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12 April 2024

P2464 Jackson Moss Vale light industrial TIA Ver02

SAAS Australia Pty Ltd
C/- Jackson Environment and Planning
Suite 102, Level 1, 25-29 Berry Street
North Sydney NSW 2060

Attn: Tasneem Rangwala

Dear Tasneem,

Traffic Impact Statement for proposed Industrial Subdivision and General Industry Development, 2 Bowman Road, Moss Vale

Further to your engagement we have now completed our site visit and review of the documentation provided for the proposed development application for 3 buildings to be constructed at 2 Bowman Road, Moss Vale. The following traffic impact statement has been prepared in conjunction with the Austroads Guidelines and Section 2.3 of the RTA Guide to Traffic Generating Developments which provides the structure for the reporting of key issues to be addressed when determining the impacts of traffic associated with a development. The RTA guide indicates that the use of this format and checklist ensures that the most significant matters are considered by the relevant road authority.

References to the RTA or RMS are interchangeable with Transport for New South Wales (TfNSW) as certain documentation remains unchanged.

SAAS Aus Pty Ltd (SAAS) are suppliers of access equipment products, including a range of fixed and mobile scaffolding, for sale or hire. SAAS's NSW business currently operates from a warehouse in Moorebank. Given the company's growth, and the significant growth of the construction industry, the industrial buildings will be used to house SAAS' scaffolding businesses.

SAAS is seeking to create an industrial subdivision that will include land from the property at 2 Bowman Road, Moss Vale (Lot 2/DP1070888), and a small portion of the adjacent property at 10 Bowman Road (Lot 51/DP130176). Industrial buildings are proposed to be constructed on three of the created lots.

1. Site Location and Context

The proposed development is located at 2 Bowman Road, Moss Vale with connection to the greater road network via the intersection of Bowman Road and Berrima Road as shown below.

Access to the subject site is proposed off the current end of Bowman Road which then connects to Berrima Road. The site is located within an existing industrial area.

The property is located within the Moss Vale Enterprise Corridor. The Enterprise Corridor aims to cater to light and general industrial developments and provide a business park for commercial developments and larger scale freight storage and distribution operations associated with the existing rail infrastructure.

The property shares its northern boundary with the Moss Vale Resource Recovery Centre and Community Recycling Centre, and Anderson Waste Services is located immediately east of the property. The Moss Vale Sewage Treatment Plant is located south of the property on the opposite side of Whites Creek.

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Other neighbouring businesses include a ready-mix concrete supplier, bulk haulage operator, Mitre 10 warehouse including landscape supplies, and the Southern Rural Livestock Exchange saleyards.

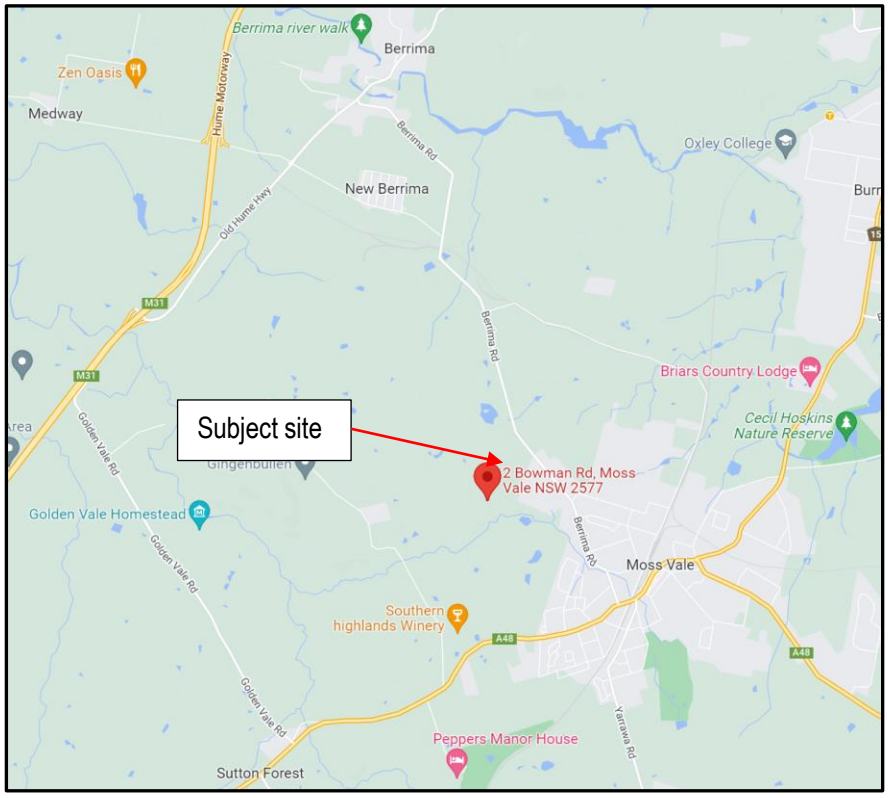

Figure 1 Location of the subject site in the context of the broader road network

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Figure 2 Site location off Berrima Road

2. Traffic Impact Assessment:

Item	Comment
Existing Situation	
2.1.1 Site Location and Access	The subject site is located on Bowman Road as shown in Figure 1 and 2 above. Access to the subject site is available via Bowman Road only.
2.2.1 Road Hierarchy	The main road through the locality is the Hume Motorway to the north that provides access across the broader area through to Sydney in the north and Goulburn to the south. To the south of the site is Moss Vale, accessed via **Berrima Road** that runs in a north-south direction between Moss Vale and Berrima. Berrima Road provides a single lane of travel in both directions for the majority of its length and in the vicinity of the subject site operates under the posted speed limit of 80 km/h. This area is semi-rural and as such there are no

Item	Comment
	footpaths provided along Berrima Road nor street lights for much of its length. There are street lights provided over the intersection with Bowman Road. Berrima Road is an approved B-double route. Berrima Road and **Bowman Road** connect via a give way controlled intersection with Berrima Road being the priority road. Bowman Road provides access to the subject site and adjacent industrial users including a waste resource centre and a large industrial shed and hardstand development. Bowman Road provides a single lane of travel in both directions with no footpaths or street lights. Bowman Road is not approved for B-double use. To the south of the location, Berrima Road connects with Argyle Street in Moss Vale via a three way give way controlled intersection with Argyle Street being the priority road. Argyle Street forms part of the Illawarra Highway and allows for local connections to the various towns across this area. To the north, Berrima Road connects with the Old Hume Highway in Berrima which then allows for connection to the Hume Motorway via a half intersection at Medway Road (north facing) or directly to the south 2.5 kms south of the north facing half interchange. The designated route for the highway traffic is via Taylor Avenue which acts as a bypass to avoid Berrima. At the give way controlled intersection of Berrima Road and Bowman Road there is a sheltered right turn lane for traffic turning into Bowman Road as well as a left turn deceleration lane. Opposite Bowman Road there is a concrete batching plant with a driveway located directly opposite Bowman Road. Berrima Road forms part of the Regional Road network (MR372) and connects via Taylor Avenue to the Old Hume Highway then the Hume Motorway which is a State Road. Argyle Street at Moss Vale forms part of the State Road network (MR025). The remaining roads are all local roads under the control of Wingecarribee Shire Council.
2.2.2 Current and Proposed Roadworks, Traffic Management Works and Bikeways	At the time of the site visit, road maintenance works were being undertaken to fill the potholes created by recent weather events along Berrima Road in the vicinity of the intersection with Bowman Road, which would have been created by recent wet weather. Other than regular maintenance work and patching work as observed on site, there are no further roadworks or traffic management works currently proposed in the vicinity of the subject site. Given the generally low traffic flows in the general vicinity of the subject site it can be seen that no road upgrades works are required.
2.3 Traffic Flows	Seca Solution undertook traffic surveys at the intersection of Bowman Road and Berrima Road on Wednesday 14th February 2024 (3.30-5.30PM) and Thursday 15th February 2024 (7.15-9.15AM period) to update data previously collected on Wednesday 19th October 2022 (PM period) and Thursday 20th October 2022 (AM period) to determine the current traffic flows at this location.

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<table>
<tr><th>Item</th><th>Comment</th></tr>
<tr><td></td><td>The full results of these surveys are shown in Appendix A and summarised below. The AM peak was determined as being 8-9AM whilst the PM peak was 3.30-4.30PM.

<table>
<tr><th>Road</th><th>AM peak</th><th>PM Peak</th></tr>
<tr><td>Berrima Road southbound</td><td>292</td><td>245</td></tr>
<tr><td>Berrima Road northbound</td><td>262</td><td>342</td></tr>
<tr><td>Two-way</td><td>554</td><td>587</td></tr>
</table>

A comparison with the October 2022 data indicates traffic flows in this location have increased during this period by between 10% and 11%. This represents an annual increase of 6-7% pa.

Traffic flows on Bowman Road were much lower, at 57 two-way in the AM peak and 61 in the PM peak period.</td></tr>
<tr><td>2.3.1 Daily Traffic Flows</td><td>Peak hour flows typically represent around 10% of daily flows. Based on the above traffic survey data, this would indicate that the daily traffic flows on Berrima Road could be in the order of 5,700 vehicles per day.</td></tr>
<tr><td>2.3.2 AADT</td><td>There is no TfNSW count station within this location for AADT data.</td></tr>
<tr><td>2.3.3 Daily Traffic Flow Distribution</td><td>Traffic surveys along Berrima Road show the flows are reasonably well balanced in the morning period and a slight bias northbound in the afternoon peak period. These could be associated with some commuter demand towards the Hume Motorway for trips north towards Greater Sydney.

It is expected that overall, the daily traffic flows would be reasonably evenly balanced between north and south movements in this location.</td></tr>
<tr><td>2.3.4 Vehicle Speeds</td><td>No speed surveys were completed as part of the site work. However, the alignment of Berrima Road does not encourage drivers to speed.

The road works at the time of the site visit and the pavement damage evident at the time of the site visit impacted vehicle speeds at that time.</td></tr>
<tr><td>2.3.5 Existing Site Flows</td><td>The site is currently un-occupied and does not generate any traffic demands.</td></tr>
<tr><td>2.3.6 Heavy Vehicle Flows</td><td>There are some regional truck movements along Berrima Road associated with deliveries to Moss Vale and also a number of heavy vehicles including concrete mixers, truck and dog combinations and semi-trailers associated with the industrial users to both sides of Berrima Road in this location. There are also a number of light industrial users located to the south of the site towards Moss Vale.

From the traffic surveys, in the AM peak 11% of vehicles using the intersection were heavy vehicles whilst in the PM peak there was 4% heavy vehicles.</td></tr>
<tr><td>2.3.7 Current Road Network Operation</td><td>Observations on site indicate that the intersection of Berrima Road and Bowman Road works very well with minor delays for all turning movements. There is a sheltered right turn lane for traffic travelling south along Berrima Road for the turn into Bowman Road as well as a left turn</td></tr>
</table>

Item	Comment
	deceleration lane for northbound traffic on Berrima Road to run into Bowman Road. These reduce the delays for the dominant through traffic movements. There is also a channelised left turn to allow for vehicles entering the concrete batching plant which has an entry opposite Bowman Road. The traffic flows on Berrima Road are relatively low and as such the traffic flows smoothly along this road with some bunching of traffic created by the occasional slower moving vehicles.
2.4 Traffic Safety and Accident History	Accident data, provided by Centre for Road Safety, for the intersection of Berrima Road and Bowman Road has been reviewed, and no accidents have been recorded at this intersection over a 5 year period 2017-2021. There have been less than 20 accidents recorded along the length of Berrima Road between Moss Vale and the Hume Motorway over the 5-year recorded history. Overall, the intersection is well laid out with good visibility on intersection approaches. It is considered that the road network in the vicinity of the subject site provides an acceptable level of overall road safety.
2.5 Parking Supply and Demand	
2.5.1 On-street Parking Provision	There is no parking available in the general locality of the site on Berrima Road or Bowman Road. There is a shoulder that allows a vehicle to be parked in an emergency only and be clear of the through traffic movements.
2.5.2 Off-street Parking Provision	No public off-street parking is provided in the locality of the site. The existing users in this location allow for parking within the individual lots as required.
2.5.3 Current Parking Demand and Utilisation	No on-street parking demands was observed in the locality of the intersection of Berrima Road and Bowman Road during the site visit.
2.5.4 Short term set down or pick up areas	None
2.6 Modal Split	Given the location of the site it is considered that all trips shall be undertaken by private vehicles and heavy trucks.
2.7 Public Transport	
2.7.1 Rail Station Locations	The site is not accessible by train.
2.7.2 Bus Stops and Associated Facilities	None in this location.
2.7.3 Transport Services	Berrima Buslines provides a limited service between Berrima and Moss Vale Monday to Saturday. These are around 2 hours apart per direction.
2.8 Pedestrian Network	None provided within the locality of the subject site.
2.9 Other Proposed Developments	There are no other significant developments currently proposed within the immediate vicinity of the subject site. It is noted that there is a large lot (42 hectares) for sale on the opposite side of Berrima Road from Bowman Road which is zoned IN1 but there is no development currently occurring.

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Item	Comment
The Development	
3.1.1 Nature of Development	The proposed development allows for the development of 3 industrial buildings that will be used to house SASS scaffolding business as part of the relocation of the of SASS Aus Pty Ltd from Moorebank to Moss Vale. SAAS is seeking to create an industrial subdivision that will include land from the property at 2 Bowman Road, Moss Vale (Lot 2 / DP1070888), and a small portion of the adjacent property at 10 Bowman Road (Lot 51 / DP130176). The subdivision will result in the creation of four new lots and leave Lot 1 / DP103123 in its current arrangement. The proposed subdivision will result in the following lots as shown in Figure 2: • Created Lot 1 – approximately 2.88 ha of land zoned E4 General Industrial. Access to the lot will be directly from Bowman Road at the eastern end of the lot. The road frontage will be approximately 157 m, and the depth of the lot will vary from approximately 148 m on the southern boundary, to approximately 224 m on the northern boundary; • Created Lot 2 – approximately 2.64 ha of land zoned E4 General Industrial. This lot will be formed by adjusting the boundaries of Lot 51 and Lot 2 to match the land use zone boundaries. This lot has a frontage to Bowman Road at the eastern end of the lot approximately 127 m wide. The lot will be approximately 352 m deep, tapering to a width of approximately 35 m at the western boundary. This lot is affected by the gas pipeline easement at the south-eastern end; • Created Lot 3 – approximately 2.62 ha of land zoned E4 General Industrial. This is an irregularly shaped lot with a frontage to Bowman Road of approximately 388 m. This lot also has a frontage of approximately 132 m to an unformed paper road (Hutchinson Road) on the southern boundary. The northern portion of this lot is affected by the gas pipeline easement; and • Created Lot 4 – approximately 54.64 ha of RU2 Rural Landscape zoned land. This is the RU2 portion of Lot 2 / DP1070888 separated from the remainder of the lot by the paper road along its northern boundary. The southern boundary of this lot is defined by Whites Creek and is within Wingecarribee Shire Council's Flood Planning Area. This part of the lot is to be merged with the remainder of the RU2 Rural Landscape lot of 51 / DP130176; Access to the property is from the cul-de-sac on Bowman Road. The southern end of Bowman Road, south of the cul-de-sac, is currently unformed. Construction of this part of the road will be required to support the development. The development allows for the construction of the 3 industrial buildings and the associated hardstand areas for parking, loading and truck turning paths etc.
3.1.2 Access and Circulation Requirements	Access driveways are to be designed to allow all vehicles to enter or exit in a single turning movement and in a forward direction. The driveway

Item	Comment
	crossings shall be designed and located in accordance with the current relevant Australian Standard (AS2890 Parking Facilities) and shall provide adequate sight distance to traffic on the frontage road as well as pedestrians. The required maximum size design vehicle for this site is a B-double combination with a separate application required for access to the site for B-doubles. It is B-double access is permitted along Berrima Road for connection to the greater road network for B-doubles.
3.2 Access	
3.2.1 Driveway Location	Access to the development is proposed via an extension to Bowman Road and formation of part of Hutchinson Road and will be a public road. The individual lots housing the buildings will then have access direct off this road extension. The extension of Bowman Road allows for a straight alignment to ensure the location of the driveways can be provided in a safe manner. The driveways have been designed with the layout of the buildings taken into account, to ensure the trucks can enter and circulate the site in a forward direction. The driveways allow for the swept path movement of B-double trucks for access to Buildings 1 & 2, the largest vehicle requiring access to these buildings. Semitrailer access only is required to Building 3.
3.2.2 Sight Distances	Currently there is no posted speed limit shown for Bowman Road, indicating the speed limit is 80 km/h. It can be seen on site that vehicle speeds are much lower than this in practice, and the proposed extension will not encourage drivers to speed. A review of the speed limit here could be considered by Council (as the road authority) and a speed limit of 60 km/h could be applied. For a posted speed limit of 60 km/h the sight distance requirement for the driveway to allow for heavy vehicles per AS2890.2 is 83 metres minimum and 111 metres desirable. The extension of Bowman Road offers a straight horizontal and vertical alignment in the locality of the site access. Visibility to the north (right) along Bowman Road will be in excess of 111 metres, allowing for safe vehicle movements. For the key intersection of Bowman Road and Berrima Road, under the posted speed limit the sight distance requirement is 181 metres. The sight distance assessment on site confirms that this sight distance is available on both sides, with the sight distance exceeding 200 metres in both directions.
3.2.3 Service Vehicle Access	The lots will require general servicing including requirement for machine maintenance, office supplies, material delivery etc. As the sites are being developed to allow for B-double access for Buildings 1 and 2, service vehicles shall be able to access the site in a safe and appropriate manner.
3.2.4 Queuing at entrance to site	Vehicles have free flow entering the site with no constraints at the site entry. The layout of the site allows vehicles to be located wholly within the site and away from the entry points to ensure that no queues will occur back onto Bowman Road.
3.2.5 Comparison with existing site access	The site is currently vacant.

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<table>
<tr><th>Item</th><th>Comment</th></tr>
<tr><td>3.2.6 Access to Public Transport</td><td>The site is not serviced by public transport.
There is a bus route along Berrima Road but no bus stops in the locality of the subject site.</td></tr>
<tr><td>3.3 Circulation</td><td></td></tr>
<tr><td>3.3.1 Pattern of circulation</td><td>All vehicles will be able to enter and exit the site in a forward direction.</td></tr>
<tr><td>3.3.2 Internal Road Widths</td><td>The three buildings will provide a range of bulky equipment and vehicle storage spaces, as well as offices and staff amenities. The layout of the site will allow for the safe movement of trucks (up to 26m B- Doubles), passenger vehicles and pedestrians, and ensure emergency service vehicles can access all areas of the property.

Internal haul roads to accommodate up to 26m B-Doubles (Building 1 and 2); heavy vehicles to use Building 3 will be limited to 19m semi-trailer.

Line marking and signage will be provided internal to the three separate Lots (noting Building 3A and 3B are on same Lot) to direct drivers around the site. This will be completed as part of the detailed design for the project.</td></tr>
<tr><td>3.3.3 Internal Bus Movements</td><td>No requirement for buses to access the development.</td></tr>
<tr><td>3.3.4 Service Area Layout</td><td>A service area is provided to the rear or side of the buildings, which shall allow for general servicing and deliveries.</td></tr>
<tr><td>3.4 Parking</td><td></td></tr>
<tr><td>3.4.1 Proposed Supply</td><td>Building 1 will provide 59 parking spaces.
Building 2 will provide 53 parking spaces.
Building 3 will provide 26 parking spaces.</td></tr>
<tr><td>3.4.2 Authority Parking</td><td>The Moss Vale Enterprise Corridor Development Control Plan nominates the following parking rates:

<u>Factory</u>
1 space per 100 sq m of gross floor area, or 1 space per 2 employees, whichever is the greater, PLUS
1 space per 40 sq m of office and showroom area

<u>Warehouse</u>

1 space per 300 sq m of gross floor area (minimum 3 car spaces)

1 Heavy Goods Vehicle (HGV) parking Bay per 1000m² nett floor area (or part thereof) is required for single use sites (where one business occupies a whole or majority of a site).

No specific parking rate is provided for a scaffolding storage facility. It is considered an appropriate rate is 1 space per employee, based on all staff driving to the site.</td></tr>
<tr><td>3.4.3 Parking Layout</td><td>The layout of the carpark shall be in accordance with AS2890.</td></tr>
<tr><td>3.4.4 Parking Demand</td><td>Based on the floor areas the following parking demand has been determined:

<table>
<tr><th></th><th>GFA m2</th><th>Parking Requirement</th></tr>
<tr><td>Building 1</td><td>17370.73</td><td>58</td></tr>
<tr><td>Building 2</td><td>12795.35</td><td>43</td></tr>
<tr><td>Building 3</td><td>10993.04</td><td>37</td></tr>
</table>
</td></tr>
</table>

Item	Comment
	Building 1 – 58 required and 59 provided. Building 2 – 43 required and 42 provided. Building 3 – 37 required and 43 provided. The site therefore provides a suitable level of parking to meet the requirements of the DCP.
3.4.5 Service Vehicle Parking	Service bays are included in the design to allow for service vehicles to park within each site along with articulated vehicles which can stand within each building as required. These are as shown in Attachment A.
3.4.6 Pedestrian and Bicycle Facilities	No dedicated bicycle facilities are provided on site. Bicycle storage / parking can be accommodated within each industrial building for employees wishing to access the site by cycling. Given the site's location it is considered that no staff will walk to the site. Internal staff movements within each lot will be managed as part of the future on-site management plan for the end user. A designated path will be provided to connect between Lot 1 and the parking area located opposite this lot on Bowman Road.
Traffic Assessment	
4.1 Traffic Generation	The RTA Guide to Traffic Generating Developments does not provide specific traffic generation rates for the end user as a scaffolding company and as such the traffic generated by the project has been determined based on the existing and future operations. A summary of the vehicle movements is provided below with heavy vehicles being both light rigid and 19m semi-trailers

BUILDING 1

		Monday - Friday					
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailers	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Night	12:00am to 1:00am						
	1:00am to 2:00am						
	2:00am to 3:00am						
	3:00am to 4:00am						
	4:00am to 5:00am						
	5:00am to 6:00am	13					
	6:00am to 7:00am	4			8		2
Day	7:00am to 8:00am			8	7	2	2
	8:00am to 9:00am			7		2	2
	9:00am to 10:00am	3				2	
	10:00am to 11:00am						
	11:00am to 12:00pm	10					
	12:00pm to 1:00pm						
	1:00pm to 2:00pm		13				
	2:00pm to 3:00pm				7		2
	3:00pm to 4:00pm		4	7	8	2	2
	4:00pm to 5:00pm			8		2	
	5:00pm to 6:00pm		3				
Evening	6:00pm to 7:00pm						
	7:00pm to 8:00pm						
	8:00pm to 9:00pm		10				
	9:00pm to 10:00pm						
Night	10:00pm to 11:00pm						
	11:00pm to 12:00am						
	Totals	30	30	30	30	10	10

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Item	Comment

BUILDING 2

		Daily Movements Monday - Friday					
Time Period	Time of day	Passenger Vehicles		Light Rigid		Heavy Articulated	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Night	12:00am to 1:00am						
	1:00am to 2:00am						
	2:00am to 3:00am						
	3:00am to 4:00am						
	4:00am to 5:00am						
	5:00am to 6:00am	13					
	6:00am to 7:00am	4			8		2
Day	7:00am to 8:00am	20			7		2
	8:00am to 9:00am	20		5		2	2
	9:00am to 10:00am	23		6	2	2	
	10:00am to 11:00am	2		8	2	1	
	11:00am to 12:00pm	2	2	2	2	1	
	12:00pm to 1:00pm	12	2	2	2		
	1:00pm to 2:00pm	2	15	2	2		
	2:00pm to 3:00pm	2	6		7		2
	3:00pm to 4:00pm		2	1	8		2
	4:00pm to 5:00pm		20	5		2	
	5:00pm to 6:00pm		23	6		1	
Evening	6:00pm to 7:00pm		20	2		1	
	7:00pm to 8:00pm			1			
	8:00pm to 9:00pm		10				
	9:00pm to 10:00pm						
Night	10:00pm to 11:00pm						
	11:00pm to 12:00am						
	Totals	100	100	40	40	10	10

BUILDING 3

		Monday - Friday					
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailer	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Night	12:00am to 1:00am						
	1:00am to 2:00am						
	2:00am to 3:00am						
	3:00am to 4:00am						
	4:00am to 5:00am						
	5:00am to 6:00am	7					
	6:00am to 7:00am	3			3		1
Day	7:00am to 8:00am				3		1
	8:00am to 9:00am			1			1
	9:00am to 10:00am	3		2		1	
	10:00am to 11:00am	1		2	1	1	
	11:00am to 12:00pm	8	1	1			
	12:00pm to 1:00pm	1	1	1	1	1	
	1:00pm to 2:00pm	1	8				
	2:00pm to 3:00pm	1	1	1	1		1
	3:00pm to 4:00pm		4		3		1
	4:00pm to 5:00pm			1	3		
	5:00pm to 6:00pm		3	2		1	
Evening	6:00pm to 7:00pm			2		1	
	7:00pm to 8:00pm			2			
	8:00pm to 9:00pm		7				
	9:00pm to 10:00pm						
Night	10:00pm to 11:00pm						
	11:00pm to 12:00am						
	Totals	25	25	15	15	5	5

For the Monday to Friday operation, in summary the AM and PM flows are:
44 inbound light vehicles, - inbound heavy vehicles and 24 outbound heavy vehicles between 5-7 AM. Between 7-9AM flows are 40 inbound light vehicles, 27 inbound heavy and 27 outbound heavy vehicles.

For the PM between 3-5PM there are 0 inbound light vehicles and 30 outbound light vehicles. There are also 28 inbound heavy vehicles and 27 outbound heavy vehicles across the 2 hours.

Overall it can be seen that as this is across two hours there are typically less than 50 vehicle movements per hour across the site for the combined entry and exit movements for all vehicles.

<table>
<tr><th>Item</th><th>Comment</th></tr>
<tr><td></td><td>Peak hour movements for the development during the local road peak would therefore be:

<table>
<tr><th></th><th>Inbound Light</th><th>Outbound Light</th><th>Inbound Rigid</th><th>Outbound Rigid</th><th>Inbound 19m AV</th><th>Outbound 19m AV</th></tr>
<tr><td>7-8am</td><td>20</td><td>-</td><td>8</td><td>17</td><td>2</td><td>5</td></tr>
<tr><td>8-9am*</td><td></td><td>-</td><td>7</td><td>-</td><td>2</td><td>2</td></tr>
<tr><td>3-4pm</td><td>0</td><td>10</td><td>8</td><td>19</td><td>2</td><td>5</td></tr>
</table>
*Local road peak

The daily traffic flows Monday to Friday are 530, being equally split between 265 inbound and 265 outbound per day.

The Saturday and Sunday flows are lower and are provided in Appendix B to this report.</td></tr>
<tr><td>4.1.1 Daily and Seasonal Factors</td><td>The traffic flows on a Saturday are less than half the weekday flows with Sunday flows being 50% or less of the Saturday flows.</td></tr>
<tr><td>4.1.2 Pedestrian Movements</td><td>No external pedestrian movements expected to the site, given its relatively remote location.
Internal pedestrian movements within the Lots will be managed as part of the on site management plan. A pedestrian route will be provided to connect the parking area opposite Building 1 to be used by staff.</td></tr>
<tr><td>4.2 Hourly distribution of trips</td><td>Traffic will be distributed as shown above in Sec 4.1, typically between 5am – 9pm. There will be demand for staff to enter the site in the morning peak and then depart in the afternoon period.</td></tr>
<tr><td>4.2.1 Origin / destinations assignment</td><td>Traffic will access the site via the intersection of Bowman Road and Berrima Road. The split of the existing traffic north v south at the intersection of Bowman Road and Berrima Road has been assumed to be acceptable for the project. The distribution of traffic has been based on 60% of traffic having an origin/destination to the south, towards Moss Vale being light and heavy vehicles bot not semi-trailers (AVs) or B-Doubles. The balance (40%) will include a mix of light and heavy vehicles including AVs and B-Doubles travelling north along the approved B-Double route travelling left onto Berrima Road to Taylor Avenue, then the Old Hume Highway to the Hume Motorway. This route in reverse will provide access to the site for all AVs and B-Doubles, avoiding the Moss Vale township.</td></tr>
<tr><td>4.3 Impact on Road Safety</td><td>The proposed extension to Bowman Road will be designed in accordance with Austroads and Council design guidelines and will therefore provide a safe road environment.

The access driveways are located to ensure sight lines are available and consistent with the road environment. It is considered that the proposed access points can operate in a safe and acceptable manner.

The intersection of Bowman Road and Berrima Road shows no history of accidents and is well laid out with good sight lines and dedicated turn lanes. It is considered that the additional traffic movements associated with the development of the project site shall have an acceptable impact upon road safety in this location.

Overall, it is considered that the project will have a minimal and acceptable impact upon road safety in this location.</td></tr>
</table>

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Item	Comment
4.4 Impact of Generated Traffic	
4.4.1 Impact on Daily Traffic Flows	From section 4.1 above, the following daily traffic movements are predicted for the overall site: Building 1 – 140 Building 2 – 300 Building 3 - 90 This gives a daily total of 530 vehicles 2-way i.e. 265 inbound and 265 outbound. With 60% of the traffic from the south of Bowman Road this would give additional daily flows of 318 vpd two-way on Berrima Road and 212 vehicles north of Bowman Road on Berrima Road. The current hourly flows on Berrima Road show a peak demand of 587 vehicles south of Bowman Road. The RTA Guide (Table 4.5) provides advice for the capacity of the road per hour and the current demands would indicate a level of service of C, assuming 10% heavy vehicles and level road alignment. The hourly limit for level of service C is 920. The development could increase these by less than 50 vehicles per hour and remain well within the desirable limit of level of service C. Whilst no advice is provided with regard to daily traffic limits, it is considered that with the flows being acceptable in the peak hours the overall flows will be acceptable across the day.
4.4.2 Peak Hour Impacts on Intersections	The traffic impacts during the peak periods created by the development traffic are considered to be low. The potential traffic movements generated by the site have been assessed using Sidra modelling, with a summary of the results provided in Part 3 following this table. In summary, the assessment of the development flows as well as background growth to the 2034 design horizon determined that the level of service will remain similar to the existing operations and the current intersection controls have adequate capacity to cater for the development traffic. The delays and queues shall remain relatively low and acceptable when assessed against the criteria provided by TfNSW.
4.4.3 Impact of Construction Traffic	A detailed construction traffic management plan will be prepared as part of the detailed design process to manage the impact of heavy vehicles accessing the site during construction. All construction traffic will access the site via Bowman Road. Given the overall size of the site it is considered that the parking for the construction workers can be accommodated on site with minimal impact upon the local roads.
4.4.4 Other Developments	There are no other significant developments in the immediate vicinity of the site.
4.5 Public Transport	
4.5.1 Options for improving services	The site will not generate significant demand for public transport therefore no improvements are required.
4.5.2 Pedestrian Access to Bus Stops	None required
4.6 Recommended Works	

Item	Comment
4.6.1 Improvements to Access and Circulation	The proposed site layout allows for ease of circulation around the site and no alterations are required to improve the access.
4.6.2 Improvements to External Road Network	No changes required as a result of this development.
4.6.3 Improvements to Pedestrian Facilities	None required.
4.6.4 Effect of Recommended Works on Adjacent Developments	No works proposed that will impact on adjacent developments.
4.6.5 Effect of Recommended Works on Public Transport Services	None
4.6.6 Provision of LATM Measures	None Required
4.6.7 Funding	All works on site shall be funded by the developer.

Site Photos

Photo 1 – View to right for a driver exiting Bowman Road onto Berrima Road

Photo 2 – View to left for a driver exiting Bowman Road onto Berrima Road

Photo 3 – Cross-section of Bowman Road looking from Berrima Road

Photo 4 – Existing left turn deceleration lane for traffic turning off Berrima Road into Bowman Road

Photo 5 – Existing right turn lane for traffic turning into Bowman Road off Berrima Road

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Photo 6 – View from section of road that forms the extension of Bowman Road looking towards Berrima Road

3. Intersection of Bowman Road and Berrima Road – Sidra assessment

Sidra modelling has been completed for the intersection of Bowman Road and Berrima Road, to determine its capacity to support the additional traffic movements associated with the proposed development. The intersection has been assessed for the current 2024 AM and PM flows as well as the future 2034 AM and PM flows.

The existing operation is outlined in Table 1 below.

Table 1: Sidra Results - Existing Situation 2024 (AM/PM)

Approach	Degree of saturation	Average delay (seconds)	Level of service	95% Queue (metres)
Berrima Road south	0.133 / 0.178	0.7 / 0.3	A / A	0.6 / 0.2
Concrete plant access	0.025 / 0.007	11.4 / 5.0	A / A	1.1 / 0.2
Berrima Road north	0.153 / 0.116	0.4 / 0.4	A / A	0.4 / 0.5
Bowman Road	0.069 / 0.112	13.0 / 12.6	A / A	1.7 / 2.8

NOTE- results for AM / PM peak

The results above demonstrate that the intersection works well with minor delays and minimal queues.

The intersection was then modelled with the existing traffic demands plus the development flows. The predicted development flows are shown below applying the development AM peak (7-8am) as a worst case scenario.

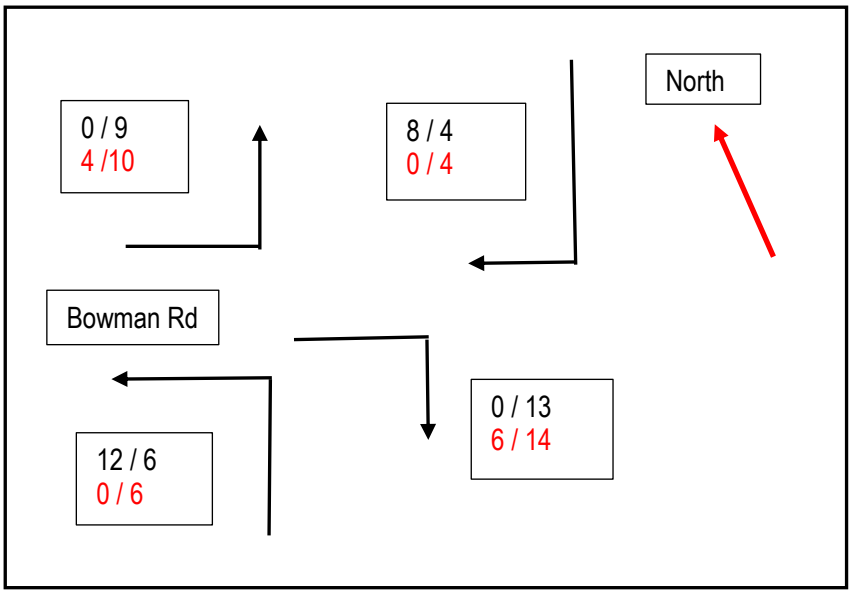

Figure 3 – Future predicted traffic demands at Bowman Road and Berrima Road (AM light / heavy / PM light / heavy)

Table 2: Sidra Results – Existing + development 2024 (AM/PM)

Approach	Degree of saturation	Average delay (seconds)	Level of service	95% Queue (metres)
Berrima Road south	0.133 / 0.178	1.1 / 0.5	A / A	0.6 / 0.2
Concrete plant access	0.026 / 0.007	12.0 / 5.1	A / A	1.1 / 0.2
Berrima Road north	0.153 / 0.116	0.7 / 0.5	A / A	0.9 / 0.9
Bowman Road	0.200 / 0.278	19.7 / 18.3	B / B	6.5 / 9.3

NOTE- results for AM / PM peak

The above results show the existing intersection controls have adequate capacity to cater for the additional traffic demands associated with the project.

The intersection was then tested for the future 2034 design year, allowing for background traffic growth of 4% per annum along Berrima Road. This background growth value of 4% represents a high value to cater for development along this growth corridor, with normal TfNSW requirements for background growth being 2% per annum. The 4% per annum gives a 40% background growth in traffic volumes over the 10 year design scenario. The results are presented below.

Table 3 – Sidra results – base 2034 with no development (background growth only)

Approach	Degree of saturation	Average delay (seconds)	Level of service	95% Queue (metres)
Berrima Road south	0.187 / 0.250	0.8 / 0.4	A / A	1.0 / 0.3
Concrete plant access	0.061 / 0.014	21.2 / 6.9	B / A	2.4 / 0.3
Berrima Road north	0.215 / 0.162	0.4 / 0.4	A / A	0.6 / 0.8
Bowman Road	0.156 / 0.249	20.2 / 20.3	B / B	3.5 / 6.4

NOTE- results for AM / PM peak

The intersection was then modelled for the future design year of 2034 plus the development traffic flows and the results are shown below.

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Table 4 – Sidra results – 2034 future flows plus development traffic

Approach	Degree of saturation	Average delay (seconds)	Level of service	95% Queue (metres)
Berrima Road south	0.187 / 0.250	0.9 / 0.4	A / A	0.7 / 0.3
Concrete plant access	0.045 / 0.010	21.6 / 7.1	B / A	1.8 / 0.2
Berrima Road north	0.214 / 0.170	0.6 / 0.5	A / A	1.0 / 1.1
Bowman Road	0.356 / 0.511	36.9 / 36.8	C / C	11.6 / 17.0

NOTE- results for AM / PM peak

The above results demonstrate that the existing intersection controls at the intersection of Berrima Road and Bowman Road will have adequate capacity to cater for the development traffic flows for the future design year of 2034. Whilst there may be some delays for the right turn out of Bowman Road, these delays remain within acceptable limits and the traffic queue is low. With platooning of traffic created by slower moving vehicles bigger gaps can occur in the through traffic demands which would reduce these delays. As discussed, it can also be seen that a 4% per annum background growth is higher than the normal requirements from TfNSW which could provide a further buffer in the results.

4. Conclusion

From the site work undertaken and the review of the development proposal and associated plans against the requirements of the RTA Guide to Traffic Generating Developments and Austroads Guide to Traffic Management, it is considered that the proposed development application should have no objections raised on traffic and access grounds.

Sidra modelling of the key intersection of Bowman Road and Berrima Road shows that the impact of the development traffic flows shall have an acceptable impact and the intersection will continue to operate to a high level with minimal delays and queues.

Parking for the project can be accommodated on site and the overall site layout will allow for safe entry and exit movements for heavy vehicles up to B-Doubles.

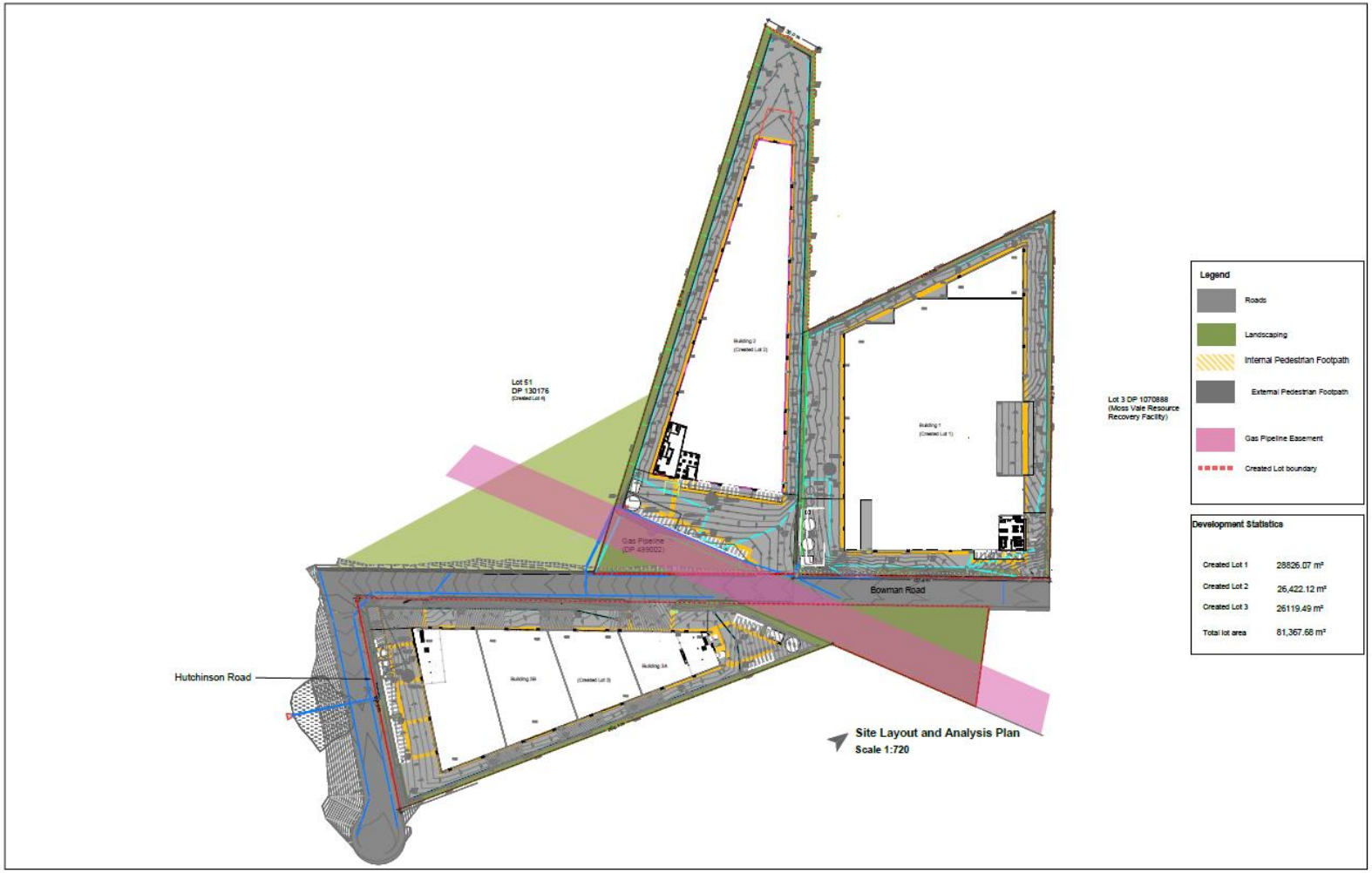
Please feel free to contact me on 4032 7979, should you have any queries.

Yours sincerely,

Sean Morgan
Senior Traffic Engineer

Attachment A: Site Plans including autoturn and loading bays
Attachment B: Sidra Assessment

Attachment A: Site Plans and Autoturn



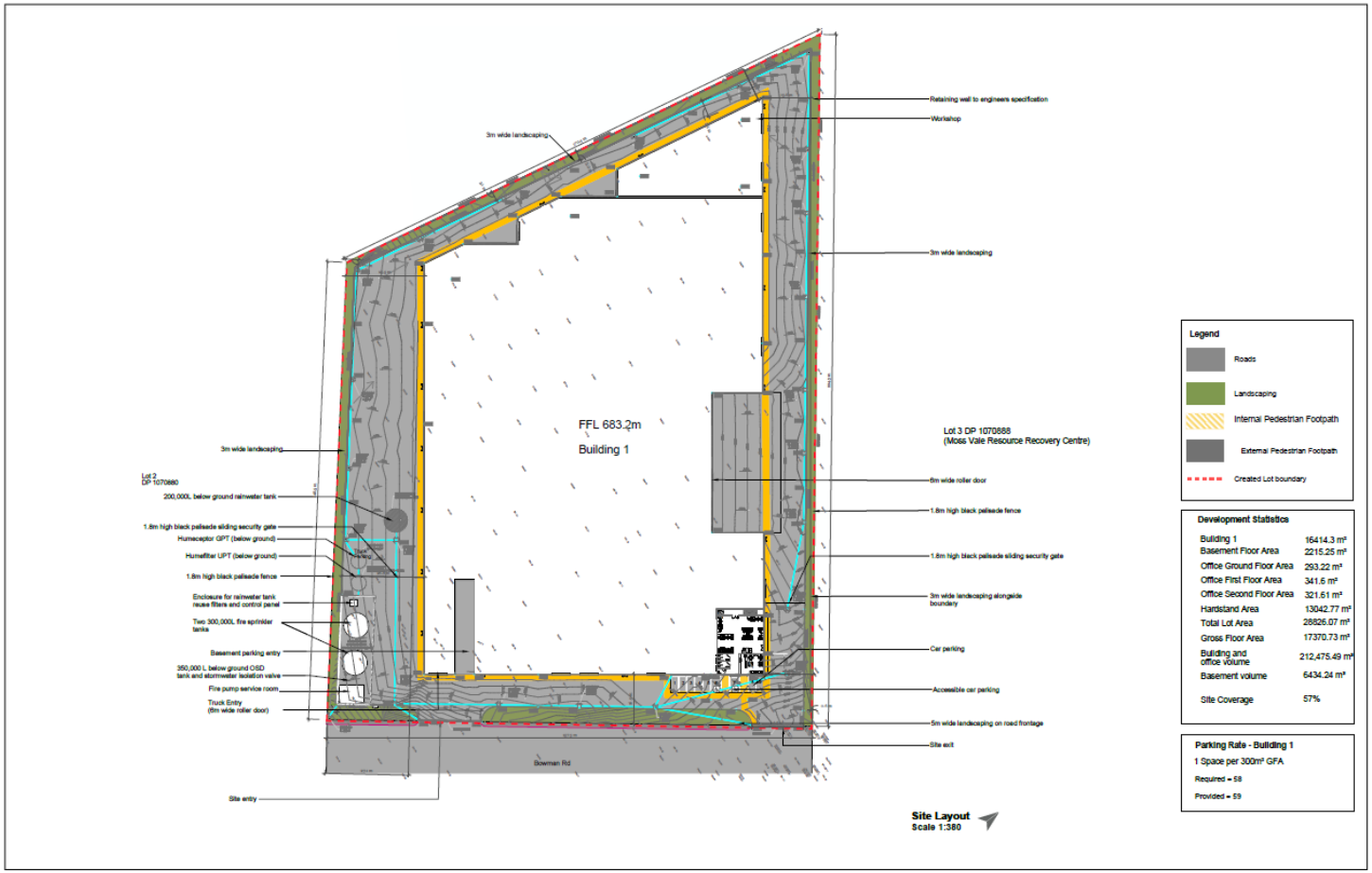
Date	Plan Number	Site Layout And Analysis Plan
6-7-2023	1	2 Bowman Road, Moss Vale (Part of lot 51, DP 130176 , Lot 2, DP1070888)

Jackson Environment and Planning Pty Ltd
Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
T: 02 8056 1849
W: http://www.jacksonenvironment.com.au

JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivision and General Industry Development
Title	Site Layout and Analysis Plan
Scale	1:720
Source	Jackson Environment and Planning Pty Ltd

01
A



Date	Plan Number	Site Layout (Building 1)
6-7-2023	1.1	2 Bowman Road, Moss Vale (Lot 2, DP1070888)

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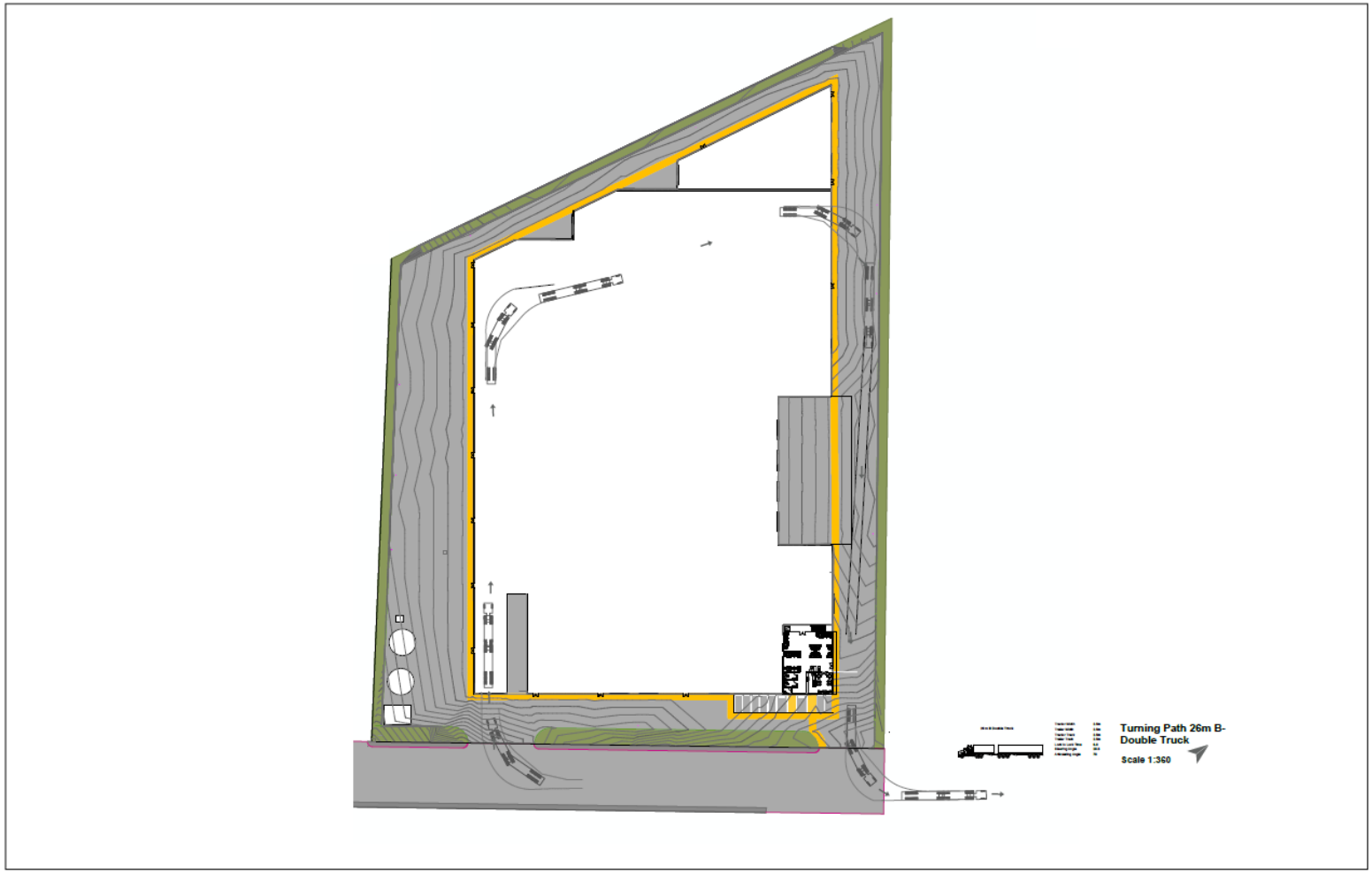
JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivision and General Industry Development
Title	Building 1 Site Layout Plan
Scale	1:380
Source	Jackson Environment and Planning Pty Ltd

01
A

Quality Traffic Advice



Date	Plan Number	Turning Path 26 m B Double Truck
6-7-2023	1.3	2 Bowman Road, Moss Vale (Lot 2, DP1070888)

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Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
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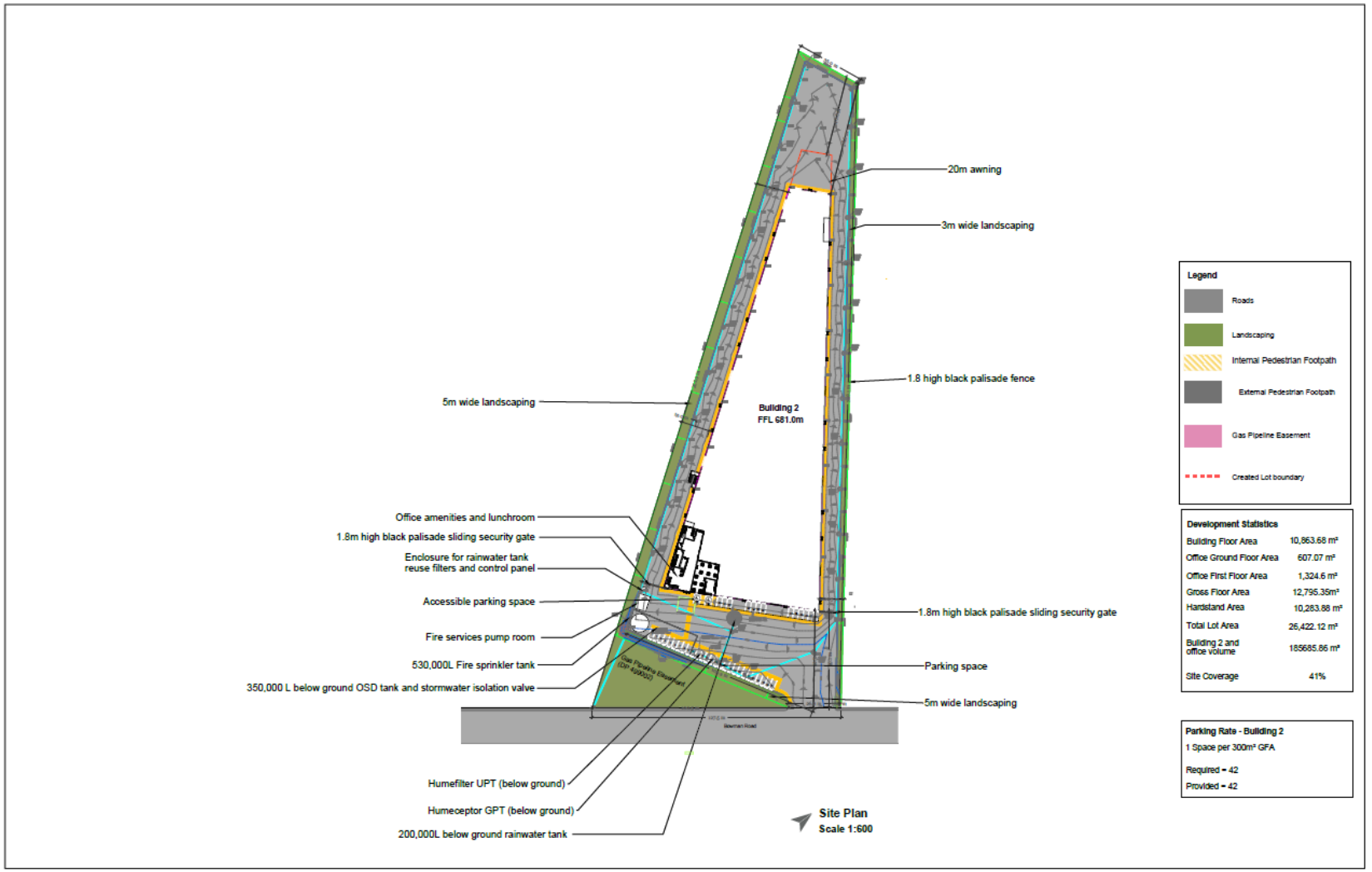
JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivsion and General Industry Developpment
Title	Building 1 Turning Path 26 m B Double Truck
Scale	1:360
Source	Jackson Environment and Planning Pty Ltd

10
A

Quality Traffic Advice



Date	Plan Number	Site Layout (Building 2)
6-7-2023	2.1	2 Bowman Road, Moss Vale (Part of Lot 51, DP130176, Lot 2, DP1070888)

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A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
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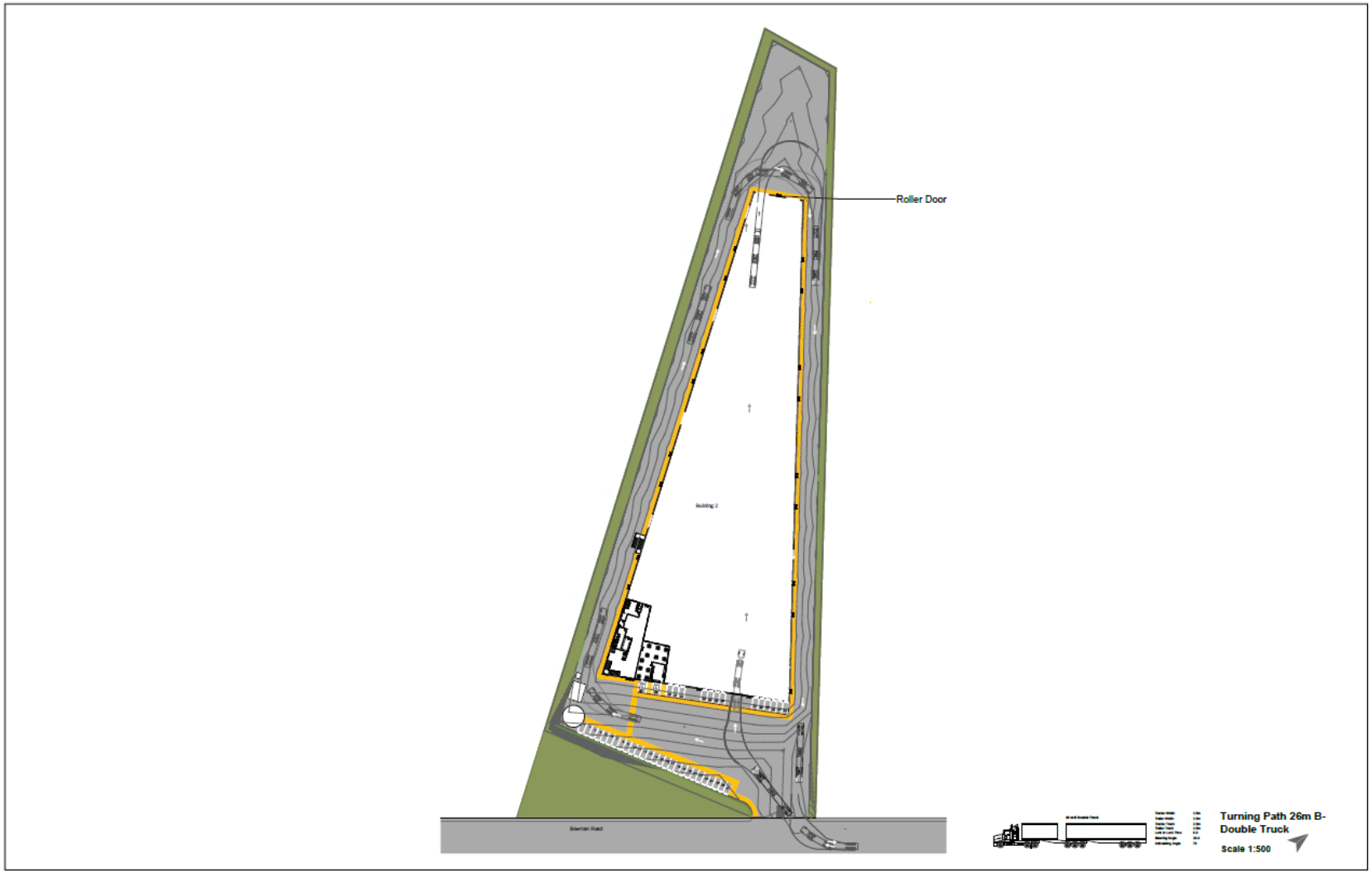
JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivision and General Industry Development
Title	Building 2 Site Layout Plan
Scale	1:600
Source	Jackson Environment and Planning Pty Ltd

01
A

Quality Traffic Advice



Date	Plan Number	Turning Path 26 m Truck (Building 2)
6-7-2023	2.3	2 Bowman Road, Moss Vale (Part of Lot 51, DP130176, Lot 2, DP1070888)

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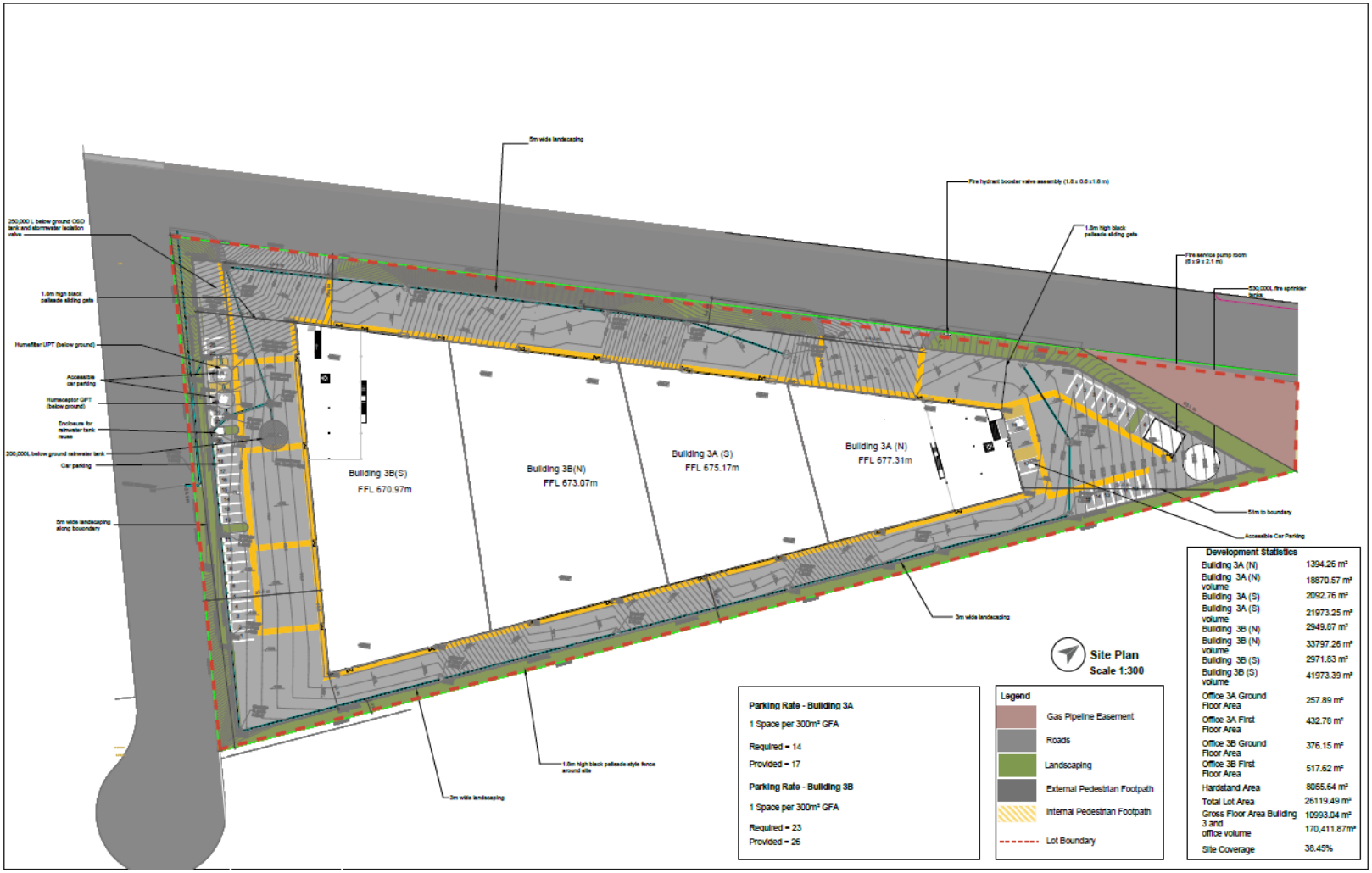
JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivsion and General Industry Developpment
Title	Turning Path 26m B-double Truck
Scale	1:500
Source	Jackson Environment and Planning Pty Ltd

01
A

Quality Traffic Advice



Date	Plan Number	Site Layout (Building 3A, 3B)
6-7-2023	3.1	2 Bowman Road, Moss Vale (Lot 2, DP1070888)

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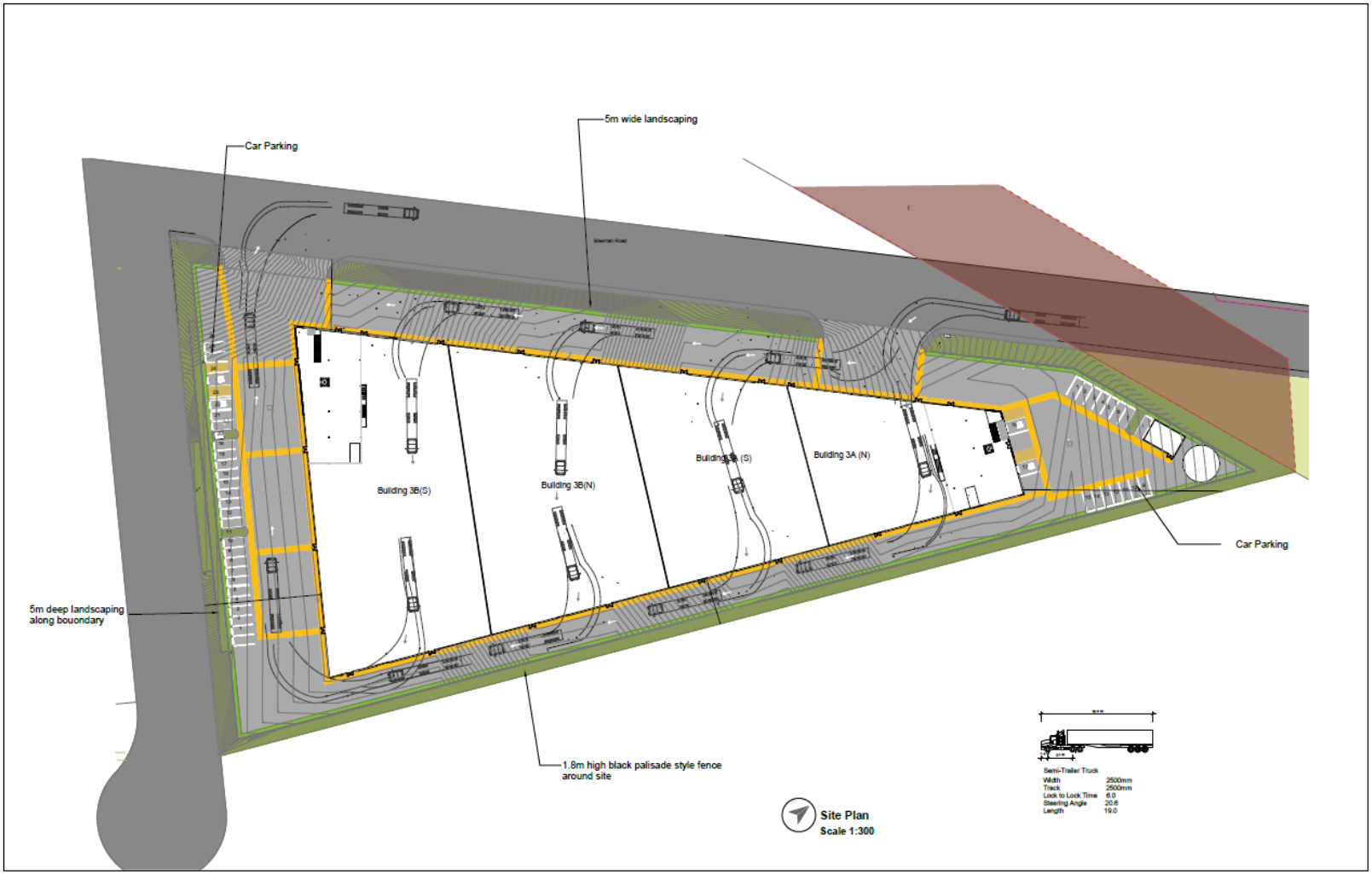
Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
T: 02 8056 1849
W: http://www.jacksonenvironment.com.au

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivision and General Industry Development
Title	Building 3A, 3B Site Layout Plan
Scale	1:300
Source	Jackson Environment and Planning Pty Ltd

01
A

Quality Traffic Advice



Date	Plan Number	19m Truck Turning Path
6-7-2023	3.2	2 Bowman Road, Moss Vale (Lot 2, DP1070888)

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Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
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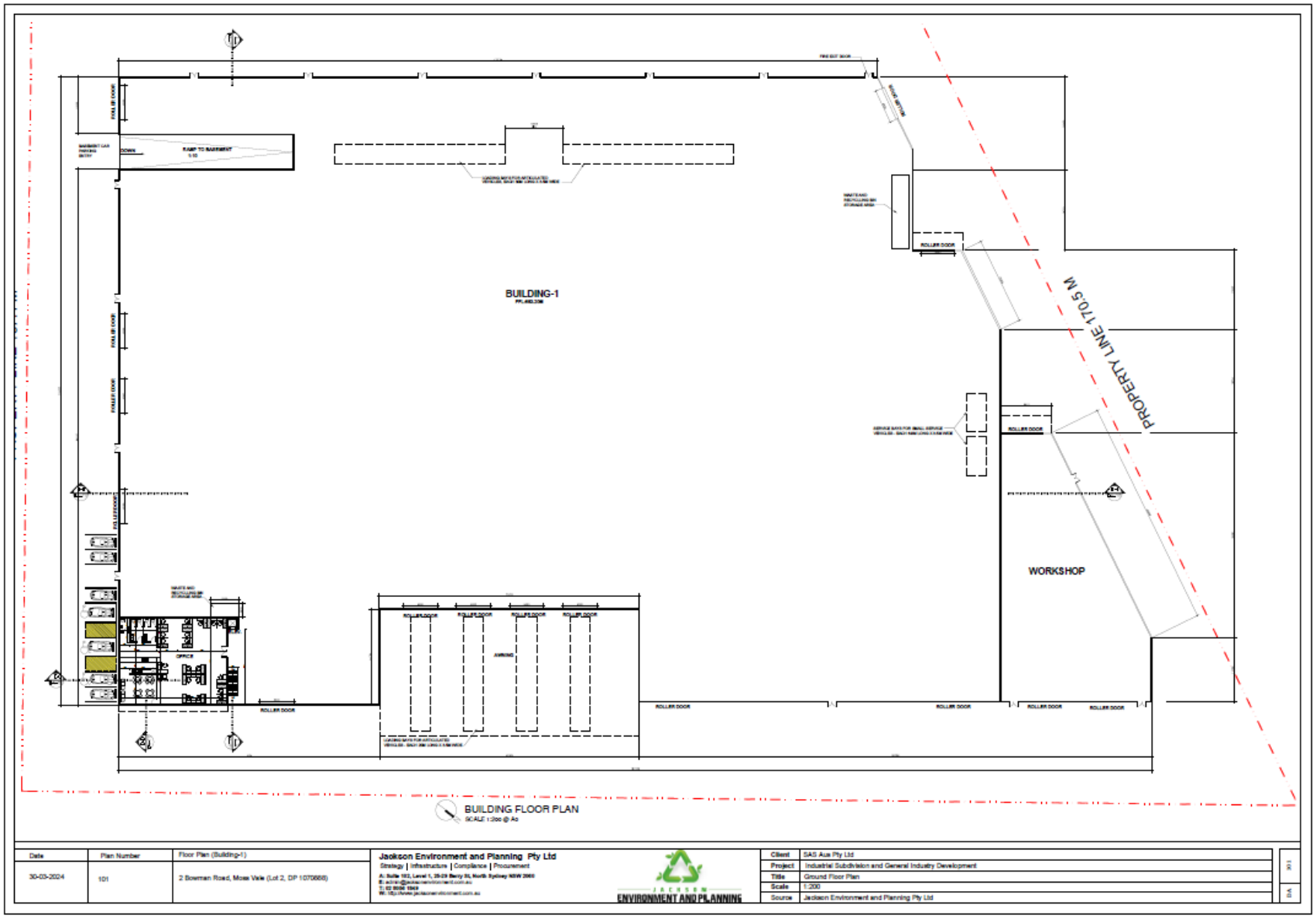
T: 02 8056 1849
W: http://www.jacksonenvironment.com.au
JACKSON ENVIRONMENT AND PLANNING

Client	SAAS Aus Pty Ltd
Project	Industrial Subdivsion and General Industry Developpment
Title	Building 3 semi-trailer truck turning path
Scale	1:300
Source	Jackson Environment and Planning Pty Ltd

01
A

Quality Traffic Advice



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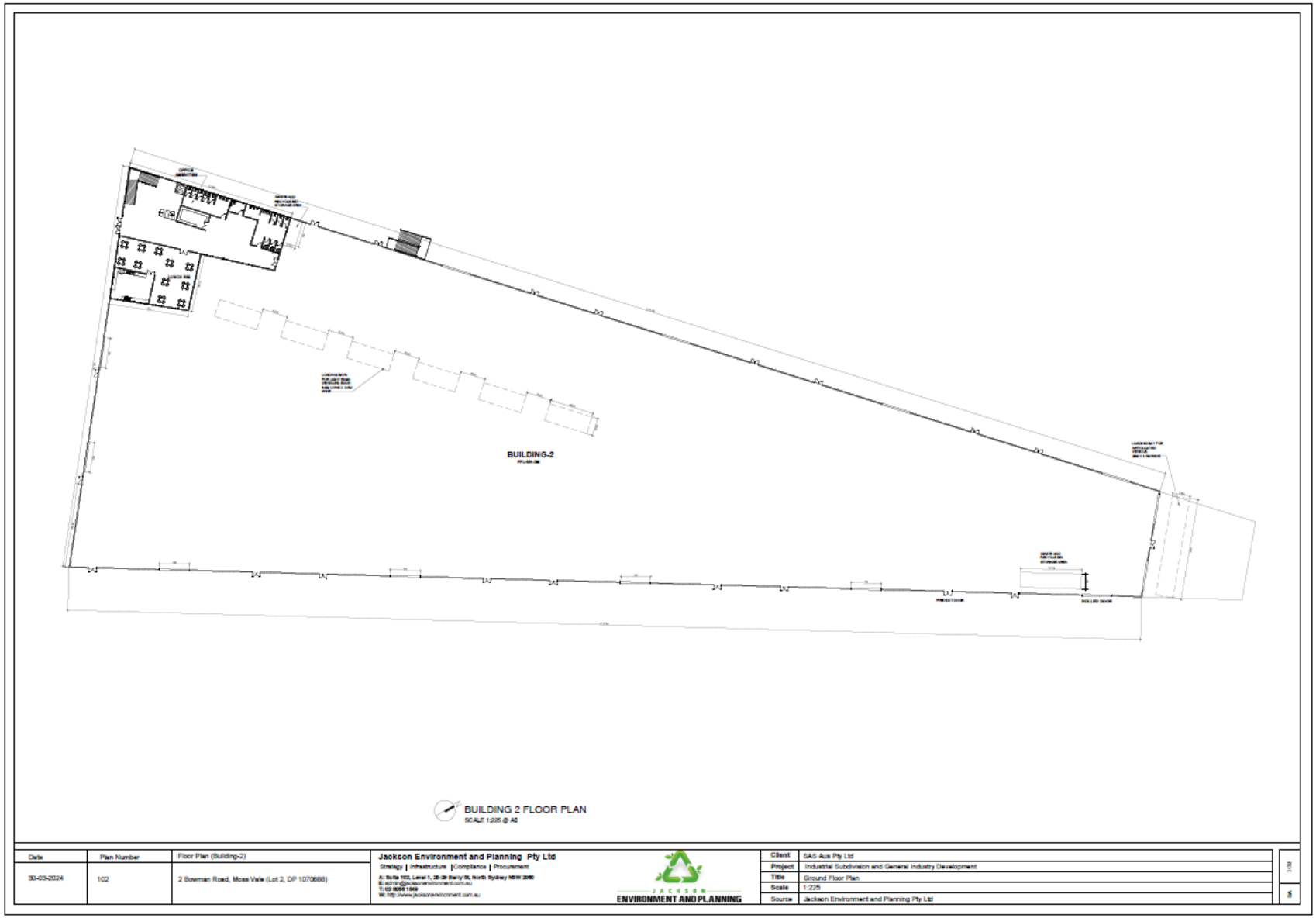

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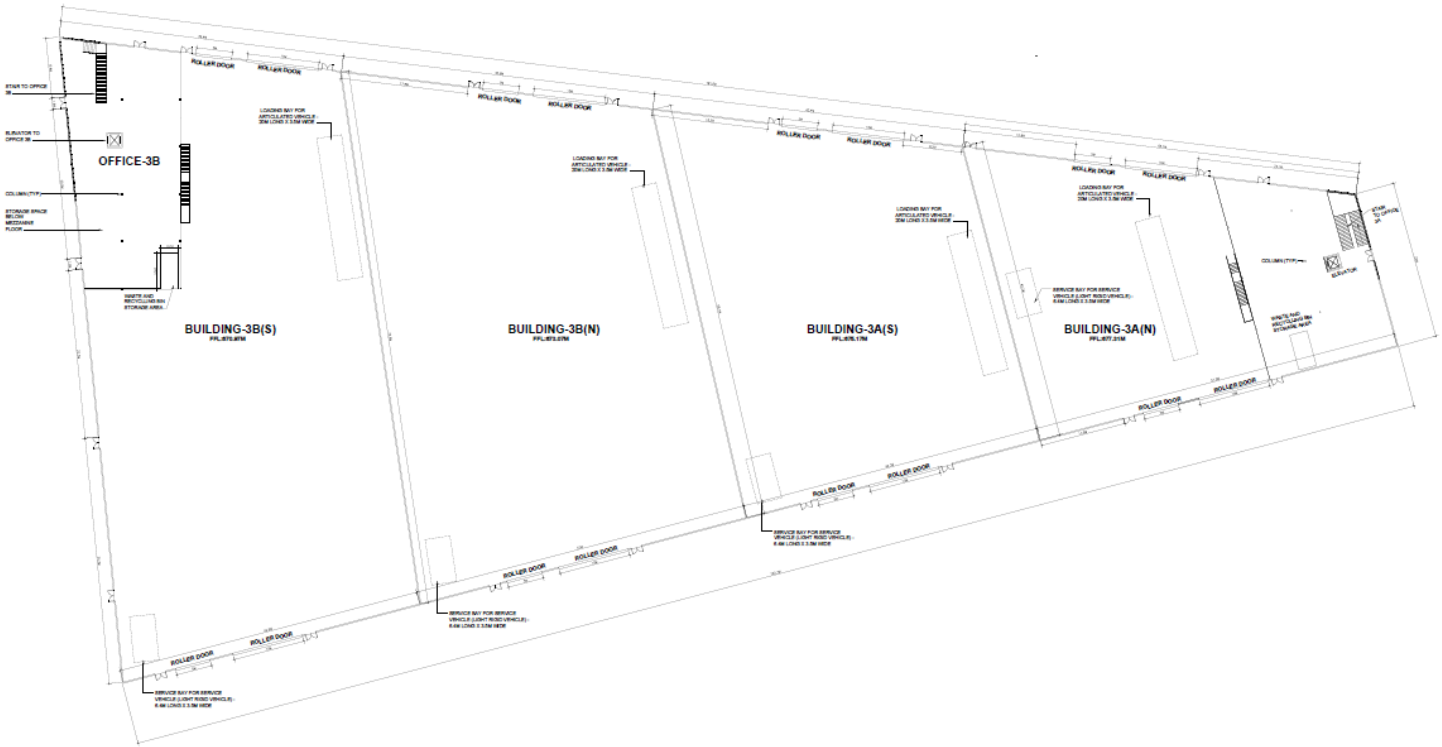


BUILDING 3A AND 3B FLOOR PLAN
SCALE 1:200 @ A0

Date	Plan Number	Floor Plan (Building-3A 3B)
30-03-2024	103	2 Bowman Road, Moss Vale (Lot 2, DP 1070888)

Jackson Environment and Planning Pty Ltd
Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 26-28 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
T: 02 8050 1040
W: http://www.jacksonenvironment.com.au

JACKSON ENVIRONMENT AND PLANNING

Client	SAS Aus Pty Ltd
Project	Industrial Subdivision and General Industry Development
Title	Building 3A 3B Floor Plan
Scale	1:200
Source	Jackson Environment and Planning Pty Ltd

Quality Traffic Advice

Attachment B: Traffic volumes

1		Monday - Friday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailers		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am	13						13	
	6:00am to 7:00am	4			8		2	14	
Day	7:00am to 8:00am			8	7	2	2	19	
	8:00am to 9:00am			7		2	2	11	
	9:00am to 10:00am	3				2		5	
	10:00am to 11:00am							0	
	11:00am to 12:00pm	10						10	
	12:00pm to 1:00pm							0	
	1:00pm to 2:00pm		13					13	
	2:00pm to 3:00pm				7		2	9	
	3:00pm to 4:00pm		4	7	8	2	2	23	
	4:00pm to 5:00pm			8		2		10	
	5:00pm to 6:00pm		3					3	
Evening	6:00pm to 7:00pm							0	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm		10					10	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	30	30	30	30	10	10	140	Total per day

1		Saturday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailer		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am	6					2	8	
Day	7:00am to 8:00am	3			8		2	13	
	8:00am to 9:00am			3	7	2	2	14	
	9:00am to 10:00am			4		2		6	
	10:00am to 11:00am			4		1		5	
	11:00am to 12:00pm			4		1		5	
	12:00pm to 1:00pm				7			7	
	1:00pm to 2:00pm				8			8	
	2:00pm to 3:00pm		3	4			2	9	
	3:00pm to 4:00pm		6	4			2	12	
	4:00pm to 5:00pm			4		2		6	
	5:00pm to 6:00pm			3		1		4	
Evening	6:00pm to 7:00pm					1		1	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	9	9	30	30	10	10	98	Total per day

Quality Traffic Advice

1		Sunday							
Time Period	Time of day			Light Rigid		19m Semi-Trailer		Total per hour	
				Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am							0	
Day	7:00am to 8:00am	5						5	
	8:00am to 9:00am							0	
	9:00am to 10:00am				2		1	3	
	10:00am to 11:00am				2			2	
	11:00am to 12:00pm			2	2			4	
	12:00pm to 1:00pm			2	2	1		5	
	1:00pm to 2:00pm			2	2			4	
	2:00pm to 3:00pm		5	2				7	
	3:00pm to 4:00pm			2				2	
	4:00pm to 5:00pm							0	
	5:00pm to 6:00pm							0	
Evening	6:00pm to 7:00pm							0	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	5	5	10	10	1	1	32	Total per day

2

Time Period	Time of day	Daily Movements Monday - Friday							
		Passenger Vehicles		Light Rigid		Heavy Articulated		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am								
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am	13						0	
	6:00am to 7:00am	4			8		2	13	
Day	7:00am to 8:00am	20			7		2	14	
	8:00am to 9:00am	20		5		2	2	29	
	9:00am to 10:00am	23		6	2	2		29	
	10:00am to 11:00am	2		8	2	1		33	
	11:00am to 12:00pm	2	2	2	2	1		13	
	12:00pm to 1:00pm	12	2	2	2			9	
	1:00pm to 2:00pm	2	15	2	2			18	
	2:00pm to 3:00pm	2	6		7		2	21	
	3:00pm to 4:00pm		2	1	8		2	17	
	4:00pm to 5:00pm		20	5		2		13	
	5:00pm to 6:00pm		23	6		1		27	
Evening	6:00pm to 7:00pm		20	2		1		30	
	7:00pm to 8:00pm			1				23	
	8:00pm to 9:00pm		10					1	
	9:00pm to 10:00pm							10	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	100	100	40	40	10	10	300	Total per day

Quality Traffic Advice

2		Saturday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		Heavy Articulated		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am	6					2	8	
Day	7:00am to 8:00am	13			8		2	23	
	8:00am to 9:00am	10		3	7	2	2	24	
	9:00am to 10:00am	10		4		2		16	
	10:00am to 11:00am			4		1		5	
	11:00am to 12:00pm			4		1		5	
	12:00pm to 1:00pm				7			7	
	1:00pm to 2:00pm				8			8	
	2:00pm to 3:00pm		19	4			2	25	
	3:00pm to 4:00pm		10	4			2	16	
	4:00pm to 5:00pm		10	4		2		16	
	5:00pm to 6:00pm			3		1		4	
Evening	6:00pm to 7:00pm					1		1	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	39	39	30	30	10	10	158	Total per day

2		Sunday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		Heavy Articulated		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am							0	
Day	7:00am to 8:00am	5						5	
	8:00am to 9:00am							0	
	9:00am to 10:00am				2		1	3	
	10:00am to 11:00am				2			2	
	11:00am to 12:00pm			2	2			4	
	12:00pm to 1:00pm			2	2	1		5	
	1:00pm to 2:00pm			2	2			4	
	2:00pm to 3:00pm		5	2				7	
	3:00pm to 4:00pm			2				2	
	4:00pm to 5:00pm							0	
	5:00pm to 6:00pm							0	
Evening	6:00pm to 7:00pm							0	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	5	5	10	10	1	1	32	Total per day

Quality Traffic Advice

3

Time Period	Time of day	Monday - Friday						
		Passenger Vehicles		Light Rigid		19m Semi-Trailer		Total per hour
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	
Night	12:00am to 1:00am							0
	1:00am to 2:00am							0
	2:00am to 3:00am							0
	3:00am to 4:00am							0
	4:00am to 5:00am							0
	5:00am to 6:00am	7						7
	6:00am to 7:00am	3			3		1	7
Day	7:00am to 8:00am				3		1	4
	8:00am to 9:00am			1			1	2
	9:00am to 10:00am	3		2		1		6
	10:00am to 11:00am	1		2	1	1		5
	11:00am to 12:00pm	8	1	1				10
	12:00pm to 1:00pm	1	1	1	1	1		5
	1:00pm to 2:00pm	1	8					9
	2:00pm to 3:00pm	1	1	1	1		1	5
	3:00pm to 4:00pm		4		3		1	8
	4:00pm to 5:00pm			1	3			4
	5:00pm to 6:00pm		3	2		1		6
Evening	6:00pm to 7:00pm			2		1		3
	7:00pm to 8:00pm			2				2
	8:00pm to 9:00pm		7					7
	9:00pm to 10:00pm							0
Night	10:00pm to 11:00pm							0
	11:00pm to 12:00am							0
	Totals	25	25	15	15	5	5	90 Total per day

3		Saturday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailer		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am	5			3		1	9	
Day	7:00am to 8:00am	3			3		1	7	
	8:00am to 9:00am			1		1	1	3	
	9:00am to 10:00am			2		1		3	
	10:00am to 11:00am			2	1			3	
	11:00am to 12:00pm			1		1	1	3	
	12:00pm to 1:00pm			1	1		1	3	
	1:00pm to 2:00pm					1		1	
	2:00pm to 3:00pm		3	1	1	1		6	
	3:00pm to 4:00pm		5		3			8	
	4:00pm to 5:00pm			1	3			4	
	5:00pm to 6:00pm			2				2	
Evening	6:00pm to 7:00pm			2				2	
	7:00pm to 8:00pm			2				2	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	8	8	15	15	5	5	56	Total per day

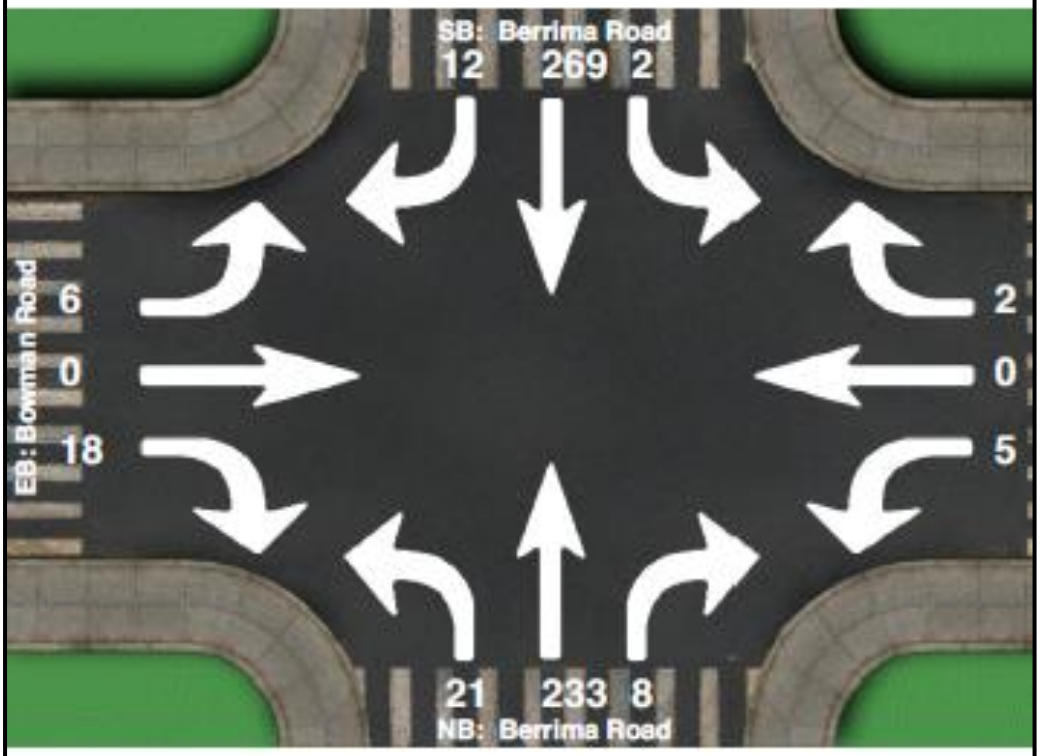
Quality Traffic Advice

3		Sunday							
Time Period	Time of day	Passenger Vehicles		Light Rigid		19m Semi-Trailer		Total per hour	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound		
Night	12:00am to 1:00am							0	
	1:00am to 2:00am							0	
	2:00am to 3:00am							0	
	3:00am to 4:00am							0	
	4:00am to 5:00am							0	
	5:00am to 6:00am							0	
	6:00am to 7:00am							0	
Day	7:00am to 8:00am	5						5	
	8:00am to 9:00am							0	
	9:00am to 10:00am				2		1	3	
	10:00am to 11:00am				1			1	
	11:00am to 12:00pm			2	2			4	
	12:00pm to 1:00pm			1		1		2	
	1:00pm to 2:00pm			2				2	
	2:00pm to 3:00pm		5					5	
	3:00pm to 4:00pm							0	
	4:00pm to 5:00pm							0	
	5:00pm to 6:00pm							0	
Evening	6:00pm to 7:00pm							0	
	7:00pm to 8:00pm							0	
	8:00pm to 9:00pm							0	
	9:00pm to 10:00pm							0	
Night	10:00pm to 11:00pm							0	
	11:00pm to 12:00am							0	
	Totals	5	5	5	5	1	1	22	Total per day

Appendix C – Traffic Surveys

Intersection Peak Hour

Location: Berrima Road at Bowman Road, Moss Vale
GPS Coordinates: Lat=-34.534518, Lon=150.356575
Date: 2024-02-15
Day of week: Thursday
Weather: Light Rain
Analyst: ST



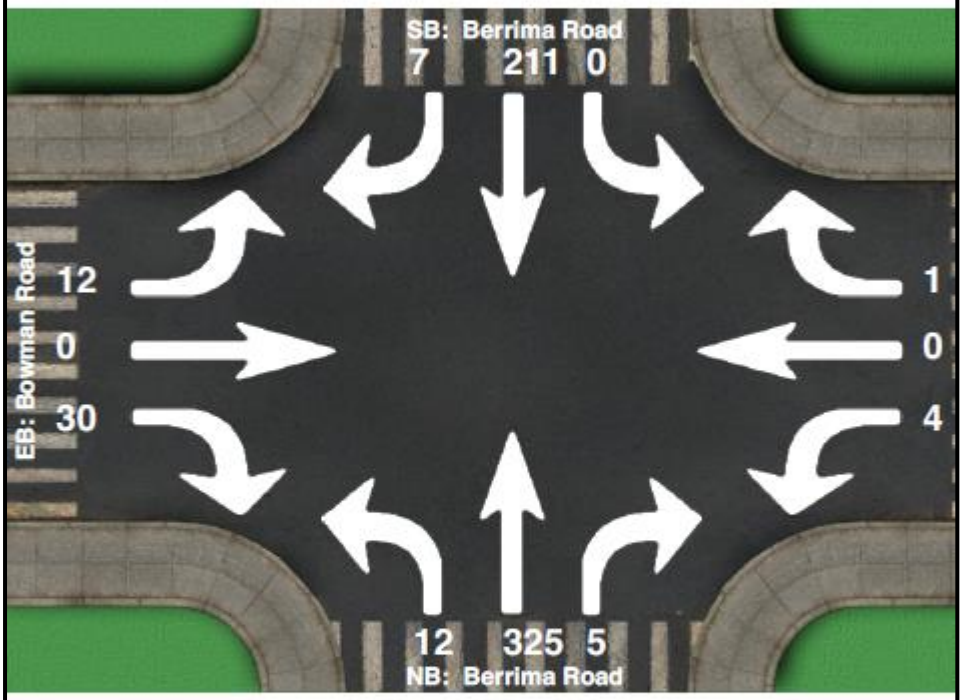
Intersection Peak Hour

08:00 - 09:00

	SouthBound			WestBound			NorthBound			EastBound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	2	269	12	5	0	2	21	233	8	6	0	18	576
Factor	0.50	0.78	0.43	0.62	0.00	0.50	0.75	0.80	0.67	0.50	0.00	0.64	0.97
Approach Factor	0.74			0.58			0.84			0.75			

Intersection Peak Hour

Location: Berrima Road at Bowman Road, Moss Vale
GPS Coordinates: Lat=-34.534529, Lon=150.356546
Date: 2024-02-14
Day of week: Wednesday
Weather: Overcast
Analyst: CT



Intersection Peak Hour

15:30 - 16:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	211	7	4	0	1	12	325	5	12	0	30	607
Factor	0.00	0.91	0.58	0.50	0.00	0.25	0.50	0.80	0.42	0.60	0.00	0.68	0.85
Approach Factor	0.92			0.62			0.83			0.66			

Appendix D – Sidra Assessment results

MOVEMENT SUMMARY

Site: 101 [2024 AM base (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

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

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	22	0.0	22	0.0	0.012	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.8
2	T1	All MCs	245	9.4	245	9.4	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	8	100.0	8	100.0	0.011	8.9	LOS A	0.0	0.6	0.45	0.60	0.45	44.3
Approach			276	11.5	276	11.5	0.133	0.7	NA	0.0	0.6	0.01	0.06	0.01	58.9
East: Concrete plant															
4	L2	All MCs	5	100.0	5	100.0	0.025	5.5	LOS A	0.1	1.1	0.58	0.66	0.58	37.3
6	R2	All MCs	2	100.0	2	100.0	0.025	26.0	LOS B	0.1	1.1	0.58	0.66	0.58	37.1
Approach			7	100.0	7	100.0	0.025	11.4	LOS A	0.1	1.1	0.58	0.66	0.58	37.3
North: Berrima Road north															
7	L2	All MCs	2	100.0	2	100.0	0.153	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	29.9
8	T1	All MCs	283	6.7	283	6.7	0.153	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	13	16.7	13	16.7	0.013	7.0	LOS A	0.0	0.4	0.37	0.59	0.37	46.7
Approach			298	7.8	298	7.8	0.153	0.4	NA	0.0	0.4	0.02	0.03	0.02	59.2
West: Bowman Road															
10	L2	All MCs	6	0.0	6	0.0	0.069	6.6	LOS A	0.2	1.7	0.58	0.76	0.58	43.2
12	R2	All MCs	19	5.6	19	5.6	0.069	15.1	LOS B	0.2	1.7	0.58	0.76	0.58	43.0
Approach			25	4.2	25	4.2	0.069	13.0	LOS A	0.2	1.7	0.58	0.76	0.58	43.0
All Vehicles			606	10.4	606	10.4	0.153	1.2	NA	0.2	1.7	0.05	0.08	0.05	58.2

Site Level of Service (LOS) Method: Delay (RTA 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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Quality Traffic Advice

MOVEMENT SUMMARY

Site: 101 [2024 PM base (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

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

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	13	0.0	13	0.0	0.007	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.8
2	T1	All MCs	342	2.5	342	2.5	0.178	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	5	60.0	5	60.0	0.005	7.4	LOS A	0.0	0.2	0.36	0.56	0.36	46.9
Approach			360	3.2	360	3.2	0.178	0.3	NA	0.0	0.2	0.01	0.03	0.01	59.5
East: Concrete plant															
4	L2	All MCs	4	0.0	4	0.0	0.007	3.5	LOS A	0.0	0.2	0.39	0.53	0.39	48.5
6	R2	All MCs	1	0.0	1	0.0	0.007	10.9	LOS A	0.0	0.2	0.39	0.53	0.39	48.3
Approach			5	0.0	5	0.0	0.007	5.0	LOS A	0.0	0.2	0.39	0.53	0.39	48.5
North: Berrima Road north															
7	L2	All MCs	1	0.0	1	0.0	0.116	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	30.1
8	T1	All MCs	222	1.9	222	1.9	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	7	71.4	7	71.4	0.012	9.4	LOS A	0.0	0.5	0.47	0.64	0.47	41.4
Approach			231	4.1	231	4.1	0.116	0.4	NA	0.0	0.5	0.02	0.02	0.02	59.2
West: Bowman Road															
10	L2	All MCs	13	8.3	13	8.3	0.112	7.4	LOS A	0.4	2.8	0.59	0.81	0.59	43.1
12	R2	All MCs	32	0.0	32	0.0	0.112	14.6	LOS B	0.4	2.8	0.59	0.81	0.59	43.5
Approach			44	2.4	44	2.4	0.112	12.6	LOS A	0.4	2.8	0.59	0.81	0.59	43.4
All Vehicles			640	3.5	640	3.5	0.178	1.2	NA	0.4	2.8	0.05	0.08	0.05	58.3

Site Level of Service (LOS) Method: Delay (RTA 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: 101 [2024 AM base+dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

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

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	41	15.4	41	15.4	0.025	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	48.5
2	T1	All MCs	245	9.4	245	9.4	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	8	100.0	8	100.0	0.011	8.9	LOS A	0.0	0.6	0.45	0.60	0.45	44.3
Approach			295	12.9	295	12.9	0.133	1.1	NA	0.0	0.6	0.01	0.10	0.01	58.3
East: Concrete plant															
4	L2	All MCs	5	100.0	5	100.0	0.026	5.5	LOS A	0.1	1.1	0.59	0.66	0.59	36.8
6	R2	All MCs	2	100.0	2	100.0	0.026	28.3	LOS B	0.1	1.1	0.59	0.66	0.59	36.6
Approach			7	100.0	7	100.0	0.026	12.0	LOS A	0.1	1.1	0.59	0.66	0.59	36.8
North: Berrima Road north															
7	L2	All MCs	2	100.0	2	100.0	0.153	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	29.9
8	T1	All MCs	283	6.7	283	6.7	0.153	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	25	25.0	25	25.0	0.028	7.4	LOS A	0.1	0.9	0.40	0.62	0.40	45.8
Approach			311	8.8	311	8.8	0.153	0.7	NA	0.1	0.9	0.03	0.05	0.03	58.7
West: Bowman Road															
10	L2	All MCs	16	60.0	16	60.0	0.200	8.5	LOS A	0.7	6.5	0.66	0.85	0.68	36.9
12	R2	All MCs	33	45.2	33	45.2	0.200	25.1	LOS B	0.7	6.5	0.66	0.85	0.68	37.4
Approach			48	50.0	48	50.0	0.200	19.7	LOS B	0.7	6.5	0.66	0.85	0.68	37.2
All Vehicles			661	14.6	661	14.6	0.200	2.4	NA	0.7	6.5	0.08	0.14	0.08	56.6

Site Level of Service (LOS) Method: Delay (RTA 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: 101 [2024 PM base+dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

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

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	19	33.3	19	33.3	0.013	5.9	LOS A	0.0	0.0	0.00	0.57	0.00	47.1
2	T1	All MCs	342	2.5	342	2.5	0.178	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	5	60.0	5	60.0	0.005	7.4	LOS A	0.0	0.2	0.36	0.56	0.36	46.9
Approach			366	4.9	366	4.9	0.178	0.5	NA	0.0	0.2	0.01	0.04	0.01	59.2
East: Concrete plant															
4	L2	All MCs	4	0.0	4	0.0	0.007	3.5	LOS A	0.0	0.2	0.40	0.53	0.40	48.4
6	R2	All MCs	1	0.0	1	0.0	0.007	11.4	LOS A	0.0	0.2	0.40	0.53	0.40	48.2
Approach			5	0.0	5	0.0	0.007	5.1	LOS A	0.0	0.2	0.40	0.53	0.40	48.3
North: Berrima Road north															
7	L2	All MCs	1	0.0	1	0.0	0.116	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	30.1
8	T1	All MCs	222	1.9	222	1.9	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	12	81.8	12	81.8	0.020	9.9	LOS A	0.1	0.9	0.49	0.66	0.49	40.5
Approach			235	5.8	235	5.8	0.116	0.5	NA	0.1	0.9	0.02	0.04	0.02	58.9
West: Bowman Road															
10	L2	All MCs	27	42.3	27	42.3	0.278	9.7	LOS A	1.0	9.3	0.67	0.90	0.79	38.1
12	R2	All MCs	53	28.0	53	28.0	0.278	22.8	LOS B	1.0	9.3	0.67	0.90	0.79	38.6
Approach			80	32.9	80	32.9	0.278	18.3	LOS B	1.0	9.3	0.67	0.90	0.79	38.5
All Vehicles			686	8.4	686	8.4	0.278	2.6	NA	1.0	9.3	0.09	0.14	0.11	56.5

Site Level of Service (LOS) Method: Delay (RTA 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

Quality Traffic Advice

Site: 101 [2034 AM base (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	22	0.0	22	0.0	0.012	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.8
2	T1	All MCs	343	9.4	343	9.4	0.187	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	8	100.0	8	100.0	0.013	10.2	LOS A	0.1	0.7	0.54	0.66	0.54	43.0
Approach			374	10.9	374	10.9	0.187	0.6	NA	0.1	0.7	0.01	0.05	0.01	59.1
East: Concrete plant															
4	L2	All MCs	5	100.0	5	100.0	0.042	7.3	LOS A	0.1	1.7	0.72	0.81	0.72	31.8
6	R2	All MCs	2	100.0	2	100.0	0.042	52.7	LOS D [11]	0.1	1.7	0.72	0.81	0.72	31.7
Approach			7	100.0	7	100.0	0.042	20.3	LOS B	0.1	1.7	0.72	0.81	0.72	31.8
North: Berrima Road north															
7	L2	All MCs	2	100.0	2	100.0	0.214	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	29.8
8	T1	All MCs	396	6.7	396	6.7	0.214	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	All MCs	13	16.7	13	16.7	0.015	7.7	LOS A	0.1	0.4	0.44	0.63	0.44	46.1
Approach			411	7.5	411	7.5	0.214	0.3	NA	0.1	0.4	0.01	0.02	0.01	59.3
West: Bowman Road															
10	L2	All MCs	6	0.0	6	0.0	0.107	7.1	LOS A	0.3	2.4	0.71	0.88	0.71	38.8
12	R2	All MCs	19	5.6	19	5.6	0.107	23.3	LOS B	0.3	2.4	0.71	0.88	0.71	38.6
Approach			25	4.2	25	4.2	0.107	19.3	LOS B	0.3	2.4	0.71	0.88	0.71	38.7
All Vehicles			818	9.8	818	9.8	0.214	1.2	NA	0.3	2.4	0.04	0.07	0.04	58.3

Site Level of Service (LOS) Method: Delay (RTA 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.
11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

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MOVEMENT SUMMARY

Site: 101 [2034 PM base (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	13	0.0	13	0.0	0.007	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	49.8
2	T1	All MCs	479	2.5	479	2.5	0.250	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	5	60.0	5	60.0	0.006	8.0	LOS A	0.0	0.2	0.44	0.58	0.44	46.4
Approach			497	3.0	497	3.0	0.250	0.3	NA	0.0	0.2	0.00	0.02	0.00	59.6
East: Concrete plant															
4	L2	All MCs	4	0.0	4	0.0	0.010	3.9	LOS A	0.0	0.2	0.51	0.58	0.51	46.4
6	R2	All MCs	1	0.0	1	0.0	0.010	18.1	LOS B	0.0	0.2	0.51	0.58	0.51	46.2
Approach			5	0.0	5	0.0	0.010	6.8	LOS A	0.0	0.2	0.51	0.58	0.51	46.4
North: Berrima Road north															
7	L2	All MCs	1	0.0	1	0.0	0.162	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	30.1
8	T1	All MCs	311	1.9	311	1.9	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	7	71.4	7	71.4	0.015	11.4	LOS A	0.1	0.6	0.55	0.71	0.55	40.0
Approach			319	3.5	319	3.5	0.162	0.3	NA	0.1	0.6	0.01	0.02	0.01	59.3
West: Bowman Road															
10	L2	All MCs	13	8.3	13	8.3	0.175	8.5	LOS A	0.6	4.1	0.74	0.89	0.74	38.9
12	R2	All MCs	32	0.0	32	0.0	0.175	22.6	LOS B	0.6	4.1	0.74	0.89	0.74	39.2
Approach			44	2.4	44	2.4	0.175	18.6	LOS B	0.6	4.1	0.74	0.89	0.74	39.1
All Vehicles			866	3.1	866	3.1	0.250	1.3	NA	0.6	4.1	0.05	0.07	0.05	58.4

Site Level of Service (LOS) Method: Delay (RTA 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: 101 [2034 AM base+dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	41	15.4	41	15.4	0.025	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	48.5
2	T1	All MCs	343	9.4	343	9.4	0.187	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	8	100.0	8	100.0	0.013	10.2	LOS A	0.1	0.7	0.54	0.66	0.54	43.0
Approach			393	12.0	393	12.0	0.187	0.9	NA	0.1	0.7	0.01	0.07	0.01	58.6
East: Concrete plant															
4	L2	All MCs	5	100.0	5	100.0	0.045	7.3	LOS A	0.1	1.8	0.73	0.82	0.73	31.1
6	R2	All MCs	2	100.0	2	100.0	0.045	57.4	LOS E 11	0.1	1.8	0.73	0.82	0.73	31.0
Approach			7	100.0	7	100.0	0.045	21.6	LOS B	0.1	1.8	0.73	0.82	0.73	31.1
North: Berrima Road north															
7	L2	All MCs	2	100.0	2	100.0	0.214	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	29.8
8	T1	All MCs	396	6.7	396	6.7	0.214	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	All MCs	25	25.0	25	25.0	0.033	8.2	LOS A	0.1	1.0	0.46	0.66	0.46	45.1
Approach			424	8.2	424	8.2	0.214	0.6	NA	0.1	1.0	0.03	0.04	0.03	58.9
West: Bowman Road															
10	L2	All MCs	16	60.0	16	60.0	0.356	13.2	LOS A	1.2	11.6	0.83	1.00	1.06	29.2
12	R2	All MCs	33	45.2	33	45.2	0.356	48.3	LOS D 11	1.2	11.6	0.83	1.00	1.06	29.5
Approach			48	50.0	48	50.0	0.356	36.9	LOS C	1.2	11.6	0.83	1.00	1.06	29.4
All Vehicles			872	13.0	872	13.0	0.356	2.9	NA	1.2	11.6	0.07	0.12	0.08	56.4

Site Level of Service (LOS) Method: Delay (RTA 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.
11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

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MOVEMENT SUMMARY

Site: 101 [2034 PM base+dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (Two-Way)
Design Life Analysis (Final Year): Results for 10 years

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. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Berrima Road south															
1	L2	All MCs	19	33.3	19	33.3	0.013	5.9	LOS A	0.0	0.0	0.00	0.57	0.00	47.1
2	T1	All MCs	479	2.5	479	2.5	0.250	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	5	60.0	5	60.0	0.006	8.1	LOS A	0.0	0.3	0.45	0.58	0.45	46.2
Approach			503	4.2	503	4.2	0.250	0.4	NA	0.0	0.3	0.00	0.03	0.00	59.4
East: Concrete plant															
4	L2	All MCs	4	0.0	4	0.0	0.010	4.0	LOS A	0.0	0.2	0.52	0.59	0.52	46.0
6	R2	All MCs	1	0.0	1	0.0	0.010	19.6	LOS B	0.0	0.2	0.52	0.59	0.52	45.8
Approach			5	0.0	5	0.0	0.010	7.1	LOS A	0.0	0.2	0.52	0.59	0.52	46.0
North: Berrima Road north															
7	L2	All MCs	1	0.0	1	0.0	0.170	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	30.1
8	T1	All MCs	326	1.8	326	1.8	0.170	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	12	81.8	12	81.8	0.026	12.2	LOS A	0.1	1.1	0.57	0.74	0.57	39.0
Approach			338	4.5	338	4.5	0.170	0.5	NA	0.1	1.1	0.02	0.03	0.02	59.1
West: Bowman Road															
10	L2	All MCs	27	42.3	27	42.3	0.511	17.0	LOS B	1.9	17.0	0.87	1.07	1.29	29.5
12	R2	All MCs	53	28.0	53	28.0	0.511	47.1	LOS D [11]	1.9	17.0	0.87	1.07	1.29	29.8
Approach			80	32.9	80	32.9	0.511	36.8	LOS C	1.9	17.0	0.87	1.07	1.29	29.7
All Vehicles			927	6.8	927	6.8	0.511	3.6	NA	1.9	17.0	0.09	0.12	0.12	55.9

Site Level of Service (LOS) Method: Delay (RTA 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.
11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

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