward gear. Servicing and delivery activities would be managed to avoid simultaneous movements by the 8.8 m MRV and 9.8 m waste vehicle, minimising potential conflicts at the bend in the basement ramp. The loading bays can be seen in Figure 17.

The associated swept path analysis of vehicles manoeuvring within the loading dock has been undertaken and is contained in Appendix B.

The impacts of the proposed 8.8 m MRVs and 9.8 m waste vehicle on the surrounding local street network, are assessed via swept paths analysis in Section 4.5.

[2] https://www.anz.veolia.com/sites/g/files/dvc2011/files/document/2024/07/Veolia_Equipment%20Matrix%20Brochure_05-23.pdf

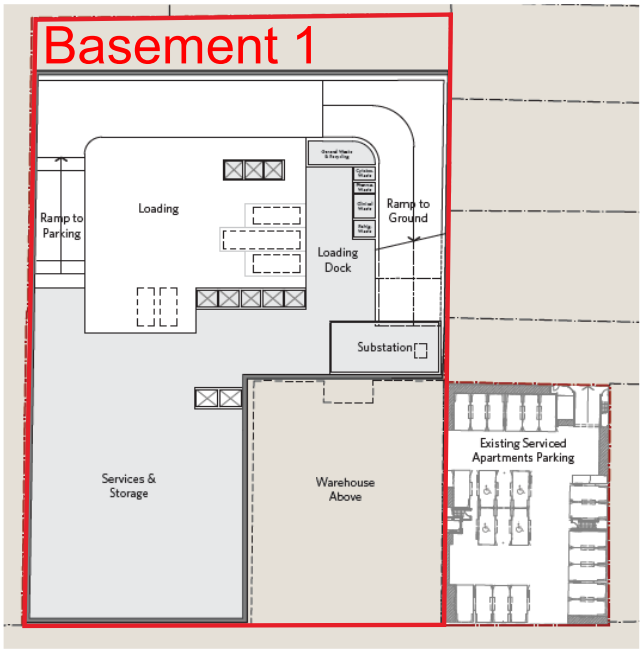


Figure 17: Loading dock

3.5 Bicycle parking and End of Trip Facilities

The provision of good quality bicycle parking will be incorporated into the development. The DCP provides guidance on the provision of bicycle facilities to support sustainable travel outcomes. The bicycle parking provision of the development will meet the number of spaces required and will be located in the southeast corner of basements 2 and 3.

Table 7: Minimum cycle parking rates

Land use	Quantum	Rate		Requirement	
		Resident / Employee	Visitor	Resident / Employee	Visitor
Life science (industrial)	27,685m^2	1 per 10 staff (966 FTE)	-	97	-
Life science Education (Office)	6,647m^2	1 per 150m^2 GFA	1 per 400m^2 GFA	44	17
Total				c. 141	17

4. Transport impact assessment

4.1 Trip generation

As there are no published trip generation rates specifically for life sciences developments within the TfNSW Guide to Traffic Generating Developments 2002 (GTGD), a first-principles approach has been adopted to estimate vehicle trip generation associated with the Proposal. The methodology has been informed by two comparable developments within the Camperdown health and innovation precinct:

- Children's Medical Research Institute (CMRI) Gene Technologies Building, documented in the Transport Impact Assessment (March 2025)
- Sydney Biomedical Accelerator (SBA), documented in the Sydney Biomedical Accelerator Transport Impact Assessment (October 2023).

Both developments comprise specialised biomedical and life sciences research facilities with a comparable mix of laboratory, research, teaching and supporting workspace functions to those proposed at the Site.

4.1.1 Building capacity estimation

The benchmark assessments were reviewed to establish the relationship between gross floor area (GFA) and building capacity. As shown in Table 8, building capacity ratios were derived for the CMRI and SBA benchmark developments and blended to establish an adopted benchmark rate. This rate was then applied to the Proposal's GFA to estimate the building capacity adopted for traffic demand calculations.

Table 8: Building capacity benchmark and estimate

Item	GFA	Building capacity	Building capacity ratio
CMRI Gene Technologies Building	27,692m²	770 persons	1 person / 36m²
Sydney Biomedical Accelerator	37,400m²	1,953 persons	1 person / 19m²
Adopted blended benchmark rate	—	—	1 person / 28m²
Proposal	34,332m²	1,246 persons	1 person / 28m²

The existing development is estimated to accommodate approximately 82 workers, as identified in the Economic Impact Assessment prepared for the Proposal. This existing building capacity has been considered when estimating the net increase in person-based travel demand associated with the Proposal.

4.1.2 Staff arrival profile

The CMRI travel survey data was reviewed to understand the distribution of staff arrivals and departures throughout the day. The survey identified the busiest arrival and departure hours within the daily profile and the proportion of total daily movements occurring during those periods.

The survey data indicates that:

- the busiest arrival hour accommodated approximately 51% of total daily staff arrivals; and
- the busiest departure hour accommodated approximately 44% of total daily staff departures.

These arrival and departure profiles were adopted as the basis for estimating peak-hour occupant movements associated with the Proposal.

4.1.3 Network peak hour adjustment

The proposed life sciences development is expected to operate over an extended period between approximately 7:00 AM and 7:00 PM, with arrivals and departures occurring throughout the day rather than being concentrated within a traditional office peak period.

For context, the CMRI arrival and departure profiles identify the busiest staff arrival and departure hours for that development. However, these periods are not expected to directly align with the assessed road network peak hours of 7:45 AM - 8:45 AM and 5:15 PM - 6:15 PM.

For the Proposal, staff movements are expected to be concentrated around the start and end of the operating day, rather than wholly within the road network peak hours. As a result, a significant proportion of arrivals and departures are expected to occur outside the AM and PM network commuter peak hours.

Nonetheless, a 40% network peak hour adjustment factor has been applied to the benchmark arrival and departure profiles to estimate the proportion of building capacity movements occurring during the assessed road network peak hours.

4.1.4 Vehicle trip generation

The Proposal and existing site vehicle trips were estimated separately using the adopted arrival/departure profile, network peak hour adjustment and private vehicle mode share, as shown in Table 9 and Table 10.

Table 9: Proposal total estimated vehicle trips

Step	Item	AM peak	PM peak
A	Building capacity	1,246 persons	1,246 persons
B	Busiest arrival/departure hour	51% arrivals	44% departures
C	Network peak hour adjustment	40%	40%
D	Persons travelling in network peak (A x B x C)	254.2 persons	219.3 persons
E	Private vehicle mode share	44%	44%
F	**Total vehicle trips (D x E)**	**112 trips**	**96 trips**

Table 10: Existing site estimated vehicle trips

Step	Item	AM peak	PM peak
A	Estimated workers	82	82
B	Busiest arrival/departure hour	51% arrivals	44% departures
C	Network peak hour adjustment	40%	40%
D	Persons travelling in network peak (A x B x C)	16.7 persons	14.4 persons
E	Private vehicle mode share	44%	44%
F	**Total vehicle trips (D x E)**	**7**	**6**

Net additional vehicle trips were then calculated by deducting the estimated existing site trips from the Proposal total trips. The directional split was applied to the net additional trips, as shown in Table 11, to determine the inbound and outbound trips adopted for traffic modelling.

Table 11: Net additional trips and direction by direction

	AM		PM	
Proposal total vehicle trips	112 trips		96 trips	
Less: existing site vehicle trips	7 trips		6 trips	
Net (additional) vehicle trips	105 trips		90 trips	
	Inbound	**Outbound**	**Inbound**	**Outbound**
Directional split	90%	10%	10%	90%
Net additional trips by direction	95 trips	10 trips	9 trips	81 trips

4.2 Servicing trip generation

Deliveries are expected from 7am-5pm on weekdays, with some exceptions for out-of-hours deliveries.

The loading dock will be managed and accept:

- Dangerous goods deliveries and storage.
- Dangerous waste storage and removals.
- Bulk gas delivery and refuelling and bulk cylinder gas provision.
- Delivery and removal of large scientific instrumentation.
- Bulk consumable palette deliveries.
- Diesel back-up generator refuelling.

A management system would be implemented to minimise impacts on the surrounding road network during peak periods. A high-level UFFM assessment indicates that the development, excluding the serviced apartments, is expected to generate approximately 125 service and delivery vehicles per week, equivalent to approximately 25 vehicles per day or 50 vehicle trips per day comprising inbound and outbound movements.

Servicing activity is generally distributed outside peak traffic periods. During the peak hours, servicing demand is expected to be low, with up to one servicing vehicle anticipated during the PM peak hour and a higher concentration of activity during the AM peak, as reflected in the table above. This corresponds to a total of up to six vehicle trips during the peak hour period.

It is anticipated that servicing vehicles will generally arrive and depart within a short timeframe, with most servicing activities taking less than 30 minutes to complete. On this basis, the provision of five servicing bays is considered sufficient to accommodate peak servicing demand without adverse impacts on the surrounding road network.

Table 12 Service vehicle trips

Timeframe	Vehicles	Trips (in and out)
Vehicles per day	25 vehicles	50 trips
Vehicles during the peak hour	AM Peak: 2 vehicles PM Peak: 1 vehicle	AM Peak: 4 trips PM Peak: 2 trips
Total peak hour trips		6 trips

4.3 Vehicle trip distribution

The regional distribution of vehicle trips generated by the Proposal has been derived from Journey to Work data from the 2021 ABS Census. Origin-to-destination trip records were extracted for the destination zone encompassing the Site (DZN 113311281) and filtered to car-based journeys only.

Each origin was routed to the Site (by Google Maps API) to identify the most likely path through the surrounding road network for a typical weekday, with separate routes generated for the AM and PM peak periods. For each turn movement at the six modelled intersections, the proportion of total development traffic passing through that movement was then calculated, as summarised in Table 13 (inbound) and Table 14 (outbound).

The most prominent routes to and from the development are shown in Figure 18 and Figure 19 respectively. These illustrate the dominant travel routes only, and do not show every lower-demand route variation through the surrounding network. The routes are also presented as stick diagrams in Appendix D, in the 'Development AM' and 'Development PM' sheets.

Together, this provides an evidence-based estimate of how vehicle trips are likely to arrive at and depart from the Site, reflecting both observed Journey to Work patterns and realistic route choices through the local road network.

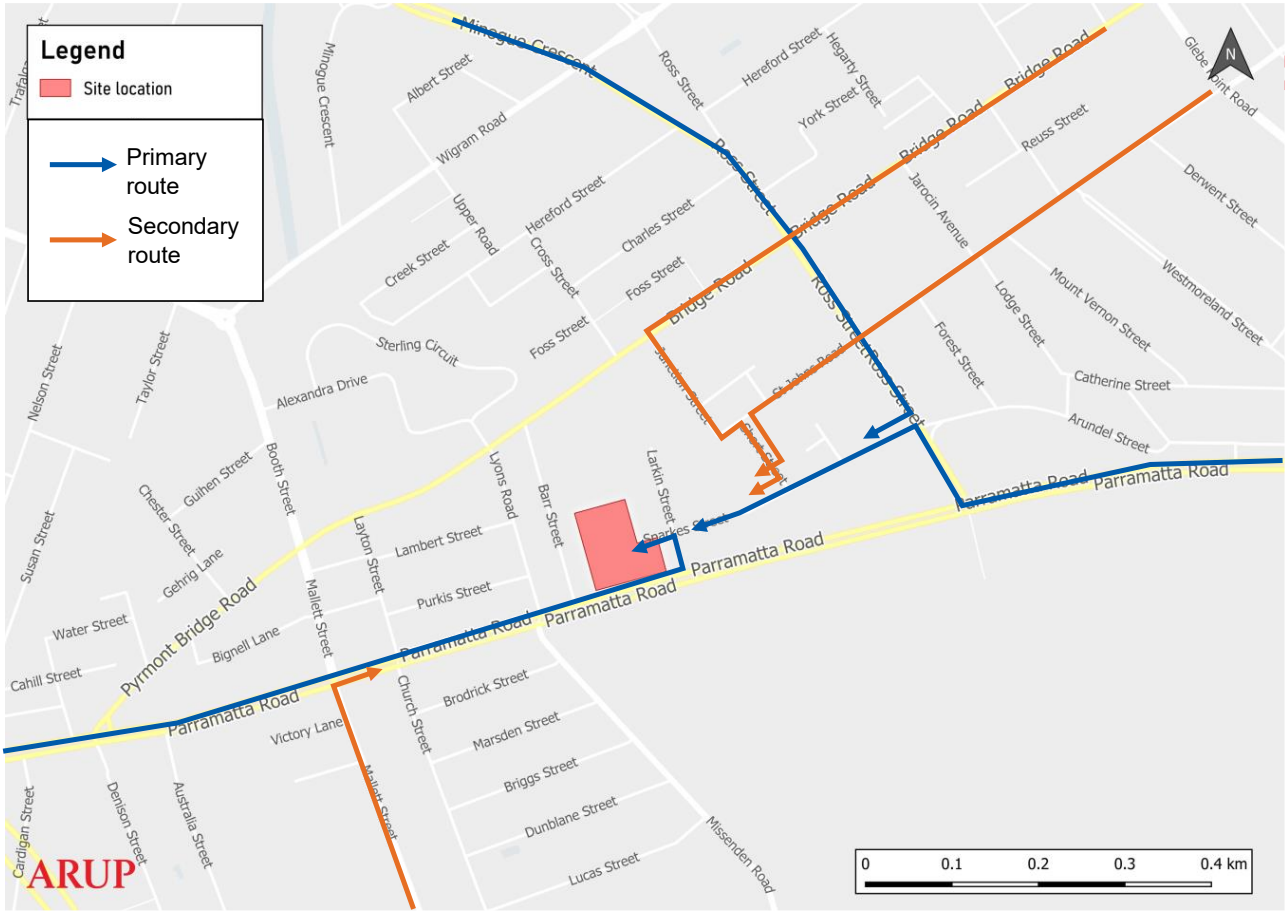


Figure 18: AM inbound routes from the development



Figure 19: PM outbound routes from the development

Table 13: Proportion of AM trips traveling to Site

Intersection	From leg	To leg	Percent of total inbound trips
Arundel Street / Ross Street	N	W	20%
Arundel Street / Ross Street	S	W	14%
Bridge Road / Ross Street	N	S	20%
Bridge Road / Ross Street	E	W	9%
Bridge Road / Ross Street	E	S	1%
Parramatta Road / Larkin Street	W	N	47%
Parramatta Road / Lyons Street	W	E	47%
Parramatta Road / Ross Street	E	N	14%
Parramatta Road / Ross Street	S	N	1%
Sparkes Street / Larkin Street	E	W	53%
Sparkes Street / Larkin Street	S	W	47%

Table 14: Proportion of PM trips leaving the Site

Intersection	From leg	To leg	Percent of total outbound trips
Arundel Street / Ross Street	S	N	69%
Arundel Street / Ross Street	E	S	2%
Bridge Road / Ross Street	S	N	36%
Bridge Road / Ross Street	S	W	14%
Parramatta Road / Larkin Street	N	E	100%
Parramatta Road / Larkin Street	E	W	1%
Parramatta Road / Lyons Street	E	W	1%
Parramatta Road / Ross Street	W	N	69%
Parramatta Road / Ross Street	W	E	31%
Parramatta Road / Ross Street	N	W	1%
Parramatta Road / Ross Street	N	S	1%
Sparkes Street / Larkin Street	W	S	100%

4.4 Traffic modelling

Traffic modelling was conducted using SIDRA Intersection 10. Key intersections were analysed to determine their performance characteristics under existing and future traffic conditions.

4.4.1 Key intersections for assessment

Key intersections assessed around the site are summarised in Table 15.

Table 15: Key intersections for assessment

Intersection	Type	Description
Parramatta Road / Missenden Road / Lyons Road	4-leg signalised intersection	○ Eastern Approach (Parramatta Rd): Three through lanes including one bus lane, an additional dedicated right-turn short lane to Missenden Rd. ○ Western Approach (Parramatta Rd): Three through lanes including one bus lane ○ Northern Approach (Missenden Rd): Two lanes including one short lane with on-street parking ○ Southern Approach (Lyons Rd): Two lanes including one short lane with on-street parking
Parramatta Road / Western Avenue / Ross Street intersection	4-leg signalised intersection	○ Eastern Approach (Parramatta Rd): Three through lanes including one bus lane. ○ Western Approach (Parramatta Rd): Three through lanes including one bus lane, an additional dedicated right-turn short lane to Ross St ○ Northern Approach (Western Avenue): Single lane ○ Southern Approach (Ross St): Two lanes including one short lane with on-street parking
Bridge Road / Ross Street intersection	4-leg signalised intersection	○ Eastern Approach (Bridge Rd): Two lanes with a dedicated right-turn short lane into Ross St. ○ Western Approach (Bridge Rd): Two lanes with a dedicated bus only right-turn short lane into Ross St. ○ Northern Approach (Ross St): Two lanes with no right turns, no left turns (short vehicles excepted). ○ Southern Approach (Ross St): Tow lanes, with no right turns.
Parramatta Rd / Larkin Street	3-leg priority-controlled intersection	○ Eastern Approach (Parramatta Rd): Multiple through lanes. Operates with bus lane in AM and PM peak. ○ Western Approach (Parramatta Rd): Multiple through lanes and left turn into Larkin Street. Operates with bus lane in AM and PM peak. ○ Northern Approach (Larkin St): Left turn only onto Parramatta Rd
Larkin Street / Sparkes Street	4-leg priority-controlled intersection	○ Northern Approach (Larkin St): Single lane, two-way operation. ○ Southern Approach (Larkin St): Single lane, two-way operation. ○ Eastern Approach (Sparkes St): Single lane, one-way westbound operation. ○ Western Approach (Sparkes St): Single lane local street approach.
Ross Street / Arundel Street	4-leg priority-controlled intersection	○ Northern Approach (Ross St): Two lane southbound (one lane in PM peak), two-way operation. ○ Southern Approach (Ross St): Single lane, two-way operation. ○ Western Approach (Arundel St): Single lane, two-way operation with high angel slip lane onto Arundel Street.

4.4.2 Modelling Scenarios

Intersection modelling was undertaken for the following scenarios:

- 2024 Base case,
- 2030 Base case (linear growth rate of 1% per annum has been assumed for background traffic), and
- 2030 Project case (i.e. Base with Development).

These scenarios were assessed for the AM and PM peak hours.

4.4.3 Performance metrics

The intersection performance has been assessed using the following metrics:

- Degree of saturation (DoS)
- Average delay (seconds per vehicle)
- Level of service (LoS)
- 95th percentile queue length

A common measure of the intersection performance is the DoS, which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DoS of 1.0 indicates that an intersection is operating at capacity. The desirable maximum degree of saturation for an intersection is 0.9 (or 90%).

In urban areas, the traffic capacity of the major road network is generally a function of the performance of key intersections. This performance is quantified in terms of LoS, which is based on the average delay per vehicle. LoS ranges from A = very good to F = unsatisfactory. A full breakdown is shown in Table 16. An intersection operating at LoS D is considered to be performing at an acceptable level.

Table 16: Intersection performance indicators (TfNSW)

Level of Service	Average delay per vehicle (sec)	Traffic Signals, Roundabout	Give Way and Stop Sign
A	< 14	Good operation	Good operation
B	15 to 28	Good, acceptable delays with spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

4.4.4 Modelling results

The operational performance results of the 6 intersections for all scenarios and peak hours, as predicted by SIDRA modelling, are summarised in Table 17. Detailed SIDRA results are attached in Appendix A.

Table 17: SIDRA results

ID	Intersection	Peak hour	Scenario	Total traffic at intersection	DOS	Delay(s)*	LoS*
1	Parramatta Rd / Missenden Rd / Lyons Rd	AM	2024 Base	4,044	0.89	30s	C
			2030 Base	4,282	0.93	37s	C
			2030 Project case	4,329	0.95	41s	C
		PM	2024 Base	3,905	0.86	27s	B
			2030 Base	4,135	0.91	33s	C
			2030 Project case	4,139	0.91	33s	C
2	Parramatta Rd / Western Ave / Ross St	AM	2024 Base	3,708	0.93	35s	C
			2030 Base	3,924	0.99	51s	D
			2030 Project case	3,952	0.99	53s	D
		PM	2024 Base	3,874	0.79	26s	B
			2030 Base	4,102	0.84	29s	C
			2030 Project case	4,192	0.83	30s	C
3	Bridge Rd / Ross St	AM	2024 Base	2,042	0.75	18s	B
			2030 Base	2,160	0.80	19s	B
			2030 Project case	2,195	0.80	19s	B
		PM	2024 Base	2,252	0.67	17s	B
			2030 Base	2,382	0.71	18s	B
			2030 Project case	2,431	0.73	18s	B
4	Parramatta Rd / Larkin St	AM	2024 Base	3,345	0.61	6s	A
			2030 Base	3,541	0.64	6s	A
			2030 Project case	3,601	0.64	6s	A
		PM	2024 Base	3,332	0.51	6s	A
			2030 Base	3,525	0.54	6s	A
			2030 Project case	3,616	0.54	6s	A
5	Larkin St / Sparkes St	AM	2024 Base	86	0.02	5s	A
			2030 Base	89	0.02	5s	A
			2030 Project case	204	0.07	5s	A
		PM	2024 Base	77	0.02	5s	A
			2030 Base	82	0.02	5s	A
			2030 Project case	178	0.10	5s	A
6	Ross St / Arundel St	AM	2024 Base	814	0.23	16s	B
			2030 Base	864	0.24	16s	B
			2030 Project case	905	0.25	17s	B
		PM	2024 Base	929	0.25	14s	A
			2030 Base	989	0.27	15s	B
			2030 Project case	1,054	0.30	17s	B

** For priority-controlled intersections, Delay and LoS correspond to the movement experiencing the greatest delay, whereas DoS is based on the movement with the highest modelled degree of saturation. For signalised intersections, the Delay and LoS represent the weighted average of all movements, while DoS reflects the critical movement with highest degree of saturation.*

As shown in Table 17, the six assessed intersections are forecast to operate at acceptable levels under the 2030 Project case scenario. The three signalised intersections operate at LoS B to D, with the highest DoS recorded at 0.99 at Intersection 2 Parramatta Road / Western Avenue / Ross Street during the AM peak. The priority and stop-controlled intersections operate at LoS A to B in both the AM and PM peak periods, with minor delay increases. Overall, the Development scenario results show only minor changes compared with the 2030 Base scenario and indicate that the surrounding road network is expected to accommodate the additional traffic generated by the Proposal.

As shown in Table 18, the modelled delay changes on the specific legs relevant to ambulance egress from Central Ambulance Station are negligible under the 2030 Project case scenario. On the Larkin Street egress leg at Intersection 4 (onto Parramatta Road), average delay remains effectively unchanged at approximately 4 seconds in both the AM and PM peaks across all scenarios. On the Arundel Street leg at Intersection 6, average delay increases only marginally to approximately 11 seconds (AM) and 13 seconds (PM) under the 2030 Project case scenario, an increase of less than one second relative to the 2030 Base. These minor changes are not expected to materially affect ambulance egress from Central Ambulance Station or access to Parramatta Road.

Table 18: Comparison of modelled delays on key local streets and legs

ID	Intersection Leg	Peak hour	Scenario	Demand flow (veh/h)	Average delay (s)	Change vs 2030 Base (s)
4	Parramatta Road / Larkin Street North: Larkin St (37m)	AM	2024 Base	47	3.6s	
			2030 Base	52	3.6s	
			2030 Project case	64	3.6s	0.0s
		PM	2024 Base	56	3.5s	
			2030 Base	59	3.5s	
			2030 Project case	145	3.5s	0.0s
5	Larkin Street / Sparkes Street East: Sparkes St (90m)	AM	2024 Base	28	4.5s	
			2030 Base	29	4.5s	
			2030 Project case	84	3.9s	-0.6s *
		PM	2024 Base	23	4.7s	
			2030 Base	25	4.7s	
			2030 Project case	33	4.4s	-0.3s *
6	Ross Street / Arundel Street West: Arundel St (155m)	AM	2024 Base	55	10.2s	
			2030 Base	58	10.5s	
			2030 Project case	58	10.8s	+0.3s
		PM	2024 Base	63	11.4s	
			2030 Base	67	12.0s	
			2030 Project case	67	12.9s	+0.9s

** Minor reductions in modelled delay of less than one second are considered to reflect normal SIDRA model sensitivity, rounding and changes in movement weighting, and are not operationally material.*

4.5 On-street parking impacts

Swept-path assessments were undertaken to evaluate the impacts of servicing vehicle movements on the local street network, including potential impacts on footpaths, on-street parking and street infrastructure.

The assessments considered inbound and outbound movements through the Sparkes Street/Larkin Street intersection for on-street gas deliveries (8.8 m MRV) as well as vehicles accessing the Basement 1 loading dock (8.8 m MRV and 9.8m waste vehicle). Several feasible servicing arrangements were assessed, with varying implications for on-street parking, signposts and potential footpath widening.

Importantly, the on-street swept path assessments for this study were undertaken with utmost care to avoid impacts to significant roadside features, including utility poles, street trees and property boundaries.

One inbound route is proposed via Arundel Street / Sparkes Street for all service vehicles, as summarised in Table 19. Detailed swept paths are shown in Appendices C.1, C.2 and C.3. For context, in Page title, "GAS" refers to gas delivery, "B1" refers to Basement 1, "MRV" refers to 8.8 m MRVs and "WASTE" refers to 9.8 m waste vehicles.

Table 19: Inbound swept paths

Drawing #	Page title	Movement	Impacts	Avoided impacts
SKT019	GAS MRV IN	Forward in from Sparkes Street (east)	No impact	
SKT004	B1 MRV IN	Forward in from Sparkes Street (east)	No impact	
SKT013	B1 WASTE IN	Forward in from Sparkes Street (east)	No impact	

For outbound movements, broadly 3 options have been assessed to provide flexibility for further consideration:

In **Option 1,** the outbound movements would require vehicles to reverse along Sparkes Street and into the northern side of Larkin Street, before departing forward and continuing southbound along Larkin Street. These movements would be pre-arranged and undertaken outside of peak traffic periods, under a reasonable level of traffic control, with a suitably trained vehicle spotter controlling the manoeuvring area and preventing conflicting pedestrian and vehicle movements.

In **Option 2**, vehicles would be departing forward via Sparkes Street and then turning onto Larkin Street. Gas delivery would require vehicles to reverse into the basement ramp first.

Option 3 incorporates similar movements as Option 2, with more impact to on-street parking (particularly on Sparkes Street). Notwithstanding, this also creates opportunity for potential widening of the footpath along Sparkes Street.

Opportunities for widening are constrained by vehicle turning movements at the Sparkes Street/Larkin Street corner, where the swept path runs close to the existing kerb. Beyond this corner, the footpath could be widened to approximately 2.3 m, consistent with the preferred path width identified in the City of Sydney's *Sydney Streets Code 2021*. Achieving this widening would require the removal of all on-street parking along this section of Sparkes Street.

Overall, the category and references of the 3 outbound options can be summarised as:

- Option 1: No impact to parking (Table 20, Appendix C.1)
- Option 2: Moderate impact to parking (Table 21, Appendix C.2)
- Option 3: Most impact to parking, possible footpath widening (Table 22, Appendix C.3).

Table 20: Outbound option 1: No impact to parking

Drawing #	Page title	Movement	Impacts	Avoided impacts
SKT003	GAS MRV OUT 1	Reverse out from Sparkes Street into Larkin Street (north), then continue forward on Larkin Street (south)	• Relocation of one (1) street sign pole	• Parking on Sparkes Street (west) retained • Parking on Larkin Street (north and south) retained
SKT020	B1 MRV OUT 1	Forward out from B1, turn right into the alley, reverse out from Sparkes Street into Larkin Street (north), then continue forward on Larkin Street (south)	• Relocation of one (1) street sign pole	• Parking on Sparkes Street (west) retained • Parking on Larkin Street (north and south) retained
SKT022	B1 WASTE OUT 1	Forward out from B1, turn right into the alley, reverse out from Sparkes Street into Larkin Street (north), then continue forward on Larkin Street (south)	• Relocation of one (1) street sign pole	• Parking on Sparkes Street (west) retained • Parking on Larkin Street (north and south) retained

Table 21: Outbound option 2: Moderate impact to parking

Drawing #	Page title	Movement	Impacts	Avoided impacts
SKT021	GAS MRV OUT 2	Reverse into the basement ramp, forward out from Sparkes St, then turn right onto Larkin St (south)	• Two (2) on-street parking removed along Larkin Street (south) • Relocation of two (2) street sign poles	• Parking on Sparkes St (west) retained
SKT013	GAS MRV OUT 3A	Reverse into the basement ramp, forward out from Sparkes St, then turn left onto Larkin St (north) towards cul-de-sac	• One (1) on-street parking removed along Larkin Street (north) • Relocation of one (1) street sign pole	• Parking on Sparkes St (west) retained
SKT014	GAS MRV OUT 3B	5-point turn in cul-de-sac, then continuing forward southbound on Larkin St	• Two (2) on-street parking removed along Larkin Street	
SKT005	B1 MRV OUT 2	Forward out from Sparkes St, then turn right onto Larkin St (south)	• Up to two (2) on-street parking removed along Larkin Street (south) • Relocation of two (2) street sign poles	• Parking on Sparkes St (west) retained
SKT016	B1 WASTE OUT 2	Forward out from Sparkes St, then turn right onto Larkin St (south)	• Up to two (2) on-street parking removed along Larkin Street (south) • Relocation of one (1) street sign pole	• Parking on Sparkes St (west) retained

Table 22: Outbound option 3: Most impact to parking, possible footpath widening

Drawing #	Page title	Movement	Impacts	Avoided impacts
SKT012	GAS MRV OUT 4	Reverse into the basement ramp, proceed forward out from Sparkes Street, then turn right onto Larkin Street (south)	• All on-street parking impacted (4 spaces) on Sparkes Street (west) • Up to two (2) on-street parking spaces impacted on Larkin Street (south) • One (1) sign pole relocated	• One (1) street sign pole retained
SKT006	B1 MRV OUT 3	Proceed forward along Sparkes Street, turning right onto Larkin Street (south)	• All on-street parking impacted (4 spaces) on Sparkes Street (west) • Up to two (2) on-street parking impacted on Larkin Street (south) • One (1) sign pole relocated	• One (1) street sign pole retained
SKT023	B1 WASTE OUT 3	Proceed forward along Sparkes Street, turning right onto Larkin Street (south)	• All on-street parking impacted (4 spaces) on Sparkes Street (west) • Up to two (2) on-street parking spaces impacted on Larkin Street (south) • One (1) sign pole relocated	• One (1) street sign pole retained

Table 23: Summary of outbound option impacts

Option	Servicing arrangement	Impact on Parking	Impact on signpost	Other findings
1	Vehicles reverse along Sparkes Street into the Sparkes Street/Larkin Street intersection, then depart forward southbound	0 spaces removed	1 sign post relocated	Requires controlled reversing movements
2A	Vehicles depart forward from Sparkes Street and turn right into Larkin Street south	2 spaces removed on Larkin Street (south)	2 sign posts relocated	Retains all on-street parking on Sparkes Street
2B	Vehicles depart forward from Sparkes Street, turns left into Larkin Street north and undertakes a five-point turn at the cul-de-sac, then continues southbound on Larkin Street	3 spaces removed on Larkin Street (north)	1 sign post relocated	Retains all on-street parking on Sparkes Street
3	Vehicles proceed or turn within the basement-ramp area before departing forward via Larkin Street south	All 4 parking removed along Sparkes Street west. 2 parking removed on Larkin Street (south)	1 sign post relocated	Enables footpath widening beyond the constrained Sparkes/Larkin corner

No posted load, vehicle-length or height restrictions have been identified along Arundel Street, Sparkes Street or Larkin Street. However, these streets also provide access to existing residential and commercial properties requiring regular waste collection and servicing. This indicates that service vehicles of a comparable general scale already use the surrounding local street network.

The proposed 8.8 m MRVs and 9.8 m waste vehicles are therefore not expected to encounter load or height-clearance constraints along the proposed servicing route.

Additional swept path analysis demonstrates that both vehicle types can satisfactorily turn left from Larkin Street onto Parramatta Road, entering the second lane from the kerb, which represents the nearest available general traffic lane given that the kerbside lane operates as a bus lane. The corresponding swept path drawings are provided in Appendix C.4.

4.6 Impacts on Walking, Cycling and Public Transport

As discussed in Section 3.2, the main pedestrian access for the Site is proposed from Parramatta Road. Most roads in the surrounding area have footpaths on both sides, and intersections have pedestrian facilities for crossing.

Cyclist access will be provided via Parramatta Road, with dedicated bicycle parking and end-of-trip facilities located within the Proposal.

The Planning Proposal is expected to have minimal impact on public transport, walking, and cycling networks. The site benefits from strong connectivity, with 10 bus routes within a 10-minute walk, and two light rail stops accessible within 25-minute walk or 10-minute cycle.

4.7 Recommendations

To manage travel demand generated by the Planning Proposal, travel demand management measures are proposed to be implemented. Measures would aim to promote sustainable travel choices for staff and visitors and are detailed in a Framework Travel Plan as shown in Section 5.

5. Outline Framework Travel Plan

5.1 Objectives

A Framework Travel Plan (FTP) is a package of measures put in place by an employer or building manager to encourage more sustainable travel whilst commuting to and from a development. It allows an organisation to demonstrate a commitment and a proactive step towards improving environmental sustainability by reducing the environmental impact associated with travel to and from the development.

The key element of this plan is reducing reliance on private vehicles and maximising the use of public transport and other sustainable modes of transport. The FTP would contribute to a healthier and higher quality environment for building occupants, staff and visitors whilst reducing air and noise pollution. An FTP would apply to all who travel to and from the site.

As a constantly evolving strategy, the success of the plan will rely on ongoing monitoring and review. A robust governance structure could include a nominated FTP representative or committee consisting of building management. Objectives can act as measures of success and may also be used to identify potential refinements.

The objectives of an FTP typically cover the following:

- **Encourage the use of more sustainable transport modes** i.e. walking, cycling, public transport and carpooling in place of higher energy consumption travel modes such as single occupant car travel and taxi.
- **Raise awareness of sustainable modes of transportation** for employees or visitors who commute to, from and within the Site.
- **Reduce traffic congestion and air pollution** around the Site to enhance safer and more enjoyable journeys.
- **Travel Demand Management (TDM)** which includes management measures to reduce travel demand, such as by remoding, reducing or retiming trips.
- **Develop, implement, monitor, evaluate and review** the progress of the travel plan strategy.

A framework of potential management measures is also outlined to help achieve the objectives of the FTP.

5.2 Potential measures

The package of measures has been provided to encourage more sustainable travel while travelling to and from the Site. Physical and behavioural measures are two potential measures to introduce into a viable FTP. Physical measures will prioritise sustainable transport via walking, cycling, public transport or car share whereas behavioural measures aim to provide soft strategies which influence travel behaviours for those who will travel to and from the Site.

To meet the objectives and targets of an FTP, this section outlines the potential management measures that could be considered for implementation for the Proposal. The measures have been grouped into the principles of remode and reduce, which are the most relevant to this FTP as they focus specifically on sustainable travel or reducing travel altogether. These principles are discussed below.

5.2.1 Remode

The principle of remode aims to promote non-private vehicle modes of travel, such as public transport, walking or cycling, or more fuel-efficient vehicles such as electric vehicles (EVs) or small vehicles. Measures to remode travel are discussed below.

5.2.1.1 Education and awareness

Education and awareness of the availability of sustainable travel modes would be crucial in encouraging all users at the site to adopt travel plan measures. It is important that all are made aware of the need to reduce car dependency where possible.

A new development provides an opportunity to offer staff advice on travel modes to and from the site. At this time, new travel patterns are being established, and people may particularly welcome information about the travel services and facilities available to them.

Potential measures to encourage education and awareness include:

- Provide travel information for visitors travelling to and from the Site using sustainable forms of transport, as well as outlining the benefits, objectives and measures of the wider FTP. A website or app associated with the development could include links to TfNSW websites to promote sustainable travel.
- A Travel Access Guide (TAG) could also be provided to staff and visitors to highlight sustainable travel methods. The purpose of a TAG is to highlight sustainable travel methods in a legible and easy to read format and would include the following:
  - Map showing key public transport, walking and cycling routes to the development.
  - Information on end of trip facilities, events and programs.
- Provide an overview of the FTP and TAG as part of all staff induction programs. Induction may also include a visit to bicycle parking and end of trip facilities to increase awareness.
- Events such as ‘National Bike Week’, ‘Bike2Work Days’ and ‘Walk to Work Day’ could be promoted to staff.
- Other incentives to encourage sustainable travel may also include discount vouchers for a local bicycle retailer.

5.2.1.2 Promotion of public transport

The use of train and bus services could be promoted by outlining public transport services in a TAG to enable staff and visitors to assess route options and to plan a public transport route to work.

Links to journey planning websites and real-time public transport service data on a website or app associated with the development. All user groups should be provided with a user-friendly map describing the surrounding public transport links. Maps can be distributed via a range of digital platforms including email or mobile phone application. These maps would advertise and promote public transport and prompts all site users to consider public transport as their first transport option when travelling to and from the site. These public transport maps should also include information on accessible transport routes for all site users with special access needs.

5.2.1.3 Promotion of walking

Walking could be promoted via the following measures:

- All site users should have access to a legible map outlining surrounding public transport linkages, local outlets and attractions within a reasonable walking distance. Maps can be distributed via a range of digital platforms including email, mobile phone application or information boards within the Site. Walking networks can be presented in a TAG and paths to key destinations such as nearby bus stops and serviced routes are indicated clearly.
- Participate in regular events such as ‘Walk to Work Day’.

5.2.1.4 Promotion of cycling

As discussed in Section 2.8 the proposed development is located near the wider off-road cycling network and will provide easily accessible bicycle parking and end of trip facilities for cyclists. The provision of secure bicycle parking and end of trip facilities are expected to encourage all site users.

Cycling could also be promoted via the following measures:

- Outline cycling facilities in the TAG to enable cyclists to assess route options and to plan how to cycle to work.
- Facilitate a bike-sharing program within the Proposal. Bikes could be made available to all users, which would be booked for a specific period of time. A bike-sharing program would provide access to a bike for site users who do not own one and could encourage long-term adoption of cycling.
- Form a Cycling Group consisting of staff who cycle to work regularly. The Cycling Group could advocate for cycling for all site occupants, including organising cycling events and notifying building management of maintenance and issues relating to the provision of on-Site cycling facilities.
- Participate in regular events such as 'Ride to Work Day'.
- Provide bicycle maps showing surrounding cycleways and infrastructure via a mobile phone application, the development's website or as physical wayfinding. This will allow cyclists to assess route options and plan how they cycle to the Site. As the surrounding area has high quality cycling infrastructure, cycling to and from the Site can be an enjoyable and sustainable method of travel.

5.2.1.5 Car parking management

Car parking management strategies could be considered to reduce private vehicle demand or a shift to more fuel-efficient private vehicles via the following measures:

- Provision of EV charging infrastructure or provision of 'small car' parking spaces to facilitate the uptake of EVs and small cars. EVs and small cars generally have lower exhaust emissions than typical internal combustion engine or larger vehicles during operation.
  - To further encourage EV uptake and small cars, small car parking spaces or spaces with EV charging infrastructure can be located in the most desirable parking spaces near access points to the development.
- Unbundled parking is a travel demand management strategy where parking spaces are rented, leased, or sold separately from the associated premises. It allows people to choose whether they need and want to pay for a parking space, rather than paying regardless of use. This measure can encourage individuals to reconsider and potentially reduce parking needs and private vehicle demand.

5.2.2 Reduce

The principle of reduce aims to reduce the overall number of trips generated. Measures to reduce travel are discussed below.

5.2.2.1 Carpooling

Carpooling (or ride sharing) involves carrying additional vehicle passengers while undertaking a journey with low additional distance. Carpooling enables a reduction in separate vehicle trips to a similar destination and is generally cost-effective, particularly to and from areas that are not well served by public transport.

Carpooling could be facilitated in the proposed development by building management to connect site users travelling to and from a similar destination.

5.3 Monitoring and review

The FTP is a live document, and its successful implementation would rely on ongoing monitoring and review. Although the objectives of the FTP would not change, targets and measures may be changed to reflect an ambition for continued progress.

Monitoring mechanisms could include periodic travel surveys to understand the travel behaviour of site occupants and success of the measures. The survey could be distributed 3 months post-occupation as well as yearly or following key transport network changes (such as new bus routes).

A key part of an effective FTP is to nominate personnel to champion and administer the plan. A robust governance structure would contribute to the success of the plan and could include a nominated FTP representative or committee. A representative or committee could consist of building management, who would:

- Manage and implement the FTP measures.
- Periodically update the FTP as new or safer transport routes become available.
- Engage with stakeholders, promote the FTP and solicit feedback.
- Achieve target mode shares, monitor performance and make decisions on the FTP.
- Raise improvements to public transport or walking and cycling facilities with Council or TfNSW.

6. Framework Construction Traffic Management Plan (CTMP)

This section outlines the objectives of the Framework CTMP and the high-level principles that can be used to achieve them.

6.1 Traffic management objectives

The key aim of this Framework CTMP is to minimise impacts to the surrounding transport network during construction. The following objectives have been developed to support this overarching aim:

- Ensure safety of pedestrians, cyclists, construction workers, road users and the local community;
- Minimise the overall impacts to road users;
- Ensure minimal disruptions to public transport operations, including schedules, stop location and routes;
- Maintain access for existing road users, including the local community, public transport operators, pedestrians and cyclists;
- Ensure disruption to surrounding stakeholders and land uses is minimised, including appropriate consultation.
- Minimise disruption to existing road furniture and kerbside provisions including existing bus stops, cycleways and on-street parking; and
- Comply with all relevant legislation and other requirements specified by relevant authorities.

6.2 Traffic management principles

To achieve the objectives outlined above a set of principles have been developed to guide all construction management measures across the project. The key principles are as follows:

- Clear and timely communication in relation to any changes, to affected areas and the expected duration of works via various platforms through the project website, radio, newspapers, social media or direct community engagement;
- Implement appropriate traffic controls including signage, line marking and stop lights to direct private vehicles, transport operators, pedestrians and cyclists past work Sites. Alternative routes may be provided where existing infrastructure is impacted by the works;
- Manage Site compounds and work areas to ensure construction traffic and works are primarily contained within these areas and road occupancy is minimised;
- Manage pedestrians and other vulnerable road users to ensure safe and continuous movement past the work Sites. Consideration of the land uses and key pedestrian desire lines in the surrounds of the work Sites will be the key drivers for the type of traffic management strategies implemented;
- Where practical, consideration of scheduling construction traffic movements to avoid peak times and smoothing of peaks in construction traffic activity to minimise impacts to the transport network; and
- Encourage construction workers, where possible, to use modes other than private vehicle.

These principles are to be communicated to any parties involved in construction traffic management across the project. Any issues arising during the works will also require notification to the users outlined, ensuring transparency across the duration of the construction phase.

6.3 Existing user group hierarchy

During preparation of any CTMPs, prioritisation of potential user groups is important in providing appropriate construction traffic management measures at each work Site. The hierarchy of users is listed below from highest to lowest:

- Pedestrians;
- Cyclists;
- Public transport users;
- Service vehicles (relating to businesses and agricultural uses); and
- Private vehicles.

The development of the user group hierarchy has been based on similar approaches applied in Framework CTMPs for other large infrastructure schemes. This hierarchy also aligns with Future Transport 2056. This hierarchy will be considered alongside the TfNSW functional road hierarchy provided below, in order of high to low priority roads, during the development of management measures.

- Primary arterial roads;
- Sub-arterial roads;
- Collector roads; and
- Local roads.

6.4 Governance

The document owner of each CTMP will be appointed during the procurement process and the governance of the construction traffic management process will be discussed and developed with the Department of Planning, Housing and Infrastructure as the project progresses.

6.5 Proposed working hours

While the construction times will vary throughout the project, the typical working hours are 07:00-18:00, with personnel arriving to the Site before 07:00 and leaving after 18:00.

In some cases, there may be night works to minimise disruption to traffic. Further assessments of these requirements will be undertaken once the detailed design stage is undertaken, and the requirements are known. All night works would be undertaken in accordance with the TfNSW Environmental Noise Management Manual (2001): Practice Note vii–Roadworks outside normal working hours, as well as the Office of Environment and Heritage Interim Construction Noise Guideline (DECC 2009).

6.6 Truck routes and controls

Due to the location of the proposed construction access is proposed from Parramatta Road (Great Western Highway). A detailed CTMP will need to be prepared for the works following approval with details of the size of vehicles due to the one-way narrow roads within the local road network.

7. Conclusion

This Transport Impact Assessment evaluates the transport implications of the proposed Life Sciences development at 88-94 Parramatta Road, Camperdown. The assessment considered existing transport conditions, including the local road network, public transport services, active transport facilities, and travel behaviour patterns.

To estimate the impact of development on the surrounding road network, SIDRA modelling and traffic analysis were undertaken for the below scenarios:

- 2024 Base case (existing conditions),
- 2030 Base case (linear growth rate of 1% per annum has been assumed for background traffic), and
- 2030 Project case (i.e. Base with Development).

The proposal is expected to generate a net increase of 105 vehicle trips in AM peak and 90 vehicle trips in PM peak, which is considered modest compared to the existing and future background traffic in the network. Under the 2030 Project case scenario, the surrounding road network is expected to accommodate the additional traffic generated by the Proposal, with all assessed intersections continuing to operate at acceptable levels of service.

Swept-path assessments demonstrate that the proposed 8.8 m MRVs and 9.8 m waste vehicle can access and service the development. Several feasible servicing arrangements have been identified, ranging from an option that retains all existing on-street parking to options involving progressively greater parking impacts. Depending on the option selected, associated public-domain changes may also include the relocation of street signs and widening of the northern footpath along the western section of Sparkes Street.

The preferred servicing arrangement and associated public-domain works would be confirmed through the subsequent design and approval process.

As construction traffic volumes are anticipated to be lower than operational traffic volumes, the associated impacts on the road network are also expected to be lower.

Car parking demand was estimated using a first-principles approach informed by the proposed land uses.

A CTMP is planned to be prepared as part of the detailed design phase.

Overall, the Planning Proposal is not expected to significantly worsen network conditions and can be accommodated with appropriate travel demand management measures provided in the Framework Travel Plan. Swept-path assessments confirm that feasible servicing routes are available for the proposed vehicles, subject to appropriate traffic management and any public-domain changes associated with the selected servicing arrangement.

Appendix A

SIDRA Modelling

MOVEMENT SUMMARY

Site: [1.24.B.AM] 1. Parramatta x Lyons - 2024 AM (2024 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	99	2.1	99	2.1	0.113	22.7	LOS B	3.4	23.9	0.58	0.66	0.58	29.4
2	T1	All MCs	122	9.5	122	9.5	0.522	54.8	LOS D	8.0	63.3	0.97	0.79	0.97	21.2
3	R2	All MCs	12	72.7	12	72.7	0.522	75.1	LOS F	8.0	63.3	0.97	0.79	0.97	20.4
Approach			233	9.5	233	9.5	0.522	42.2	LOS C	8.0	63.3	0.80	0.73	0.80	23.9
East: Parramatta Rd (155m)															
4	L2	All MCs	114	13.9	114	13.9	0.254	38.4	LOS C	6.0	51.6	0.74	0.74	0.74	26.2
5	T1	All MCs	739	8.8	739	8.8	0.510	32.7	LOS C	17.3	127.5	0.82	0.71	0.82	21.8
Approach			853	9.5	853	9.5	0.510	33.5	LOS C	17.3	127.5	0.81	0.72	0.81	22.8
North: Lyons Rd (180m)															
7	L2	All MCs	83	2.5	83	2.5	0.303	76.9	LOS F	4.8	34.1	0.93	0.76	0.93	14.5
8	T1	All MCs	201	2.1	201	2.1	* 0.731	77.2	LOS F	13.0	92.5	1.00	0.88	1.07	20.9
9	R2	All MCs	5	0.0	5	0.0	0.731	94.3	LOS F	13.0	92.5	1.00	0.88	1.07	14.3
Approach			289	2.2	289	2.2	0.731	77.4	LOS F	13.0	92.5	0.98	0.85	1.03	16.5
West: Parramatta Rd (140m)															
10	L2	All MCs	16	6.7	16	6.7	0.076	12.5	LOS A	1.1	12.4	0.34	0.54	0.34	32.8
11	T1	All MCs	2386	4.1	2386	4.1	* 0.890	20.1	LOS B	61.3	438.0	0.84	0.79	0.86	30.9
12	R2	All MCs	267	3.9	267	3.9	0.510	51.8	LOS D	14.1	101.9	0.88	0.82	0.88	23.2
Approach			2669	4.1	2669	4.1	0.890	23.2	LOS B	61.3	438.0	0.84	0.79	0.86	27.3
All Vehicles			4044	5.4	4044	5.4	0.890	30.4	LOS C	61.3	438.0	0.84	0.78	0.86	24.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	57	60	59.3	LOS E	0.2	0.2	0.96	0.96	213.1	200.0	0.94
East: Parramatta Rd (155m)												
P2	Full	132	139	59.5	LOS E	0.5	0.5	0.96	0.96	213.3	200.0	0.94
North: Lyons Rd (180m)												
P3	Full	69	73	59.3	LOS E	0.3	0.3	0.96	0.96	213.2	200.0	0.94
West: Parramatta Rd (140m)												
P4	Full	215	226	59.7	LOS E	0.8	0.8	0.96	0.96	213.5	200.0	0.94
All Pedestrians		473	498	59.5	LOS E	0.8	0.8	0.96	0.96	213.4	200.0	0.94

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: ARUP AUSTRALIA SERVICES PTY LTD | Licence: NETWORK / FLOATING | Processed: Monday, 27 July 2026 3:07:14 PM
Project: C:\Users\Jack.Gelabert\OneDrive - Arup\Project work and bits\Camperdown Life Sciences RFI from CoS\SIDRA \20260727_Camperdown_v2.sipx

MOVEMENT SUMMARY

Site: [2.24.B.AM] 2. Parramatta x Ross - 2024 AM (2024 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	32	10.0	32	10.0	0.470	63.3	LOS E	6.1	44.1	0.99	0.77	0.99	10.8
2	T1	All MCs	39	0.0	39	0.0	0.470	59.9	LOS E	6.1	44.1	0.99	0.77	0.99	7.8
3	R2	All MCs	21	5.0	21	5.0	0.470	78.5	LOS F	6.1	44.1	0.99	0.77	0.99	13.8
Approach			92	4.6	92	4.6	0.470	65.3	LOS E	6.1	44.1	0.99	0.77	0.99	10.2
East: Parramatta Rd (600m)															
4	L2	All MCs	32	3.3	32	3.3	0.070	15.6	LOS B	1.2	12.0	0.34	1.03	0.34	16.1
5	T1	All MCs	761	9.5	761	9.5	0.272	6.6	LOS A	8.2	60.0	0.36	0.35	0.36	52.8
6	R2	All MCs	113	2.8	113	2.8	* 0.659	74.7	LOS F	7.8	55.8	1.00	0.82	1.05	21.2
Approach			905	8.5	905	8.5	0.659	15.4	LOS B	8.2	60.0	0.44	0.43	0.45	42.5
North: Ross St (85m)															
7	L2	All MCs	91	0.0	91	0.0	0.586	55.2	LOS D	12.0	84.5	0.97	0.82	0.97	22.6
8	T1	All MCs	97	2.2	97	2.2	0.586	76.9	LOS F	12.0	84.5	0.97	0.82	0.97	8.6
9	R2	All MCs	143	5.9	143	5.9	* 0.929	91.9	LOS F	11.6	85.1	1.00	1.07	1.43	12.4
Approach			331	3.2	331	3.2	0.929	77.5	LOS F	12.0	85.1	0.99	0.93	1.17	12.6
West: Parramatta Rd (310m)															
10	L2	All MCs	244	1.7	244	1.7	0.325	22.5	LOS B	10.4	84.2	0.56	0.70	0.56	30.5
11	T1	All MCs	2137	4.8	2137	4.8	* 0.923	37.3	LOS C	71.1	508.4	0.97	0.96	1.05	35.9
Approach			2381	4.5	2381	4.5	0.923	35.8	LOS C	71.1	508.4	0.93	0.93	1.00	35.6
All Vehicles			3708	5.4	3708	5.4	0.929	35.3	LOS C	71.1	508.4	0.82	0.81	0.88	31.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	52	55	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Parramatta Rd (600m)												
P2	Full	228	240	64.8	LOS F	0.9	0.9	0.97	0.97	218.6	200.0	0.91
North: Ross St (85m)												
P3	Full	47	49	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Parramatta Rd (310m)												
P4	Full	51	54	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		378	398	64.6	LOS F	0.9	0.9	0.96	0.96	218.4	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.24.B.AM] 3. Ross x Bridge - 2024 AM (2024 Base AM)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	100	6.3	100	6.3	0.353	28.8	LOS C	2.8	20.3	0.93	0.76	0.93	24.5
2	T1	All MCs	153	4.8	153	4.8	0.385	22.7	LOS B	4.0	29.1	0.90	0.72	0.90	26.8
Approach			253	5.4	253	5.4	0.385	25.1	LOS B	4.0	29.1	0.91	0.74	0.91	25.7
East: Bridge Rd (500m)															
4	L2	All MCs	57	1.9	57	1.9	0.454	12.9	LOS A	8.4	59.8	0.61	0.56	0.61	34.4
5	T1	All MCs	444	1.9	444	1.9	0.454	7.6	LOS A	8.4	59.8	0.61	0.56	0.61	36.4
6	R2	All MCs	36	0.0	36	0.0	0.151	22.9	LOS B	0.9	6.0	0.80	0.70	0.80	31.3
Approach			537	1.8	537	1.8	0.454	9.1	LOS A	8.4	59.8	0.62	0.57	0.62	35.9
North: Ross St (280m)															
7	L2	All MCs	83	6.3	83	6.3	0.585	32.1	LOS C	5.6	40.7	0.96	0.81	0.98	30.0
8	T1	All MCs	351	3.0	351	3.0	* 0.585	25.1	LOS B	6.5	46.6	0.95	0.80	0.96	25.4
Approach			434	3.6	434	3.6	0.585	26.5	LOS B	6.5	46.6	0.96	0.80	0.96	26.7
West: Bridge Rd (400m)															
10	L2	All MCs	44	4.8	44	4.8	* 0.748	21.3	LOS B	18.3	130.2	0.80	0.75	0.82	35.5
11	T1	All MCs	761	2.1	761	2.1	0.748	16.0	LOS B	18.3	130.2	0.80	0.75	0.82	35.3
12	R2	All MCs	14	100.0	14	100.0	0.055	20.3	LOS B	0.2	3.2	0.60	0.63	0.60	29.5
Approach			819	3.9	819	3.9	0.748	16.4	LOS B	18.3	130.2	0.79	0.75	0.82	33.3
All Vehicles			2042	3.5	2042	3.5	0.748	17.7	LOS B	18.3	130.2	0.80	0.71	0.81	32.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												
P1	Full	94	99	24.4	LOS C	0.2	0.2	0.90	0.90	178.2	200.0	1.12

East: Bridge Rd (500m)											
P2 Full	150	158	24.5	LOS C	0.2	0.2	0.91	0.91	178.3	200.0	1.12
North: Ross St (280m)											
P3 Full	70	74	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)											
P4 Full	98	103	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12
All Pedestrians	412	434	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.24.B.AM] 4. Parramatta x Larkin - 2024 AM (2024 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	895	10.8	895	10.8	0.230	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			895	10.8	895	10.8	0.230	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Larkin St (37m)															
7	L2	All MCs	47	6.7	47	6.7	0.040	3.6	LOS A	0.1	1.0	0.17	0.48	0.17	44.7
Approach			47	6.7	47	6.7	0.040	3.6	LOS A	0.1	1.0	0.17	0.48	0.17	44.7
West: Parramatta Rd (155m)															
10	L2	All MCs	25	8.3	25	8.3	0.059	5.6	LOS A	0.0	0.0	0.00	0.19	0.00	21.2
11	T1	All MCs	2378	5.2	2378	5.2	0.608	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.3
Approach			2403	5.3	2403	5.3	0.608	0.2	NA	0.0	0.0	0.00	0.01	0.00	58.8
All Vehicles			3345	6.8	3345	6.8	0.608	0.2	NA	0.1	1.0	0.00	0.01	0.00	58.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.24.B.AM] 5. Larkin x Sparkes - 2024 AM (2024 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	14	7.7	14	7.7	0.013	3.3	LOS A	0.0	0.0	0.00	0.31	0.00	20.8
2	T1	All MCs	9	11.1	9	11.1	0.013	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	42.3
Approach			23	9.1	23	9.1	0.013	1.9	NA	0.0	0.0	0.00	0.31	0.00	27.6
East: Sparkes St (90m)															
4	L2	All MCs	14	15.4	14	15.4	0.022	4.8	LOS A	0.1	0.6	0.11	0.50	0.11	30.4
5	T1	All MCs	7	0.0	7	0.0	0.022	3.4	LOS A	0.1	0.6	0.11	0.50	0.11	28.8
6	R2	All MCs	7	0.0	7	0.0	0.022	5.1	LOS A	0.1	0.6	0.11	0.50	0.11	33.7
Approach			28	7.4	28	7.4	0.022	4.5	LOS A	0.1	0.6	0.11	0.50	0.11	30.9
North: Larkin St (100m)															
8	T1	All MCs	29	0.0	29	0.0	0.016	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	49.1
9	R2	All MCs	1	0.0	1	0.0	0.016	4.6	LOS A	0.0	0.0	0.01	0.02	0.01	35.4
Approach			31	0.0	31	0.0	0.016	0.2	NA	0.0	0.0	0.01	0.02	0.01	48.4
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.004	4.3	LOS A	0.0	0.1	0.10	0.51	0.10	32.8
12	R2	All MCs	3	33.3	3	33.3	0.004	4.7	LOS A	0.0	0.1	0.10	0.51	0.10	26.4
Approach			4	25.0	4	25.0	0.004	4.6	LOS A	0.0	0.1	0.10	0.51	0.10	28.3
All Vehicles			86	6.1	86	6.1	0.022	2.3	NA	0.1	0.6	0.04	0.28	0.04	34.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.24.B.AM] 6. Ross x Arundel - 2024 AM (2024 Base AM)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	64	4.9	64	4.9	0.226	5.6	LOS A	0.9	6.4	0.26	0.34	0.26	36.4
2	T1	All MCs	226	3.7	226	3.7	0.226	0.6	LOS A	0.9	6.4	0.26	0.34	0.26	41.8
3	R2	All MCs	72	10.3	72	10.3	0.226	6.0	LOS A	0.9	6.4	0.26	0.34	0.26	41.3
3u	U	All MCs	11	0.0	11	0.0	0.226	7.7	LOS A	0.9	6.4	0.26	0.34	0.26	35.6
Approach			373	5.1	373	5.1	0.226	2.7	NA	0.9	6.4	0.26	0.34	0.26	40.4
East: Arundel St (250m)															
4	L2	All MCs	33	9.7	33	9.7	0.082	9.7	LOS A	0.3	2.2	0.48	0.90	0.48	34.3
5	T1	All MCs	4	25.0	4	25.0	0.082	15.6	LOS B	0.3	2.2	0.48	0.90	0.48	34.4
6	R2	All MCs	18	0.0	18	0.0	0.082	12.6	LOS A	0.3	2.2	0.48	0.90	0.48	34.5
Approach			55	7.7	55	7.7	0.082	11.1	LOS A	0.3	2.2	0.48	0.90	0.48	34.4
North: Ross St (105m)															
7	L2	All MCs	34	9.4	34	9.4	0.192	5.5	LOS A	0.5	3.5	0.17	0.24	0.17	43.5
8	T1	All MCs	246	3.0	246	3.0	0.192	0.3	LOS A	0.5	3.5	0.17	0.24	0.17	44.2
9	R2	All MCs	52	0.0	52	0.0	0.192	5.8	LOS A	0.5	3.5	0.17	0.24	0.17	38.0
Approach			332	3.2	332	3.2	0.192	1.7	NA	0.5	3.5	0.17	0.24	0.17	42.8
West: Arundel St (155m)															
10	L2	All MCs	26	4.0	26	4.0	0.087	7.8	LOS A	0.3	2.2	0.49	0.90	0.49	29.0
11	T1	All MCs	6	0.0	6	0.0	0.087	11.2	LOS A	0.3	2.2	0.49	0.90	0.49	34.1
12	R2	All MCs	22	4.8	22	4.8	0.087	12.8	LOS A	0.3	2.2	0.49	0.90	0.49	27.9
Approach			55	3.8	55	3.8	0.087	10.2	LOS A	0.3	2.2	0.49	0.90	0.49	29.3
All Vehicles			814	4.4	814	4.4	0.226	3.3	NA	0.9	6.4	0.26	0.37	0.26	39.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1.24.B.PM] 1. Parramatta x Lyons - 2024 PM (2024 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	133	0.0	133	0.0	0.235	53.4	LOS D	6.7	47.0	0.79	0.74	0.79	23.7
2	T1	All MCs	234	1.4	234	1.4	* 0.837	79.4	LOS F	17.1	122.3	1.00	0.99	1.17	19.3
3	R2	All MCs	3	66.7	3	66.7	0.837	90.2	LOS F	17.1	122.3	1.00	0.99	1.17	18.6
Approach			369	1.4	369	1.4	0.837	70.1	LOS E	17.1	122.3	0.93	0.90	1.03	18.8
East: Parramatta Rd (155m)															
4	L2	All MCs	148	7.1	148	7.1	0.217	22.5	LOS B	6.1	52.0	0.53	0.67	0.53	31.4
5	T1	All MCs	1966	2.7	1966	2.7	* 0.860	26.4	LOS B	54.8	387.0	0.90	0.84	0.91	24.9
Approach			2115	3.0	2115	3.0	0.860	26.2	LOS B	54.8	387.0	0.88	0.83	0.88	25.6
North: Lyons Rd (180m)															
7	L2	All MCs	48	0.0	48	0.0	0.192	61.9	LOS E	3.0	20.8	0.93	0.73	0.93	13.8
8	T1	All MCs	94	0.0	94	0.0	0.395	59.7	LOS E	6.4	44.6	0.96	0.76	0.96	20.4
9	R2	All MCs	6	0.0	6	0.0	0.395	83.9	LOS F	6.4	44.6	0.96	0.76	0.96	13.8
Approach			148	0.0	148	0.0	0.395	61.4	LOS E	6.4	44.6	0.95	0.75	0.95	18.4
West: Parramatta Rd (140m)															
10	L2	All MCs	24	0.0	24	0.0	0.051	12.1	LOS A	0.9	8.5	0.33	0.81	0.33	29.4
11	T1	All MCs	1143	2.3	1143	2.3	0.388	6.7	LOS A	13.4	94.3	0.39	0.36	0.39	43.8
12	R2	All MCs	105	1.0	105	1.0	* 0.482	69.2	LOS E	6.9	48.6	0.98	0.79	0.98	19.0
Approach			1273	2.2	1273	2.2	0.482	12.0	LOS A	13.4	94.3	0.44	0.41	0.44	36.0
All Vehicles			3905	2.5	3905	2.5	0.860	27.1	LOS B	54.8	387.0	0.74	0.69	0.76	25.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	76	80	64.3	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
East: Parramatta Rd (155m)												
P2	Full	171	180	64.6	LOS F	0.7	0.7	0.96	0.96	218.5	200.0	0.92
North: Lyons Rd (180m)												
P3	Full	81	85	64.4	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
West: Parramatta Rd (140m)												
P4	Full	104	109	64.4	LOS F	0.4	0.4	0.96	0.96	218.3	200.0	0.92
All Pedestrians		432	455	64.5	LOS F	0.7	0.7	0.96	0.96	218.3	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [2.24.B.PM] 2. Parramatta x Ross - 2024 PM (2024 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	66	1.6	66	1.6	0.363	32.4	LOS C	5.9	41.7	0.89	0.72	0.89	12.3
2	T1	All MCs	67	1.6	67	1.6	0.363	29.6	LOS C	5.9	41.7	0.89	0.72	0.89	8.4
3	R2	All MCs	22	0.0	22	0.0	0.363	41.8	LOS C	5.9	41.7	0.89	0.72	0.89	15.5
Approach			156	1.4	156	1.4	0.363	32.5	LOS C	5.9	41.7	0.89	0.72	0.89	11.1
East: Parramatta Rd (600m)															
4	L2	All MCs	38	0.0	38	0.0	0.129	19.6	LOS B	1.7	17.4	0.53	0.94	0.53	16.2
5	T1	All MCs	1807	3.3	1807	3.3	0.789	16.3	LOS B	30.3	213.3	0.83	0.78	0.84	46.4
6	R2	All MCs	207	0.5	207	0.5	* 0.784	51.5	LOS D	9.7	68.0	1.00	0.92	1.19	26.6
Approach			2053	3.0	2053	3.0	0.789	19.9	LOS B	30.3	213.3	0.84	0.80	0.87	41.9
North: Ross St (85m)															
7	L2	All MCs	124	0.8	124	0.8	0.411	27.8	LOS B	7.7	54.1	0.87	0.82	0.87	30.7
8	T1	All MCs	86	1.2	86	1.2	0.411	49.0	LOS D	7.7	54.1	0.87	0.82	0.87	9.7
9	R2	All MCs	188	0.6	188	0.6	* 0.772	48.7	LOS D	8.8	61.9	1.00	0.93	1.19	19.4
Approach			399	0.8	399	0.8	0.772	42.2	LOS C	8.8	61.9	0.93	0.87	1.02	17.8
West: Parramatta Rd (310m)															
10	L2	All MCs	104	2.0	104	2.0	0.252	29.5	LOS C	4.2	35.3	0.76	0.73	0.76	27.0
11	T1	All MCs	1162	2.8	1162	2.8	* 0.784	29.1	LOS C	23.3	163.5	0.95	0.88	1.00	39.3
Approach			1266	2.7	1266	2.7	0.784	29.1	LOS C	23.3	163.5	0.93	0.87	0.98	38.7
All Vehicles			3874	2.6	3874	2.6	0.789	25.7	LOS B	30.3	213.3	0.88	0.82	0.92	34.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	62	65	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
East: Parramatta Rd (600m)												
P2	Full	274	288	39.7	LOS D	0.7	0.7	0.94	0.94	193.5	200.0	1.03
North: Ross St (85m)												
P3	Full	73	77	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
West: Parramatta Rd (310m)												
P4	Full	63	66	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
All Pedestrians		472	497	39.5	LOS D	0.7	0.7	0.94	0.94	193.4	200.0	1.03

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.24.B.PM] 3. Ross x Bridge - 2024 PM (2024 Base PM)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	237	3.1	237	3.1	0.595	27.1	LOS B	6.5	46.9	0.95	0.81	0.96	25.1
2	T1	All MCs	351	0.3	351	0.3	* 0.673	22.5	LOS B	9.7	68.0	0.95	0.84	0.99	26.9
Approach			587	1.4	587	1.4	0.673	24.3	LOS B	9.7	68.0	0.95	0.83	0.98	26.0
East: Bridge Rd (500m)															
4	L2	All MCs	44	2.4	44	2.4	* 0.673	17.1	LOS B	14.8	104.7	0.79	0.71	0.79	32.7
5	T1	All MCs	641	1.0	641	1.0	0.673	11.1	LOS A	14.8	104.7	0.79	0.71	0.79	35.1
6	R2	All MCs	122	0.9	122	0.9	0.301	18.4	LOS B	2.6	18.6	0.74	0.73	0.74	32.9
Approach			807	1.0	807	1.0	0.673	12.5	LOS A	14.8	104.7	0.78	0.71	0.78	34.7
North: Ross St (280m)															
7	L2	All MCs	58	0.0	58	0.0	0.163	25.6	LOS B	1.7	11.7	0.84	0.72	0.84	31.1
8	T1	All MCs	320	1.0	320	1.0	0.597	22.5	LOS B	8.2	57.6	0.92	0.79	0.92	27.1
Approach			378	0.8	378	0.8	0.597	23.0	LOS B	8.2	57.6	0.91	0.78	0.91	28.0
West: Bridge Rd (400m)															
10	L2	All MCs	89	2.4	89	2.4	0.478	16.5	LOS B	8.9	63.1	0.68	0.63	0.68	35.7
11	T1	All MCs	384	0.8	384	0.8	0.478	11.0	LOS A	8.9	63.1	0.68	0.63	0.68	35.5
12	R2	All MCs	5	100.0	5	100.0	0.035	24.0	LOS B	0.1	1.6	0.76	0.64	0.76	26.4
Approach			479	2.2	479	2.2	0.478	12.1	LOS A	8.9	63.1	0.68	0.63	0.68	34.9
All Vehicles			2252	1.4	2252	1.4	0.673	17.3	LOS B	14.8	104.7	0.82	0.74	0.83	32.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												
P1	Full	77	81	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

East: Bridge Rd (500m)											
P2 Full	90	95	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Ross St (280m)											
P3 Full	91	96	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)											
P4 Full	88	93	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians	346	364	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.24.B.PM] 4. Parramatta x Larkin - 2024 PM (2024 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	2026	3.3	2026	3.3	0.509	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			2026	3.3	2026	3.3	0.509	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.6
North: Larkin St (37m)															
7	L2	All MCs	56	1.9	56	1.9	0.044	3.5	LOS A	0.2	1.1	0.13	0.48	0.13	45.3
Approach			56	1.9	56	1.9	0.044	3.5	LOS A	0.2	1.1	0.13	0.48	0.13	45.3
West: Parramatta Rd (155m)															
10	L2	All MCs	12	0.0	12	0.0	0.037	5.5	LOS A	0.0	0.0	0.00	0.15	0.00	21.4
11	T1	All MCs	1238	3.4	1238	3.4	0.309	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			1249	3.4	1249	3.4	0.309	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.3
All Vehicles			3332	3.3	3332	3.3	0.509	0.2	NA	0.2	1.1	0.00	0.01	0.00	59.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.24.B.PM] 5. Larkin x Sparkes - 2024 PM (2024 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	9	0.0	9	0.0	0.006	3.3	LOS A	0.0	0.0	0.00	0.46	0.00	20.1
2	T1	All MCs	1	0.0	1	0.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.46	0.00	39.4
Approach			11	0.0	11	0.0	0.006	3.0	NA	0.0	0.0	0.00	0.46	0.00	21.5
East: Sparkes St (90m)															
4	L2	All MCs	13	0.0	13	0.0	0.017	4.6	LOS A	0.1	0.4	0.08	0.53	0.08	30.2
5	T1	All MCs	1	0.0	1	0.0	0.017	3.3	LOS A	0.1	0.4	0.08	0.53	0.08	28.4
6	R2	All MCs	9	0.0	9	0.0	0.017	5.0	LOS A	0.1	0.4	0.08	0.53	0.08	33.3
Approach			23	0.0	23	0.0	0.017	4.7	LOS A	0.1	0.4	0.08	0.53	0.08	31.6
North: Larkin St (100m)															
8	T1	All MCs	22	4.8	22	4.8	0.012	0.0	LOS A	0.0	0.0	0.01	0.03	0.01	48.9
9	R2	All MCs	1	0.0	1	0.0	0.012	4.6	LOS A	0.0	0.0	0.01	0.03	0.01	35.3
Approach			23	4.5	23	4.5	0.012	0.2	NA	0.0	0.0	0.01	0.03	0.01	47.9
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.018	4.3	LOS A	0.1	0.4	0.06	0.53	0.06	32.9
12	R2	All MCs	19	0.0	19	0.0	0.018	4.4	LOS A	0.1	0.4	0.06	0.53	0.06	27.1
Approach			20	0.0	20	0.0	0.018	4.4	LOS A	0.1	0.4	0.06	0.53	0.06	27.5
All Vehicles			77	1.4	77	1.4	0.018	3.0	NA	0.1	0.4	0.04	0.37	0.04	32.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.24.B.PM] 6. Ross x Arundel - 2024 PM (2024 Base PM)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	51	0.0	51	0.0	0.250	5.5	LOS A	0.8	5.4	0.21	0.27	0.21	37.5
2	T1	All MCs	317	1.0	317	1.0	0.250	0.4	LOS A	0.8	5.4	0.21	0.27	0.21	43.5
3	R2	All MCs	72	1.5	72	1.5	0.250	5.8	LOS A	0.8	5.4	0.21	0.27	0.21	42.6
3u	U	All MCs	3	0.0	3	0.0	0.250	7.9	LOS A	0.8	5.4	0.21	0.27	0.21	37.0
Approach			442	1.0	442	1.0	0.250	1.9	NA	0.8	5.4	0.21	0.27	0.21	42.4
East: Arundel St (250m)															
4	L2	All MCs	61	0.0	61	0.0	0.152	9.3	LOS A	0.6	3.9	0.52	0.91	0.52	34.4
5	T1	All MCs	3	0.0	3	0.0	0.152	13.3	LOS A	0.6	3.9	0.52	0.91	0.52	34.3
6	R2	All MCs	36	0.0	36	0.0	0.152	14.1	LOS A	0.6	3.9	0.52	0.91	0.52	34.2
Approach			100	0.0	100	0.0	0.152	11.2	LOS A	0.6	3.9	0.52	0.91	0.52	34.3
North: Ross St (105m)															
7	L2	All MCs	36	0.0	36	0.0	0.180	5.3	LOS A	0.3	1.8	0.10	0.17	0.10	44.7
8	T1	All MCs	265	0.0	265	0.0	0.180	0.2	LOS A	0.3	1.8	0.10	0.17	0.10	46.0
9	R2	All MCs	23	0.0	23	0.0	0.180	6.2	LOS A	0.3	1.8	0.10	0.17	0.10	39.0
Approach			324	0.0	324	0.0	0.180	1.2	NA	0.3	1.8	0.10	0.17	0.10	45.1
West: Arundel St (155m)															
10	L2	All MCs	20	0.0	20	0.0	0.120	8.1	LOS A	0.4	2.9	0.56	0.96	0.56	28.3
11	T1	All MCs	12	0.0	12	0.0	0.120	12.2	LOS A	0.4	2.9	0.56	0.96	0.56	33.3
12	R2	All MCs	32	0.0	32	0.0	0.120	13.1	LOS A	0.4	2.9	0.56	0.96	0.56	27.1
Approach			63	0.0	63	0.0	0.120	11.4	LOS A	0.4	2.9	0.56	0.96	0.56	28.9
All Vehicles			929	0.5	929	0.5	0.250	3.3	NA	0.8	5.4	0.23	0.35	0.23	40.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1.30.B.AM] 1. Parramatta x Lyons - 2030 Base AM (2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	105	2.0	105	2.0	0.136	27.0	LOS B	4.2	29.6	0.62	0.67	0.62	27.8
2	T1	All MCs	129	9.8	129	9.8	0.631	62.5	LOS E	9.4	73.9	1.00	0.81	1.01	19.9
3	R2	All MCs	12	72.7	12	72.7	0.631	87.2	LOS F	9.4	73.9	1.00	0.81	1.01	19.1
Approach			246	9.4	246	9.4	0.631	48.5	LOS D	9.4	73.9	0.83	0.75	0.84	22.5
East: Parramatta Rd (155m)															
4	L2	All MCs	120	13.2	120	13.2	0.253	39.3	LOS C	6.6	56.4	0.73	0.74	0.73	26.0
5	T1	All MCs	782	8.7	782	8.7	0.522	34.1	LOS C	19.6	144.2	0.81	0.71	0.81	21.3
Approach			902	9.3	902	9.3	0.522	34.8	LOS C	19.6	144.2	0.80	0.72	0.80	22.3
North: Lyons Rd (180m)															
7	L2	All MCs	88	2.4	88	2.4	0.349	90.3	LOS F	5.6	39.7	0.95	0.77	0.95	13.6
8	T1	All MCs	213	2.0	213	2.0	*0.867	99.7	LOS F	16.4	116.4	1.00	1.04	1.23	18.6
9	R2	All MCs	5	0.0	5	0.0	0.867	120.5	LOS F	16.4	116.4	1.00	1.04	1.23	12.2
Approach			306	2.1	306	2.1	0.867	97.4	LOS F	16.4	116.4	0.98	0.96	1.15	14.3
West: Parramatta Rd (140m)															
10	L2	All MCs	17	6.2	17	6.2	0.074	12.1	LOS A	1.1	12.5	0.31	0.53	0.31	33.2
11	T1	All MCs	2527	4.0	2527	4.0	*0.929	27.3	LOS B	79.6	568.5	0.90	0.87	0.96	26.1
12	R2	All MCs	283	3.7	283	3.7	0.522	55.5	LOS D	15.9	115.2	0.88	0.82	0.88	22.7
Approach			2827	3.9	2827	3.9	0.929	30.0	LOS C	79.6	568.5	0.89	0.86	0.95	23.8
All Vehicles			4282	5.3	4282	5.3	0.929	36.9	LOS C	79.6	568.5	0.88	0.83	0.92	21.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	57	60	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Parramatta Rd (155m)												
P2	Full	132	139	64.5	LOS F	0.5	0.5	0.96	0.96	218.3	200.0	0.92
North: Lyons Rd (180m)												
P3	Full	69	73	64.3	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
West: Parramatta Rd (140m)												
P4	Full	215	226	64.7	LOS F	0.9	0.9	0.97	0.97	218.6	200.0	0.91
All Pedestrians		473	498	64.6	LOS F	0.9	0.9	0.96	0.96	218.4	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [2.30.B.AM] 2. Parramatta x Ross - 2030 Base AM (2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	34	9.4	34	9.4	0.482	62.8	LOS E	6.4	46.5	0.99	0.77	0.99	10.9
2	T1	All MCs	41	0.0	41	0.0	0.482	59.4	LOS E	6.4	46.5	0.99	0.77	0.99	7.8
3	R2	All MCs	22	4.8	22	4.8	0.482	78.8	LOS F	6.4	46.5	0.99	0.77	0.99	13.8
Approach			97	4.3	97	4.3	0.482	65.0	LOS E	6.4	46.5	0.99	0.77	0.99	10.3
East: Parramatta Rd (600m)															
4	L2	All MCs	34	3.1	34	3.1	0.072	16.0	LOS B	1.3	12.7	0.35	1.04	0.35	16.1
5	T1	All MCs	804	9.3	804	9.3	0.291	7.0	LOS A	9.0	66.2	0.38	0.36	0.38	52.4
6	R2	All MCs	119	2.7	119	2.7	* 0.695	75.4	LOS F	8.3	59.4	1.00	0.84	1.08	21.1
Approach			957	8.3	957	8.3	0.695	15.9	LOS B	9.0	66.2	0.45	0.44	0.46	42.2
North: Ross St (85m)															
7	L2	All MCs	96	0.0	96	0.0	0.593	54.5	LOS D	12.6	88.8	0.97	0.83	0.97	22.7
8	T1	All MCs	102	2.1	102	2.1	0.593	76.1	LOS F	12.6	88.8	0.97	0.83	0.97	8.6
9	R2	All MCs	152	5.6	152	5.6	* 0.929	91.6	LOS F	12.3	89.9	1.00	1.07	1.42	12.5
Approach			349	3.0	349	3.0	0.929	76.9	LOS F	12.6	89.9	0.98	0.93	1.17	12.7
West: Parramatta Rd (310m)															
10	L2	All MCs	259	1.6	259	1.6	0.344	23.3	LOS B	11.2	90.3	0.58	0.71	0.58	30.0
11	T1	All MCs	2262	4.7	2262	4.7	* 0.991	65.1	LOS E	96.5	689.6	0.99	1.18	1.24	27.6
Approach			2521	4.4	2521	4.4	0.991	60.8	LOS E	96.5	689.6	0.95	1.13	1.17	27.8
All Vehicles			3924	5.2	3924	5.2	0.991	51.4	LOS D	96.5	689.6	0.83	0.94	0.99	27.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	52	55	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Parramatta Rd (600m)												
P2	Full	228	240	64.8	LOS F	0.9	0.9	0.97	0.97	218.6	200.0	0.91
North: Ross St (85m)												
P3	Full	47	49	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Parramatta Rd (310m)												
P4	Full	51	54	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		378	398	64.6	LOS F	0.9	0.9	0.96	0.96	218.4	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.30.B.AM] 3. Ross x Bridge - 2030 Base AM (2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	105	6.0	105	6.0	0.371	28.9	LOS C	2.9	21.4	0.93	0.76	0.93	24.5
2	T1	All MCs	161	4.6	161	4.6	0.405	22.8	LOS B	4.2	30.8	0.91	0.73	0.91	26.7
Approach			266	5.1	266	5.1	0.405	25.2	LOS B	4.2	30.8	0.92	0.74	0.92	25.6
East: Bridge Rd (500m)															
4	L2	All MCs	60	1.8	60	1.8	0.480	13.1	LOS A	9.1	64.6	0.62	0.57	0.62	34.3
5	T1	All MCs	471	1.8	471	1.8	0.480	7.7	LOS A	9.1	64.6	0.62	0.57	0.62	36.3
6	R2	All MCs	38	0.0	38	0.0	0.180	25.1	LOS B	1.0	6.7	0.84	0.72	0.84	30.6
Approach			568	1.7	568	1.7	0.480	9.4	LOS A	9.1	64.6	0.64	0.58	0.64	35.8
North: Ross St (280m)															
7	L2	All MCs	87	6.0	87	6.0	0.616	32.5	LOS C	6.0	43.5	0.97	0.83	1.01	29.9
8	T1	All MCs	371	2.8	371	2.8	* 0.616	25.5	LOS B	7.0	49.9	0.96	0.82	0.99	25.3
Approach			458	3.4	458	3.4	0.616	26.9	LOS B	7.0	49.9	0.96	0.82	0.99	26.6
West: Bridge Rd (400m)															
10	L2	All MCs	46	4.5	46	4.5	* 0.795	24.5	LOS B	21.6	154.3	0.84	0.83	0.91	34.3
11	T1	All MCs	806	2.1	806	2.1	0.795	19.1	LOS B	21.6	154.3	0.84	0.83	0.91	34.4
12	R2	All MCs	15	100.0	15	100.0	0.063	21.5	LOS B	0.3	3.5	0.61	0.63	0.61	29.3
Approach			867	3.9	867	3.9	0.795	19.4	LOS B	21.6	154.3	0.83	0.82	0.91	32.3
All Vehicles			2160	3.4	2160	3.4	0.795	19.1	LOS B	21.6	154.3	0.82	0.75	0.86	31.7

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												

P1	Full	94	99	24.4	LOS C	0.2	0.2	0.90	0.90	178.2	200.0	1.12
East: Bridge Rd (500m)												
P2	Full	150	158	24.5	LOS C	0.2	0.2	0.91	0.91	178.3	200.0	1.12
North: Ross St (280m)												
P3	Full	70	74	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)												
P4	Full	98	103	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12
All Pedestrians		412	434	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.30.B.AM] 4. Parramatta x Larkin - 2030 Base AM

(2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	945	10.6	945	10.6	0.244	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			945	10.6	945	10.6	0.244	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Larkin St (37m)															
7	L2	All MCs	52	8.2	52	8.2	0.043	3.6	LOS A	0.2	1.2	0.17	0.49	0.17	44.5
Approach			52	8.2	52	8.2	0.043	3.6	LOS A	0.2	1.2	0.17	0.49	0.17	44.5
West: Parramatta Rd (155m)															
10	L2	All MCs	27	7.7	27	7.7	0.060	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	21.1
11	T1	All MCs	2517	5.1	2517	5.1	0.644	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.2
Approach			2544	5.1	2544	5.1	0.644	0.2	NA	0.0	0.0	0.00	0.01	0.00	58.7
All Vehicles			3541	6.6	3541	6.6	0.644	0.2	NA	0.2	1.2	0.00	0.01	0.00	58.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.30.B.AM] 5. Larkin x Sparkes - 2030 Base AM (2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	15	7.1	15	7.1	0.014	3.3	LOS A	0.0	0.0	0.00	0.31	0.00	20.8
2	T1	All MCs	9	11.1	9	11.1	0.014	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	42.1
Approach			24	8.7	24	8.7	0.014	2.0	NA	0.0	0.0	0.00	0.31	0.00	27.2
East: Sparkes St (90m)															
4	L2	All MCs	15	14.3	15	14.3	0.023	4.8	LOS A	0.1	0.6	0.11	0.50	0.11	30.4
5	T1	All MCs	7	0.0	7	0.0	0.023	3.4	LOS A	0.1	0.6	0.11	0.50	0.11	28.8
6	R2	All MCs	7	0.0	7	0.0	0.023	5.1	LOS A	0.1	0.6	0.11	0.50	0.11	33.7
Approach			29	7.1	29	7.1	0.023	4.5	LOS A	0.1	0.6	0.11	0.50	0.11	30.9
North: Larkin St (100m)															
8	T1	All MCs	31	0.0	31	0.0	0.016	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	49.2
9	R2	All MCs	1	0.0	1	0.0	0.016	4.6	LOS A	0.0	0.0	0.01	0.02	0.01	35.4
Approach			32	0.0	32	0.0	0.016	0.2	NA	0.0	0.0	0.01	0.02	0.01	48.4
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.004	4.3	LOS A	0.0	0.1	0.10	0.51	0.10	32.8
12	R2	All MCs	3	33.3	3	33.3	0.004	4.7	LOS A	0.0	0.1	0.10	0.51	0.10	26.4
Approach			4	25.0	4	25.0	0.004	4.6	LOS A	0.0	0.1	0.10	0.51	0.10	28.3
All Vehicles			89	5.9	89	5.9	0.023	2.3	NA	0.1	0.6	0.04	0.28	0.04	34.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.30.B.AM] 6. Ross x Arundel - 2030 Base AM (2030 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	68	6.2	68	6.2	0.241	5.7	LOS A	1.0	7.0	0.28	0.35	0.28	36.3
2	T1	All MCs	239	3.5	239	3.5	0.241	0.6	LOS A	1.0	7.0	0.28	0.35	0.28	41.6
3	R2	All MCs	76	9.7	76	9.7	0.241	6.1	LOS A	1.0	7.0	0.28	0.35	0.28	41.2
3u	U	All MCs	12	0.0	12	0.0	0.241	7.9	LOS A	1.0	7.0	0.28	0.35	0.28	35.5
Approach			395	5.1	395	5.1	0.241	2.8	NA	1.0	7.0	0.28	0.35	0.28	40.3
East: Arundel St (250m)															
4	L2	All MCs	35	12.1	35	12.1	0.093	10.0	LOS A	0.3	2.5	0.50	0.91	0.50	34.0
5	T1	All MCs	5	20.0	5	20.0	0.093	15.7	LOS B	0.3	2.5	0.50	0.91	0.50	34.2
6	R2	All MCs	19	0.0	19	0.0	0.093	13.2	LOS A	0.3	2.5	0.50	0.91	0.50	34.2
Approach			59	8.9	59	8.9	0.093	11.5	LOS A	0.3	2.5	0.50	0.91	0.50	34.1
North: Ross St (105m)															
7	L2	All MCs	37	11.4	37	11.4	0.205	5.5	LOS A	0.5	3.8	0.18	0.25	0.18	43.3
8	T1	All MCs	261	2.8	261	2.8	0.205	0.3	LOS A	0.5	3.8	0.18	0.25	0.18	44.1
9	R2	All MCs	55	0.0	55	0.0	0.205	5.9	LOS A	0.5	3.8	0.18	0.25	0.18	38.0
Approach			353	3.3	353	3.3	0.205	1.7	NA	0.5	3.8	0.18	0.25	0.18	42.7
West: Arundel St (155m)															
10	L2	All MCs	28	3.7	28	3.7	0.096	7.9	LOS A	0.3	2.4	0.50	0.90	0.50	28.8
11	T1	All MCs	6	0.0	6	0.0	0.096	11.7	LOS A	0.3	2.4	0.50	0.90	0.50	33.9
12	R2	All MCs	23	4.5	23	4.5	0.096	13.4	LOS A	0.3	2.4	0.50	0.90	0.50	27.7
Approach			58	3.6	58	3.6	0.096	10.5	LOS A	0.3	2.4	0.50	0.90	0.50	29.1
All Vehicles			864	4.5	864	4.5	0.241	3.5	NA	1.0	7.0	0.27	0.38	0.27	39.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1.30.B.PM] 1. Parramatta x Lyons - 2030 Base PM (2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	141	0.0	141	0.0	0.250	56.6	LOS E	7.2	50.3	0.80	0.75	0.80	23.6
2	T1	All MCs	247	1.3	247	1.3	*0.910	92.3	LOS F	19.7	140.7	1.00	1.11	1.30	17.9
3	R2	All MCs	3	66.7	3	66.7	0.910	104.6	LOS F	19.7	140.7	1.00	1.11	1.30	17.3
Approach			392	1.3	392	1.3	0.910	79.6	LOS F	19.7	140.7	0.93	0.98	1.12	17.6
East: Parramatta Rd (155m)															
4	L2	All MCs	157	6.7	157	6.7	0.225	22.6	LOS B	6.5	54.3	0.54	0.68	0.54	31.3
5	T1	All MCs	2082	2.6	2082	2.6	*0.911	35.4	LOS C	67.5	476.2	0.96	0.94	1.03	20.8
Approach			2239	2.9	2239	2.9	0.911	34.5	LOS C	67.5	476.2	0.93	0.92	0.99	21.8
North: Lyons Rd (180m)															
7	L2	All MCs	52	0.0	52	0.0	0.205	62.0	LOS E	3.2	22.2	0.93	0.74	0.93	13.8
8	T1	All MCs	99	0.0	99	0.0	0.432	60.7	LOS E	6.8	47.4	0.97	0.77	0.97	20.2
9	R2	All MCs	6	0.0	6	0.0	0.432	87.7	LOS F	6.8	47.4	0.97	0.77	0.97	13.6
Approach			157	0.0	157	0.0	0.432	62.2	LOS E	6.8	47.4	0.96	0.76	0.96	18.3
West: Parramatta Rd (140m)															
10	L2	All MCs	25	0.0	25	0.0	0.052	12.1	LOS A	0.9	8.7	0.33	0.82	0.33	29.3
11	T1	All MCs	1211	2.2	1211	2.2	0.411	6.9	LOS A	14.6	102.5	0.40	0.37	0.40	43.6
12	R2	All MCs	112	0.9	112	0.9	*0.511	69.5	LOS E	7.3	51.7	0.98	0.79	0.98	19.0
Approach			1347	2.0	1347	2.0	0.511	12.2	LOS A	14.6	102.5	0.45	0.41	0.45	35.8
All Vehicles			4135	2.4	4135	2.4	0.911	32.5	LOS C	67.5	476.2	0.77	0.75	0.83	23.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	76	80	64.3	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
East: Parramatta Rd (155m)												
P2	Full	171	180	64.6	LOS F	0.7	0.7	0.96	0.96	218.5	200.0	0.92
North: Lyons Rd (180m)												
P3	Full	81	85	64.4	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
West: Parramatta Rd (140m)												
P4	Full	104	109	64.4	LOS F	0.4	0.4	0.96	0.96	218.3	200.0	0.92
All Pedestrians		432	455	64.5	LOS F	0.7	0.7	0.96	0.96	218.3	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [2.30.B.PM] 2. Parramatta x Ross - 2030 Base PM (2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	71	1.5	71	1.5	0.388	32.7	LOS C	6.3	44.6	0.90	0.73	0.90	12.3
2	T1	All MCs	72	1.5	72	1.5	0.388	29.8	LOS C	6.3	44.6	0.90	0.73	0.90	8.4
3	R2	All MCs	23	0.0	23	0.0	0.388	42.7	LOS D	6.3	44.6	0.90	0.73	0.90	15.5
Approach			165	1.3	165	1.3	0.388	32.8	LOS C	6.3	44.6	0.90	0.73	0.90	11.0
East: Parramatta Rd (600m)															
4	L2	All MCs	40	0.0	40	0.0	0.131	19.5	LOS B	1.7	17.7	0.53	0.95	0.53	16.2
5	T1	All MCs	1914	3.2	1914	3.2	0.841	21.0	LOS B	36.8	259.3	0.88	0.86	0.93	43.9
6	R2	All MCs	220	0.5	220	0.5	* 0.827	54.8	LOS D	10.6	74.4	1.00	0.96	1.25	26.0
Approach			2174	2.9	2174	2.9	0.841	24.4	LOS B	36.8	259.3	0.88	0.87	0.96	39.6
North: Ross St (85m)															
7	L2	All MCs	132	0.8	132	0.8	0.439	28.1	LOS B	8.2	58.0	0.88	0.82	0.88	30.5
8	T1	All MCs	92	1.1	92	1.1	0.439	49.6	LOS D	8.2	58.0	0.88	0.82	0.88	9.7
9	R2	All MCs	200	0.5	200	0.5	* 0.829	51.9	LOS D	9.8	68.8	1.00	0.99	1.28	18.6
Approach			423	0.7	423	0.7	0.829	44.0	LOS D	9.8	68.8	0.93	0.90	1.07	17.5
West: Parramatta Rd (310m)															
10	L2	All MCs	111	1.9	111	1.9	0.261	29.5	LOS C	4.4	36.8	0.76	0.73	0.76	27.0
11	T1	All MCs	1229	2.7	1229	2.7	* 0.827	31.9	LOS C	26.3	184.5	0.97	0.94	1.07	38.1
Approach			1340	2.6	1340	2.6	0.827	31.7	LOS C	26.3	184.5	0.95	0.92	1.04	37.5
All Vehicles			4102	2.5	4102	2.5	0.841	29.1	LOS C	36.8	259.3	0.91	0.89	1.00	33.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	62	65	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
East: Parramatta Rd (600m)												
P2	Full	274	288	39.7	LOS D	0.7	0.7	0.94	0.94	193.5	200.0	1.03
North: Ross St (85m)												
P3	Full	73	77	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
West: Parramatta Rd (310m)												
P4	Full	63	66	39.3	LOS D	0.2	0.2	0.94	0.94	193.2	200.0	1.04
All Pedestrians		472	497	39.5	LOS D	0.7	0.7	0.94	0.94	193.4	200.0	1.03

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.30.B.PM] 3. Ross x Bridge - 2030 Base PM (2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	251	2.9	251	2.9	0.625	27.4	LOS B	7.0	50.3	0.95	0.83	0.99	25.0
2	T1	All MCs	372	0.3	372	0.3	* 0.710	23.2	LOS B	10.6	74.1	0.96	0.88	1.04	26.5
Approach			622	1.4	622	1.4	0.710	24.9	LOS B	10.6	74.1	0.96	0.86	1.02	25.8
East: Bridge Rd (500m)															
4	L2	All MCs	46	2.3	46	2.3	* 0.710	17.7	LOS B	16.2	114.3	0.81	0.74	0.82	32.5
5	T1	All MCs	677	0.6	677	0.6	0.710	11.6	LOS A	16.2	114.3	0.81	0.74	0.82	34.9
6	R2	All MCs	129	0.8	129	0.8	0.337	19.3	LOS B	2.9	20.4	0.77	0.74	0.77	32.6
Approach			853	0.7	853	0.7	0.710	13.1	LOS A	16.2	114.3	0.81	0.74	0.81	34.5
North: Ross St (280m)															
7	L2	All MCs	61	0.0	61	0.0	0.172	25.6	LOS B	1.8	12.4	0.84	0.72	0.84	31.1
8	T1	All MCs	339	0.9	339	0.9	0.629	22.7	LOS B	8.7	61.7	0.93	0.81	0.94	26.9
Approach			400	0.8	400	0.8	0.629	23.2	LOS B	8.7	61.7	0.92	0.79	0.92	27.9
West: Bridge Rd (400m)															
10	L2	All MCs	95	2.2	95	2.2	0.509	17.4	LOS B	9.7	68.4	0.70	0.64	0.70	35.6
11	T1	All MCs	407	0.8	407	0.8	0.509	11.9	LOS A	9.7	68.4	0.70	0.64	0.70	35.3
12	R2	All MCs	5	100.0	5	100.0	0.037	26.0	LOS B	0.1	1.6	0.78	0.64	0.78	25.9
Approach			507	2.1	507	2.1	0.509	13.1	LOS A	9.7	68.4	0.70	0.64	0.70	34.5
All Vehicles			2382	1.2	2382	1.2	0.710	17.9	LOS B	16.2	114.3	0.84	0.76	0.86	31.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												

P1	Full	77	81	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Bridge Rd (500m)												
P2	Full	90	95	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Ross St (280m)												
P3	Full	91	96	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)												
P4	Full	88	93	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		346	364	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.30.B.PM] 4. Parramatta x Larkin - 2030 Base PM

(2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	2144	3.2	2144	3.2	0.540	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			2144	3.2	2144	3.2	0.540	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.5
North: Larkin St (37m)															
7	L2	All MCs	59	1.8	59	1.8	0.047	3.5	LOS A	0.2	1.2	0.13	0.48	0.13	45.3
Approach			59	1.8	59	1.8	0.047	3.5	LOS A	0.2	1.2	0.13	0.48	0.13	45.3
West: Parramatta Rd (155m)															
10	L2	All MCs	13	0.0	13	0.0	0.037	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	21.3
11	T1	All MCs	1309	3.2	1309	3.2	0.328	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			1322	3.2	1322	3.2	0.328	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.3
All Vehicles			3525	3.2	3525	3.2	0.540	0.2	NA	0.2	1.2	0.00	0.01	0.00	59.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.30.B.PM] 5. Larkin x Sparkes - 2030 Base PM (2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	1	0.0	1	0.0	0.006	3.3	LOS A	0.0	0.0	0.00	0.05	0.00	22.6
2	T1	All MCs	11	0.0	11	0.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
Approach			12	0.0	12	0.0	0.006	0.3	NA	0.0	0.0	0.00	0.05	0.00	45.1
East: Sparkes St (90m)															
4	L2	All MCs	14	0.0	14	0.0	0.019	4.6	LOS A	0.1	0.5	0.09	0.53	0.09	30.1
5	T1	All MCs	1	0.0	1	0.0	0.019	3.3	LOS A	0.1	0.5	0.09	0.53	0.09	28.4
6	R2	All MCs	11	0.0	11	0.0	0.019	5.0	LOS A	0.1	0.5	0.09	0.53	0.09	33.2
Approach			25	0.0	25	0.0	0.019	4.7	LOS A	0.1	0.5	0.09	0.53	0.09	31.5
North: Larkin St (100m)															
8	T1	All MCs	23	4.5	23	4.5	0.013	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	48.9
9	R2	All MCs	1	0.0	1	0.0	0.013	4.6	LOS A	0.0	0.0	0.01	0.02	0.01	35.3
Approach			24	4.3	24	4.3	0.013	0.2	NA	0.0	0.0	0.01	0.02	0.01	48.0
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.019	4.3	LOS A	0.1	0.4	0.11	0.52	0.11	32.6
12	R2	All MCs	20	0.0	20	0.0	0.019	4.5	LOS A	0.1	0.4	0.11	0.52	0.11	26.8
Approach			21	0.0	21	0.0	0.019	4.5	LOS A	0.1	0.4	0.11	0.52	0.11	27.2
All Vehicles			82	1.3	82	1.3	0.019	2.7	NA	0.1	0.5	0.06	0.31	0.06	35.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.30.B.PM] 6. Ross x Arundel - 2030 Base PM (2030 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	54	0.0	54	0.0	0.268	5.6	LOS A	0.9	6.0	0.22	0.28	0.22	37.4
2	T1	All MCs	337	1.2	337	1.2	0.268	0.4	LOS A	0.9	6.0	0.22	0.28	0.22	43.4
3	R2	All MCs	76	1.4	76	1.4	0.268	6.0	LOS A	0.9	6.0	0.22	0.28	0.22	42.5
3u	U	All MCs	4	0.0	4	0.0	0.268	8.1	LOS A	0.9	6.0	0.22	0.28	0.22	36.9
Approach			471	1.1	471	1.1	0.268	2.0	NA	0.9	6.0	0.22	0.28	0.22	42.3
East: Arundel St (250m)															
4	L2	All MCs	65	0.0	65	0.0	0.173	9.5	LOS A	0.6	4.4	0.54	0.92	0.54	34.0
5	T1	All MCs	4	0.0	4	0.0	0.173	14.1	LOS A	0.6	4.4	0.54	0.92	0.54	34.0
6	R2	All MCs	38	0.0	38	0.0	0.173	15.1	LOS B	0.6	4.4	0.54	0.92	0.54	33.9
Approach			107	0.0	107	0.0	0.173	11.6	LOS A	0.6	4.4	0.54	0.92	0.54	34.0
North: Ross St (105m)															
7	L2	All MCs	38	0.0	38	0.0	0.192	5.3	LOS A	0.3	2.1	0.11	0.18	0.11	44.7
8	T1	All MCs	281	0.0	281	0.0	0.192	0.2	LOS A	0.3	2.1	0.11	0.18	0.11	45.9
9	R2	All MCs	25	0.0	25	0.0	0.192	6.3	LOS A	0.3	2.1	0.11	0.18	0.11	38.9
Approach			344	0.0	344	0.0	0.192	1.2	NA	0.3	2.1	0.11	0.18	0.11	44.9
West: Arundel St (155m)															
10	L2	All MCs	21	0.0	21	0.0	0.136	8.2	LOS A	0.5	3.3	0.58	0.98	0.58	27.8
11	T1	All MCs	13	0.0	13	0.0	0.136	12.9	LOS A	0.5	3.3	0.58	0.98	0.58	32.9
12	R2	All MCs	34	0.0	34	0.0	0.136	14.0	LOS A	0.5	3.3	0.58	0.98	0.58	26.6
Approach			67	0.0	67	0.0	0.136	12.0	LOS A	0.5	3.3	0.58	0.98	0.58	28.4
All Vehicles			989	0.5	989	0.5	0.268	3.4	NA	0.9	6.0	0.24	0.36	0.24	39.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1.30.P.AM] 1. Parramatta x Lyons - 2030 Project Case AM

(2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	105	2.0	105	2.0	0.136	27.1	LOS B	4.2	29.7	0.62	0.68	0.62	27.8
2	T1	All MCs	129	9.8	129	9.8	0.631	62.5	LOS E	9.4	73.9	1.00	0.81	1.01	19.9
3	R2	All MCs	12	72.7	12	72.7	0.631	87.2	LOS F	9.4	73.9	1.00	0.81	1.01	19.1
Approach			246	9.4	246	9.4	0.631	48.5	LOS D	9.4	73.9	0.84	0.75	0.84	22.5
East: Parramatta Rd (155m)															
4	L2	All MCs	120	13.2	120	13.2	0.253	39.3	LOS C	6.6	56.4	0.73	0.74	0.73	26.0
5	T1	All MCs	782	8.7	782	8.7	0.522	34.1	LOS C	19.6	144.2	0.81	0.71	0.81	21.3
Approach			902	9.3	902	9.3	0.522	34.8	LOS C	19.6	144.2	0.80	0.72	0.80	22.3
North: Lyons Rd (180m)															
7	L2	All MCs	88	2.4	88	2.4	0.349	90.3	LOS F	5.6	39.7	0.95	0.77	0.95	13.6
8	T1	All MCs	213	2.0	213	2.0	* 0.867	99.7	LOS F	16.4	116.4	1.00	1.04	1.23	18.6
9	R2	All MCs	5	0.0	5	0.0	0.867	120.5	LOS F	16.4	116.4	1.00	1.04	1.23	12.2
Approach			306	2.1	306	2.1	0.867	97.4	LOS F	16.4	116.4	0.98	0.96	1.15	14.3
West: Parramatta Rd (140m)															
10	L2	All MCs	17	6.2	17	6.2	0.074	12.1	LOS A	1.1	12.5	0.31	0.53	0.31	33.2
11	T1	All MCs	2575	3.9	2575	3.9	* 0.949	34.3	LOS C	89.9	641.6	0.94	0.94	1.04	22.6
12	R2	All MCs	283	3.7	283	3.7	0.522	56.2	LOS D	15.9	115.2	0.88	0.82	0.88	22.7
Approach			2875	3.9	2875	3.9	0.949	36.3	LOS C	89.9	641.6	0.93	0.93	1.02	21.3
All Vehicles			4329	5.2	4329	5.2	0.949	41.0	LOS C	89.9	641.6	0.90	0.88	0.97	20.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	57	60	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Parramatta Rd (155m)												
P2	Full	132	139	64.5	LOS F	0.5	0.5	0.96	0.96	218.3	200.0	0.92
North: Lyons Rd (180m)												
P3	Full	69	73	64.3	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
West: Parramatta Rd (140m)												
P4	Full	215	226	64.7	LOS F	0.9	0.9	0.97	0.97	218.6	200.0	0.91
All Pedestrians		473	498	64.6	LOS F	0.9	0.9	0.96	0.96	218.4	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [2.30.P.AM] 2. Parramatta x Ross - 2030 Project Case AM

(2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	34	9.4	34	9.4	0.483	62.7	LOS E	6.5	46.9	0.99	0.77	0.99	10.9
2	T1	All MCs	42	0.0	42	0.0	0.483	59.4	LOS E	6.5	46.9	0.99	0.77	0.99	7.8
3	R2	All MCs	22	4.8	22	4.8	0.483	78.8	LOS F	6.5	46.9	0.99	0.77	0.99	13.8
Approach			98	4.3	98	4.3	0.483	64.9	LOS E	6.5	46.9	0.99	0.77	0.99	10.2
East: Parramatta Rd (600m)															
4	L2	All MCs	34	3.1	34	3.1	0.072	16.0	LOS B	1.3	12.7	0.35	1.04	0.35	16.1
5	T1	All MCs	804	9.3	804	9.3	0.291	7.1	LOS A	9.0	66.3	0.38	0.36	0.38	52.4
6	R2	All MCs	133	2.4	133	2.4	* 0.773	77.7	LOS F	9.5	67.8	1.00	0.89	1.15	20.7
Approach			971	8.1	971	8.1	0.773	17.0	LOS B	9.5	67.8	0.46	0.46	0.48	41.6
North: Ross St (85m)															
7	L2	All MCs	96	0.0	96	0.0	0.592	54.5	LOS D	12.6	88.8	0.97	0.83	0.97	22.7
8	T1	All MCs	102	2.1	102	2.1	0.592	76.1	LOS F	12.6	88.8	0.97	0.83	0.97	8.6
9	R2	All MCs	152	5.6	152	5.6	* 0.932	92.3	LOS F	12.3	90.3	1.00	1.07	1.43	12.4
Approach			349	3.0	349	3.0	0.932	77.2	LOS F	12.6	90.3	0.98	0.93	1.17	12.6
West: Parramatta Rd (310m)															
10	L2	All MCs	266	2.0	266	2.0	0.352	23.5	LOS B	11.5	93.0	0.58	0.71	0.58	29.9
11	T1	All MCs	2267	4.7	2267	4.7	* 0.994	66.8	LOS E	97.9	699.7	0.99	1.19	1.25	27.2
Approach			2534	4.4	2534	4.4	0.994	62.3	LOS E	97.9	699.7	0.95	1.14	1.18	27.4
All Vehicles			3952	5.2	3952	5.2	0.994	52.5	LOS D	97.9	699.7	0.83	0.95	1.00	26.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	52	55	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Parramatta Rd (600m)												
P2	Full	228	240	64.8	LOS F	0.9	0.9	0.97	0.97	218.6	200.0	0.91
North: Ross St (85m)												
P3	Full	47	49	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Parramatta Rd (310m)												
P4	Full	51	54	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		378	398	64.6	LOS F	0.9	0.9	0.96	0.96	218.4	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.30.P.AM] 3. Ross x Bridge - 2030 Project Case AM

(2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	107	5.9	107	5.9	0.378	29.0	LOS C	3.0	21.8	0.93	0.76	0.93	24.5
2	T1	All MCs	163	4.5	163	4.5	0.410	22.8	LOS B	4.3	31.2	0.91	0.73	0.91	26.7
Approach			271	5.1	271	5.1	0.410	25.3	LOS B	4.3	31.2	0.92	0.74	0.92	25.6
East: Bridge Rd (500m)															
4	L2	All MCs	61	1.7	61	1.7	0.490	13.2	LOS A	9.3	66.4	0.63	0.58	0.63	34.2
5	T1	All MCs	480	1.8	480	1.8	0.490	7.8	LOS A	9.3	66.4	0.63	0.58	0.63	36.3
6	R2	All MCs	38	0.0	38	0.0	0.180	25.1	LOS B	1.0	6.7	0.84	0.72	0.84	30.6
Approach			579	1.6	579	1.6	0.490	9.5	LOS A	9.3	66.4	0.64	0.59	0.64	35.7
North: Ross St (280m)															
7	L2	All MCs	87	6.0	87	6.0	0.640	32.9	LOS C	6.4	46.0	0.97	0.84	1.03	29.8
8	T1	All MCs	391	2.7	391	2.7	* 0.640	25.9	LOS B	7.3	52.5	0.97	0.84	1.01	25.1
Approach			478	3.3	478	3.3	0.640	27.2	LOS B	7.3	52.5	0.97	0.84	1.02	26.4
West: Bridge Rd (400m)															
10	L2	All MCs	46	4.5	46	4.5	* 0.795	24.5	LOS B	21.7	154.5	0.84	0.83	0.92	34.3
11	T1	All MCs	806	2.1	806	2.1	0.795	19.1	LOS B	21.7	154.5	0.84	0.83	0.92	34.4
12	R2	All MCs	15	100.0	15	100.0	0.064	21.7	LOS B	0.3	3.5	0.62	0.64	0.62	29.2
Approach			867	3.9	867	3.9	0.795	19.5	LOS B	21.7	154.5	0.83	0.82	0.91	32.3
All Vehicles			2195	3.3	2195	3.3	0.795	19.2	LOS B	21.7	154.5	0.82	0.75	0.86	31.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												

P1	Full	94	99	24.4	LOS C	0.2	0.2	0.90	0.90	178.2	200.0	1.12
East: Bridge Rd (500m)												
P2	Full	150	158	24.5	LOS C	0.2	0.2	0.91	0.91	178.3	200.0	1.12
North: Ross St (280m)												
P3	Full	70	74	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)												
P4	Full	98	103	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12
All Pedestrians		412	434	24.4	LOS C	0.2	0.2	0.90	0.90	178.3	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.30.P.AM] 4. Parramatta x Larkin - 2030 Project Case AM (2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	945	10.6	945	10.6	0.244	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			945	10.6	945	10.6	0.244	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Larkin St (37m)															
7	L2	All MCs	64	9.8	64	9.8	0.055	3.6	LOS A	0.2	1.5	0.17	0.49	0.17	44.4
Approach			64	9.8	64	9.8	0.055	3.6	LOS A	0.2	1.5	0.17	0.49	0.17	44.4
West: Parramatta Rd (155m)															
10	L2	All MCs	75	4.2	75	4.2	0.086	5.6	LOS A	0.0	0.0	0.00	0.34	0.00	20.4
11	T1	All MCs	2517	5.1	2517	5.1	0.644	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.1
Approach			2592	5.1	2592	5.1	0.644	0.3	NA	0.0	0.0	0.00	0.02	0.00	57.8
All Vehicles			3601	6.6	3601	6.6	0.644	0.3	NA	0.2	1.5	0.00	0.02	0.00	58.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.30.P.AM] 5. Larkin x Sparkes - 2030 Project Case AM

(2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	62	3.4	62	3.4	0.039	3.3	LOS A	0.0	0.0	0.00	0.44	0.00	20.1
2	T1	All MCs	9	11.1	9	11.1	0.039	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	39.6
Approach			72	4.4	72	4.4	0.039	2.9	NA	0.0	0.0	0.00	0.44	0.00	22.0
East: Sparkes St (90m)															
4	L2	All MCs	15	14.3	15	14.3	0.068	4.8	LOS A	0.3	1.8	0.16	0.47	0.16	31.3
5	T1	All MCs	62	1.7	62	1.7	0.068	3.6	LOS A	0.3	1.8	0.16	0.47	0.16	29.4
6	R2	All MCs	7	0.0	7	0.0	0.068	5.1	LOS A	0.3	1.8	0.16	0.47	0.16	34.4
Approach			84	3.8	84	3.8	0.068	3.9	LOS A	0.3	1.8	0.16	0.47	0.16	30.2
North: Larkin St (100m)															
8	T1	All MCs	31	0.0	31	0.0	0.016	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	49.0
9	R2	All MCs	1	0.0	1	0.0	0.016	4.6	LOS A	0.0	0.0	0.01	0.02	0.01	35.4
Approach			32	0.0	32	0.0	0.016	0.2	NA	0.0	0.0	0.01	0.02	0.01	48.3
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.019	4.3	LOS A	0.1	0.5	0.19	0.52	0.19	31.9
12	R2	All MCs	16	20.0	16	20.0	0.019	5.2	LOS A	0.1	0.5	0.19	0.52	0.19	25.7
Approach			17	18.8	17	18.8	0.019	5.1	LOS A	0.1	0.5	0.19	0.52	0.19	26.2
All Vehicles			204	4.6	204	4.6	0.068	3.1	NA	0.3	1.8	0.08	0.40	0.08	28.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.30.P.AM] 6. Ross x Arundel - 2030 Project Case AM

(2030 Project Case AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	82	5.1	82	5.1	0.253	5.6	LOS A	1.0	7.3	0.27	0.36	0.27	36.3
2	T1	All MCs	246	3.8	246	3.8	0.253	0.6	LOS A	1.0	7.3	0.27	0.36	0.27	41.5
3	R2	All MCs	76	9.7	76	9.7	0.253	6.1	LOS A	1.0	7.3	0.27	0.36	0.27	41.2
3u	U	All MCs	12	0.0	12	0.0	0.253	7.9	LOS A	1.0	7.3	0.27	0.36	0.27	35.5
Approach			416	5.1	416	5.1	0.253	2.8	NA	1.0	7.3	0.27	0.36	0.27	40.1
East: Arundel St (250m)															
4	L2	All MCs	35	12.1	35	12.1	0.097	10.0	LOS A	0.3	2.5	0.51	0.92	0.51	33.8
5	T1	All MCs	5	20.0	5	20.0	0.097	16.6	LOS B	0.3	2.5	0.51	0.92	0.51	34.0
6	R2	All MCs	19	0.0	19	0.0	0.097	13.6	LOS A	0.3	2.5	0.51	0.92	0.51	34.1
Approach			59	8.9	59	8.9	0.097	11.7	LOS A	0.3	2.5	0.51	0.92	0.51	33.9
North: Ross St (105m)															
7	L2	All MCs	37	11.4	37	11.4	0.221	5.7	LOS A	0.7	5.1	0.23	0.30	0.23	42.8
8	T1	All MCs	261	2.8	261	2.8	0.221	0.5	LOS A	0.7	5.1	0.23	0.30	0.23	43.1
9	R2	All MCs	75	0.0	75	0.0	0.221	6.0	LOS A	0.7	5.1	0.23	0.30	0.23	37.4
Approach			373	3.1	373	3.1	0.221	2.1	NA	0.7	5.1	0.23	0.30	0.23	41.6
West: Arundel St (155m)															
10	L2	All MCs	28	3.7	28	3.7	0.100	7.9	LOS A	0.3	2.5	0.52	0.91	0.52	28.6
11	T1	All MCs	6	0.0	6	0.0	0.100	12.2	LOS A	0.3	2.5	0.52	0.91	0.52	33.7
12	R2	All MCs	23	4.5	23	4.5	0.100	14.0	LOS A	0.3	2.5	0.52	0.91	0.52	27.4
Approach			58	3.6	58	3.6	0.100	10.8	LOS A	0.3	2.5	0.52	0.91	0.52	28.9
All Vehicles			905	4.4	905	4.4	0.253	3.6	NA	1.0	7.3	0.29	0.40	0.29	38.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1.30.P.PM] 1. Parramatta x Lyons - 2030 Project Case PM

(2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Lyons Rd / Missenden Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Missenden Rd (500m)															
1	L2	All MCs	141	0.0	141	0.0	0.250	56.6	LOS E	7.2	50.3	0.80	0.75	0.80	23.6
2	T1	All MCs	247	1.3	247	1.3	*0.910	92.3	LOS F	19.7	140.7	1.00	1.11	1.30	17.9
3	R2	All MCs	3	66.7	3	66.7	0.910	104.6	LOS F	19.7	140.7	1.00	1.11	1.30	17.3
Approach			392	1.3	392	1.3	0.910	79.6	LOS F	19.7	140.7	0.93	0.98	1.12	17.6
East: Parramatta Rd (155m)															
4	L2	All MCs	157	6.7	157	6.7	0.225	22.6	LOS B	6.5	54.3	0.54	0.68	0.54	31.3
5	T1	All MCs	2083	2.6	2083	2.6	*0.912	35.5	LOS C	67.6	477.1	0.96	0.94	1.03	20.7
Approach			2240	2.9	2240	2.9	0.912	34.6	LOS C	67.6	477.1	0.93	0.92	0.99	21.8
North: Lyons Rd (180m)															
7	L2	All MCs	52	0.0	52	0.0	0.205	62.0	LOS E	3.2	22.2	0.93	0.74	0.93	13.8
8	T1	All MCs	99	0.0	99	0.0	0.432	60.7	LOS E	6.8	47.4	0.97	0.77	0.97	20.2
9	R2	All MCs	6	0.0	6	0.0	0.432	87.7	LOS F	6.8	47.4	0.97	0.77	0.97	13.6
Approach			157	0.0	157	0.0	0.432	62.2	LOS E	6.8	47.4	0.96	0.76	0.96	18.3
West: Parramatta Rd (140m)															
10	L2	All MCs	25	0.0	25	0.0	0.052	12.1	LOS A	0.9	8.7	0.33	0.82	0.33	29.3
11	T1	All MCs	1214	2.2	1214	2.2	0.412	6.9	LOS A	14.7	102.9	0.40	0.37	0.40	43.5
12	R2	All MCs	112	0.9	112	0.9	*0.511	69.5	LOS E	7.3	51.7	0.98	0.79	0.98	19.0
Approach			1351	2.0	1351	2.0	0.511	12.2	LOS A	14.7	102.9	0.45	0.42	0.45	35.8
All Vehicles			4139	2.4	4139	2.4	0.912	32.6	LOS C	67.6	477.1	0.77	0.75	0.83	23.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Missenden Rd (500m)												
P1	Full	76	80	64.3	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
East: Parramatta Rd (155m)												
P2	Full	171	180	64.6	LOS F	0.7	0.7	0.96	0.96	218.5	200.0	0.92
North: Lyons Rd (180m)												
P3	Full	81	85	64.4	LOS F	0.3	0.3	0.96	0.96	218.2	200.0	0.92
West: Parramatta Rd (140m)												
P4	Full	104	109	64.4	LOS F	0.4	0.4	0.96	0.96	218.3	200.0	0.92
All Pedestrians		432	455	64.5	LOS F	0.7	0.7	0.96	0.96	218.3	200.0	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [2.30.P.PM] 2. Parramatta x Ross - 2030 Project Case PM

(2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd / Ross St / Western Av
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Av															
1	L2	All MCs	71	1.5	71	1.5	0.366	35.1	LOS C	6.8	48.3	0.88	0.72	0.88	12.2
2	T1	All MCs	72	1.5	72	1.5	0.366	32.0	LOS C	6.8	48.3	0.88	0.72	0.88	8.3
3	R2	All MCs	23	0.0	23	0.0	0.366	43.6	LOS D	6.8	48.3	0.88	0.72	0.88	15.4
Approach			165	1.3	165	1.3	0.366	34.9	LOS C	6.8	48.3	0.88	0.72	0.88	10.9
East: Parramatta Rd (600m)															
4	L2	All MCs	40	0.0	40	0.0	0.127	20.0	LOS B	1.9	19.0	0.52	0.94	0.52	16.2
5	T1	All MCs	1914	3.2	1914	3.2	* 0.828	20.4	LOS B	38.3	269.9	0.86	0.82	0.88	44.5
6	R2	All MCs	221	0.5	221	0.5	0.812	59.2	LOS E	11.5	81.2	1.00	0.93	1.20	25.1
Approach			2175	2.9	2175	2.9	0.828	24.3	LOS B	38.3	269.9	0.87	0.84	0.91	39.6
North: Ross St (85m)															
7	L2	All MCs	132	0.8	132	0.8	0.415	28.4	LOS B	8.9	62.8	0.86	0.82	0.86	30.0
8	T1	All MCs	93	1.1	93	1.1	0.415	52.8	LOS D	8.9	62.8	0.86	0.82	0.86	9.6
9	R2	All MCs	201	0.5	201	0.5	* 0.814	54.9	LOS D	10.7	75.0	1.00	0.97	1.23	18.0
Approach			425	0.7	425	0.7	0.814	46.2	LOS D	10.7	75.0	0.92	0.89	1.03	17.1
West: Parramatta Rd (310m)															
10	L2	All MCs	171	1.9	171	1.9	0.343	31.7	LOS C	7.1	56.6	0.77	0.76	0.77	25.7
11	T1	All MCs	1256	2.6	1256	2.6	0.812	32.3	LOS C	28.4	199.3	0.96	0.90	1.02	37.9
Approach			1426	2.5	1426	2.5	0.812	32.2	LOS C	28.4	199.3	0.93	0.89	0.99	36.9
All Vehicles			4192	2.5	4192	2.5	0.828	29.7	LOS C	38.3	269.9	0.90	0.85	0.95	32.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Western Av												
P1	Full	77	81	44.3	LOS E	0.2	0.2	0.94	0.94	198.2	200.0	1.01
East: Parramatta Rd (600m)												
P2	Full	90	95	44.4	LOS E	0.3	0.3	0.94	0.94	198.2	200.0	1.01
North: Ross St (85m)												
P3	Full	91	96	44.4	LOS E	0.3	0.3	0.94	0.94	198.2	200.0	1.01
West: Parramatta Rd (310m)												
P4	Full	88	93	44.4	LOS E	0.2	0.2	0.94	0.94	198.2	200.0	1.01
All Pedestrians		346	364	44.3	LOS E	0.3	0.3	0.94	0.94	198.2	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [3.30.P.PM] 3. Ross x Bridge - 2030 Project Case PM

(2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St / Bridge Rd
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (110m)															
1	L2	All MCs	262	2.8	262	2.8	0.617	26.7	LOS B	7.2	51.7	0.95	0.82	0.97	25.2
2	T1	All MCs	402	0.3	402	0.3	* 0.734	23.3	LOS B	11.6	81.2	0.96	0.90	1.06	26.5
Approach			664	1.3	664	1.3	0.734	24.6	LOS B	11.6	81.2	0.96	0.87	1.02	25.9
East: Bridge Rd (500m)															
4	L2	All MCs	46	2.3	46	2.3	* 0.734	19.1	LOS B	17.3	122.1	0.84	0.78	0.86	31.9
5	T1	All MCs	681	0.9	681	0.9	0.734	12.9	LOS A	17.3	122.1	0.84	0.78	0.86	34.4
6	R2	All MCs	129	0.8	129	0.8	0.350	20.2	LOS B	3.0	21.0	0.79	0.75	0.79	32.2
Approach			857	1.0	857	1.0	0.734	14.4	LOS A	17.3	122.1	0.83	0.77	0.85	34.0
North: Ross St (280m)															
7	L2	All MCs	61	0.0	61	0.0	0.165	24.9	LOS B	1.8	12.4	0.83	0.72	0.83	31.4
8	T1	All MCs	341	0.9	341	0.9	0.602	21.8	LOS B	8.6	60.5	0.91	0.79	0.91	27.4
Approach			402	0.8	402	0.8	0.602	22.3	LOS B	8.6	60.5	0.90	0.78	0.90	28.3
West: Bridge Rd (400m)															
10	L2	All MCs	95	2.2	95	2.2	0.522	18.3	LOS B	10.0	70.3	0.72	0.66	0.72	35.3
11	T1	All MCs	407	0.8	407	0.8	0.522	12.8	LOS A	10.0	70.3	0.72	0.66	0.72	35.1
12	R2	All MCs	5	100.0	5	100.0	0.039	27.6	LOS B	0.1	1.7	0.81	0.64	0.81	25.5
Approach			507	2.1	507	2.1	0.522	14.0	LOS A	10.0	70.3	0.72	0.65	0.72	34.2
All Vehicles			2431	1.3	2431	1.3	0.734	18.4	LOS B	17.3	122.1	0.85	0.78	0.88	31.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Qued	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Ross St (110m)												

P1	Full	77	81	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
East: Bridge Rd (500m)												
P2	Full	90	95	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
North: Ross St (280m)												
P3	Full	91	96	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
West: Bridge Rd (400m)												
P4	Full	88	93	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12
All Pedestrians		346	364	24.4	LOS C	0.1	0.1	0.90	0.90	178.2	200.0	1.12

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [4.30.P.PM] 4. Parramatta x Larkin - 2030 Project Case PM (2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Parramatta Rd x Larkin St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Parramatta Rd (310m)															
5	T1	All MCs	2145	3.2	2145	3.2	0.540	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			2145	3.2	2145	3.2	0.540	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.5
North: Larkin St (37m)															
7	L2	All MCs	145	1.4	145	1.4	0.115	3.5	LOS A	0.4	3.1	0.14	0.49	0.14	45.2
Approach			145	1.4	145	1.4	0.115	3.5	LOS A	0.4	3.1	0.14	0.49	0.14	45.2
West: Parramatta Rd (155m)															
10	L2	All MCs	16	0.0	16	0.0	0.039	5.5	LOS A	0.0	0.0	0.00	0.18	0.00	21.2
11	T1	All MCs	1309	3.2	1309	3.2	0.328	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			1325	3.2	1325	3.2	0.328	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.2
All Vehicles			3616	3.1	3616	3.1	0.540	0.3	NA	0.4	3.1	0.01	0.02	0.01	58.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [5.30.P.PM] 5. Larkin x Sparkes - 2030 Project Case PM

(2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Larkin St x Sparkes St
Site Category: Existing Design
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Larkin St (37m)															
1	L2	All MCs	3	0.0	3	0.0	0.007	3.3	LOS A	0.0	0.0	0.00	0.12	0.00	22.1
2	T1	All MCs	11	0.0	11	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	46.7
Approach			14	0.0	14	0.0	0.007	0.8	NA	0.0	0.0	0.00	0.12	0.00	38.9
East: Sparkes St (90m)															
4	L2	All MCs	14	0.0	14	0.0	0.025	4.6	LOS A	0.1	0.6	0.09	0.51	0.09	30.6
5	T1	All MCs	8	12.5	8	12.5	0.025	3.4	LOS A	0.1	0.6	0.09	0.51	0.09	28.5
6	R2	All MCs	11	0.0	11	0.0	0.025	5.0	LOS A	0.1	0.6	0.09	0.51	0.09	33.6
Approach			33	3.2	33	3.2	0.025	4.4	LOS A	0.1	0.6	0.09	0.51	0.09	31.1
North: Larkin St (100m)															
8	T1	All MCs	23	4.5	23	4.5	0.013	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	48.9
9	R2	All MCs	1	0.0	1	0.0	0.013	4.6	LOS A	0.0	0.0	0.01	0.02	0.01	35.3
Approach			24	4.3	24	4.3	0.013	0.2	NA	0.0	0.0	0.01	0.02	0.01	48.0
West: Sparkes St (60m)															
10	L2	All MCs	1	0.0	1	0.0	0.101	4.3	LOS A	0.4	2.5	0.15	0.53	0.15	32.4
12	R2	All MCs	106	1.0	106	1.0	0.101	4.6	LOS A	0.4	2.5	0.15	0.53	0.15	26.5
Approach			107	1.0	107	1.0	0.101	4.6	LOS A	0.4	2.5	0.15	0.53	0.15	26.6
All Vehicles			178	1.8	178	1.8	0.101	3.7	NA	0.4	2.5	0.11	0.43	0.11	30.7

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [6.30.P.PM] 6. Ross x Arundel - 2030 Project Case PM

(2030 Project Case PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Ross St x Arundel St
Site Category: Existing Design
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Ross St (85m)															
1	L2	All MCs	55	0.0	55	0.0	0.299	5.6	LOS A	0.9	6.2	0.20	0.26	0.20	37.8
2	T1	All MCs	397	1.3	397	1.3	0.299	0.4	LOS A	0.9	6.2	0.20	0.26	0.20	44.0
3	R2	All MCs	76	1.4	76	1.4	0.299	6.0	LOS A	0.9	6.2	0.20	0.26	0.20	42.8
3u	U	All MCs	4	0.0	4	0.0	0.299	8.2	LOS A	0.9	6.2	0.20	0.26	0.20	37.4
Approach			532	1.2	532	1.2	0.299	1.8	NA	0.9	6.2	0.20	0.26	0.20	42.9
East: Arundel St (250m)															
4	L2	All MCs	66	0.0	66	0.0	0.186	9.5	LOS A	0.7	4.8	0.57	0.92	0.57	33.6
5	T1	All MCs	4	0.0	4	0.0	0.186	15.3	LOS B	0.7	4.8	0.57	0.92	0.57	33.6
6	R2	All MCs	38	0.0	38	0.0	0.186	16.5	LOS B	0.7	4.8	0.57	0.92	0.57	33.5
Approach			108	0.0	108	0.0	0.186	12.1	LOS A	0.7	4.8	0.57	0.92	0.57	33.6
North: Ross St (105m)															
7	L2	All MCs	38	0.0	38	0.0	0.195	5.6	LOS A	0.3	2.4	0.13	0.20	0.13	44.5
8	T1	All MCs	281	0.0	281	0.0	0.195	0.3	LOS A	0.3	2.4	0.13	0.20	0.13	45.6
9	R2	All MCs	27	0.0	27	0.0	0.195	6.6	LOS A	0.3	2.4	0.13	0.20	0.13	38.7
Approach			346	0.0	346	0.0	0.195	1.4	NA	0.3	2.4	0.13	0.20	0.13	44.6
West: Arundel St (155m)															
10	L2	All MCs	21	0.0	21	0.0	0.152	8.6	LOS A	0.5	3.6	0.62	1.00	0.62	27.1
11	T1	All MCs	13	0.0	13	0.0	0.152	14.0	LOS A	0.5	3.6	0.62	1.00	0.62	32.2
12	R2	All MCs	34	0.0	34	0.0	0.152	15.3	LOS B	0.5	3.6	0.62	1.00	0.62	25.9
Approach			67	0.0	67	0.0	0.152	12.9	LOS A	0.5	3.6	0.62	1.00	0.62	27.7
All Vehicles			1054	0.6	1054	0.6	0.299	3.4	NA	0.9	6.2	0.24	0.35	0.24	40.0

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Appendix B

Basement Swept Paths

A3

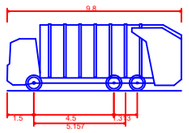
B1 WASTE PARKING



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m	
Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Issue	Date	By	Chkd	Appd
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT017**	**C**

Do not scale

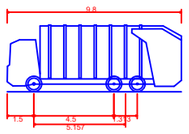
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Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m	
Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Issue	Date	By	Chkd	Appd
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT017**	**C**

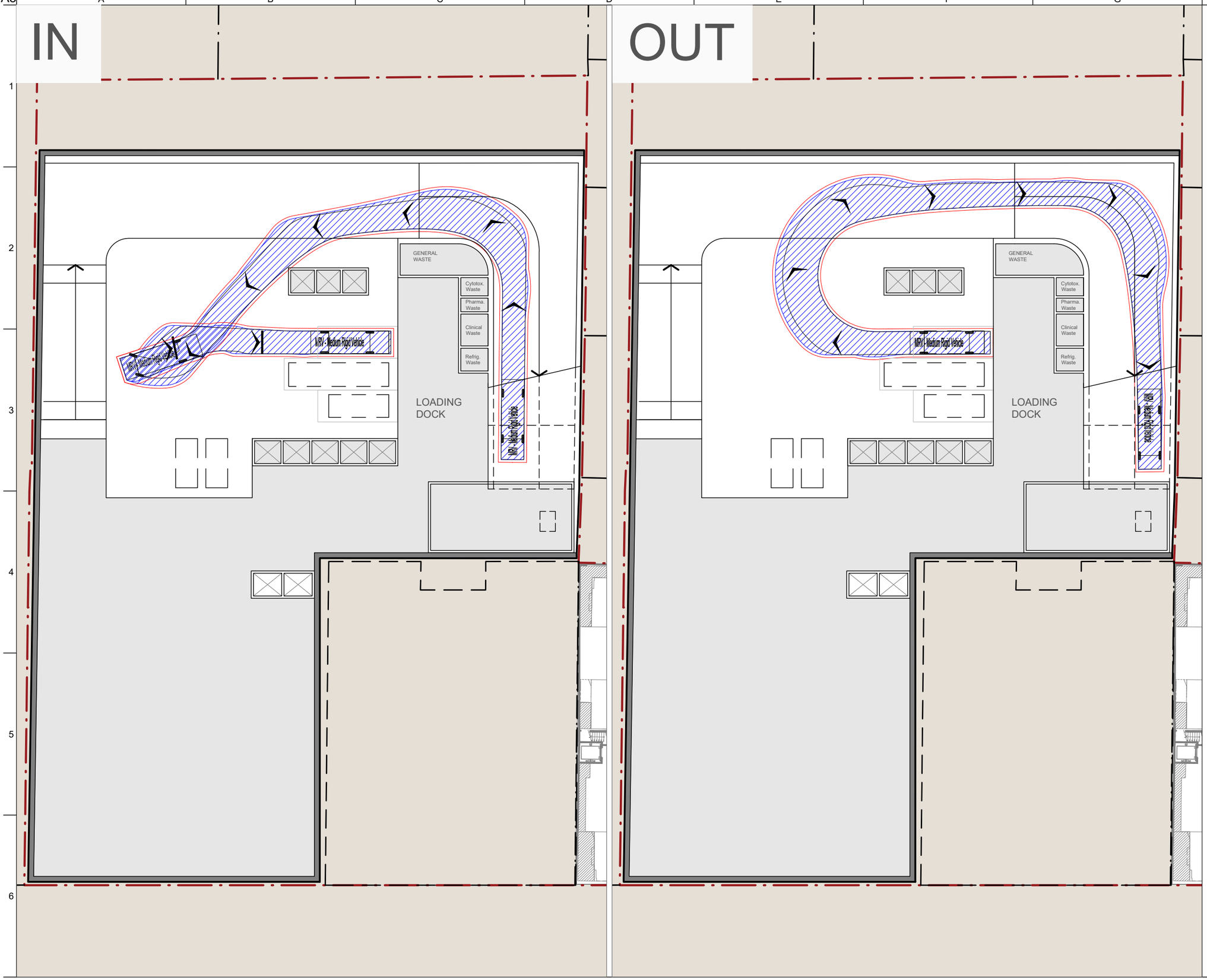
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A3

IN

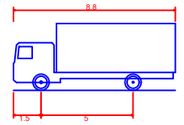
OUT



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Issue	Date	By	Chkd	Appd
B	20/07/26	JG	SH	SH
A	01/10/25	LW	WZ	WZ
For information				

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
BASEMENT 1
MRV SWEPT PATH ASSESSMENT
MRV BAY 1

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT003**	**B**

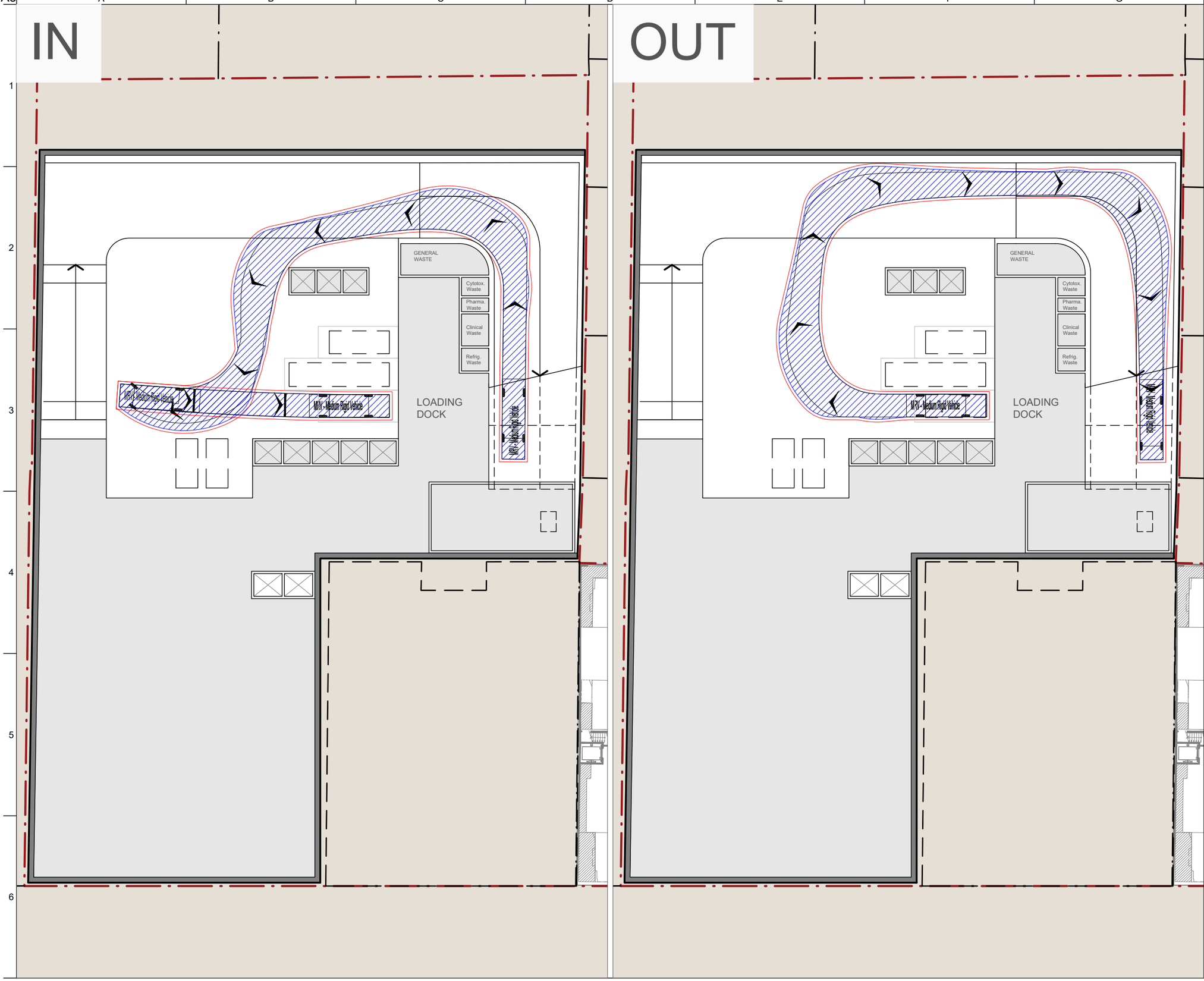
Do not scale

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A3

IN

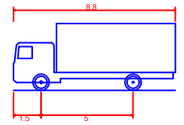
OUT



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Issue	Date	By	Chkd	Appd
B	20/07/26	JG	SH	SH
A	01/10/25	LW	WZ	WZ
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
BASEMENT 1
MRV SWEPT PATH ASSESSMENT
MRV BAY 2

Scale at A3 1:400

Discipline TRAFFIC

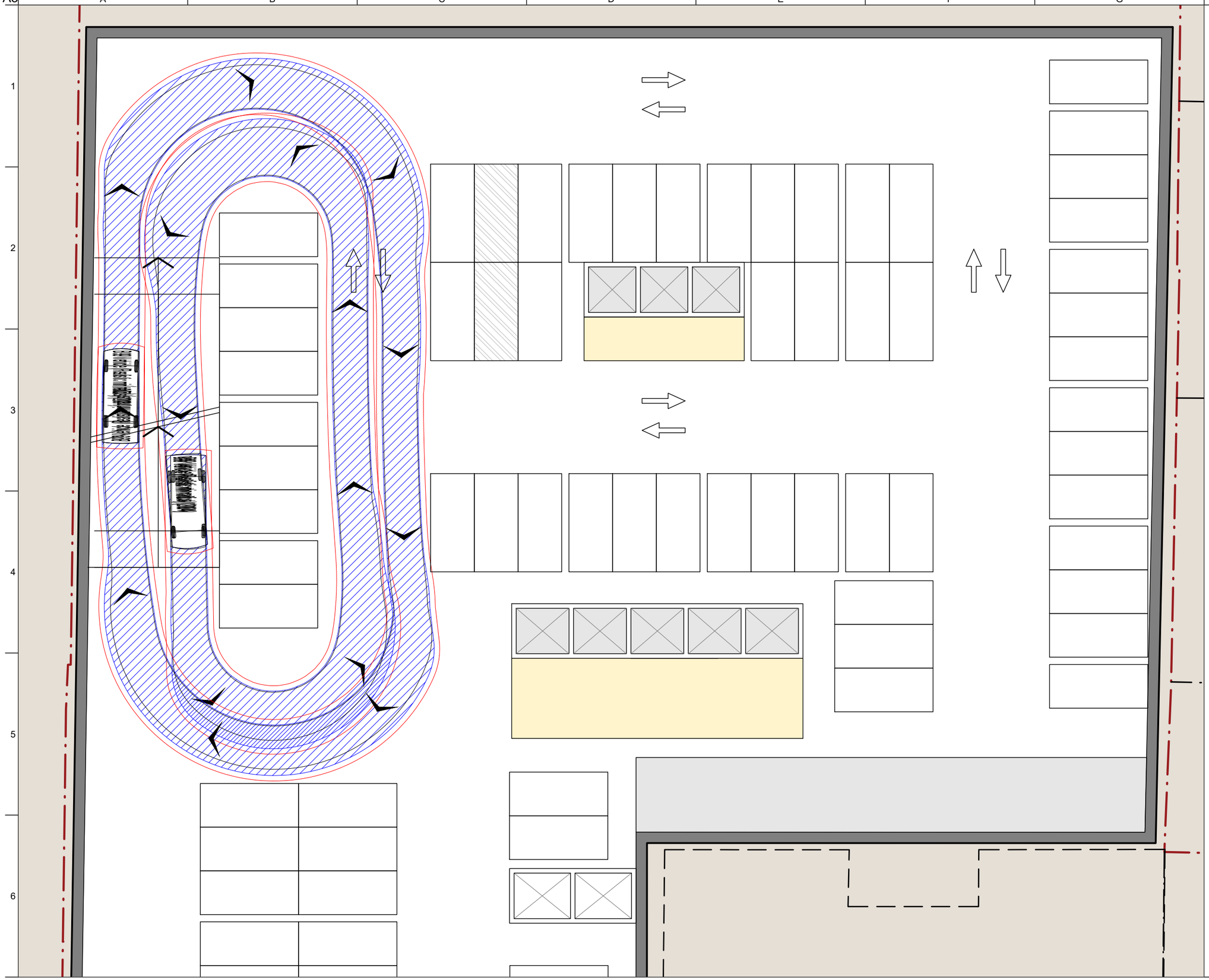
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT004**	**B**

Do not scale

© Arup

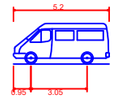
A3



Legend

- Body Envelope
- 300mm Envelope
- Wheel Envelope

Design Vehicle(s)



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.250m

Issue	Date	By	Chkd	Appd
B	20/07/26	JG	SH	SH
A	01/10/25	LW	WZ	WZ
For information				

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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
BASEMENT 1
B99 SWEPT PATH ASSESSMENT
B99 CIRCULATION

Scale at A3 1:200

Discipline TRAFFIC

Drawing Status **DRAFT**

Job No	Drawing No	Issue
304985-00	**SKT005**	**B**

Do not scale

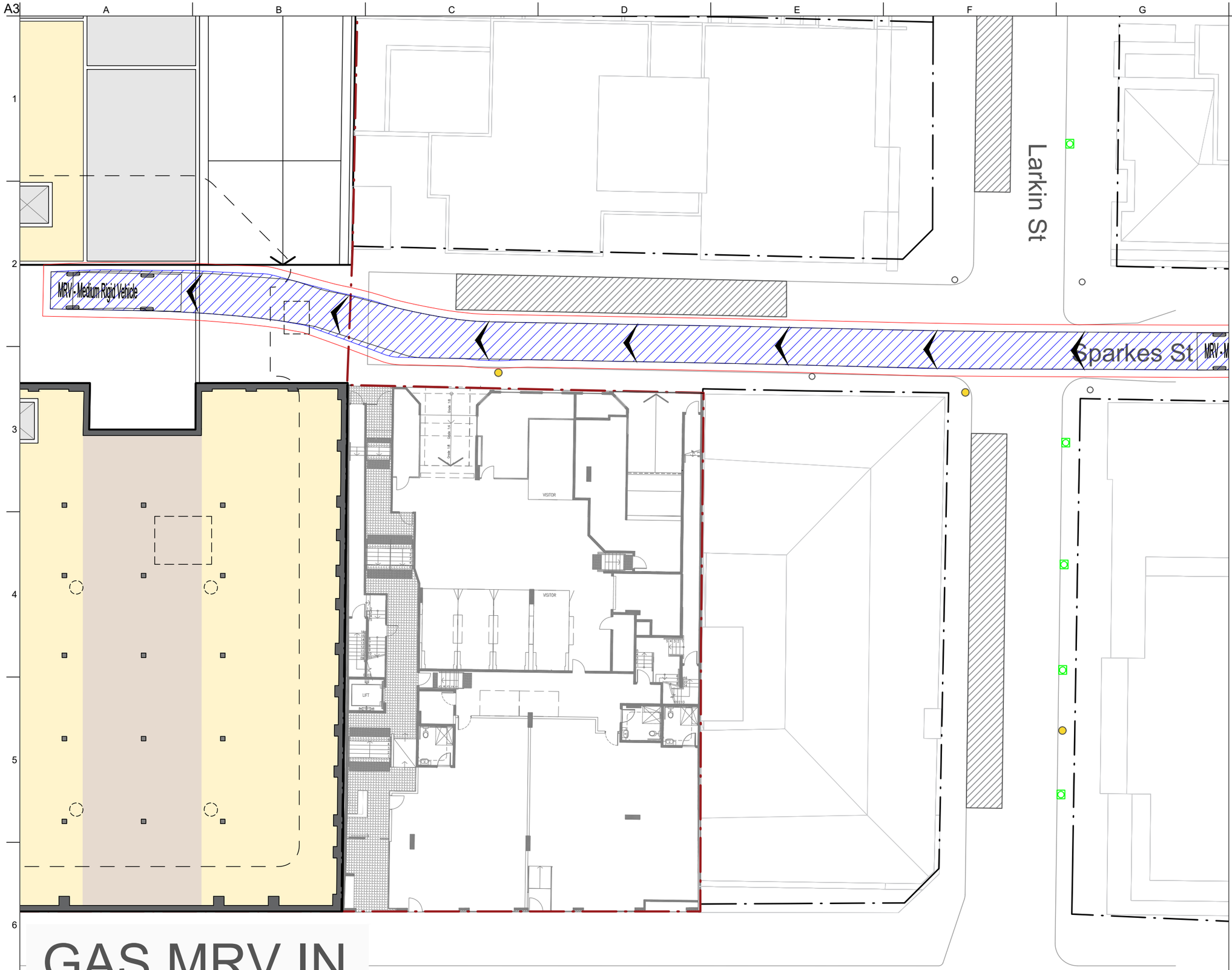
© Arup

Appendix C

On-street Swept Paths

C.1 Option 1 paths

A3

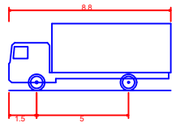


GAS MRV IN

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH

For information

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Tel +61(02)9320 9320 Fax +61(02)9320 9321
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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

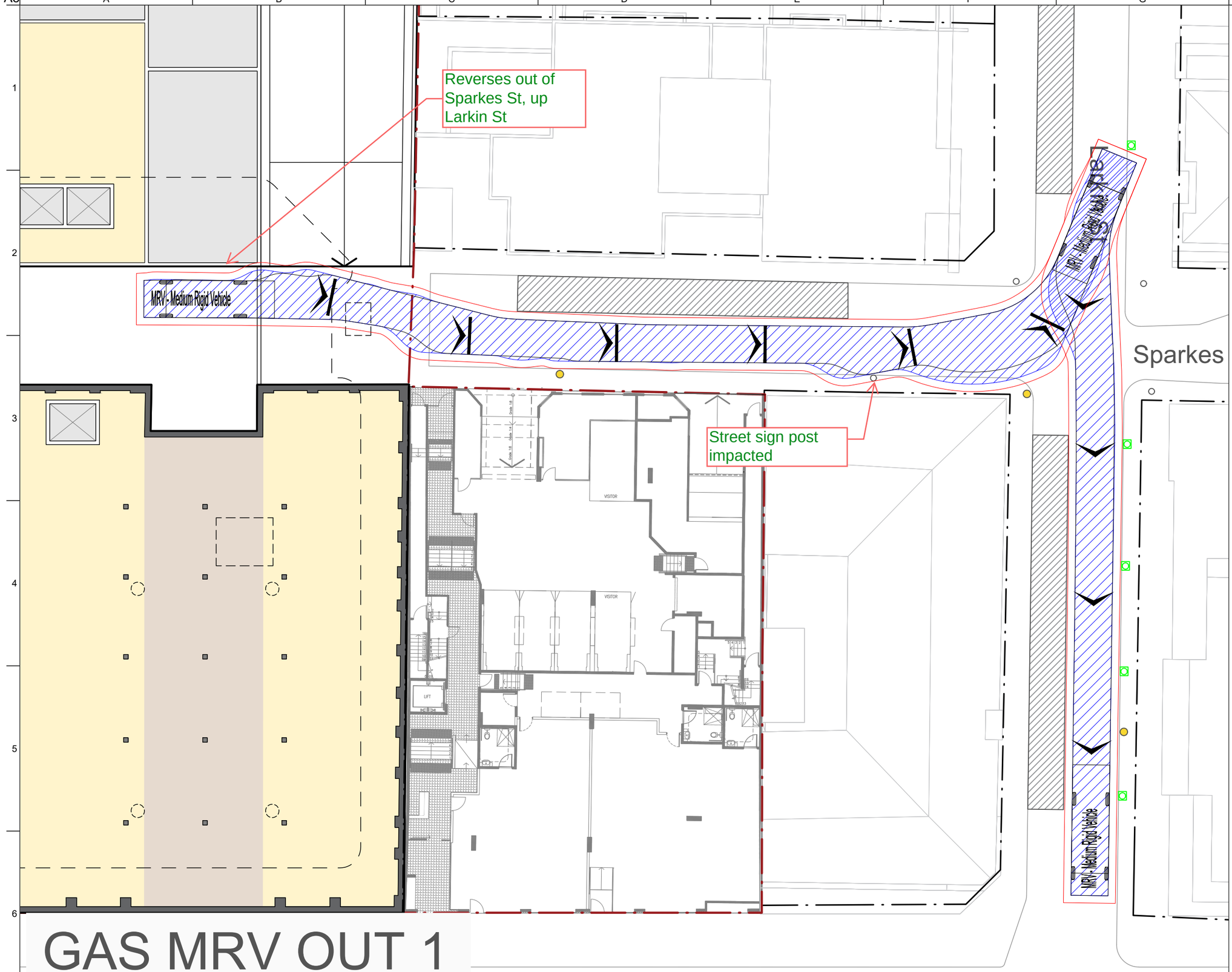
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT019**	**D**

Do not scale

© Arup

A3



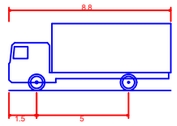
GAS MRV OUT 1

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH

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Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

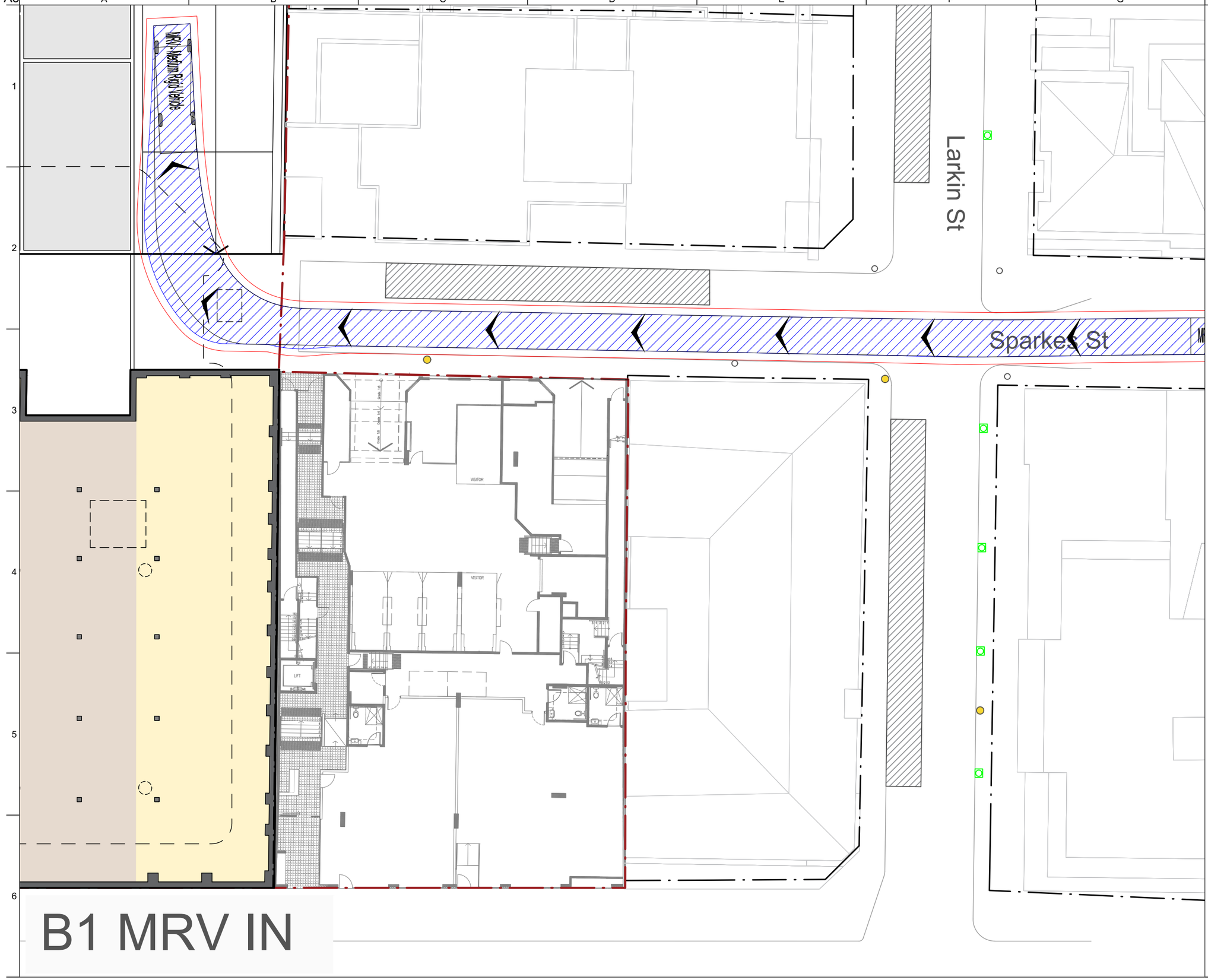
Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT003**	**D**

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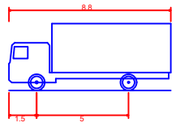
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET TO BASEMENT LEVEL
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

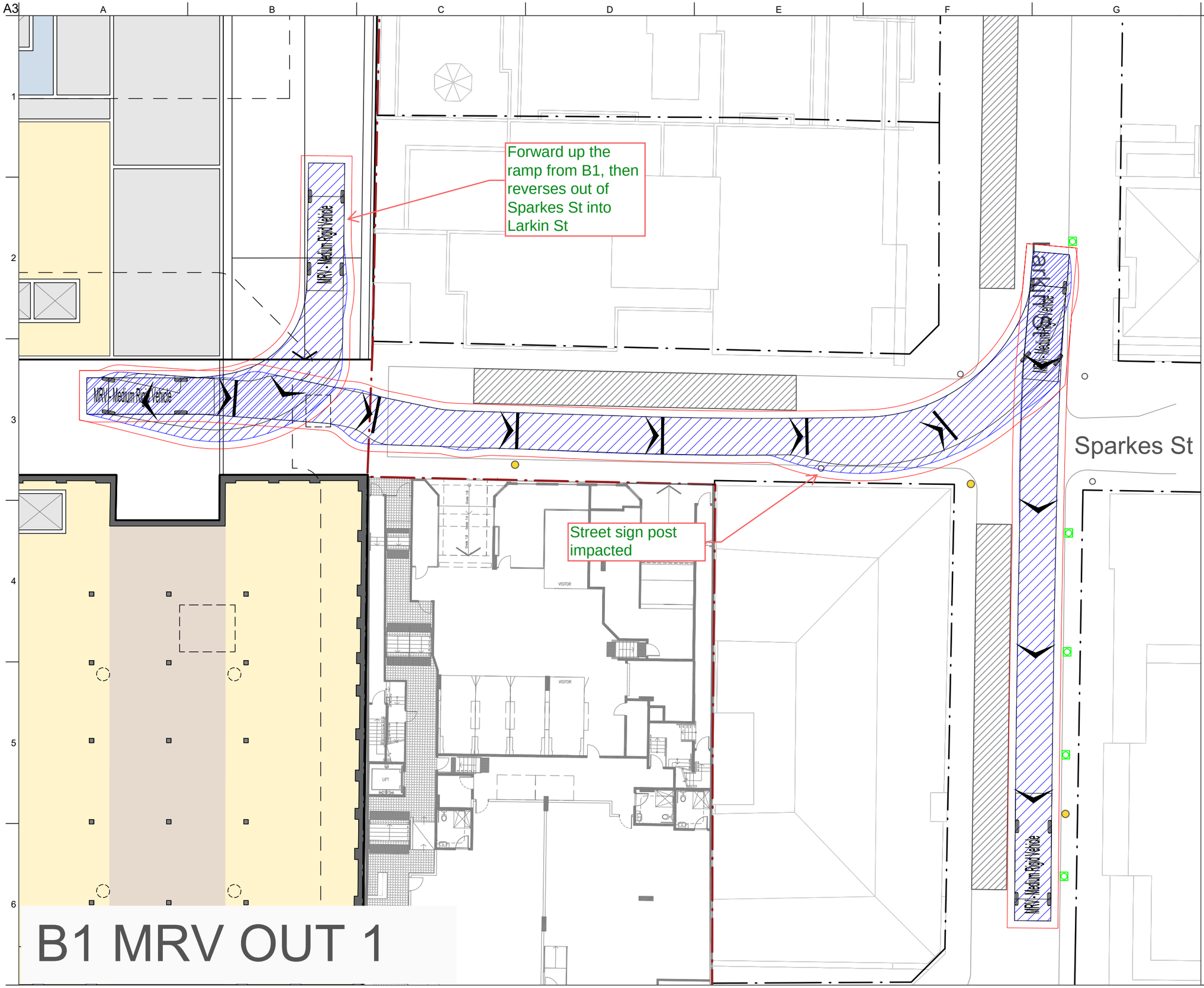
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT004**	**D**

Do not scale

© Arup

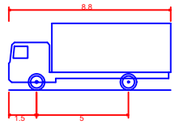
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

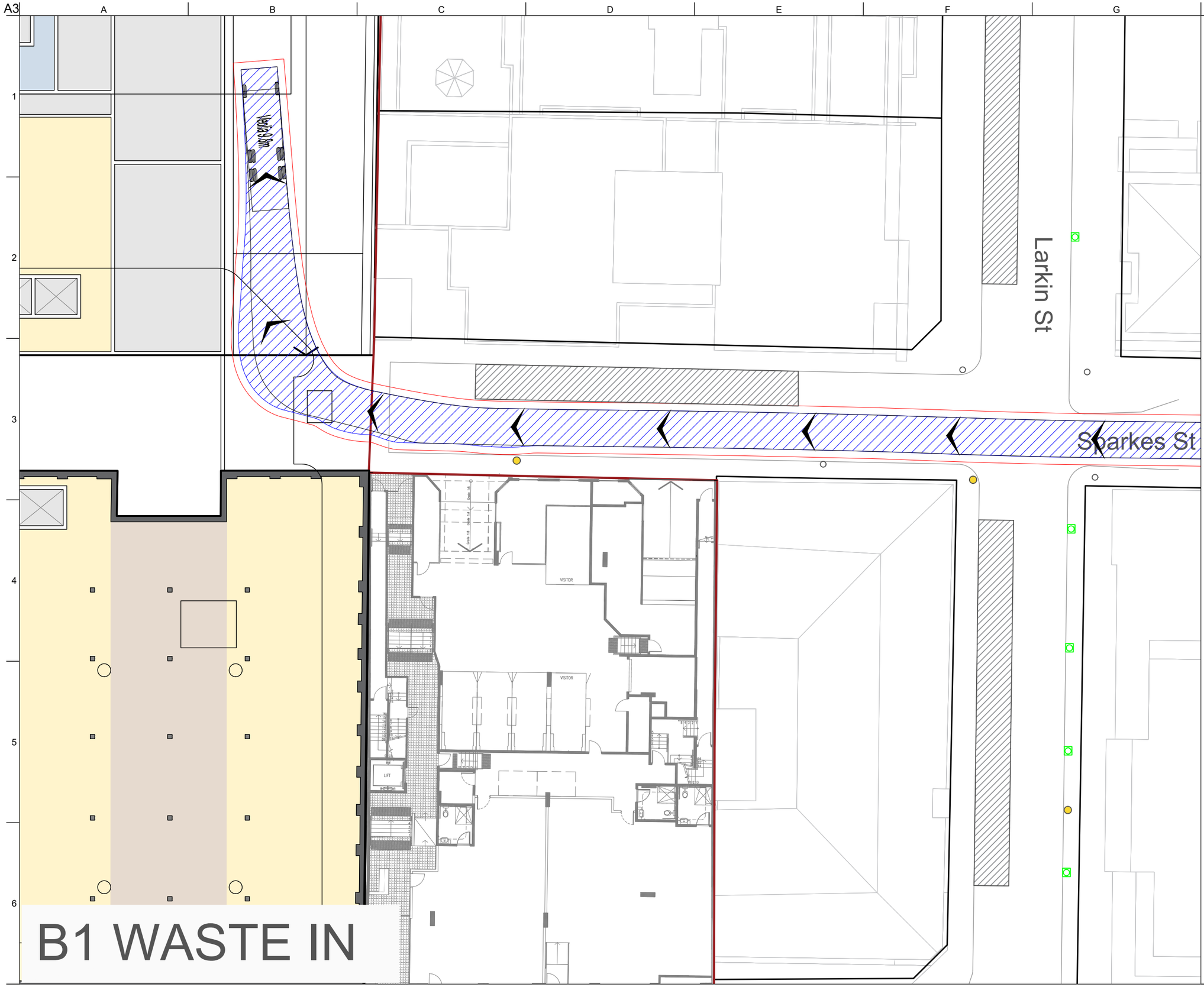
Drawing Status
DRAFT

Job No	Drawing No	Issue
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Do not scale

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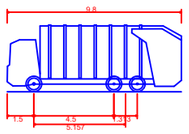
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

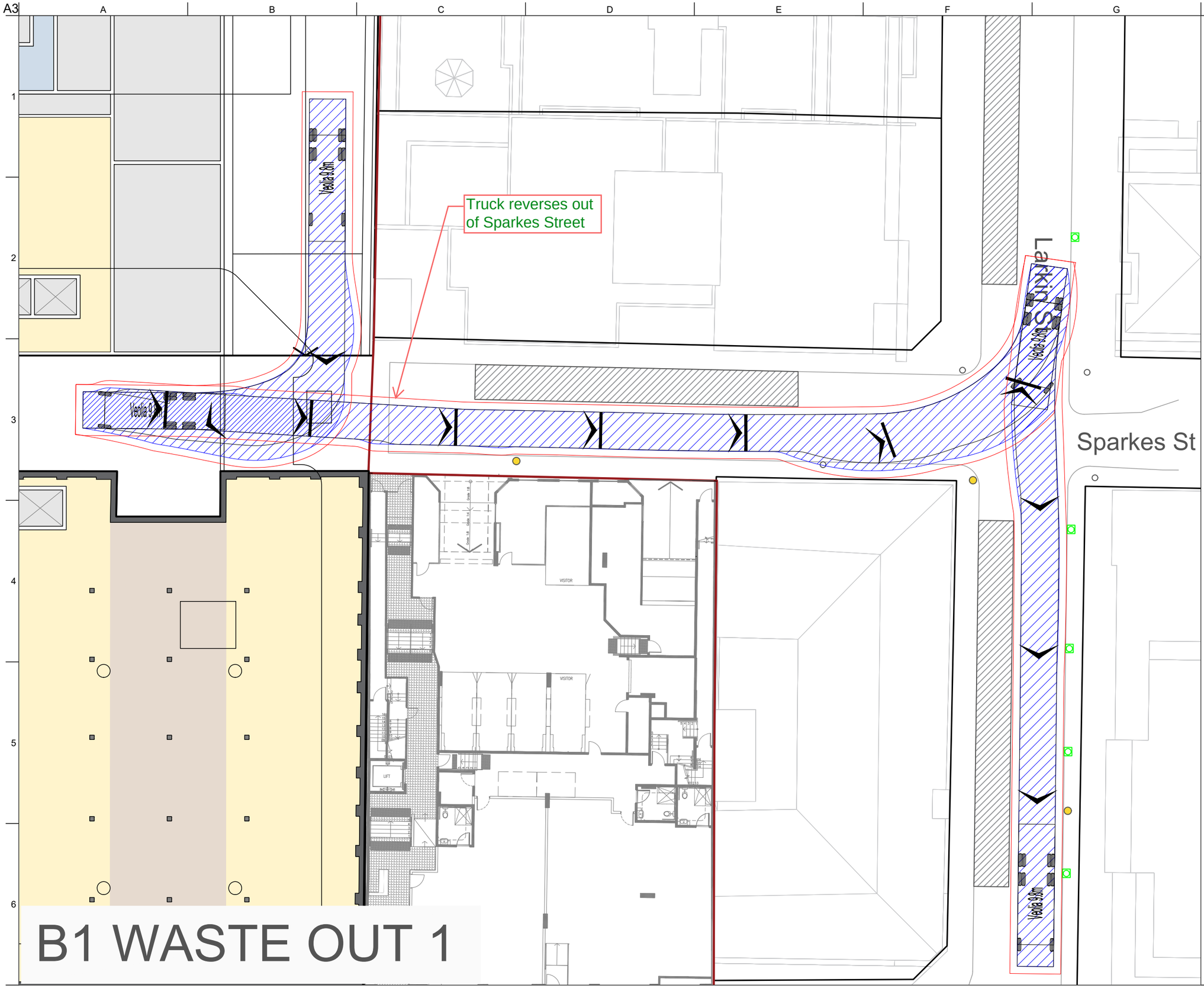
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT013**	**C**

Do not scale

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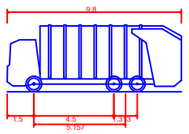
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	16/09/26	JG	SH	SH
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

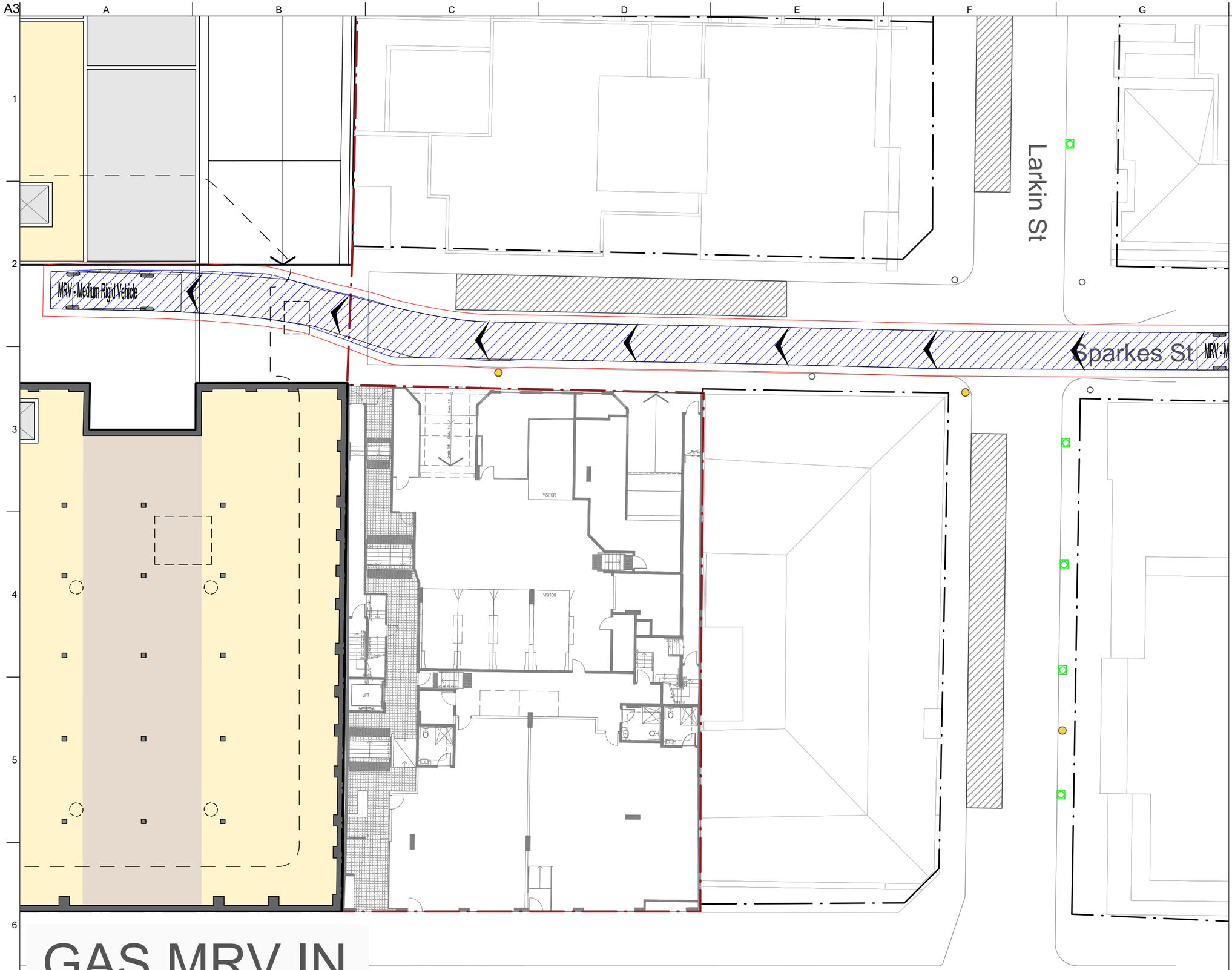
Job No	Drawing No	Issue
304985-00	**SKT022**	**D**

Do not scale

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C.2 Option 2 paths

A3

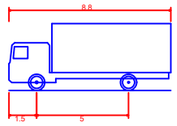


GAS MRV IN

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH

For information

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT019**	**D**

Do not scale

© Arup

A3

Reverses into the driveway then drives forward out onto Sparkes St

Street sign needs to be relocated

Street sign needs to be relocated

Half of on-street parking impacted by turning path

MRV - Medium Rigid Vehicle

Larkin St

Sparkes St

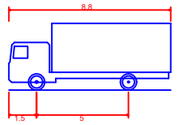
GAS MRV OUT 2

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Sydney, NSW, 2000
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www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

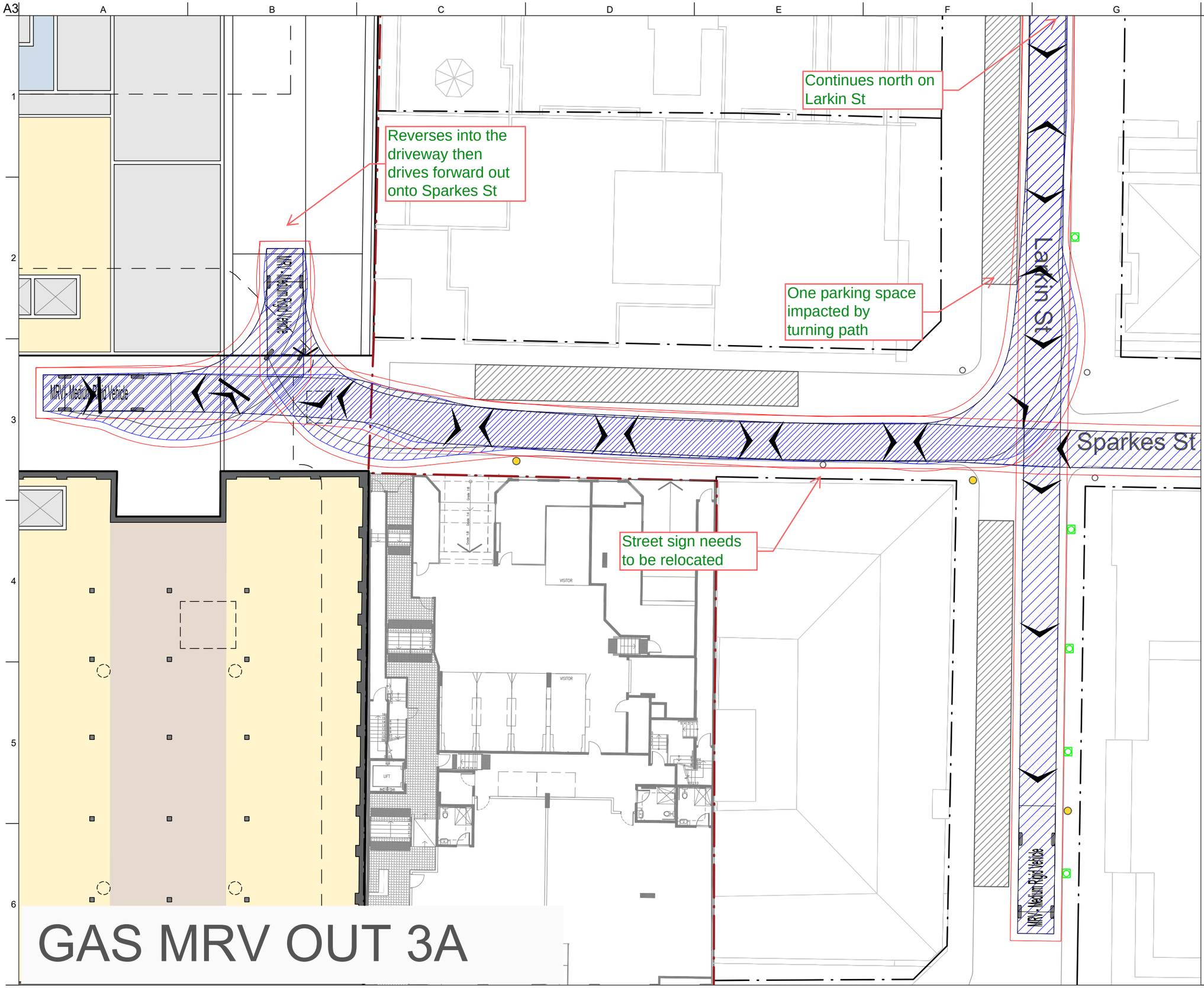
Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT021**	**D**

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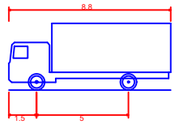
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
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Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT013**	**D**

Do not scale

© Arup

A3

FIRE HYDRANT

Vehicle body needs to avoid fire hydrant block

MRV reverses into wide driveway

5 point turn using round about and driveway

12m or about 2 parallel parking spaces impacted

Continues south on Larkin St

Larkin St Cul de sac

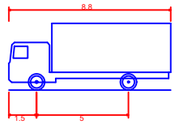
GAS MRV OUT 3B

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
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www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

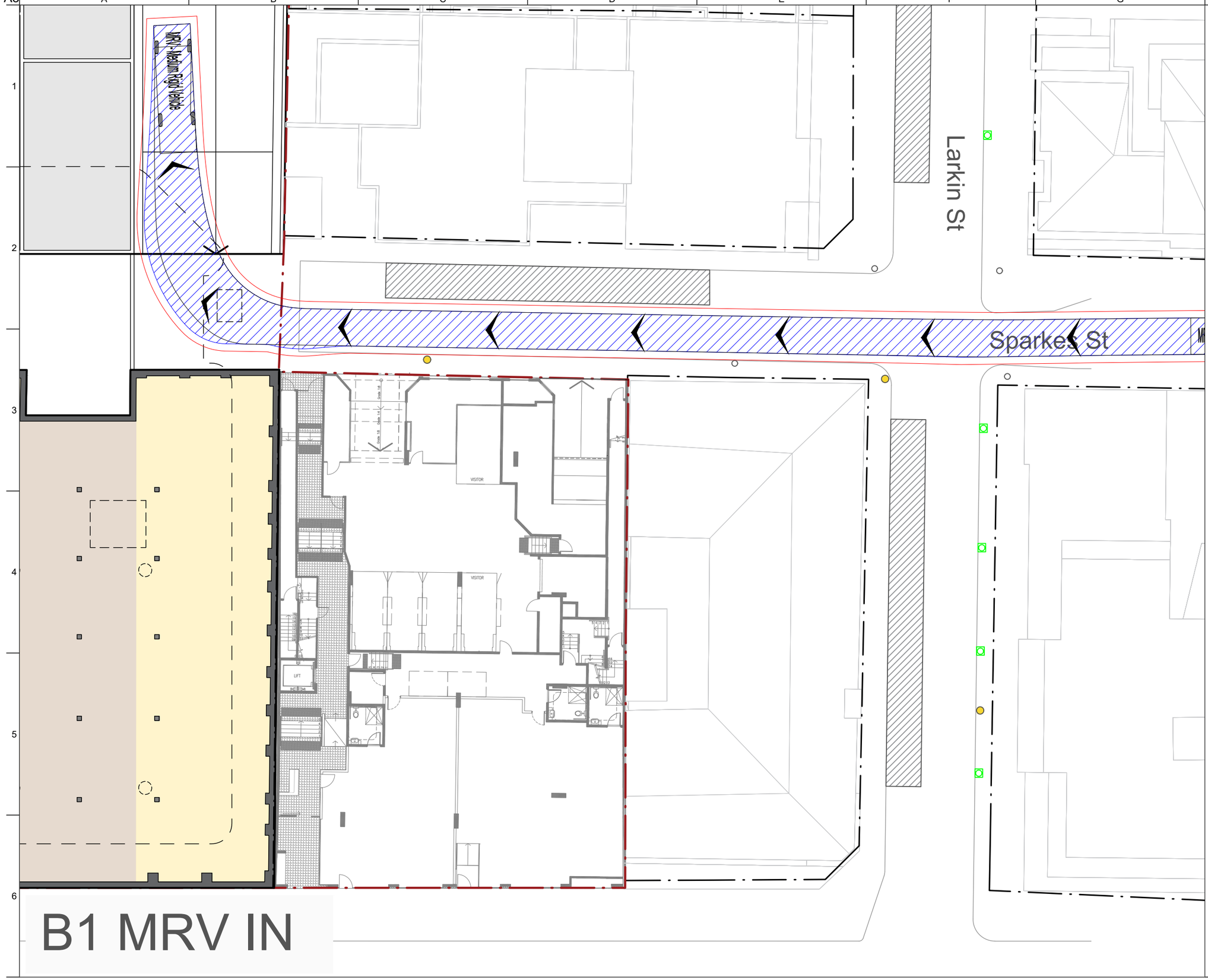
Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT014**	**D**

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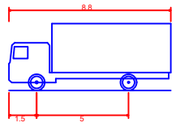
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET TO BASEMENT LEVEL
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

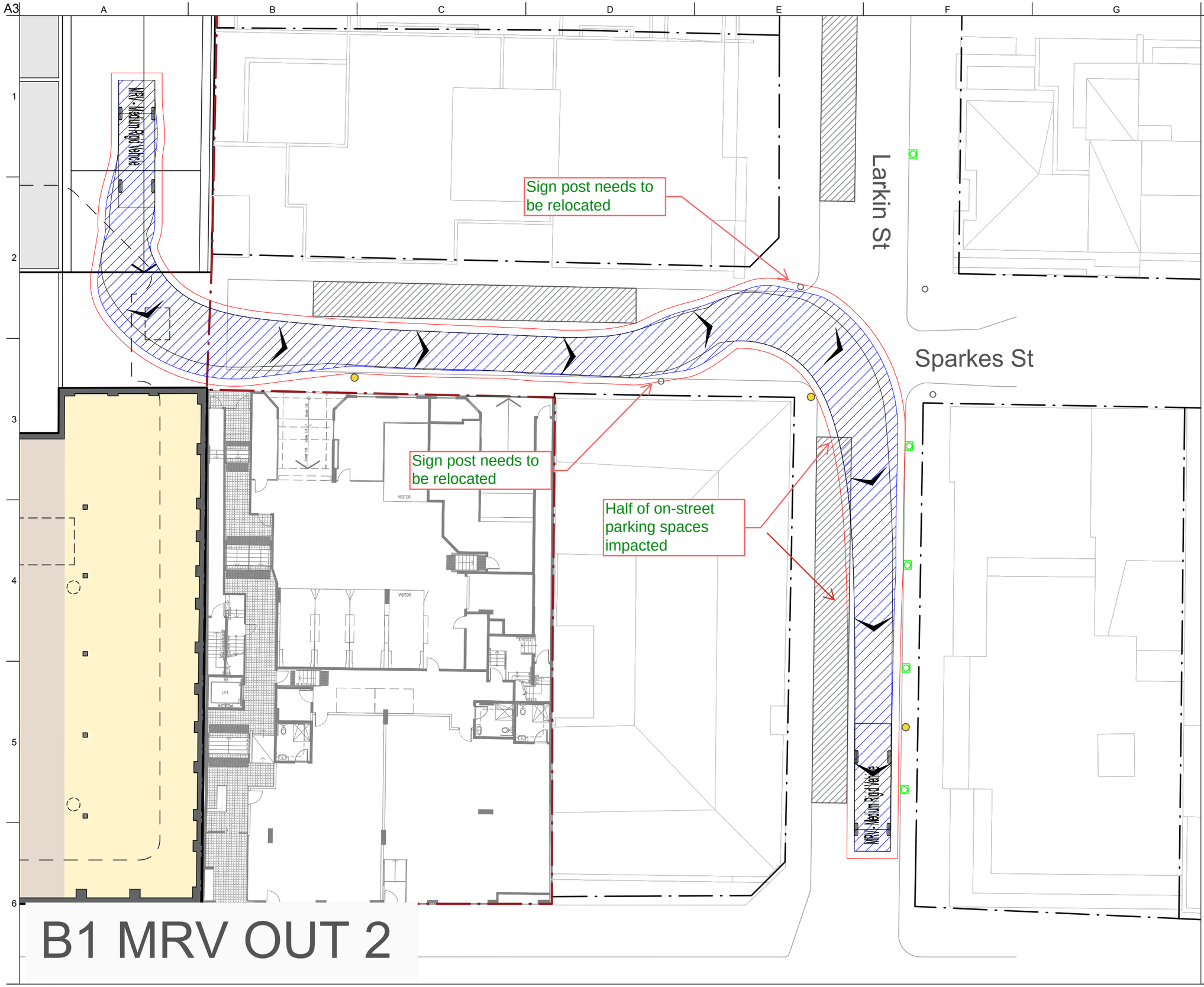
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT004**	**D**

Do not scale

© Arup

A3

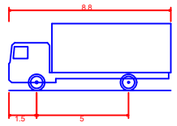


B1 MRV OUT 2

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET TO BASEMENT LEVEL
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

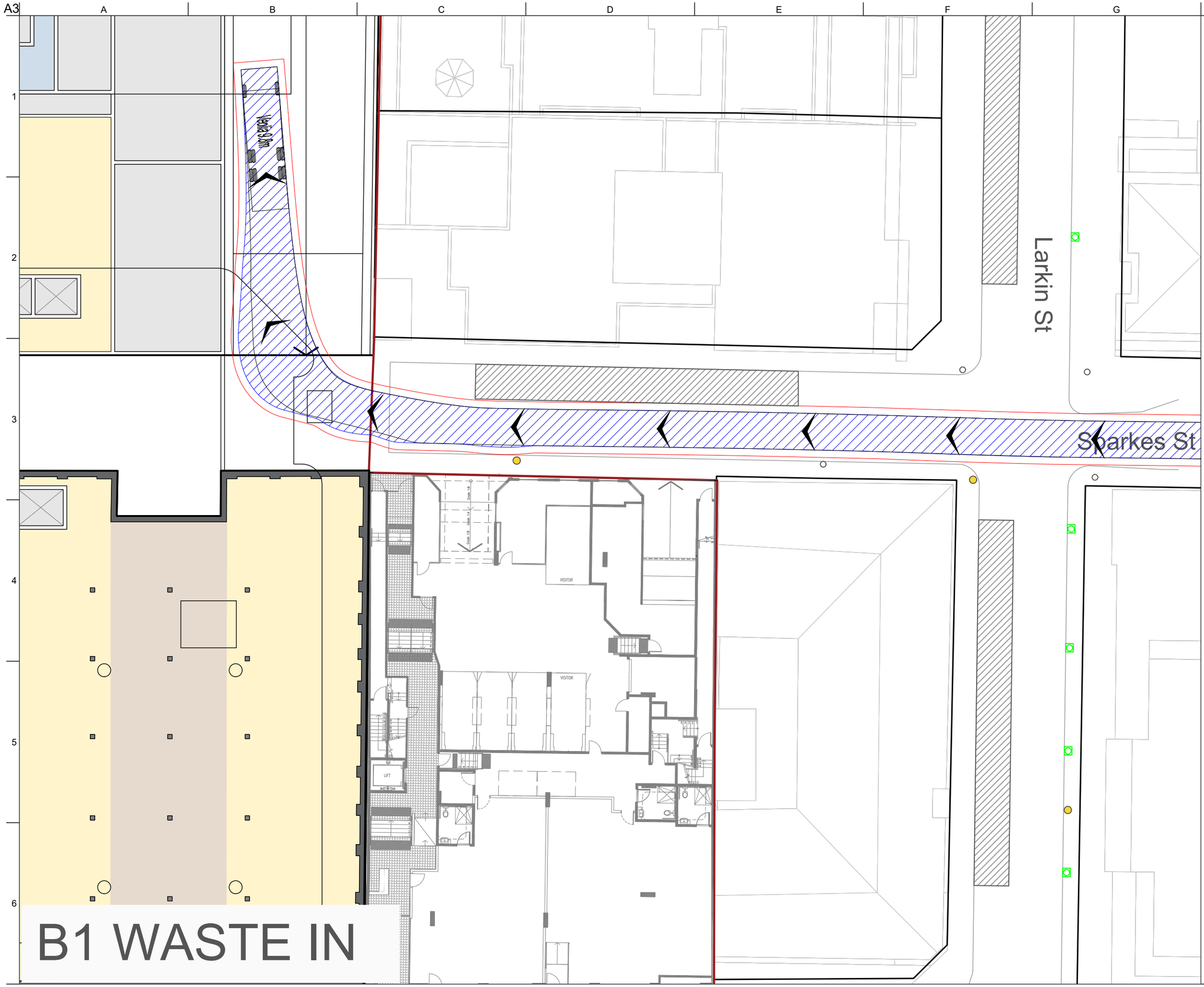
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT005**	**D**

Do not scale

© Arup

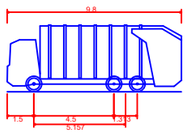
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT013**	**C**

Do not scale

© Arup

A3

Street sign needs to be relocated

Half of on-street parking impacted by turning path

Larkin St

Sparkes St

Veolia 9.8m

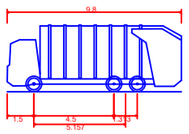
B1 WASTE OUT 2

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m	
Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	16/09/26	JG	SH	SH
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3
1:400

Discipline
TRAFFIC

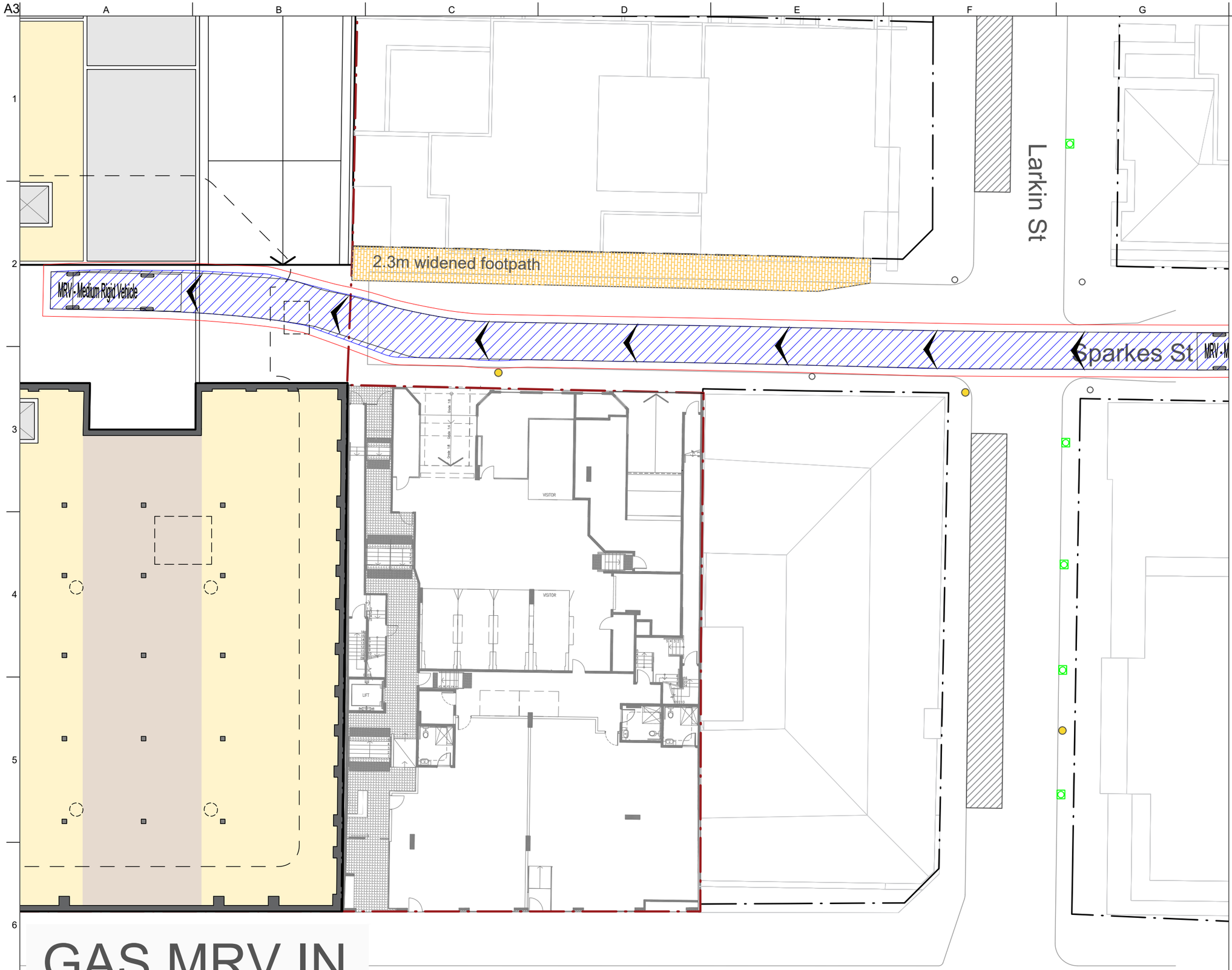
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT016**	**D**

© Arup

C.3 Option 3 paths

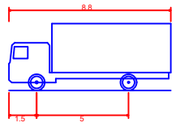
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT019**	**D**

Do not scale

© Arup

A3

Reversed on ramp to exit Sparkes St forward out

Sign post needs to be re-located

2.3m widened footpath

Half of on-street parking spaces impacted

MRV - Medium Rigid Vehicle

Larkin St

Sparkes St

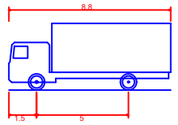
GAS MRV OUT 4

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET LEVEL GAS DELIVERY
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

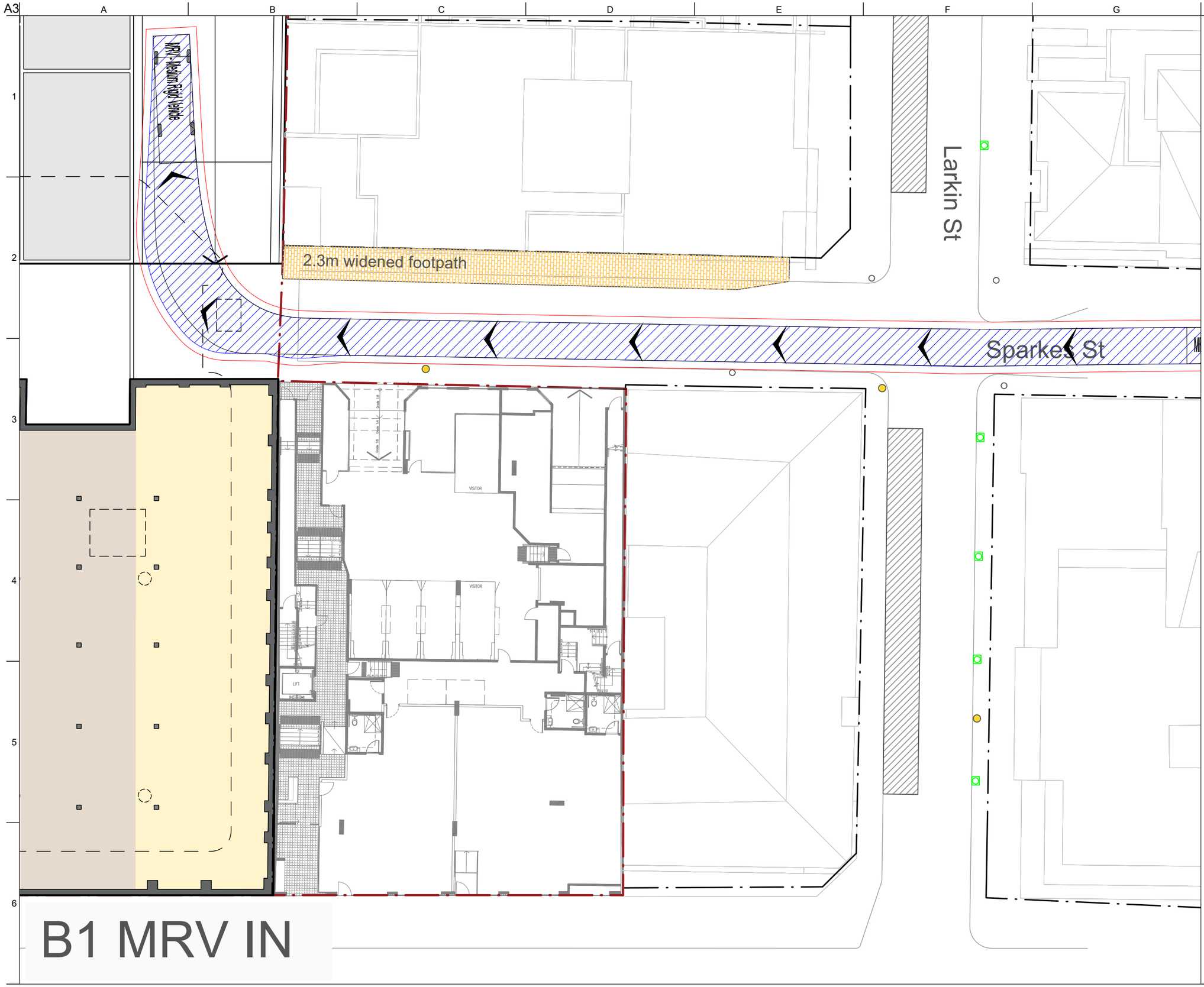
Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT012**	**D**

© Arup

A3

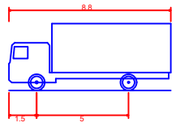


B1 MRV IN

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
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www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET TO BASEMENT LEVEL
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

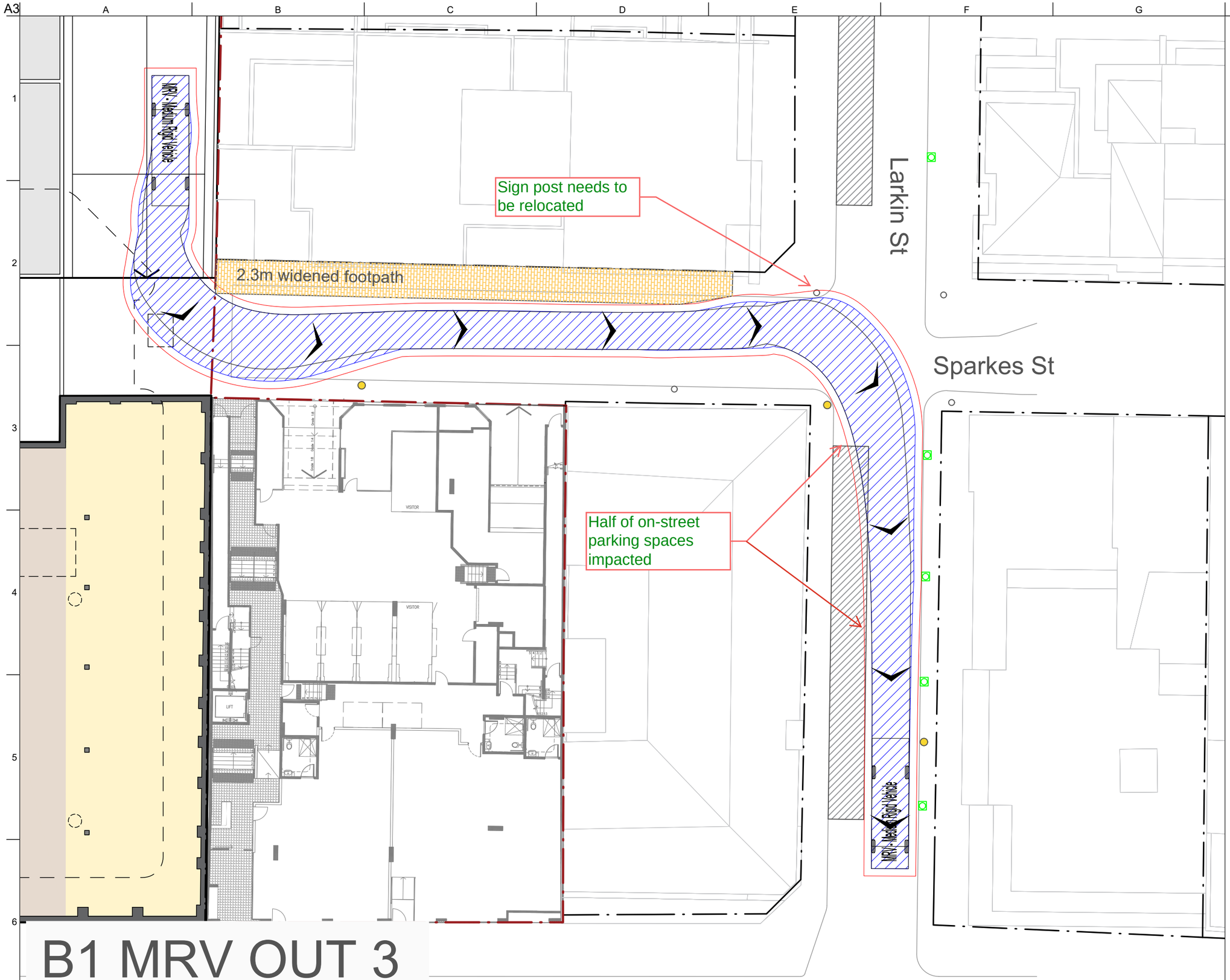
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT004**	**D**

Do not scale

© Arup

A3



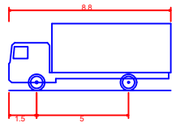
B1 MRV OUT 3

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	04/09/26	JG	SH	SH
C	25/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
STREET TO BASEMENT LEVEL
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

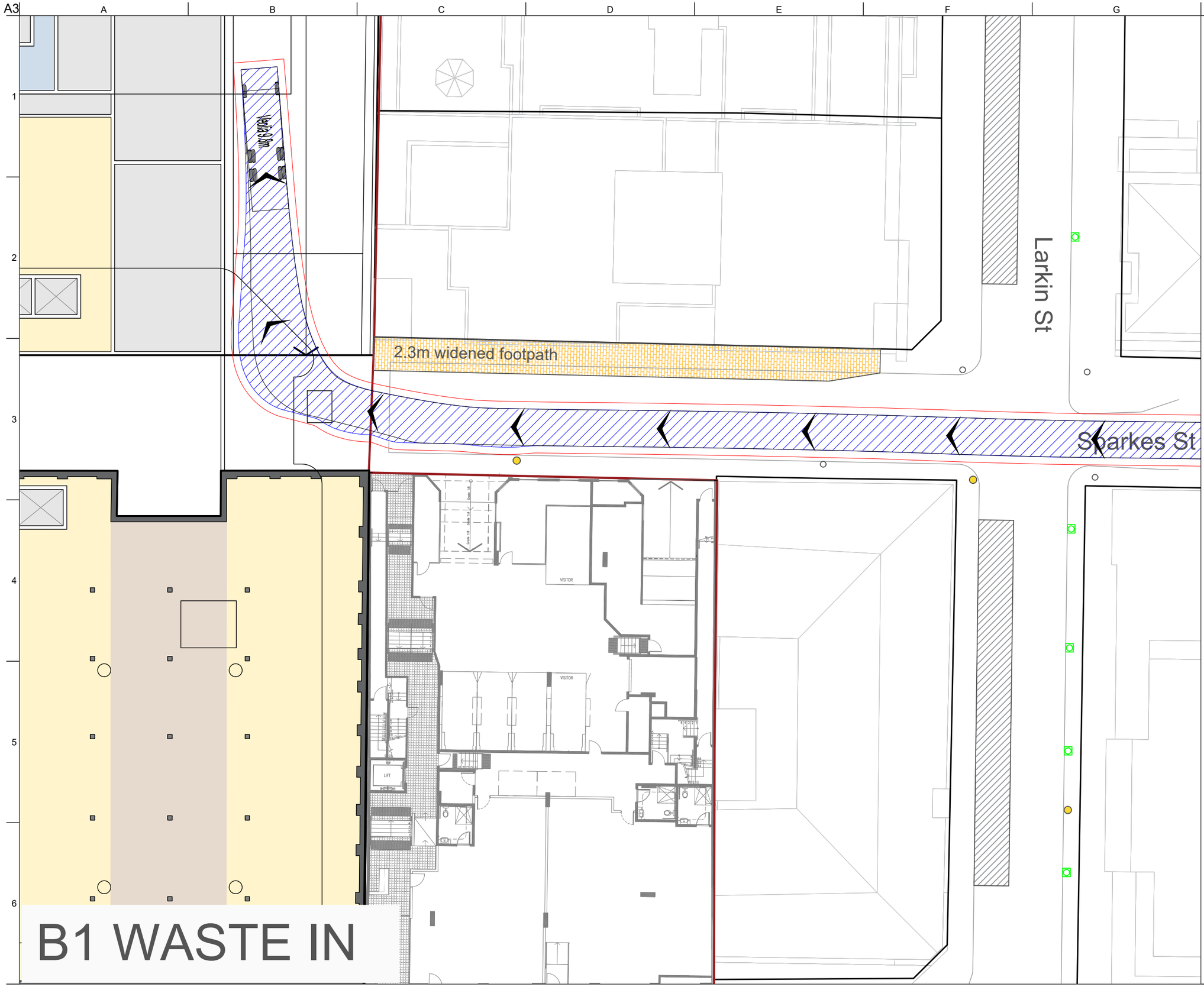
Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT006**	**D**

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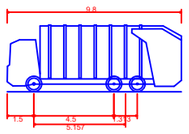
A3



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT013**	**C**

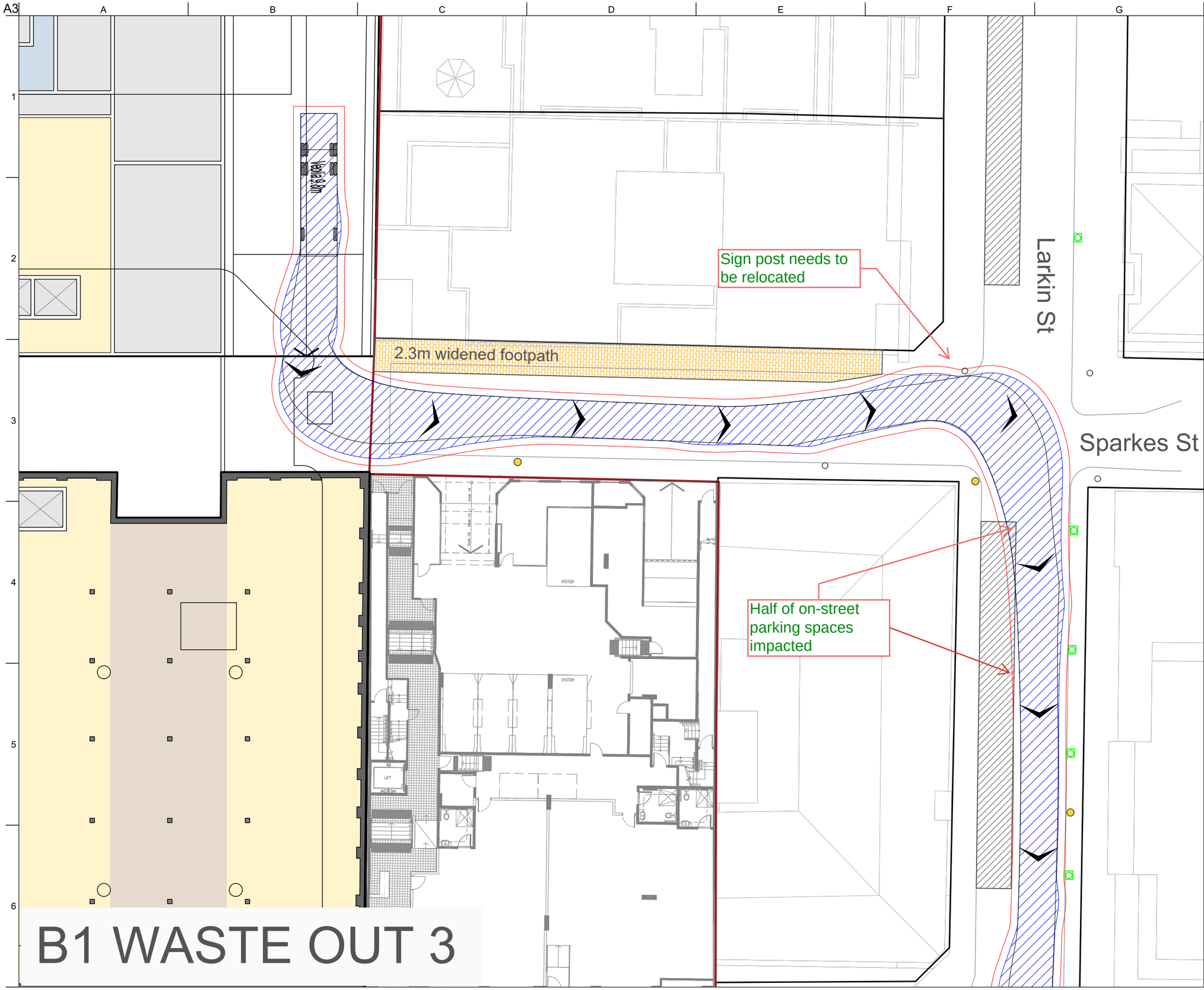
Do not scale

© Arup

A3

A B C D E F G

1 2 3 4 5 6



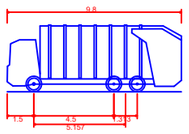
B1 WASTE OUT 3

Do not scale

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

- Tree
- Power pole
- Street sign pole

Issue	Date	By	Chkd	Appd
D	16/09/26	JG	SH	SH
C	01/09/26	JG	SH	SH
B	10/07/26	JG	SH	SH

For information

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
B1 WASTE COLLECTION
9.8M SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

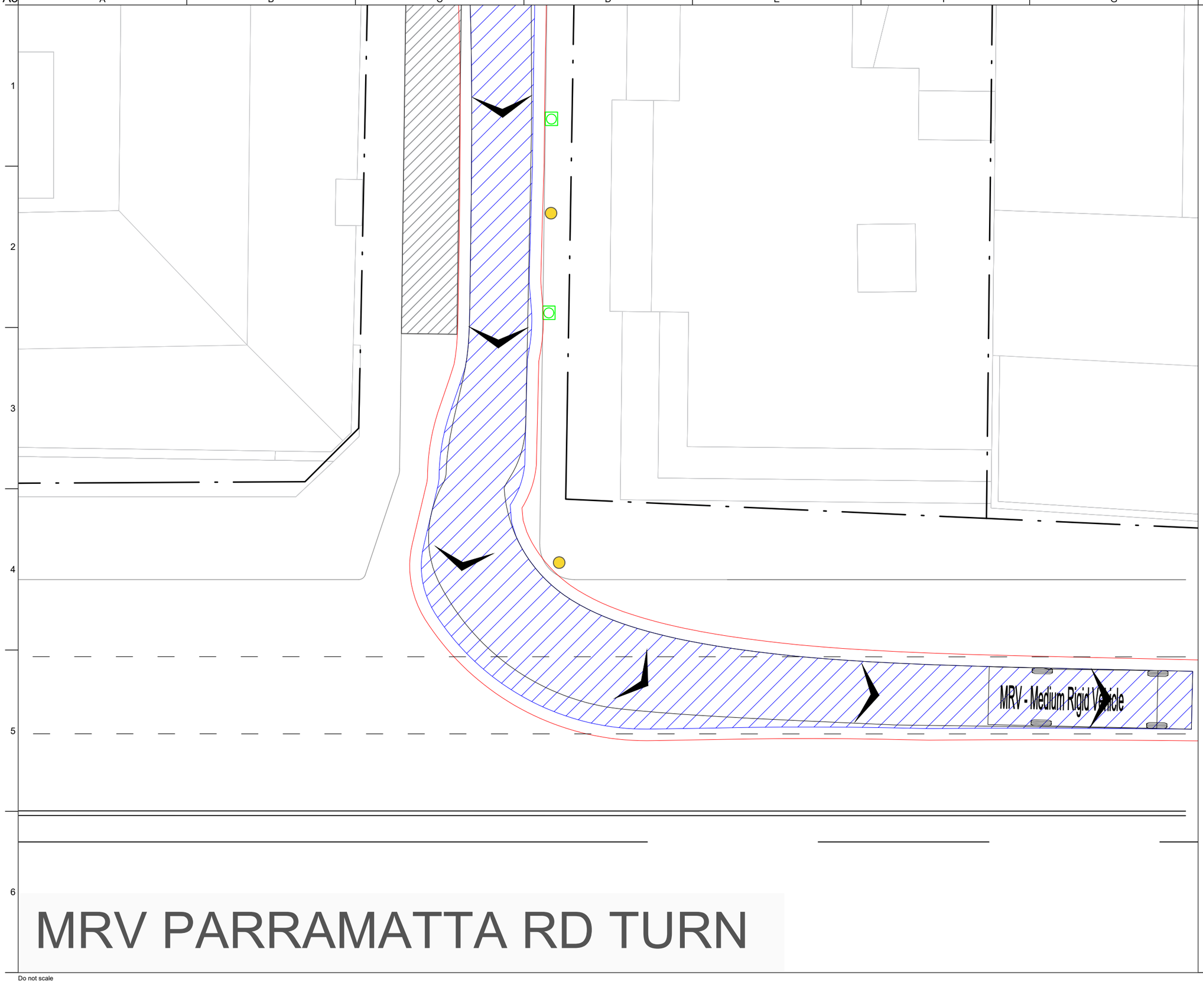
Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT023**	**D**

© Arup

C.4 Turn out to Parramatta Road paths

A3

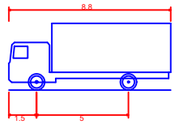


MRV PARRAMATTA RD TURN

Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



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

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	16/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH
For information				

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Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
LARKIN ST TO PARRAMATTA RD
MRV SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT024**	**D**

Do not scale

© Arup

A3

A B C D E F G

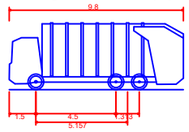
1 2 3 4 5 6



Legend

- Body Envelope
- 500mm Envelope
- Wheel Envelope

Design Vehicle(s)



Veolia 9.8m

Overall Length	9.800m
Overall Width	2.500m
Overall Body Height	3.752m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	9.000m

Tree

Power pole

Street sign pole

Issue	Date	By	Chkd	Appd
D	16/09/26	JG	SH	SH
C	31/08/26	JG	SH	SH
B	10/07/26	JG	SH	SH

For information

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
WENTWORTH CAPITAL

Job Title
84-94 PARRAMATTA ROAD

Drawing Title
DESIGN REVIEW
LARKIN ST TO PARRAMATTA RD
9.8m SWEPT PATH ASSESSMENT

Scale at A3 1:400

Discipline TRAFFIC

Drawing Status
DRAFT

Job No	Drawing No	Issue
304985-00	**SKT025**	**D**

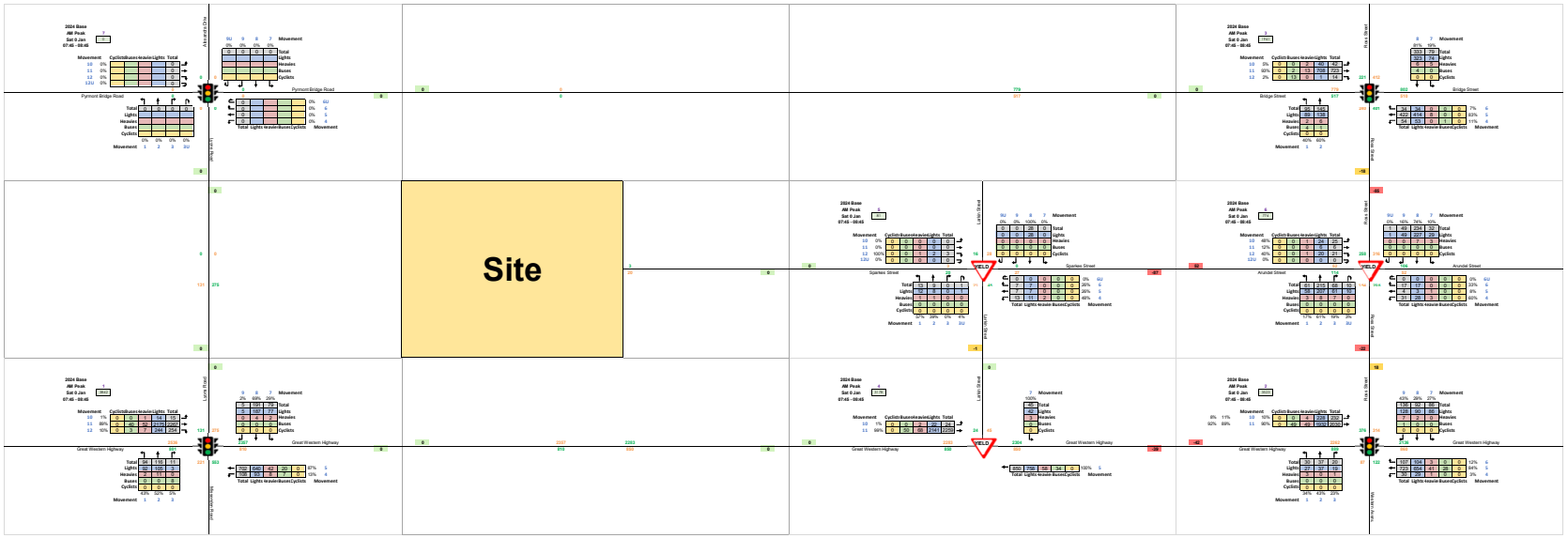
WASTE PARRAMATTA RD TURN

Do not scale

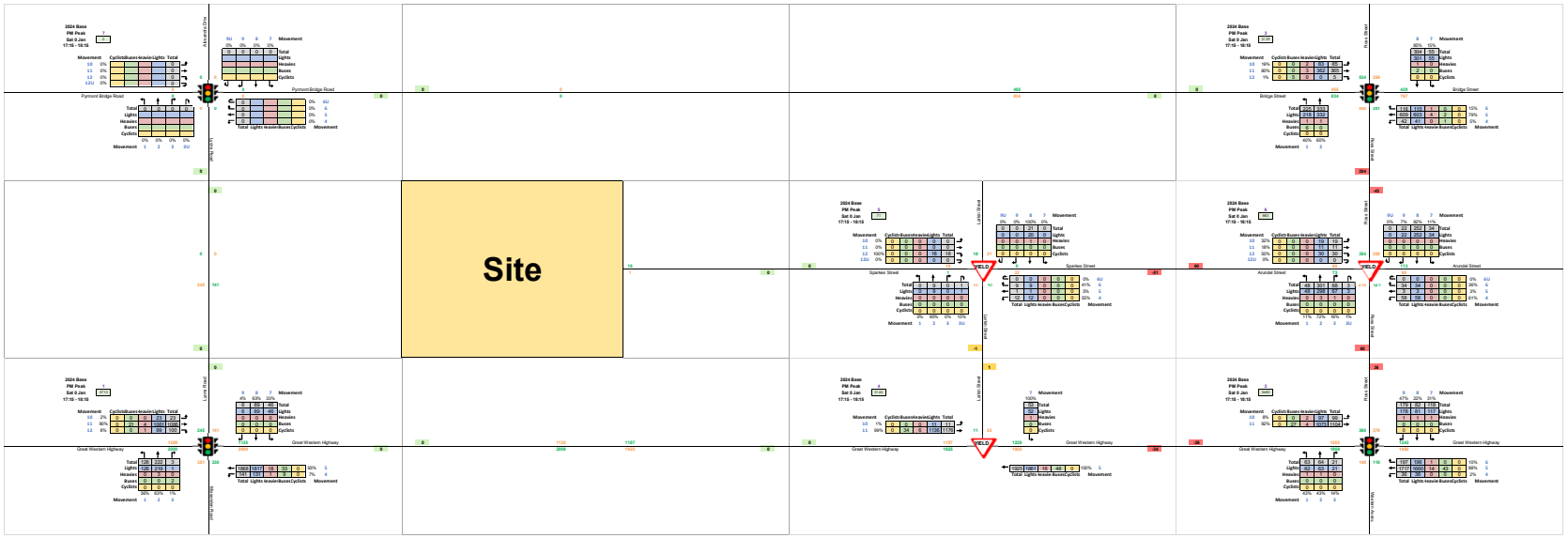
© Arup

Appendix D

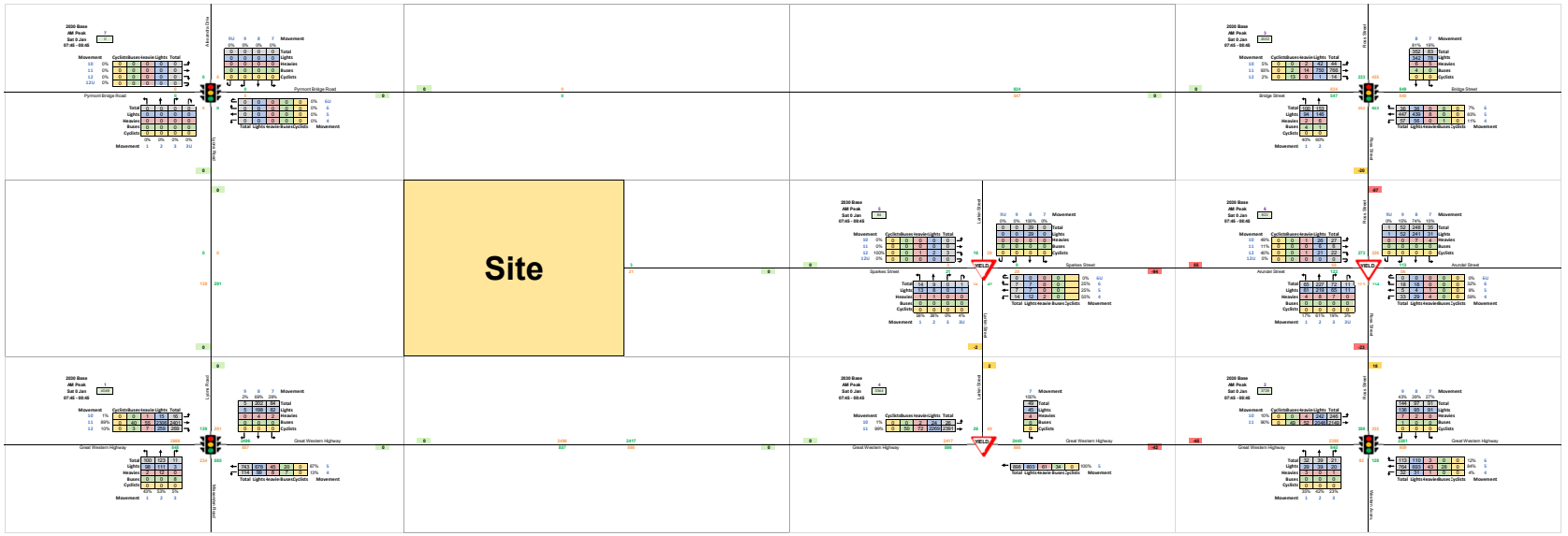
Stick diagrams


Site
Pymont Bridge Road
Alverstone Drive
Wattle Street
Sparkes Street
Lewin Street
Bridge Street
Pitt's Street
Arundel Street
Great Western Highway
Lewis Road
Harrington Street
YIELD

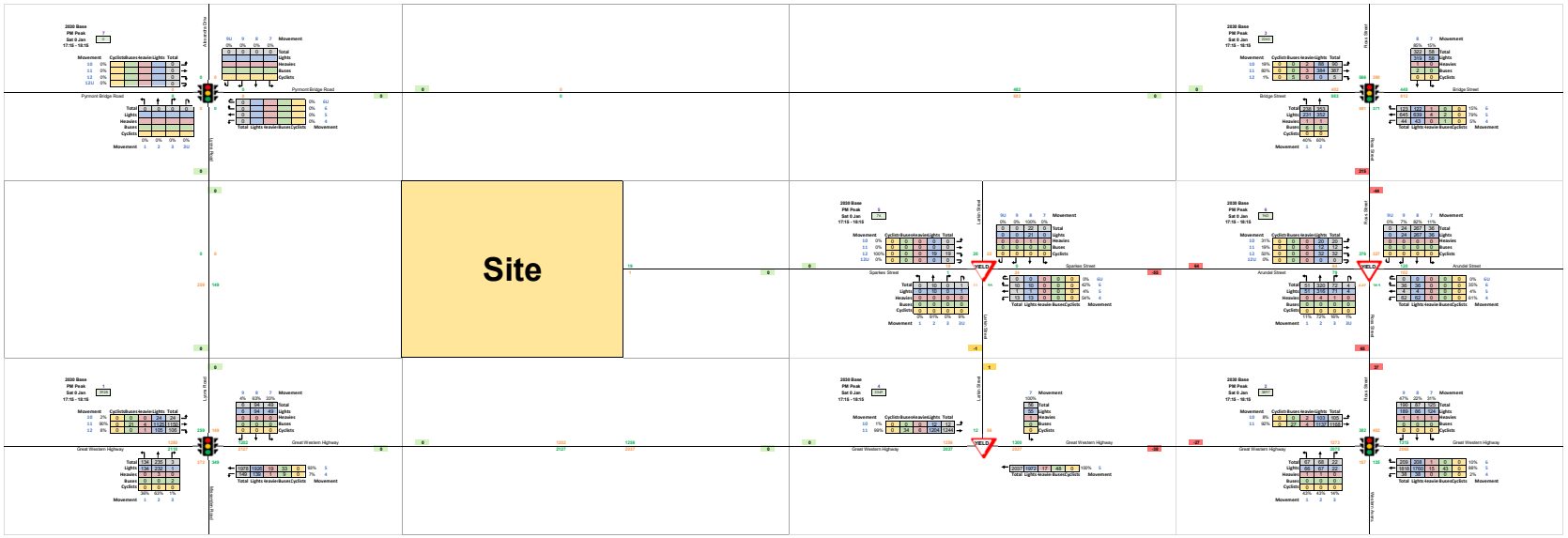
2024 Base PM



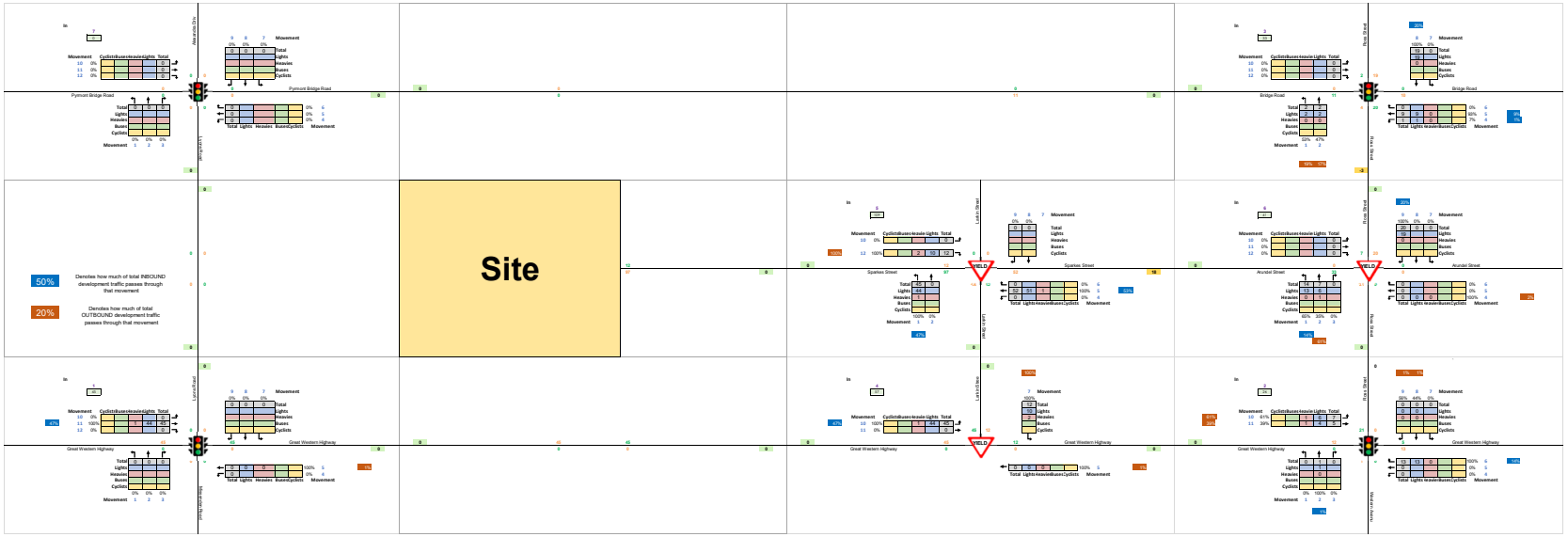
2030 Base AM



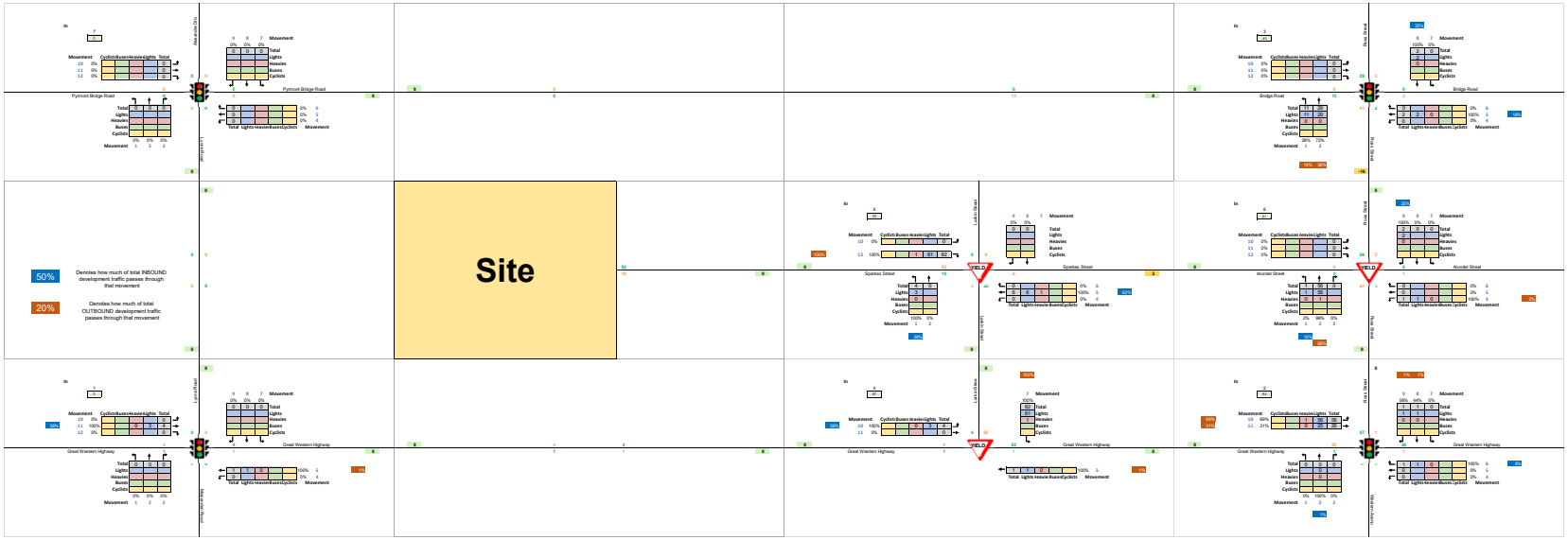
2030 Base PM


Site
Pyrmont Bridge Road
Allen Street
Sparkes Street
Lewis Street
Arundel Street
Ross Street
Bridge Street
Great Western Highway
Harold Street
YIELD

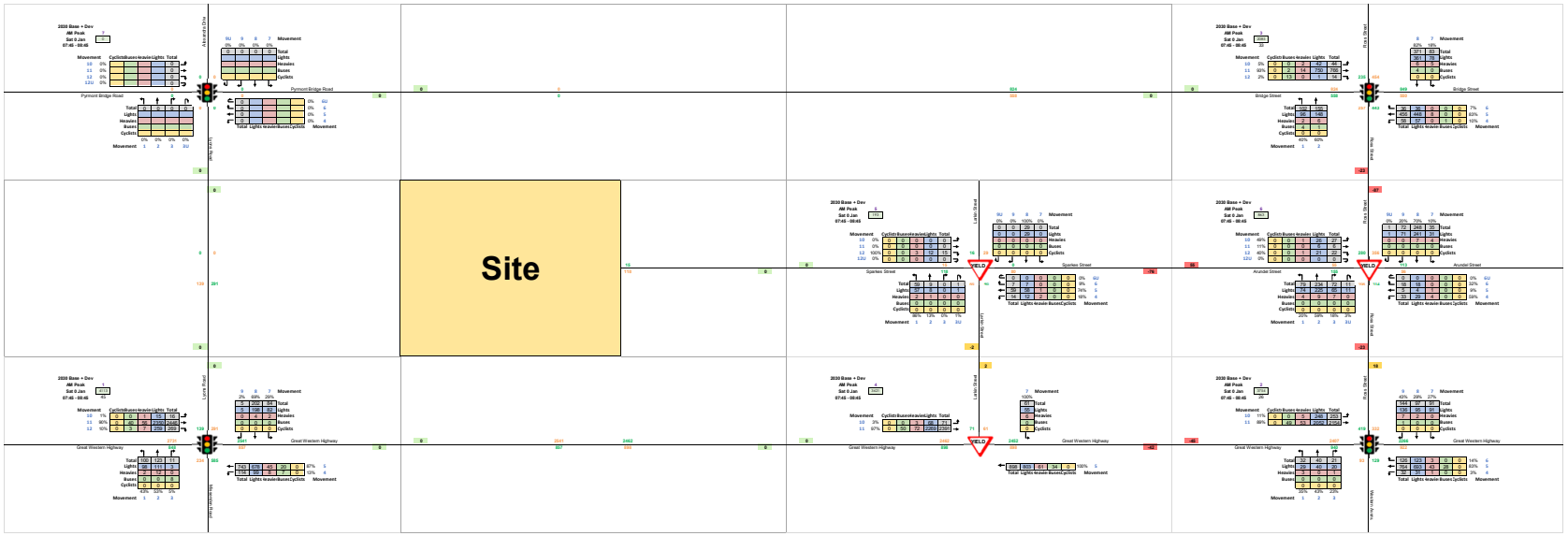
Development only generated traffic to / from development in AM



Development only generated traffic to / from development in PM



2030 Base+Dev AM



2030 Base+Dev PM

