TRAFFIC AND PARKING IMPACT ASSESSMENT FOR THE PROPOSED MODIFICATION TO THE AUSSIE SKIPS RECYCLING BELLFROG STREET UPGRADES AT 13 BELLFROG STREET, GREENACRE

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: (02) 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

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Final	F	Daniel Fonken	Daniel Walker	22 October 2025

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1 SEARS

The relevant SEARs requirements that are assessed within this TPIA are presented in the following subsection along with additional responses where relevant.

1.1 Traffic and Transport

A quantitative traffic impact assessment prepared in accordance with relevant Roads and Maritime Services and Austroads guidelines, that includes:

- *Details of all daily and peak traffic volumes likely to be generated during all key stages of construction and operation, including a description of key access / haul routes, vehicle types and potential queuing impacts and likely departure and arrival times*

During the construction of the warehouse roof, traffic volumes will vary across the three key stages: site preparation, structural framing, and roofing. Since the foundation is already in place and no interior fit-out is required, the overall construction traffic will be lower than a full build. During site preparation (approximately 1 week), daily vehicle movements will range from 8 to 10, primarily involving light trucks, compactors, and site service vehicles.

Structural framing (2-3 weeks) will see a rise to around 10-15 vehicle movements per day, including flatbed trucks delivering steel components, mobile cranes, telehandlers, and delivery vehicles.

Roofing (1-2 weeks) will maintain similar volumes, with additional traffic from scissor lifts, boom lifts, and trucks transporting insulation and roofing materials. Peak arrival times will occur between 6:30-9:00 AM, with some departure traffic around 3:00-5:00 PM. Vehicle access will be managed via designated haul routes using local distributor roads, with deliveries scheduled to minimise queuing and congestion near the site entrance. The access to and from the site for construction vehicles will be via Norfolk Road, Wentworth Street and Bellfrog Street.

- *An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts on existing performance levels of nearby intersections, using a calibrated SIDRA (or similar) traffic model*

There are no adverse impacts related to road safety or traffic flow efficiency. This is demonstrated in **Section 6**.

- *Details and plans of the proposed internal road network, loading docks, pedestrian and cycling facilities and on-site parking in accordance with the relevant Australian Standards*

This is provided in **Annexure A**.

- *Plans demonstrating how all vehicle movements likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network*

- *Details of the largest vehicle anticipated to access and move within the site, including swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site*

This is provided in **Annexure D**.

- Details of road upgrades, infrastructure works or new roads or access points required for the development, if necessary.

None are required.

2 INTRODUCTION

M^CLaren Traffic Engineering was commissioned by *4Pillars Environmental Consulting* on behalf of *Aussie Skips Recycling Pty Ltd* to provide a traffic and parking impact assessment of the proposed modification to the existing Aussie Skips Recycling Bellfrog Street Upgrades at 13 Bellfrog Street, Greenacre as depicted in **Annexure A**.

2.1 Description and Scale of Development

Aussie Skips Recycling Pty Ltd (Aussie Recycling) is proposing to upgrade the existing waste facility located at 13 Bellfrog Street, Greenacre (Lot 15/DP1133214) (the 'site').

The site is currently used for the receipt, storage and export of soils, aggregates, virgin excavated natural material (VENM) and other similar waste materials. The site is currently permitted to receive an annual combined throughput of waste material of 199,000 tonnes (t) in any 12-month period.

Aussie Recycling is proposing to lodge a new State Significant Development (SSD) application (SSD-67497708) seeking approval to construct and operate a materials recovery facility (MRF) on the site. The proposal includes minor demolition, alterations to existing site components, installation of a fixed waste processing plant and site infrastructure, construction of environmental conservation measures, and the ongoing operation of the MRF.

The MRF will have two main buildings, a waste receival building and a processing building. These will be connected by an enclosed conveyor. There will be an open yard between these buildings to allow truck access for delivery of waste and dispatch of recovered products and residual waste.

The MRF will accept and recycle construction and demolition (C&D) waste, commercial and industrial (C&I) waste and non-putrescible municipal solid waste (MSW), including building and demolition (B&D) wastes such as brick, asphalt, concrete and metals. It is proposed that up to 199,000t of waste will be accepted and processed in any 12-month period. It is proposed to amend the site's operating hours compared to those currently approved.

The proposed development has the following characteristics relevant to traffic and parking:

- No change in total waste throughput in any 12-month period of 199,000 tonnes;
- Reduction in waste storage at any one time from 8,000 tonnes to 4,000 tonnes;
- Change in the site layout and circulation to drop material in the receival warehouse building. Material will be transferred via a conveyor line to the processing building;
- No proposed changes to parking area or workshop area;
- Change in hours according to **Table 1**.

TABLE 1: HOURS OF OPERATION

Scenario	Monday to Friday	Saturday	Sunday / Public Holiday
Current	6:00AM to 5:00PM	7:00AM to 5:00PM	Sunday 7:00AM to 5:00PM Public Holidays - None
Proposed			
Processing	7:00AM to 6:00PM	7:00AM to 6:00PM	None
Transport / handling / tipping / loading	5:00AM to 10:00PM	5:00AM to 10:00PM	7:00AM to 6:00PM
Workshop	24 hr	24 hr	24 hr
Low impact activities	24 hr	24 hr	24 hr

2.2 State Environmental Planning Policy (Infrastructure) 2021

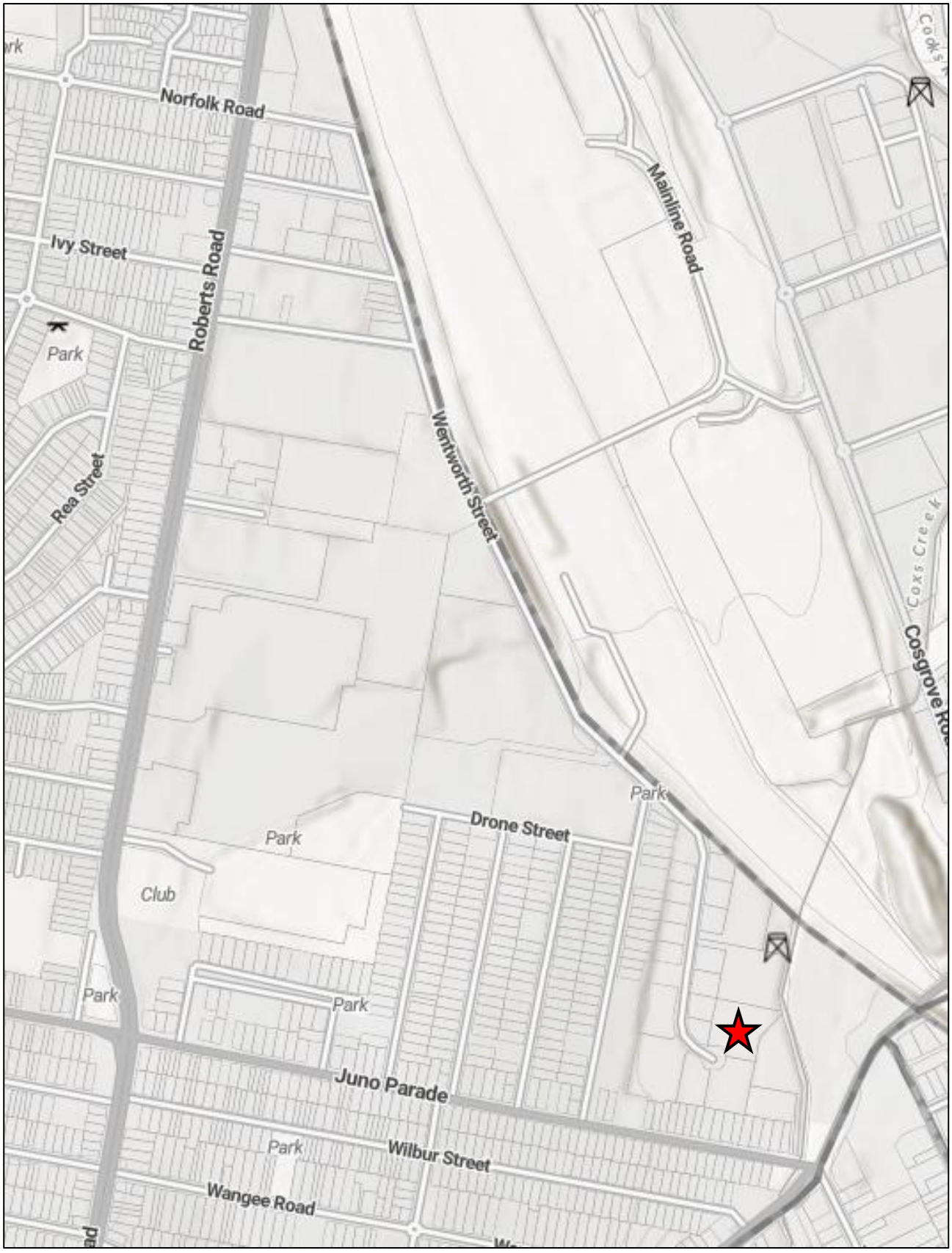
The proposed development qualifies as a traffic generating development with relevant size and/or capacity under the *SEPP (Infrastructure) 2021* as it is a waste or resource management facility. Accordingly, formal referral to Transport for New South Wales (TfNSW) is necessary.

2.3 Site Description

The subject site is zoned *E4: General Industrial* under the Strathfield LEP 2012 and is currently owned and operated by *Aussie Recycling.* The site has a single frontage to Bellfrog Street to the south and is generally surrounded by industrial developments.

2.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1**.



Site Location

FIGURE 1: SITE CONTEXT – STREET MAP

3 EXISTING TRAFFIC AND PARKING CONDITIONS

3.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

3.1.1 Mainline Road

- Unclassified LOCAL Road;
- Approximately 8m wide carriageway facilitating two (2) traffic flow lanes, (one in each direction);
- No speed limit signposted, 50km/h applies;

3.1.2 Bellfrog Street / Wentworth Street / Norfolk Road

- Unclassified LOCAL Road;
- Approximately 13m wide carriageway facilitating two (2) traffic flow lanes, (one in each direction) and kerbside parking along both sides of the road;
- No speed limit signposted, 50km/h applies;
- Unrestricted kerbside parking permitted along both sides of the road.
- Residential streets to the west of Bellfrog Street cannot be accessed via this road

3.1.3 Roberts Road

- Classified Main Road (MR 200);
- Approximately 22m wide carriageway facilitating three (3) traffic flow lanes in each direction;
- Signposted 70km/h speed limit;
- No stopping and clearway conditions along both sides of the road.

3.2 Existing Traffic Management

- Signal controlled intersection of Norfolk Road / Roberts Road.

3.3 Existing Traffic Environment

Turning movement traffic surveys were conducted at the intersections of Norfolk Road / Roberts Road and Wentworth Street / Mainline Road from 7:00am to 9:00am and 2:00pm to 6:00pm on Tuesday the 9th August 2022 representing a typical operating weekday. The full survey results are shown in **Annexure B** for reference, whilst a summary is provided in **Table 2**.

TABLE 2: TRAFFIC VOLUME SUMMARY

Peak	Approach Volumes			
	Norfolk Rd (E)	Roberts Road (N)	Norfolk Road (W)	Roberts Road (S)
AM	122	2167	2388	269
PM	299	2213	1949	208

The traffic signal phasing and timing has been calibrated to SCATS data from the same day as the surveys. The signals operated at an average cycle time of 135 seconds during the peak hour.

3.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 3** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 3: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Roberts Road/Norfolk Road	AM	0.81	33.7	**C**	Signals	RT from Roberts Road	43.3 veh (323.2m) Roberts Road
	PM	0.82	36.9	**C**		RT from Norfolk Road	43.3 veh (313.7m) Roberts Road

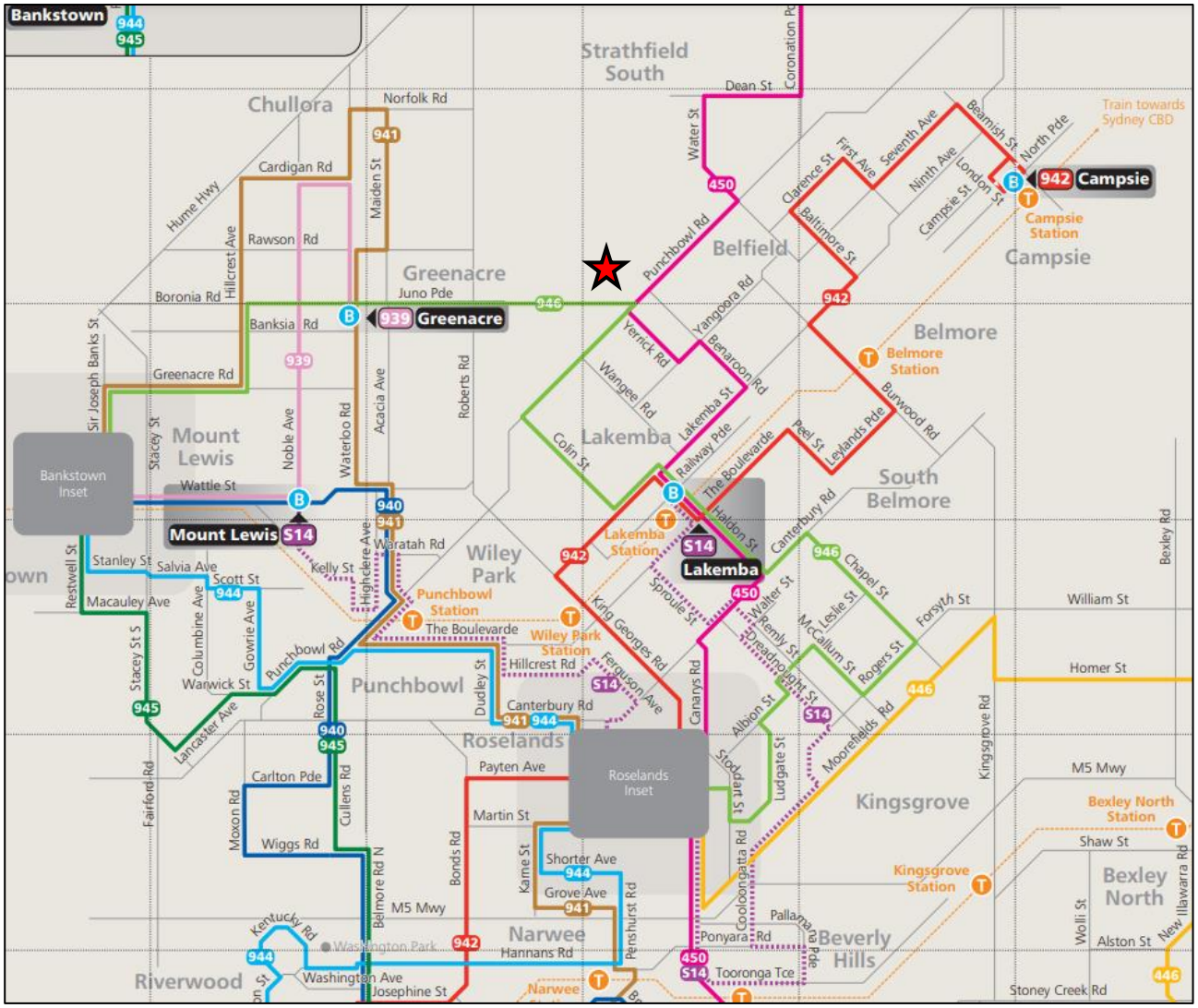
NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, the relevant intersections are currently performing at a high level of efficiency, with a level of service "A" conditions in both the AM & PM peak hour periods. The level of service "A" performance is characterised by low approach delays and spare capacity.

3.4 Public Transport

The subject site is within 1km walking distance to bidirectional bus stops on Juno Parade. The bus stops service existing bus route 946 which provides access between Roselands Shopping Centre and the Bankstown Interchange.

The location of the site subject to the surrounding public transport network is shown in **Figure 2**.



Site Location

FIGURE 2: PUBLIC TRANSPORT NETWORK MAP

3.5 Future Road and Infrastructure Upgrades

From Strathfield Council Development Application tracker and website, it appears that there are no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

4 PARKING ASSESSMENT

4.1 Council Parking Requirement

Reference is made to the *Strathfield Council Development Control Plan 2005 Part D – Industrial Development* which designates the following parking rates applicable to the proposed industrial development:

> *3.8 Industry*
>
> *3.8.1 This section shall apply to all developments involving:-*
>
> *(i) the erection of a new building;*
>
> *(ii) the extension of an existing building;*
>
> *(iii) the commencement of an industry in an existing building.*
>
> *(a) Parking*
>
> *(i) 1 space per 55 m2 gross floor area (where the office component is less that 20% of the floor area); or 1 space per 2 employees whichever provides the greater number of spaces.*
>
> *Industry: 1 car space per 50m^2 GFA where any office component is under 20%. If the office component is greater than 20% that additional area will be assessed at a rate of 1 space per 40m^2 GFA.*
>
> *Warehouses: 1 space per 300m^2 GFA*
>
> *Delivery and service vehicles associated with a development: 1 space per 800m^2 GFA up to 8,000m^2 GFA plus 1 space per 1,000m^2 GFA thereafter*

While Council's DCP provides the above parking rates, the existing operations are known and as such a first principles assessment can be undertaken of the development.

The parking of light vehicles on the site currently takes place within the 10 off-street car parking spaces outside of the yard. There are also an additional 11 car parking spaces directly adjacent to the workshop.

Currently, there are eight (8) staff members on shift at any one time. This will increase to a maximum of 16 staff members. For conservative purposes, it is assumed that each staff member drives to the site, which results in a requirement for 16 staff parking spaces. The provision of 21 car parking spaces satisfies this requirement with extra for occasional visitors or service vehicles. Therefore, the proposed development is supportable in terms of parking impact.

4.2 Disabled Parking

Strathfield Council DCP 2005 states the following regarding disabled parking provision relevant to the proposed development:

Section 2.3 Access for the Disabled

> *At least one car parking space should be designed for disabled spaces, in accordance with Australian Standard AS2890.1-1993*

No changes to the existing parking layout are proposed as part of this development application. Nevertheless, one (1) accessible car parking space is provided for, satisfying Council's DCP requirement.

4.3 Bicycle & Motorcycle Parking Requirements

Strathfield Council DCP 2005 does not require bicycle or motorcycle parking, as such none has been provided

4.4 Servicing & Loading

Currently, the largest sized vehicle required to access the site is a 26m long B-double with the site typically requiring access for 20m long truck and dogs. Loading and unloading occurs within the hardstand area, with the material moved and processed along the northern boundary of the site. The proposed arrangement will separate the loading and unloading areas such that there will be two separate circulation paths for loading and unloading vehicles.

4.4.1 Incoming Material

The incoming unloading area is proposed to be located within the existing warehouse on the southern boundary of the site (also known as the receival building). Trucks will queue and then reverse into the receival building. Trucks will tip material within the warehouse where it will be inspected then loaded into the hopper. The material will then be transported via conveyor to the fixed plant in the waste processing building on the northern site boundary where it will be processed and segregated. After the material is inspected within the warehouse, the truck will leave the warehouse in a forward direction and then will egress the site via the eastern weighbridge.

4.4.2 Outgoing Material

The outgoing material will be loaded from the segregated material bays along the southern side of the waste processing building. Trucks will enter and circulate the site in a counterclockwise direction before wither reversing into the truck bays. Material will be loaded into the trucks via both excavators or hook lift bins. Once loaded, trucks will exit the site in a forward direction via the western weighbridge.

4.4.3 Physical Site Constraints

Consideration is given to the physical constraints of the site layout and hardstand area. A swept path assessment has been conducted on aerial imagery taken of the site, reproduced in **Annexure D**, with the results demonstrating that the site has ample capacity to accommodate multiple large vehicles for loading and unloading. Vehicles will arrive to the site and entry via the eastern weighbridge. Once in the site, vehicles will turn right and circulate the site in a counterclockwise direction. Unloading will occur within the current warehouse area in the southeastern corner of the site.

4.5 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A**, has been assessed to achieve the relevant clauses and objectives of AS2890.1:2004, AS2890.2:2018 and AS2890.6:2022. Any variances from standards are addressed in the following subsections including required changes, if any. Swept path testing has been undertaken and the results are reproduced within **Annexure D** for reference.

The proposed car parking and vehicular access design achieves the following:

- 5.5m wide two-way driveway facilitating access to Bellfrog Street;
- Minimum 5.8m wide parking aisles;
- Minimum 5.4m long, 2.4m wide spaces for staff;
- Minimum 5.4m long, 2.4m wide accessible spaces with adjacent associated 5.4m long, 2.4m wide shared space;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over accessible and adaptable parking areas;

Whilst the plans have been assessed to comply with the relevant standards, it is usual and expected that a design certificate be required at the Construction Certificate stage to account for any changes following the development application.

5 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

5.1 Truck Movements

The site's expected truck generation is based upon several factors including truck capacity, material being transported and average service time to load and unload. The site is expected to generate the following truck volumes to achieve up to 199,000T of waste accepted and processed in any 12-month period. These values were obtained from *4Pillars* projections and are summarised in the following subsections.

TABLE 4: EXPECTED TRUCK TRAFFIC GENERATION

Type	Annual Truck Arrivals	Daily Truck Arrivals			Average Hourly Truck Arrivals
		Mon-Fri	Sat	Sun	
Import Material	79,087	277	135	131	14.56
Export Material	26,483	105	38	35	4.87
Total	105,570	382	173	166	19.43

5.2 Expected Breakdown of Truck Size and Capacity in the Proposed Operation

The proposal will operate with the truck types as described in **Table 5**.

TABLE 5: EXPECTED TRUCK TYPES

Type	SRV (3T)	MRV (8T)	HRV (15T)	Truck and Dog (25T)	B-Double (40T)	B-Double (>40T)
Import Material	98.7%	0.3%	0.4%	0.6%	0.0%	0.0%
Export Material	68.0%	17.0%	0.4%	12.0%	2.6%	0.0%

A detailed description of the background data and analysis which resulted in the expected truck types is provided in **Section 5.2.1**.

5.2.1 Typical Truck Sizes

The current operation of the site is mainly to process soil waste. It is proposed that the site will process mainly building and demolition material. The key difference in these waste types is the size of vehicles which bring material to the site. Soil waste typically arrives in 20m length truck and dogs with a 25-40t payload whilst building and demolition waste typically arrives in small trucks with a 3-8t payload.

As shown, most of the building and demolition waste will be brought to the site via SRVs, whilst incoming soil waste is typically brought by large combination vehicles such as truck and dogs and B-Doubles.

5.2.2 Incoming Material (Import) Truck Sizes

It is proposed that the MRF will accept and recycle, C&D waste, C&I waste and non-putrescible MSW but that C&D waste will predominate. C&D waste includes soils (VENM/ENM). Given the site's history, it has been assumed that there will be a higher portion (+10%) of soils accepted at the proposed MRF than at Aussie Recycling's Strathfield site. The proposed site's incoming heavy vehicle profile is forecasted based upon the waste type and the associated truck types.

TABLE 6: INCOMING MATERIAL (IMPORT) TRUCK TYPES

Waste Type	% of total waste	% of total loads	Average per load (T)	Truck Types (1)
B&D Waste	85%	95%	2.25	All SRVs
Brick, Concrete, Aggregate	5%	4%	3.36	93% SRV 7% MRV
Soil Waste	10%	1%	21	40% HRV 60% T&D
Total	100%	100%	-	-

Note (1): The split of vehicle types aligns with the average tonne value per load and the load capacity of each truck type

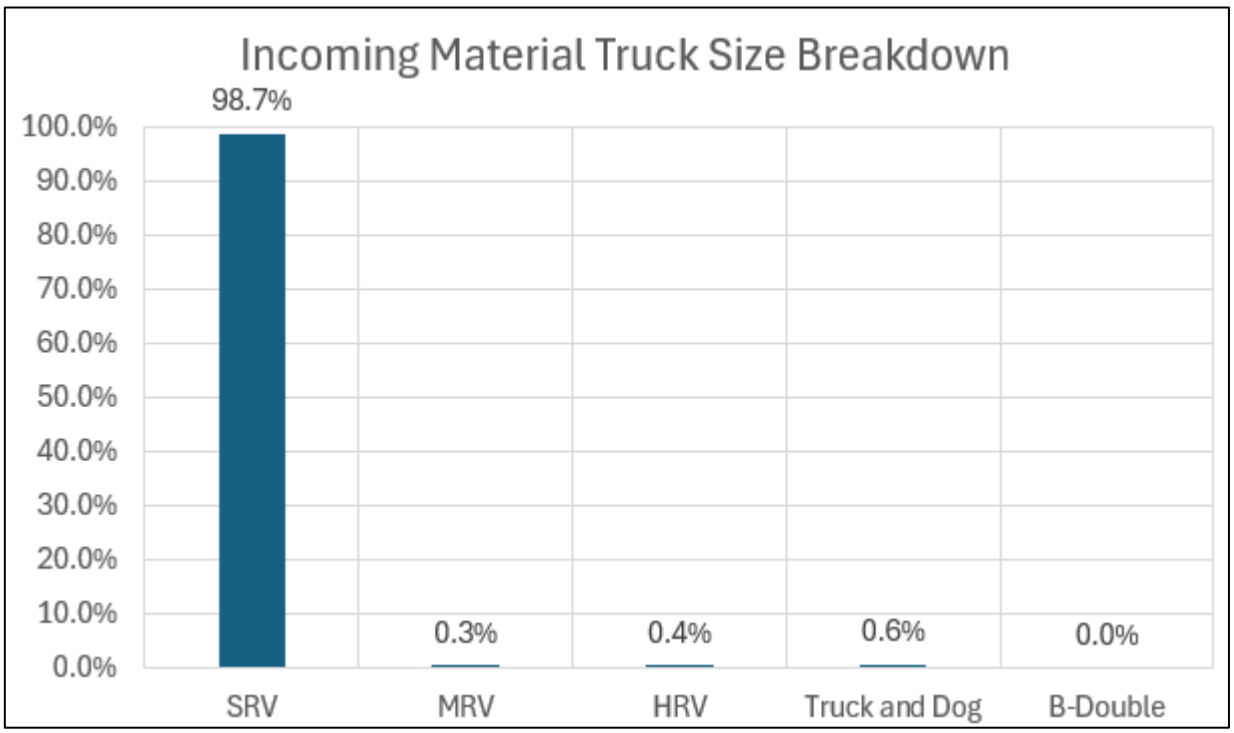


FIGURE 3: PROJECTED INCOMING MATERIAL TRUCK TYPE PROFILE

As shown, most of the importing truck fleet will be SRVs (98.7%) followed by Truck and Dogs (0.6%). The profile is heavily weighted toward smaller trucks because the site will mainly process building and demolition waste as well as brick, concrete and aggregate waste. SRVs are by far the most common type of truck that brings this type of waste.

5.2.3 Outgoing Material (Export) Truck Sizes

The proposed site's exporting heavy vehicle profile can be fully based upon the data from the Strathfield site. The profile from the Strathfield site is provided in **Figure 4**.

TABLE 7: OUTGOING MATERIAL (EXPORT) TRUCK TYPES

Waste Type	% of total waste	% of total loads	Average per load (T)	Truck Types (1)
Separated Materials (hook bin)	45%	85%	4	80% SRV 20% MRV
Brick and Concrete	25%	7%	28	80% T&D 20% B-Doubles
Residual Waste	10%	3%	25	12% HRVs 80% T&D 8% B-Doubles
Resource Recovered Material	20%	5%	28	80% T&Ds 20% B-Doubles
Total	100%	100%	-	-

Note (1): The split of vehicle types aligns with the average tonne value per load and the load capacity of each truck type

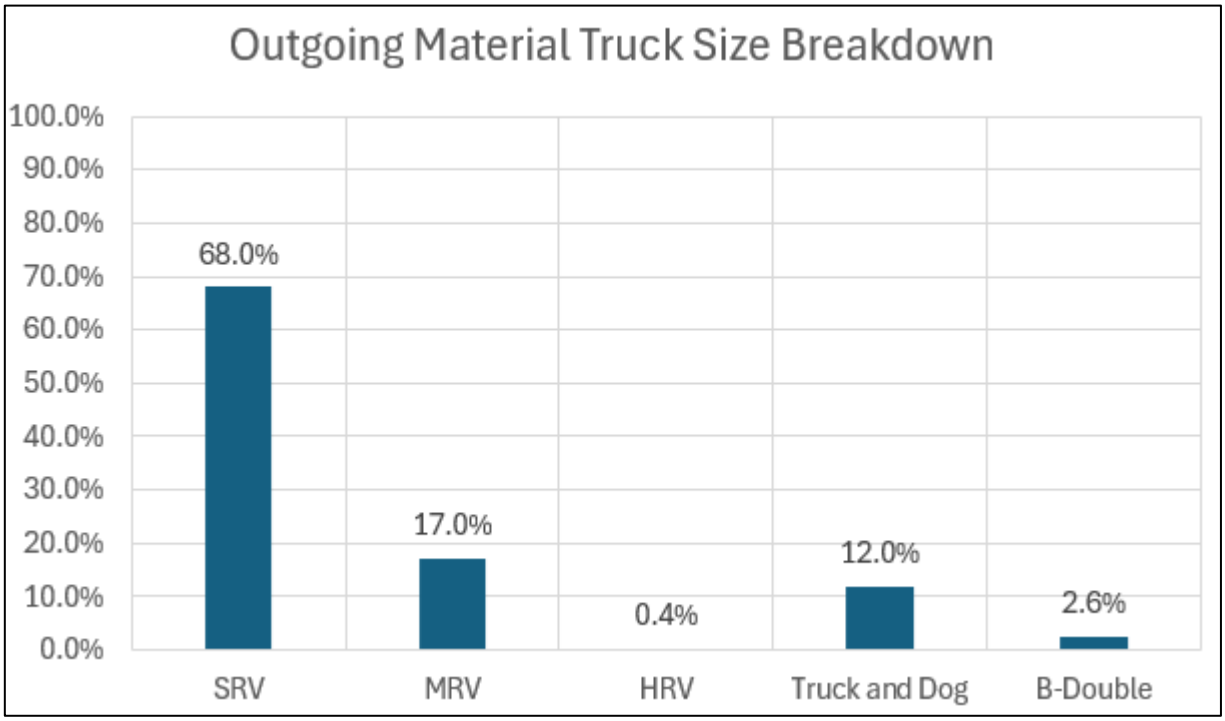


FIGURE 4: PROJECTED OUTGOING MATERIAL TRUCK TYPE PROFILE

As shown, most of the exporting truck fleet will be SRVs (68.0%) followed by MRVs (17.0%). Truck and dogs are also relatively popular for material that is not loaded by a hook bin.

5.3 Future Traffic Demand Analysis

Trucks arriving to the site will enter via the eastern weighbridge. Trucks entering the site to deposit material will turn right and circulate the site in an anticlockwise direction. Depositing material will occur within the current warehouse area in the southeastern corner of the site. Trucks entering the receival building will reverse into the building and deposit material. Trucks entering the site to collect material and carry it offsite will reverse into the loading areas along the northern boundary.

Anticlockwise circulation ensures that there are no internal conflicts between vehicles. Clockwise circulation would not be efficient or safe as vheicles egressing the site would not be able to make the tight 90-degree turn required to egress via the eastern weighbridge without encroaching on the western weighbridge.

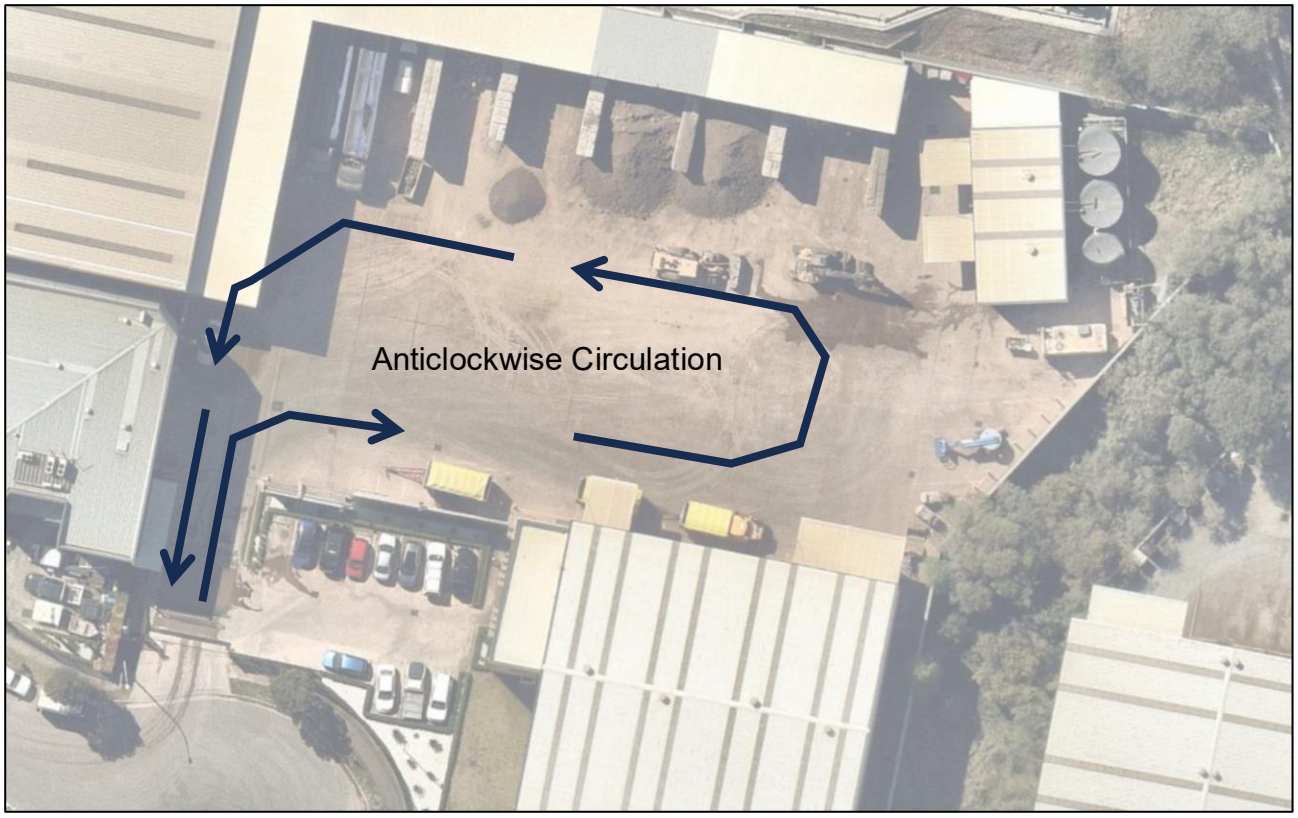


FIGURE 5: INTERNAL ANTICLOCKWISE CIRCULATION

The traffic demand has been calculated using the expected truck capacities from **Section 5.2**.

5.3.1 Incoming Material (Import) Traffic Demand

It has been advised that the average tonnage and dwell times of vehicles expected to arrive at the subject site to deposit material are as summarised below in **Table 8**.

TABLE 8: EXPECTED INCOMING TRUCK CHARACTERISTICS

Waste Type	Total Tonnes	Percentage of Total Material	Total Loads per Year	Average per load[(1)] (tonnes)	Total Loads per year	Weighted Average Load (T)
B&D Waste	169,150	85%	95%	2.25	75,178	2.52
Brick, Concrete, Aggregate	9,950	5%	4%	3.36	2,961	
Soil	19,900	10%	1%	21.0	948	
TOTAL	199,000	100%	100%	-	79,087	

Truck Type	Percentage of Arrival Rate-	Average Dwell Time [(1)] (min)	Weighted Average Dwell Time (min)
SRV	98.7%	2	2.06 mins
MRV	0.3%	2.5	
HRV	0.4%	5.5	
Truck and Dog	0.6%	9	
B-Double	0.0%	15	

Note: (1) As advised by Aussie Skips

Considering the above, we can make the following assumptions to calculate the maximum import site capacity:

- The truck movements occur at their maximum during every hour of operation, such that the site operates for a total of 17 hours on a weekday, 17 hours on a Saturday and 11 hours on a Sunday and public holiday (total of 113 operating hours per week);
- The yearly target is to transport 199,000 tonnes of material into the site;
- The average load per truck is of 2.52 tonnes;
- Two (2) vehicles can unload simultaneously;
- The weighted average dwell time is 2.06 minutes;
- 48 operating weeks (conservative assuming four full weeks of shutdown periods per year).

Under the above assumptions and restrictions, the site will demand an average of 14.56 trucks per hour for incoming vehicles. The required traffic demand calculation for 199,000 tonnes per annum is shown below.

$$Traffic\ Demand = \frac{199{,}000T}{2.52\frac{T}{truck} * 48\ weeks} * \frac{1\ week}{113\ hours} = 14.56\frac{trucks}{hour}$$

5.3.2 Outgoing Material (Export) Traffic Demand

The average tonnage and dwell times of vehicles expected to arrive at the subject site are as summarised below in **Table 9**.

TABLE 9: EXPECTED OUTGOING TRUCK CHARACTERISTICS

Waste Type	Total Tonnes (1)	Percentage of Total Material	Total Loads per Year	Average per load (1)(tonnes)	Total Loads per year	Weighted Average Load (T)
Separated Materials	89,955	45%	85%	4	22,489	7.53
Brick and Concrete	49,750	25%	7%	28	1,777	
Residual Waste	19,900	10%	3%	25	796	
Resource Recovered Material	39,800	20%	5%	28	1,421	
TOTAL	199,000	100%	100%	-	26,483	

Truck Type	Percentage of Arrival Rate	Average Dwell Time (1) (min)	Weighted Average Dwell Time (min)
SRV	68.0%	4	6.06 mins
MRV	17.0%	5	
HRV	0.4%	8	
Truck and Dog	12.0%	15	
B-Double	2.6%	25	

Note (1): As advised by Aussie Skips. Total tonnes are overestimated slightly for a conservative assessment

Considering the above, we can make the following assumptions to calculate the maximum export site capacity:

- The truck movements occur at their maximum during every hour of operation, such that the site operates for a total of 17 hours on a weekday, 17 hours on a Saturday and 11 hours on a Sunday and public holiday (total of 113 operating hours per week);
- The yearly target is to transport 199,000 tonnes of material out of the site;
- The average load per truck is of 7.53 tonnes;
- The average dwell time for incoming trucks is 6.06 minutes for a less efficient site. A 20% efficiency rate could be adopted for this site given a more efficient layout (4.85 minutes), though this is not accounted for in the calculation;
- Six (6) vehicles can load simultaneously;
- 48 operating weeks (conservative assuming four full weeks of shutdown periods).

Under the above assumptions and restrictions, the site will demand an average of 4.87 trucks per hour for incoming vehicles. The required traffic demand calculation for 199,000 tonnes per annum is shown below.

$$Traffic\ Demand = \frac{199{,}000T}{7.53\frac{T}{truck} * 48\ weeks} * \frac{1\ week}{113\ hours} = 4.87\frac{trucks}{hour}$$

5.3.3 Daily Truck Profile

Although the average number of trucks per hour are 14.56 import and 4.87 export, the demand will not be split evenly throughout the day. The applicant has provided an expected demand profile in which the number of incoming loads concentrated within the 7am-7pm hours on weekdays, 11am-6pm on Saturdays and 10am-5pm on Sundays, whilst the outgoing loads are heavily concentrated at 10am on weekdays. The profiles are provided in **Figure 6** and **Figure 7** below.

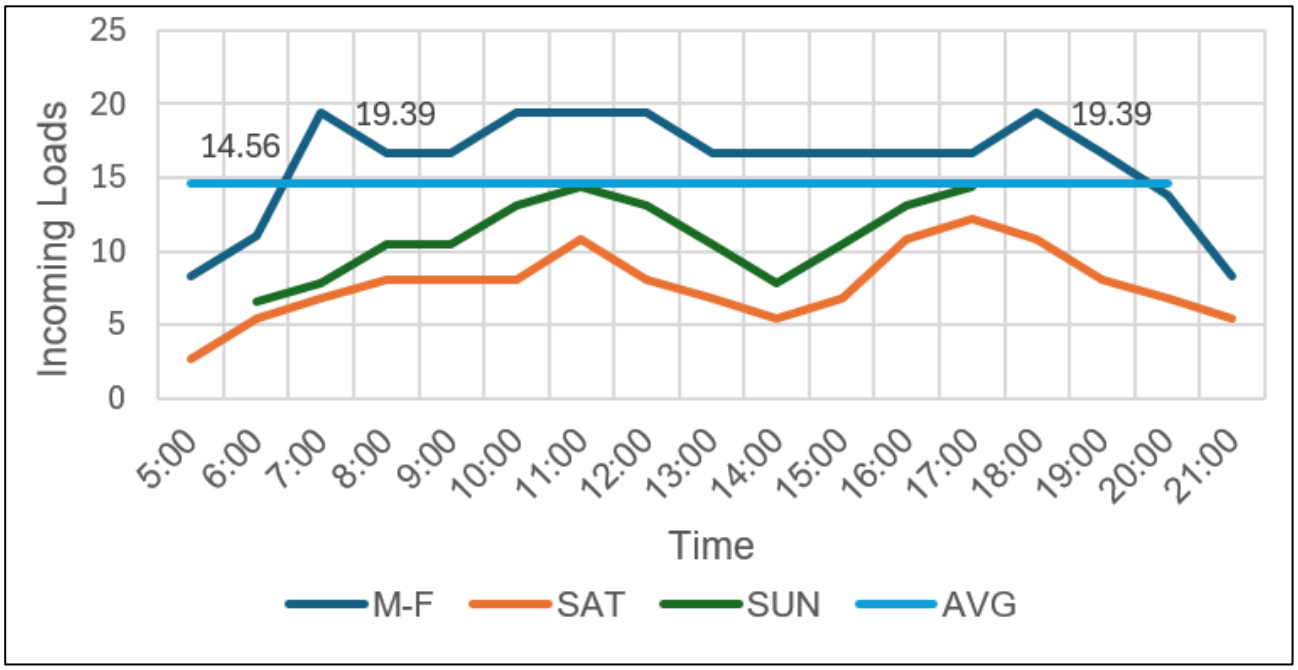


FIGURE 6: INCOMING LOAD PROFILE

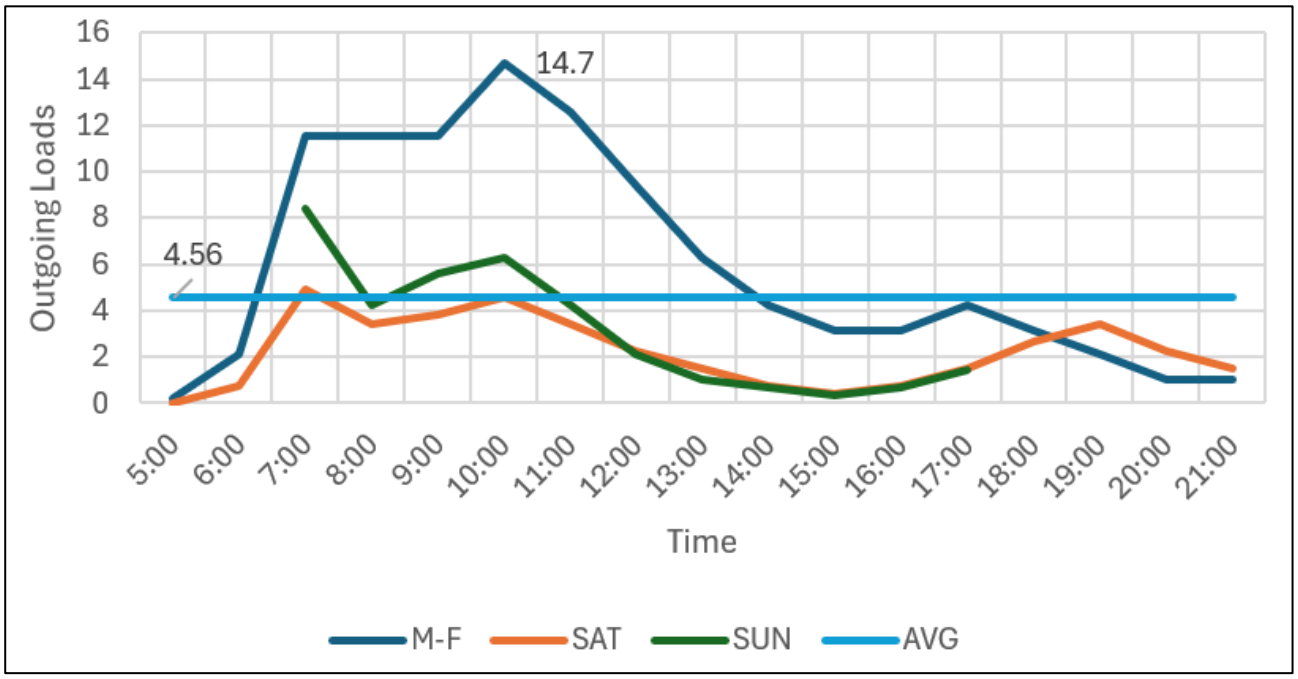


FIGURE 7: OUTGOING LOAD PROFILE

As shown, the peak number of import loads is 19.39 trucks per hour which occurs at 7am, 10am-12pm and 6pm on weekdays. The peak number of export loads is 14.7 trucks per hour which occurs at 10am on weekdays.

5.4 Queueing Analysis

The traffic demand from **Section 5.3** has been assessed for its potential for vehicles to queue, and the site's ability to accommodate the expected queue. For the purposes of this assessment, the target is for the site to accommodate the 98th percentile queue in accordance with standard traffic engineering practice and as required within AS2890.1:2004. Two (2) locations have been identified as potential pinch points for queueing.

Firstly, trucks entering the site to import material will stop on the weighbridge for measurement. Trucks will only be weighed when they are fully laden (i.e. import trucks). That is, laden trucks arriving to the site to deposit material will need to stop to be weighed upon arrival to site. Unladen trucks arriving to the site to pick up and export material will be weighed upon their egress from site. There is potential for a queue to form behind the eastern weighbridge as laden trucks arriving to the site to be weighed. Trucks arriving immediately behind an import truck may form a queue whilst the laden truck is weighed.

The other pinch point for queueing will be the time it takes trucks to fully load or unload. Trucks will form a queue behind the loading / unloading areas whilst this action is being completed. Each of these queueing points are discussed in the following sections.

5.4.1 Weighbridge Queueing Analysis

All trucks will enter the site at the site driveway on the eastern weighbridge. This is the typical operation of this site as it provides a safer more efficient anticlockwise flow within the site. It is advised within the SEE that the typical time spent to weigh a truck is 20 seconds. Only laden trucks will be weighed upon entry to the site, so whilst the average for laden trucks is 20 seconds, the average for unladen trucks is 0 seconds. Laden trucks represent 57% of the incoming vehicles in the peak hour (19.39 of 34.09 peak hourly loads as shown in **Table 8** and **Table 9**). Therefore, the weighted average of the service times is 11.4 seconds.

Based on the information in **Section 5.3.3**, MTE has undertaken a queueing analysis of the site, assuming an average weighing time of 11.4 seconds (weighted average) and a peak arrival rate of 34.09 trucks per hour (19.39 laden + 14.7 unladen). The analysis determined that the 98th percentile demand equates to a queue of (0) vehicles in the system.

In any case, there is approximately 10 metres of queuing capacity between the weighbridge and the site boundary. This is sufficient to accommodate an SRV or MRV without encroaching into the public domain. SRVs and MRVs comprise 95.5% of all truck movements to the site, inclusive of both laden and unladen arrivals.

As a sensitivity assessment, MTE has analysed a scenario where the 98th percentile queue is one (1) vehicle, rather than nil (0) as concluded prior. A 98th-percentile queue of one (1) vehicle indicates that no queueing would occur in 980 out of 1,000 peak hours. In the remaining 20 peak hours, a queue of one (1) vehicle would be observed. Of these 20 hours, 95.5% (equivalent to 19 peak hours) the queued vehicle would be an SRV or MRV, which

could be wholly contained within the site. In only one (1) peak hour would the queued vehicle be a 20-metre truck that could not be contained within the site boundary.

Accordingly, queuing would be fully accommodated on site in 999 out of 1,000 peak hours. In summary, even if the operational demands resulted in a demand for one (1) queuing space, the 99.9th percentile queueing demand would be contained within the site. The queue in the 0.01% scenario would last approximately 10 seconds which is akin to a driver giving way to a pedestrian crossing the driveway in the verge as required by NSW Road Rules.

5.4.2 Incoming Material Queueing Analysis – Import Material

Based on this information from **Section 5.3.1**, MTE has undertaken a queuing analysis of the site, assuming an average unloading time of 2.06 minutes, an average load of 2.52 tonnes and a peak arrival rate of 19.39 trucks in a peak hour. Incoming vehicles (which are dropping material) arrive to the site and circulate in a counterclockwise direction. Vehicles can queue within the 40m of hardstand area between the receival building and the weighbridge. Once there is space available within the receival building, the trucks will reverse into the building and tip their load. Once empty, the truck can drive forward out of the receival building and exit the site in a forward direction.

The analysis determined that the 98th percentile demand equates to a total of three (3) incoming vehicles within the system at any given time, comprising two (2) vehicles unloading and one (1) vehicle queued to enter the building. Detailed results of the queuing analysis are provided in **Annexure E**.

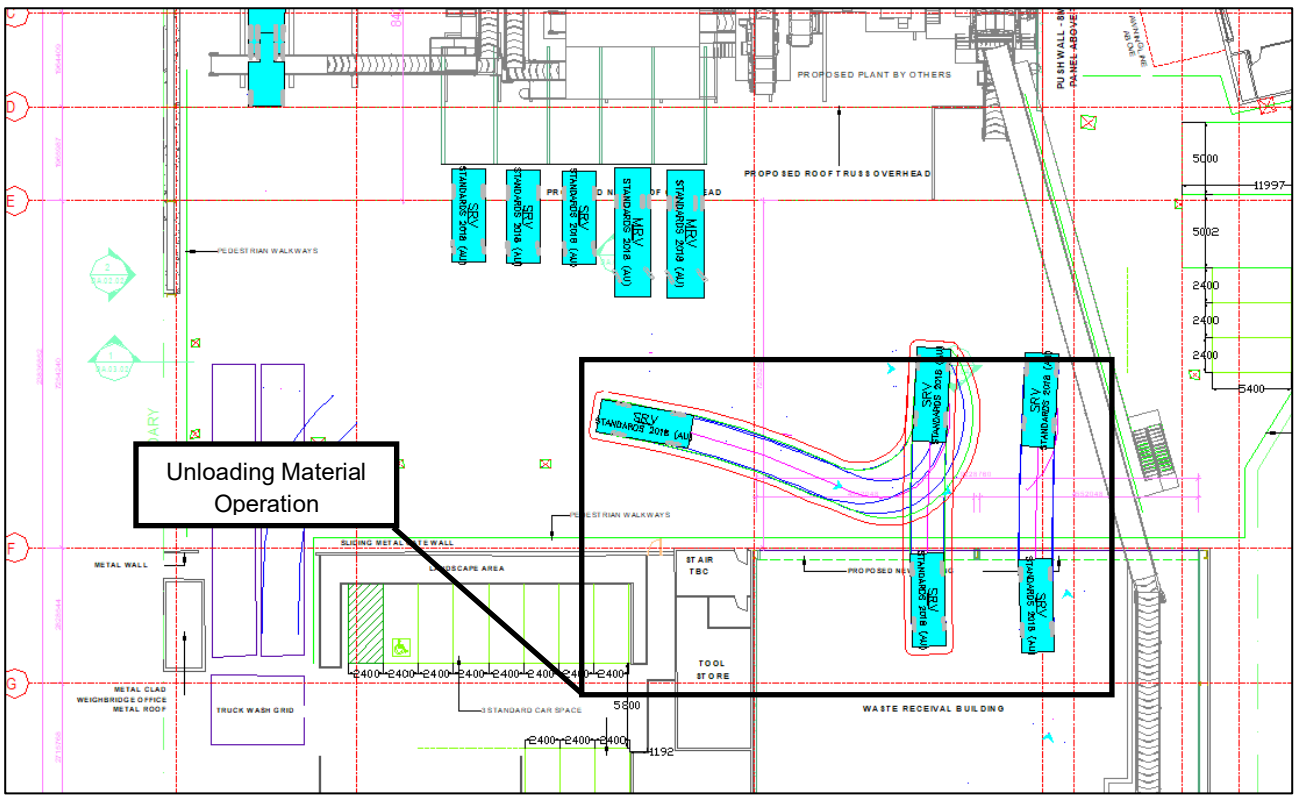


FIGURE 8: INCOMING MATERIAL OPERATION AND QUEUEING

5.4.3 Outgoing Material Queueing Analysis – Export Material

Based on the information from **Section 5.3.2**, MTE has undertaken a queuing analysis of the site, assuming an average loading time of 6.06 minutes, an average load of 7.53 tonnes and a peak arrival rate of 14.7 trucks in a peak hour. Trucks arriving to export material arrive to the site and reverse into the material storage bay or the material stockpile area. The storage bay is for large vehicles (i.e. b-doubles and truck / dog combinations), whilst the material storage bays are for hook bin trucks. There is a total of six (6) loading areas.

The analysis determined that the 98th percentile demand equates to a total of five (5) incoming vehicles within the system at any given time, all of which can be loading. The 98th percentile queue for export materials is therefore nil (0) queued vehicles. Detailed results of the queuing analysis are provided in **Annexure E**.

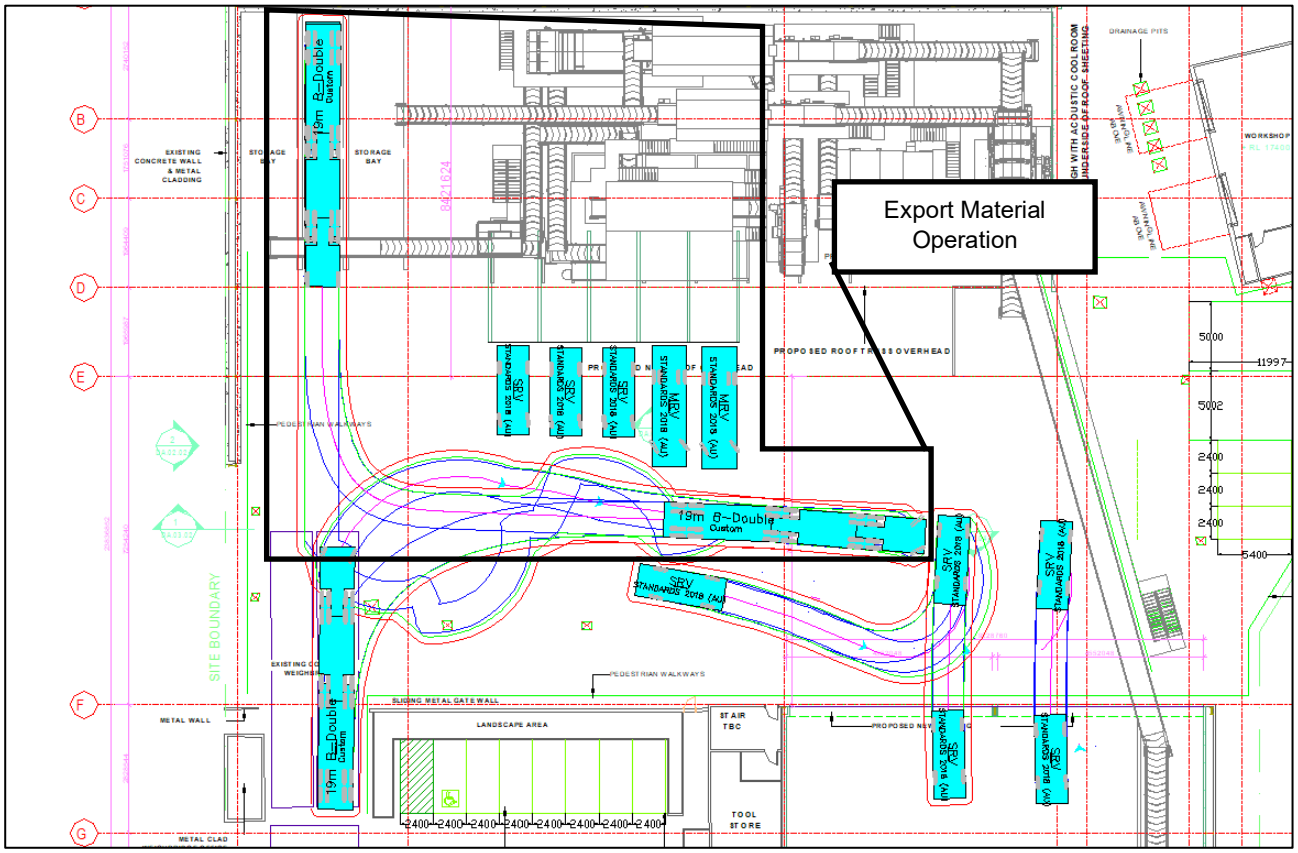


FIGURE 9: LOADING MATERIAL OPERATION AND QUEUEING (EXPORT)

5.5 Conservativity Loading / Unloading Assessment

Although the site has capacity to handle a peak arrival rate of 34.09 trucks per hour (19.39 import trucks and 14.7 export trucks), it is useful to analyse the site capacity by its physical constraints to understand its limit. The loading and unloading operations are independent of one another. Therefore, the theoretical capacity will be determined by the limiting operation. The loading operation is much more efficient than the unloading operation, in that the average load capacity is much higher and there are six (6) loading bays. The unloading operation can only accommodate two (2) unloading vehicle at a time and it demands a higher frequency of trucks based upon a smaller average load compared to the loading operation. Therefore, the theoretical capacity shall be based upon the unloading operation (import material) as the limiting factor.

5.5.1 Average Import Demand Comparison

Considering the hours of the unloading operation and the expected truck characteristics, in order to calculate the theoretical maximum site capacity, we can make the following assumptions:

- The truck movements occur at their maximum during every hour of operation, such that the site operates for a total of 17 hours on a weekday, 17 hours on a Saturday and 11 hours on a Sunday and public holiday (total of 113 operating hours per week);
- The average load per truck is of 2.52 tonnes;
- 48 operating weeks (conservative assuming four full weeks of shutdown periods per year);
- The weighted average dwell time is 2.06 minutes;
- Capacity to handle three (3) vehicles queued outside the warehouse without impacting the outgoing material operation. This is under the assumption that the queued vehicles are in accordance with the typical vehicle size profile:
    - 70.4% SRVs (2x vehicles queued);
    - 22.7% MRVs and HRVs (1x vehicle queued)

Under the above assumptions and restrictions, the site can accommodate up to 28.9 incoming material trucks per hour. Based on this, the site has the theoretical capacity to load and unload **72.8** tonnes in a peak hour as demonstrated in the below calculation.

$$Maximum\ Unloading\ Rate = \frac{28.9\ trucks}{hour} * \frac{2.52T}{truck} = \mathbf{72.8\ T/hr}$$

The proposal is for **199,000** tonnes per annum which breaks down to an average tonnage rate of **36.7** tonnes per hour as demonstrated in the below calculation.

$$Average\ Unloading\ Rate = \frac{199\ 000T}{year} * \frac{1\ year}{48\ weeks} * \frac{1\ week}{113\ hours} = \mathbf{36.7\ \ T/hr}$$

In summary, an average tonnage rate of 36.7 T/hr applied over the entire year will achieve the proposed 199,000 tonnes per annum. Meanwhile, the site has the ability in peak hours to unload 72.8T in a peak hour. Therefore, that the site has the theoretical capacity to load and unload **1.98 times** the proposal's average rate.

5.5.2 Peak Import Demand Comparison

Figure 6 demonstrates that the site will experience a peak import demand of 19.39 trucks per hour. The peak import demand shows the site will import a peak of 48.9 T/hr as calculated below.

$$Peak\ Unloading\ Rate = \frac{19.39\ trucks}{hour} * \frac{2.52T}{truck} = \mathbf{48.9\ \ T/hr}$$

In summary, the site has the ability in peak hours to unload 72.8T in a peak hour, whilst the peak hour import demand is only 48.9 T/hr. Therefore, that the site has the theoretical capacity to load and unload **1.48 times** the proposal's peak hour rate.

5.5.3 Sensitivity Analysis Summary

A capacity of 1.98 times the average rate and 1.48 times the peak hour rate will be covered by the operator's on-site management operations. For example, the applicant has implemented a booking system for arriving trucks in which hourly appointment slots are available. The schedule can be accessed through an app which has a live copy of the schedule and allows truck drivers to choose an hour-window in which they can arrive and depart the site. This will mitigate queueing impacts and will allow for a more efficient use of the site's extended hours. It is recommended that the app allow for 20 time slots per hour. The schedule can be reviewed and adjusted throughout the year should the site have any operational issues with 20 slots per hour. Further adjustments could be made, if necessary, including:

- Restricting load tonnage during peak times to below the average, noting that smaller loads take less time to load / unload.
- Incentives for unloading materials during early morning or late evening hours.

It is reiterated that the site has a theoretical capacity to be able to load and unload significantly more than the rate of the proposal, it is therefore reasonable to conclude that the site can effectively manage the arrival rate such that the proposal will not cause queueing onto the public road.

6 TRAFFIC IMPACT

6.1 Traffic Generation

The expected traffic generation calculated in **Section 5.3** has been extrapolated to determine daily and annual traffic volumes.

TABLE 10: EXPECTED TRUCK TRAFFIC GENERATION

Type	Annual Trucks	Daily Trucks			Hourly Trucks	
		Mon-Fri	Sat	Sun	Avg	Peak
Inbound Material (Import)	79,087	277	135	131	14.56	19.39
Outbound Material (Export)	26,483	105	38	35	4.87	14.7
Total	105,570	382	173	166	19.43	34.09

The peak hour traffic generation above has been added to the existing traffic volumes recorded, as shown in **Table 11**.

TABLE 11: PEAK HOUR TRAFFIC VOLUME SUMMARY

Peak	Approach Volumes			
	Norfolk Rd (E)	Roberts Road (N)	Norfolk Road (W)	Roberts Road (S)
Existing AM	122	2167	2388	269
Existing PM	299	2213	1949	208
Additional Truck Traffic[(1)(2)]	+17	+8	+0	+8
AM Staff Traffic	+0	+8	+0	+8
PM Staff Traffic	+16	+0	+0	+0
Future AM	148	2183	2388	285
Future PM	332	2221	1949	216

Notes: (1) The 34 trucks (68 movements) traffic is assumed to arrive relatively evenly from the north and south along Roberts Road
(2) The additional traffic has been assumed to be 50% of the peak hour volume. This takes into account that much of the existing traffic going to the site is already recorded in the existing traffic volumes.

6.2 Traffic Impact

SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the expected demand. The results of this assessment are shown in **Table 12**.

It is noted that the survey was undertaken when the site was operational and would have taken the current site use into account. Nonetheless, the proposed traffic volumes have been added to the surveyed scenario for a conservative assessment.

TABLE 12: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Roberts Road/Norfolk Road	AM	0.81	33.7	**C**	Signals	RT from Roberts Road	43.3 veh (323.2m) Roberts Road
	PM	0.82	36.9	**C**		RT from Norfolk Road	43.3 veh (313.7m) Roberts Road
FUTURE PERFORMANCE							
Roberts Road/Norfolk Road	AM	0.84	37.1	**C**	Signals	RT from Roberts Road	46.1 veh (344.3m) Roberts Road
	PM	0.83	39.6	**C**		RT from Norfolk Road	44.6 veh (323.9m) Roberts Road

Notes: Refer to **Table 3**

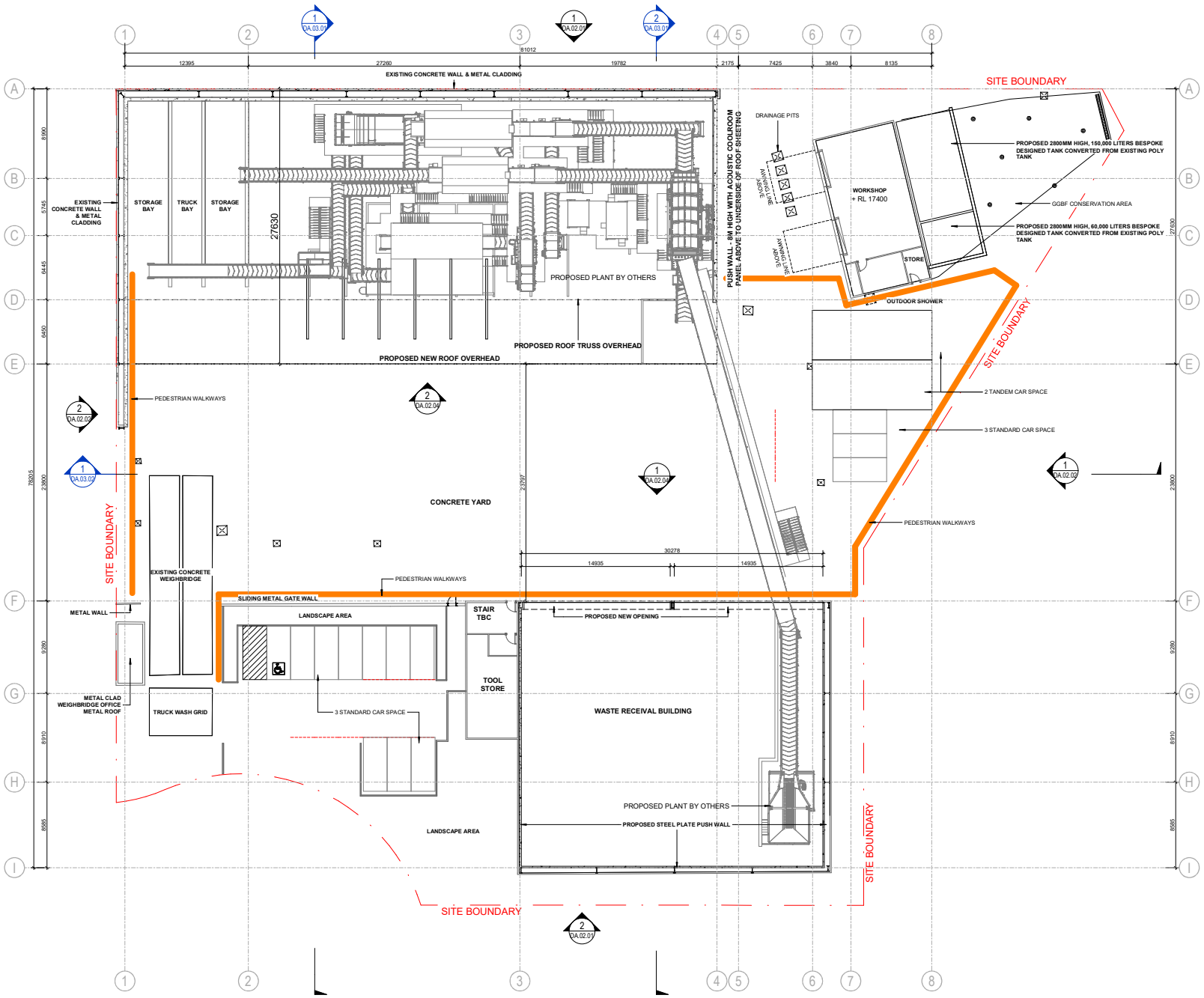
As shown, the surrounding intersections all retain the same overall level of service under future conditions with minimal delays and additional capacity, indicating that there will be no adverse impact on the existing road network as a result of the proposed development.

7 CONCLUSION

In view of the foregoing, the subject Waste Handling & Transfer Facility proposal at 13 Bellfrog Street, Greenacre (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- For conservative purposes, it is assumed that each staff member drives to the site, which results in a requirement for 16 staff parking spaces. The provision of 21 satisfies this requirement with extra for occasional visitors or service vehicles. Therefore, the proposed development is supportable in terms of parking impact.
- Council's DCP does not require the provision of motorcycle or bicycle parking facilities.
- The parking areas of the site have been assessed against the relevant sections of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2009* and have been found to comply with and satisfy the objectives of these standards.
- The additional traffic generation of the proposed development has been estimated to be some **+34 truck trips and +16 staff trips** in a peak hour. The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.1, indicating that cumulative traffic generation of the subject site and the materials storage and processing yard will result in no detrimental impact to the performance of the intersections as a result of the generated traffic.
    - It is noted that the traffic assessment was completed on the basis that 50% of the total trucks entered or exited the site during the traffic survey period. It is likely that more than 50% of trucks travelling to and from the site were captured by the traffic surveys and that the results of the assessment represent a worst case.
- Upon entry, there will be no queue forming in the 98th percentile scenario. Even, so there is enough room on site for one (1) SRV or MRV to queue behind the weighbridge upon entry. A queue would form outside the boundary if the queued vehicle were larger than an MRV. This would happen in 1 of 1,000 peak hours. The queue would last approximately 10 seconds which is akin to a driver giving way to a pedestrian crossing the driveway in the verge as required by NSW Road Rules.
- The site's average import tonnage rate is 36.7 T/hr and the site's peak import tonnage rate is 48.9 T/hr. Meanwhile, the site has the ability in peak hours to unload 72.8T in a peak hour. Therefore, the site's import capacity has the ability to unload **1.98 times** the proposal's average rate and **1.48 times** the peak hour rate.

ANNEXURE A: SITE LAYOUT
(1 SHEET)



PRELIMINARY
NOT FOR CONSTRUCTION
DEVELOPMENT APPLICATION

Document Notes
Verify all dimensions on site before commencing work. Report all discrepancies to the architect prior to construction. Place Studio shall not be held responsible for any variations to specifications or drawings due to any discrepancies without consent from us. Use figured dimensions in preference to scaled dimensions. Drawings are not to be scaled when printing. In choosing to do so the works take precedence over drawings made to smaller scales or for general purposes. All work is to conform to relevant Australian Standards and Codes together with all Authorities' requirements and Regulations.

7/7/2025 10:10:09 AM

REVISION:

REV	DATE	DESCRIPTION	APP
A	07/07/2025	ISSUED FOR SSDA	

DRAWN BY: KX

LEGEND:

PROJECT:
#2024109
AUSSIE RECYCLING - GREENACRE FACILITY
13 BELLFROG STREET, GREENACRE NSW 2190

CLIENT: AUSSIE INDUSTRIES

DRAWING TITLE:
GROUND FLOOR PLAN

SHEET NUMBER: **DA.01.02**
REV: **A**
SCALE: 1 : 200 @ A1
DATE: 07/07/2025

ARCHITECT:
PLACE STUDIO
PLACE STUDIO AU PTY LTD
L5 140 WILLIAM STREET, WOOLLOOMOOLOO NSW 2011.
T | 61 431 060 534 | J ALEXANDER-HATZIPLIS NSW ARB #10535
W | www.PlaceStudio.com.au E | Studio@PlaceStudio.com.au

ANNEXURE B: TRAFFIC SURVEYS
(2 SHEETS)

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

Intersection of Norfolk Rd and Roberts Rd, Greenacre

GPS -33.895358,151.066218

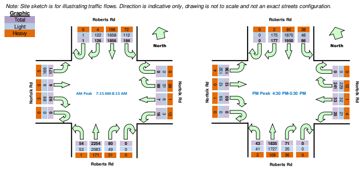
Date:	Tue 09/08/22	***North:***	Roberts Rd	***Survey Period***	AM:	7:00 AM-9:00 AM
Weather:	Fine	***East:***	Norfolk Rd		PM:	4:00 PM-6:00 PM
Suburban:	Greenacre	***South:***	Roberts Rd	***Traffic Peak***	AM:	7:15 AM-8:15 AM
Customer:	McLaren	***West:***	Norfolk Rd		PM:	4:30 PM-5:30 PM

All Vehicles

Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	17	389	47	0	23	0	1	0	20	532	7	0	17	2	34	4725	
7:15	7:30	0	20	479	38	0	17	0	7	0	18	664	7	0	21	1	39	4946	Peak
7:30	7:45	0	25	451	45	0	26	2	3	0	22	465	8	0	22	2	28	4789	
7:45	8:00	0	35	446	44	0	39	3	4	0	18	550	14	0	21	2	50	4822	
8:00	8:15	1	46	480	57	0	17	2	2	0	22	575	25	0	28	1	54	4728	
8:15	8:30	0	34	418	44	0	30	5	1	0	17	488	19	0	37	1	60		
8:30	8:45	0	47	398	52	0	33	0	4	0	19	466	16	0	37	0	60		
8:45	9:00	1	39	381	47	0	27	3	3	0	21	508	25	0	33	4	40		
16:00	16:15	1	33	520	20	0	58	6	3	0	18	534	12	0	18	1	18	4668	
16:15	16:30	0	54	464	27	0	40	6	2	0	14	435	9	0	14	3	40	4607	
16:30	16:45	0	45	483	19	0	64	9	8	0	18	441	14	0	18	1	37	4669	Peak
16:45	17:00	0	37	483	22	0	48	5	4	0	14	487	8	0	20	8	25	4640	
17:00	17:15	0	44	481	30	0	71	8	8	0	25	453	5	0	13	1	42	4585	
17:15	17:30	0	51	503	15	0	58	11	5	0	14	454	16	0	9	2	32		
17:30	17:45	0	48	494	11	0	42	10	7	0	9	448	9	0	17	1	32		
17:45	18:00	0	54	457	10	0	26	6	1	0	11	490	10	0	14	0	27		

Peak Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:15	8:15	1	126	1856	184	0	99	7	16	0	80	2254	54	0	92	6	171	4946
16:30	17:30	0	177	1950	86	0	241	33	25	0	71	1835	43	0	60	12	136	4669

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	16	356	24	0	5	0	0	0	12	488	7	0	16	1	33
7:15	7:30	0	20	431	20	0	5	0	0	0	8	610	7	0	20	1	37
7:30	7:45	0	24	410	30	0	7	2	1	0	15	424	7	0	22	2	28
7:45	8:00	0	32	396	27	0	15	2	1	0	12	509	14	0	21	2	49
8:00	8:15	1	46	421	35	0	4	2	1	0	14	540	25	0	26	1	52
8:15	8:30	0	34	379	26	0	12	5	1	0	7	454	19	0	37	1	59
8:30	8:45	0	47	350	31	0	11	0	0	0	14	427	16	0	35	0	60
8:45	9:00	1	39	332	31	0	8	2	0	0	16	471	24	0	33	4	39
16:00	16:15	1	33	490	10	0	53	5	3	0	7	505	12	0	17	1	18
16:15	16:30	0	51	438	13	0	33	6	2	0	4	399	9	0	14	2	39
16:30	16:45	0	44	460	11	0	60	9	7	0	11	413	14	0	18	1	36
16:45	17:00	0	36	462	9	0	46	5	2	0	7	463	6	0	19	8	24
17:00	17:15	0	44	464	17	0	68	8	7	0	10	422	5	0	13	1	41
17:15	17:30	0	51	484	11	0	55	10	5	0	7	429	16	0	9	2	31
17:30	17:45	0	47	482	6	0	33	10	7	0	4	419	9	0	17	1	32
17:45	18:00	0	53	433	7	0	25	6	0	0	5	469	10	0	14	0	26

Peak Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:15	8:15	1	122	1658	112	0	31	6	3	0	49	2083	53	0	89	6	166	4379
16:30	17:30	0	175	1870	48	0	229	32	21	0	35	1727	41	0	59	12	132	4381

Heavy Vehicles

Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	1	33	23	0	18	0	1	0	8	44	0	0	1	1	1
7:15	7:30	0	0	48	18	0	12	0	7	0	10	54	0	0	1	0	2
7:30	7:45	0	1	41	15	0	19	0	2	0	7	41	1	0	0	0	0
7:45	8:00	0	3	50	17	0	24	1	3	0	6	41	0	0	0	0	1
8:00	8:15	0	0	59	22	0	13	0	1	0	8	35	0	0	2	0	2
8:15	8:30	0	0	39	18	0	18	0	0	0	10	34	0	0	0	0	1
8:30	8:45	0	0	48	21	0	22	0	4	0	5	39	0	0	2	0	0
8:45	9:00	0	0	49	16	0	19	1	3	0	5	37	1	0	0	0	1
16:00	16:15	0	0	30	10	0	5	1	0	0	11	29	0	0	1	0	0
16:15	16:30	0	3	26	14	0	7	0	0	0	10	36	0	0	0	1	1
16:30	16:45	0	1	23	8	0	4	0	1	0	7	28	0	0	0	0	1
16:45	17:00	0	1	21	13	0	2	0	2	0	7	24	2	0	1	0	1
17:00	17:15	0	0	17	13	0	3	0	1	0	15	31	0	0	0	0	1
17:15	17:30	0	0	19	4	0	3	1	0	0	7	25	0	0	0	0	1
17:30	17:45	0	1	12	5	0	9	0	0	0	5	29	0	0	0	0	0
17:45	18:00	0	1	24	3	0	1	0	1	0	6	21	0	0	0	0	1

Peak Time		North Approach Roberts Rd				East Approach Norfolk Rd				South Approach Roberts Rd				West Approach Norfolk Rd				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
7:15	8:15	0	4	198	72	0	68	1	13	0	31	171	1	0	3	0	5	567
16:30	17:30	0	2	80	38	0	12	1	4	0	36	108	2	0	1	0	4	288

Queue

Time		North				East			South				West	
Period Start	Period End	Right Lane	West Lane	Middle Lane	East Lane	North Lane	Middle Lane	South Lane	Right Lane	East Lane	Middle Lane	West Lane	South Lane	North Lane
7:00	7:05	2	0	3	3	0	2	0	4	16	12	12	4	2
		0	8	7	4	2	0	0	5	20	16	11	0	2
		0	0	0	0	0	0	0	0	0	0	0	3	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:05	7:10	7	11	10	9	0	2	0	3	21	17	18	0	3
		3	16	14	11	0	5	0	2	21	19	15	7	2
		0	0	0	0	0	2	0	0	0	0	0	2	3
		0	0	0	0	0	0	0	0	0	0	0	0	4
7:10	7:15	2	19	16	16	0	2	0	2	24	18	19	4	2
		0	21	20	19	0	4	0	7	24	19	18	2	3
		0	14	13	13	0	0	0	10	22	20	19	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	7:20	0	18	15	13	2	4	0	6	22	19	20	3	4
		3	13	12	11	0	4	0	2	19	18	14	4	5
		0	0	0	0	0	0	0	0	0	0	0	0	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:20	7:25	4	16	15	14	0	2	2	3	25	23	21	4	4
		0	14	12	12	0	0	0	0	20	19	18	3	4
		0		0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:25	7:30	8	9	10	9	0	2	3	3	15	12	11	5	0
		3	9	8	8	0	0	2	3	22	19	14	0	3
		0	0	0	0	0	0	0	0	0	0	0	2	4
		0	0	0	0	0	0	0	0	0	0	0	0	2
7:30	7:35	0	19	16	15	0	2	0	2	11	8	5	2	3
		6	20	19	17	0	5	0	7	12	14	10	2	2
		0	0	0	0	0	7	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:35	7:40	4	25	22	21	0	7	0	5	19	17	7	4	0
		5	17	10	12	0	8	0	2	15	15	14	0	2
		2	16	14	11	0	0	0	2	6	5	7	6	0
		0	0	0	0	0	0	0	0	0	0	0	0	2
7:40	7:45	2	21	20	18	2	8	0	3	11	10	12	0	3
		3	8	7	6	3	8	0	4	19	16	14	2	11
		0	0	0	0	0	0	0	0	0	0	0	2	5
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	7:50	5	2	2	2	0	8	2	3	24	22	18	0	4
		3	10	9	9	0	10	0	0	15	16	14	2	4
		0	0	0	0	0	0	0	0	0	0	0	0	3
		0	0	0	0	0	0	0	0	0	0	0	0	2
7:50	7:55	5	6	5	5	4	9	0	4	10	10	9	4	6
		8	7	6	6	2	7	0	3	25	20	18	0	3
		0	0	0	0	0	0	0	0	0	0	0	4	5
		0	0	0	0	0	0	0	0	0	0	0	0	0
7:55	8:00	7	18	14	14	2	8	0	3	20	16	19	3	6
		6	20	16	15	4	7	0	6	26	23	24	3	5
		0	0	0	0	0	2	0	0	0	0	0	2	7
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	8:05	4	22	18	17	0	3	0	6	19	15	18	0	3
		3	18	15	14	0	0	0	6	15	14	12	4	3
		5	21	19	18	0	0	0	4	18	17	15	3	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:05	8:10	9	16	15	14	0	2	0	0	19	18	16	3	5
		13	12	11	10	0	2	0	2	17	14	12	2	0
		0	0	0	0	0	0	0	0	0	0	0	3	4
		0	0	0	0	0	0	0	0	0	0	0	0	3
8:10	8:15	13	0	4	4	2	3	0	2	9	9	10	4	7
		7	13	11	10	0	3	0	0	12	10	12	9	3
		0	0	0	0	0	0	0	0	0	0	0	0	5
		0	0	0	0	0	0	0	0	0	0	0	0	5
8:15	8:20	3	7	6	7	0	2	0	0	8	9	12	7	7
		3	12	10	9	0	2	0	0	16	19	11	7	4
		0	0	0	0	0	2	0	0	0	0	0	2	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:20	8:25	3	20	18	18	4	3	0	0	16	12	17	6	3
		5	12	11	10	0	5	0	0	15	12	12	5	5
		6	4	4	6	0	0	0	3	19	17	18	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:25	8:30	6	8	9	11	2	6	0	3	3	3	4	3	3
		11	13	13	11	0	8	0	5	16	12	14	8	2
		0	0	0	0	0	0	0	0	0	0	0	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	4
8:30	8:35	9	12	12	15	3	9	0	3	7	3	6	7	9
		4	19	18	17	3	3	0	4	8	9	10	6	6
		0	0	0	0	0	2	0	0	0	0	0	7	6
		0	0	0	0	0	0	0	0	0	0	0	0	7
8:35	8:40	11	18	16	16	0	2	0	2	18	12	12	7	5
		4	18	17	15	2	6	0	0	15	16	15	8	5
		4	0	0	0	0	0	0	0	0	0	0	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:40	8:45	0	21	19	19	0	5	0	0	16	15	16	5	5
		8	20	17	17	0	5	0	2	16	16	13	4	0
		7	16	14	15	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	8:50	7	6	10	10	2	4	0	3	17	13	17	2	5
		9	14	15	15	2	6	0	7	7	10	15	8	3
		0	0	0	0	0	0	0	0	17	12	14	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:50	8:55	8	6	5	6	0	5	0	4	4	5	7	5	2
		2	7	11	11	0	2	0	6	7	7	8	5	3
		0	0	0	0	0	0	0	0	0	0	0	6	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
8:55	9:00	4	18	18	19	0	2	0	4	10	11	12	6	0
		4	20	19	20	0	0	0	9	2	2	5	3	5
		0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	16:05	5	11	10	10	2	4	2	4	15	13	12	0	9
		5	10	10	9	4	9	0	5	18	14	16	0	10
		0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:05	16:10	8	12	11	12	7	7	0	4	21	25	24	0	12
		14	12	12	12	3	5	0	4	16	17	21	0	10
		8	0	0	0	0	0	0	0	0	0	0	0	10
		0	0	0	0	0	0	0	0	0	0	0	0	12
16:10	16:15	12	7	6	6	4	6	2	2	20	15	14	0	11
		9	14	13	14	3	5	0	0	24	20	16	0	12
		0	0	0	0	0	0	0	0	0	0	0	0	12
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	16:20	11	11	10	11	2	4	0	0	20	17	17	0	12
		9	21	17	17	0	2	0	0	7	9	9	0	11
		0	0	0	0	4	2	0	0	0	0	0	0	12
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:20	16:25	6	20	19	18	4	4	0	3	6	7	8	0	12
		11	19	18	18	0	2	0	3	9	11	10	0	12
		10	17	17	16	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:25	16:30	3	18	17	18	3	3	0	2	15	18	16	0	11
		4	14	15	15	2	2	0	2	8	11	10	0	9
		0	0	0	0	0	0	0	0	11	7	8	0	7
		0	0	0	0	0	0	0	0	0	0	0	0	3
16:30	16:35	7	6	7	8	5	3	2	0	8	3	6	0	5
		6	6	7	7	4	8	0	4	10	9	11	0	3
		0	0	0	0	0	0	0	0	0	0	0	0	4
		0	0	0	0	0	0	0	0	0	0	0	0	5
16:35	16:40	8	9	11	11	3	6	3	6	15	10	6	0	7
		5	22	20	20	4	4	0	2	14	11	10	0	4
		4	0	0	0	4	4	0	0	0	0	0	0	9
		0	0	0	0	0	0	0	0	0	0	0	0	6
16:40	16:45	3	22	21	20	4	5	2	3	14	18	19	0	8
		7	12	13	13	5	5	0	0	17	16	12	0	10
		0	17	18	19	0	0	0	0	0	0	0	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	16:50	9	24	24	23	5	5	3	2	14	12	9	0	6
		7	9	9	9	5	3	0	0	10	15	12	0	2
		0	0	0	0	0	0	0	0	15	11	9	0	8
		0	0	0	0	0	0	0	0	0	0	0	0	3
16:50	16:55	4	7	6	6	0	2	0	4	15	12	11	0	8
		6	6	7	7	3	3	0	3	6	6	3	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	9
		0	0	0	0	0	0	0	0	0	0	0	0	0
16:55	17:00	6	9	9	10	4	5	0	2	20	21	19	0	12
		3	15	16	17	5	6	0	2	19	20	20	0	12
		0	0	0	0	0	0	0	0	0	0	0	0	13
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:05	3	15	15	15	2	3	0	4	21	20	19	0	9
		7	17	16	18	5	5	0	6	20	21	20	0	12
		0	0	0	0	7	6	0	0	0	0	0	0	9
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:05	17:10	6	23	23	22	5	8	2	5	6	16	16	0	7
		7	22	22	22	5	7	0	3	16	17	16	0	13
		3	0	0	0	0	0	0	10	13	14	14	0	9
		0	0	0	0	0	0	0	0	0	0	0	0	7
17:10	17:15	0	23	22	19	4	5	0	2	7	11	12	0	6
		7	21	19	19	5	3	2	0	6	14	15	0	10
		7	14	14	13	0	0	0	0	0	0	0	0	6
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:20	9	14	14	14	5	4	0	0	22	23	22	0	8
		8	7	7	7	4	6	0	0	16	18	18	0	7
		0	0	0	0	0	0	0	0	0	0	0	0	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:20	17:25	11	6	7	9	3	4	0	2	9	9	9	3	5
		9	15	14	14	4	4	0	3	14	15	15	0	2
		0	0	0	0	0	0	0	0	0	0	0	0	2
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:25	17:30	6	13	12	12	0	3	0	4	12	13	12	2	0
		5	17	18	18	5	6	0	0	10	10	11	0	2
		0	0	0	0	4	3	0	0	0	0	0	0	2
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:35	4	18	17	17	3	8	2	0	17	19	18	1	8
		8	17	18	17	2	6	0	0	10	10	9	2	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:35	17:40	12	16	17	18	2	3	2	5	12	14	12	5	4
		14	20	20	19	4	2	3	4	12	14	14	0	2
		14	18	18	19	0	0	0	0	19	20	20	2	4
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:40	17:45	15	15	13	14	5	2	2	2	13	15	15	3	3
		14	16	16	16	0	7	0	0	14	15	15	2	2
		0	0	0	0	0	0	0	0	0	0	0	0	2
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	17:50	7	19	18	18	4	2	0	3	14	16	16	2	0
		7	22	21	20	0	3	0	2	16	15	17	2	3
		8	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:50	17:55	0	13	14	14	4	5	0	0	18	19	18	2	6
		5	21	20	20	0	2	0	3	22	21	19	0	3
		8	0	2	0	0	0	0	0	2	4	4	0	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
17:55	18:00	4	12	12	13	2	3	0	0	5	7	7	3	3
		5	6	7	9	0	0	0	0	14	16	15	3	3
		0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Mainline Rd and Wentworth St, Greenacre

GPS	-33.900643, 151.070016
Date:	Tue 09/08/22
Weather:	Fine
Suburban:	Greenacre
Customer:	McLaren

North:	Wentworth St
East:	Mainline Rd
South:	Wentworth St
West:	Carpark

Survey Period	AM:	7:00 AM-9:00 AM
	PM:	4:00 PM-6:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	4:15 PM-5:15 PM

All Vehicles

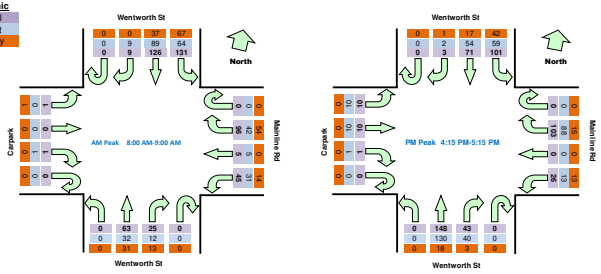
Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	2	26	29	0	23	0	4	0	8	13	0	0	0	0	1	443	
7:15	7:30	0	2	15	27	0	20	0	11	0	7	19	0	0	0	0	1	456	
7:30	7:45	0	0	28	28	0	25	1	8	0	4	16	0	0	0	0	0	484	
7:45	8:00	0	1	35	26	0	27	1	12	0	4	17	0	0	0	2	0	494	
8:00	8:15	0	2	36	29	0	27	0	7	0	5	13	0	0	0	0	0	502	Peak
8:15	8:30	0	2	25	34	0	27	4	17	0	8	12	0	0	0	0	1		
8:30	8:45	0	3	29	30	0	22	1	12	0	5	18	0	0	0	0	0		
8:45	9:00	0	2	36	38	0	20	0	9	0	7	20	0	0	1	0	0		
16:00	16:15	0	2	14	14	0	34	2	6	0	7	36	0	0	0	2	0	493	
16:15	16:30	0	1	18	28	0	19	0	7	0	4	34	0	0	0	1	1	516	Peak
16:30	16:45	0	0	21	27	0	35	0	8	0	15	35	0	0	0	2	3	515	
16:45	17:00	0	1	17	18	0	22	0	6	0	14	30	0	0	1	4	4	476	
17:00	17:15	0	1	15	28	0	27	0	5	0	10	49	0	0	0	3	2	444	
17:15	17:30	0	0	11	22	0	20	1	10	1	9	33	0	0	0	1	4		
17:30	17:45	0	0	10	23	0	18	0	7	0	9	38	0	0	0	1	1		
17:45	18:00	0	1	15	13	0	16	0	5	0	5	29	0	0	0	0	1		

Peak Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	9	126	131	0	96	5	45	0	25	63	0	0	1	0	1	502
16:15	17:15	0	3	71	101	0	103	0	26	0	43	148	0	0	1	10	10	516

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	2	22	8	0	8	0	2	0	6	1	0	0	0	0	0
7:15	7:30	0	2	10	12	0	6	0	11	0	4	5	0	0	0	0	1
7:30	7:45	0	0	21	7	0	8	1	4	0	2	4	0	0	0	0	0
7:45	8:00	0	1	24	16	0	8	1	9	0	2	6	0	0	0	2	0
8:00	8:15	0	2	25	12	0	13	0	7	0	3	8	0	0	0	0	0
8:15	8:30	0	2	20	19	0	9	4	11	0	6	6	0	0	0	0	0
8:30	8:45	0	3	21	18	0	12	1	8	0	2	9	0	0	0	0	0
8:45	9:00	0	2	23	15	0	8	0	5	0	1	9	0	0	1	0	0
16:00	16:15	0	2	7	11	0	27	2	0	0	6	26	0	0	0	2	0
16:15	16:30	0	1	12	16	0	18	0	3	0	4	29	0	0	0	1	1
16:30	16:45	0	0	14	16	0	28	0	2	0	12	25	0	0	0	2	3
16:45	17:00	0	0	15	9	0	19	0	4	0	14	28	0	0	1	4	4
17:00	17:15	0	1	13	18	0	23	0	4	0	10	48	0	0	0	3	2
17:15	17:30	0	0	8	19	0	15	1	4	0	9	33	0	0	0	1	4
17:30	17:45	0	0	4	19	0	16	0	3	0	9	32	0	0	0	1	1
17:45	18:00	0	1	10	8	0	14	0	3	0	5	29	0	0	0	0	1

Peak Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	9	89	64	0	42	5	31	0	12	32	0	0	1	0	0	285
16:15	17:15	0	2	54	59	0	88	0	13	0	40	130	0	0	1	10	10	407

Heavy Vehicles

Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	4	21	0	15	0	2	0	2	12	0	0	0	0	1
7:15	7:30	0	0	5	15	0	14	0	0	0	3	14	0	0	0	0	0
7:30	7:45	0	0	7	21	0	17	0	4	0	2	12	0	0	0	0	0
7:45	8:00	0	0	11	10	0	19	0	3	0	2	11	0	0	0	0	0
8:00	8:15	0	0	11	17	0	14	0	0	0	2	5	0	0	0	0	0
8:15	8:30	0	0	5	15	0	18	0	6	0	2	6	0	0	0	0	1
8:30	8:45	0	0	8	12	0	10	0	4	0	3	9	0	0	0	0	0
8:45	9:00	0	0	13	23	0	12	0	4	0	6	11	0	0	0	0	0
16:00	16:15	0	0	7	3	0	7	0	6	0	1	10	0	0	0	0	0
16:15	16:30	0	0	6	12	0	1	0	4	0	0	5	0	0	0	0	0
16:30	16:45	0	0	7	11	0	7	0	6	0	3	10	0	0	0	0	0
16:45	17:00	0	1	2	9	0	3	0	2	0	0	2	0	0	0	0	0
17:00	17:15	0	0	2	10	0	4	0	1	0	0	1	0	0	0	0	0
17:15	17:30	0	0	3	3	0	5	0	6	1	0	0	0	0	0	0	0
17:30	17:45	0	0	6	4	0	2	0	4	0	0	6	0	0	0	0	0
17:45	18:00	0	0	5	5	0	2	0	2	0	0	0	0	0	0	0	0

Peak Time		North Approach Wentworth St				East Approach Mainline Rd				South Approach Wentworth St				West Approach Carpark				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:00	9:00	0	0	37	67	0	54	0	14	0	13	31	0	0	0	0	1	217
16:15	17:15	0	1	17	42	0	15	0	13	0	3	18	0	0	0	0	0	109

ANNEXURE C: SIDRA RESULTS
(4 SHEETS)

MOVEMENT SUMMARY

Site: 101 [Roberts Rd / Norfolk Rd EX AM - SCATS adjusted - FINAL (Site Folder: General - SCATS adjusted)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Roberts Rd / Norfolk Rd
Existing Conditions
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site User-Given Cycle Time)

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: Roberts Road															
1	L2	All MCs	57	1.9	57	1.9	0.809	31.8	LOS C	43.3	321.8	0.88	0.82	0.88	40.5
2	T1	All MCs	2373	7.6	2373	7.6	* 0.809	29.4	LOS C	43.3	323.2	0.88	0.81	0.88	41.9
3	R2	All MCs	84	38.8	84	38.8	0.781	89.7	LOS F	6.0	56.2	1.00	0.91	1.23	25.3
Approach			2514	8.5	2514	8.5	0.809	31.5	LOS C	43.3	323.2	0.88	0.82	0.89	39.5
East: Norfolk Road															
4	L2	All MCs	17	81.2	17	81.2	0.162	60.8	LOS E	1.5	15.8	0.93	0.71	0.93	28.4
5	T1	All MCs	7	14.3	7	14.3	0.162	71.5	LOS F	1.5	15.8	0.93	0.71	0.93	30.0
6	R2	All MCs	104	68.7	104	68.7	* 0.564	76.5	LOS F	3.6	39.8	1.00	0.79	1.04	25.9
Approach			128	67.2	128	67.2	0.564	74.1	LOS F	3.6	39.8	0.99	0.77	1.02	26.4
North: Roberts Road															
7	L2	All MCs	194	39.1	194	39.1	0.154	24.7	LOS B	1.4	13.4	0.17	0.59	0.17	51.0
8	T1	All MCs	1954	10.7	1954	10.7	0.765	31.5	LOS C	38.6	295.1	0.84	0.77	0.84	42.5
9	R2	All MCs	133	3.2	133	3.2	* 0.669	47.8	LOS D	6.1	44.2	1.00	0.89	1.06	34.0
Approach			2280	12.7	2280	12.7	0.765	31.9	LOS C	38.6	295.1	0.80	0.76	0.80	39.2
West: Norfolk Road															
10	L2	All MCs	180	2.9	180	2.9	0.514	40.8	LOS C	9.0	64.3	0.94	0.80	0.94	34.8
11	T1	All MCs	6	0.0	6	0.0	* 0.514	62.2	LOS E	9.0	64.3	0.94	0.80	0.94	35.7
12	R2	All MCs	97	3.3	97	3.3	0.424	65.7	LOS E	6.0	43.4	0.97	0.78	0.97	28.4
Approach			283	3.0	283	3.0	0.514	49.8	LOS D	9.0	64.3	0.95	0.79	0.95	32.3
All Vehicles			5205	11.5	5205	11.5	0.809	33.7	LOS C	43.3	323.2	0.85	0.79	0.86	38.4

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.
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)

MOVEMENT SUMMARY

Site: 101 [Roberts Rd / Norfolk Rd EX PM - SCATS adjusted - FINAL (Site Folder: General - SCATS adjusted)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Roberts Rd / Norfolk Rd
Existing Conditions
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site User-Given Cycle Time)

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: Roberts Road															
1	L2	All MCs	45	4.7	45	4.7	0.674	30.5	LOS C	31.6	232.3	0.79	0.73	0.79	41.0
2	T1	All MCs	1932	5.9	1932	5.9	0.674	26.4	LOS B	31.7	233.2	0.79	0.72	0.79	42.5
3	R2	All MCs	75	50.7	75	50.7	0.528	75.5	LOS F	4.9	49.2	0.99	0.78	0.99	26.9
Approach			2052	7.5	2052	7.5	0.674	28.3	LOS B	31.7	233.2	0.80	0.73	0.80	40.9
East: Norfolk Road															
4	L2	All MCs	26	16.0	26	16.0	0.316	54.8	LOS D	3.8	28.6	0.96	0.75	0.96	28.8
5	T1	All MCs	35	3.0	35	3.0	0.316	70.3	LOS E	3.8	28.6	0.96	0.75	0.96	29.6
6	R2	All MCs	254	5.0	254	5.0	* 0.822	84.5	LOS F	9.0	65.7	1.00	0.93	1.24	26.0
Approach			315	5.7	315	5.7	0.822	80.5	LOS F	9.0	65.7	0.99	0.90	1.18	25.6
North: Roberts Road															
7	L2	All MCs	91	44.2	91	44.2	0.074	27.3	LOS B	0.6	5.9	0.16	0.58	0.16	50.9
8	T1	All MCs	2053	4.1	2053	4.1	* 0.809	37.3	LOS C	43.3	313.7	0.91	0.84	0.92	40.4
9	R2	All MCs	186	1.1	186	1.1	* 0.682	43.3	LOS D	8.2	57.7	1.00	0.91	1.03	35.3
Approach			2329	5.4	2329	5.4	0.809	37.4	LOS C	43.3	313.7	0.89	0.83	0.90	37.1
West: Norfolk Road															
10	L2	All MCs	143	2.9	143	2.9	0.488	39.4	LOS C	7.4	53.3	0.95	0.79	0.95	34.7
11	T1	All MCs	13	0.0	13	0.0	* 0.488	66.9	LOS E	7.4	53.3	0.95	0.79	0.95	35.7
12	R2	All MCs	63	1.7	63	1.7	0.357	69.0	LOS E	4.0	28.5	0.98	0.76	0.98	27.7
Approach			219	2.4	219	2.4	0.488	49.5	LOS D	7.4	53.3	0.95	0.78	0.95	32.4
All Vehicles			4915	6.2	4915	6.2	0.822	36.9	LOS C	43.3	313.7	0.86	0.79	0.88	37.2

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.
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)

MOVEMENT SUMMARY

Site: 101 [Roberts Rd / Norfolk Rd PD AM - SCATS adjusted - FINAL (Site Folder: SCATS adjusted - Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Roberts Rd / Norfolk Rd
Existing Conditions
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site User-Given Cycle Time)

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: Roberts Road															
1	L2	All MCs	57	1.9	57	1.9	0.837	34.8	LOS C	46.1	343.0	0.92	0.86	0.93	39.2
2	T1	All MCs	2378	7.8	2378	7.8	* 0.837	33.0	LOS C	46.1	344.3	0.92	0.85	0.93	40.4
3	R2	All MCs	102	41.2	102	41.2	0.800	89.9	LOS F	7.3	69.2	1.00	0.92	1.23	25.5
Approach			2537	9.0	2537	9.0	0.837	35.3	LOS C	46.1	344.3	0.92	0.86	0.94	37.9
East: Norfolk Road															
4	L2	All MCs	35	66.7	35	66.7	0.226	59.1	LOS E	2.5	26.3	0.92	0.74	0.92	28.9
5	T1	All MCs	7	14.3	7	14.3	0.226	72.0	LOS F	2.5	26.3	0.92	0.74	0.92	30.4
6	R2	All MCs	123	66.7	123	66.7	* 0.660	77.9	LOS F	4.3	47.4	1.00	0.84	1.12	25.6
Approach			165	64.3	165	64.3	0.660	73.7	LOS F	4.3	47.4	0.98	0.81	1.07	26.4
North: Roberts Road															
7	L2	All MCs	220	42.6	220	42.6	0.181	26.5	LOS B	1.9	18.5	0.20	0.60	0.20	50.7
8	T1	All MCs	1959	10.9	1959	10.9	0.800	35.2	LOS C	41.0	314.2	0.88	0.81	0.89	41.1
9	R2	All MCs	133	3.2	133	3.2	* 0.592	47.1	LOS D	5.8	41.6	1.00	0.86	1.00	34.7
Approach			2312	13.5	2312	13.5	0.800	35.0	LOS C	41.0	314.2	0.82	0.79	0.83	37.9
West: Norfolk Road															
10	L2	All MCs	180	2.9	180	2.9	0.486	39.2	LOS C	8.8	62.8	0.92	0.80	0.92	35.3
11	T1	All MCs	6	0.0	6	0.0	* 0.486	62.0	LOS E	8.8	62.8	0.92	0.80	0.92	36.3
12	R2	All MCs	97	3.3	97	3.3	0.424	65.7	LOS E	6.0	43.4	0.97	0.78	0.97	28.4
Approach			283	3.0	283	3.0	0.486	48.7	LOS D	8.8	62.8	0.94	0.79	0.94	32.6
All Vehicles			5297	12.4	5297	12.4	0.837	37.1	LOS C	46.1	344.3	0.88	0.82	0.90	37.1

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.
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. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Roberts Road												

MOVEMENT SUMMARY

Site: 101 [Roberts Rd / Norfolk Rd PD PM - SCATS adjusted - FINAL (Site Folder: SCATS adjusted - Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Roberts Rd / Norfolk Rd
Existing Conditions
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site User-Given Cycle Time)

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: Roberts Road															
1	L2	All MCs	45	4.7	45	4.7	0.699	32.2	LOS C	33.0	242.8	0.82	0.75	0.82	40.3
2	T1	All MCs	1937	6.1	1937	6.1	0.699	28.4	LOS B	33.1	243.7	0.82	0.75	0.82	41.7
3	R2	All MCs	93	51.1	93	51.1	0.766	83.5	LOS F	6.6	66.0	1.00	0.90	1.20	25.6
Approach			2075	8.1	2075	8.1	0.766	31.0	LOS C	33.1	243.7	0.83	0.76	0.84	39.7
East: Norfolk Road															
4	L2	All MCs	44	31.0	44	31.0	0.341	55.1	LOS D	4.8	39.0	0.95	0.76	0.95	29.3
5	T1	All MCs	35	3.0	35	3.0	0.341	68.3	LOS E	4.8	39.0	0.95	0.76	0.95	30.3
6	R2	All MCs	272	8.1	272	8.1	* 0.776	83.6	LOS F	9.3	69.9	1.00	0.90	1.16	26.9
Approach			351	10.5	351	10.5	0.776	78.5	LOS F	9.3	69.9	0.99	0.87	1.11	25.9
North: Roberts Road															
7	L2	All MCs	108	45.6	108	45.6	0.090	29.4	LOS C	0.9	8.4	0.18	0.58	0.18	50.7
8	T1	All MCs	2058	4.3	2058	4.3	* 0.829	40.4	LOS C	44.6	323.9	0.92	0.86	0.95	39.3
9	R2	All MCs	186	1.1	186	1.1	* 0.767	50.5	LOS D	8.7	61.2	1.00	0.95	1.13	33.0
Approach			2353	6.0	2353	6.0	0.829	40.7	LOS C	44.6	323.9	0.90	0.86	0.93	35.9
West: Norfolk Road															
10	L2	All MCs	143	2.9	143	2.9	0.489	37.8	LOS C	7.2	51.3	0.95	0.79	0.95	35.3
11	T1	All MCs	13	0.0	13	0.0	* 0.489	64.2	LOS E	7.2	51.3	0.95	0.79	0.95	36.3
12	R2	All MCs	63	1.7	63	1.7	0.332	67.8	LOS E	4.0	28.2	0.97	0.76	0.97	28.0
Approach			219	2.4	219	2.4	0.489	48.0	LOS D	7.2	51.3	0.95	0.78	0.95	32.9
All Vehicles			4997	7.0	4997	7.0	0.829	39.6	LOS C	44.6	323.9	0.88	0.81	0.91	36.2

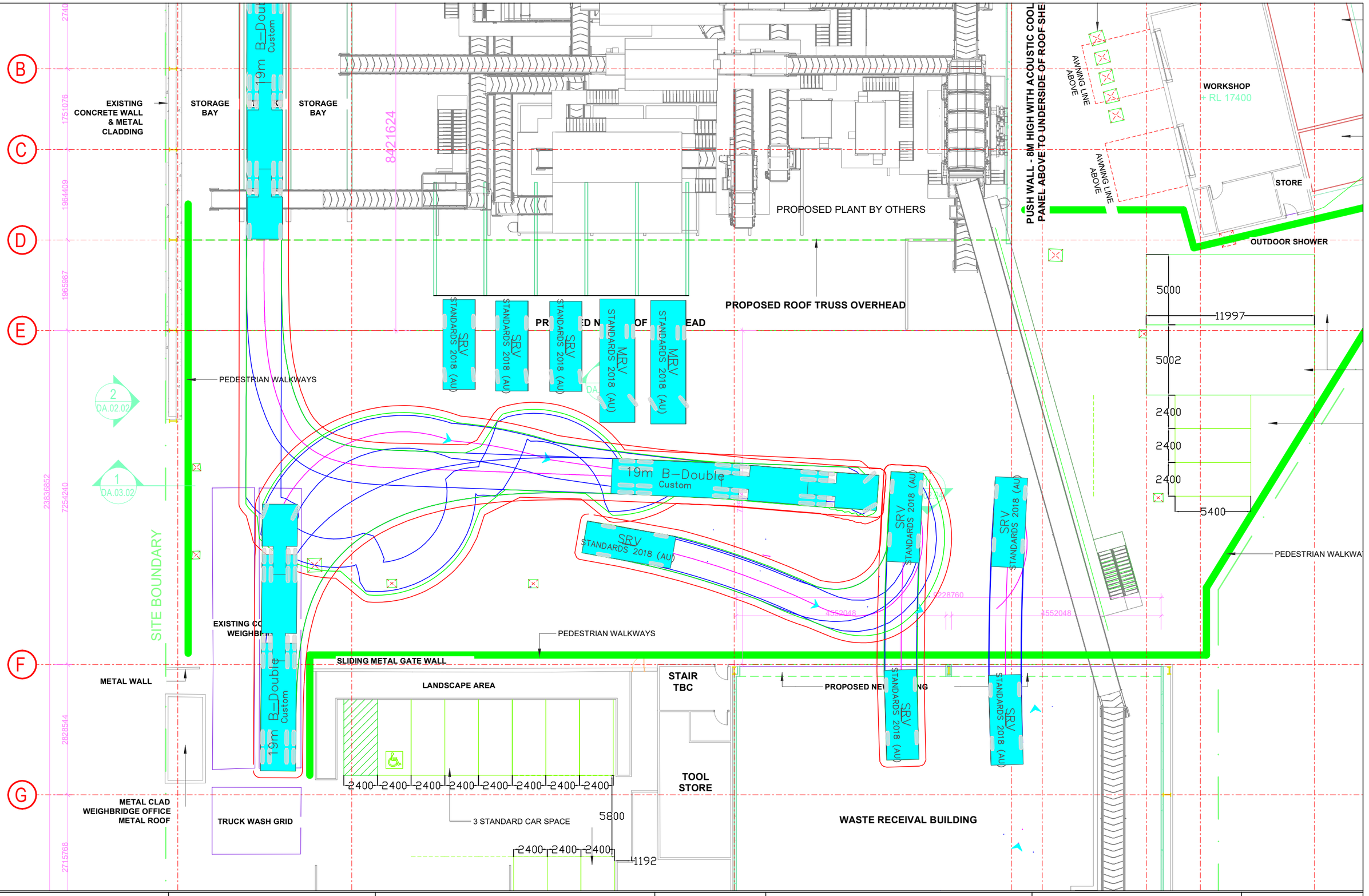
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: 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. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Roberts Road												

ANNEXURE D: SWEPT PATH ASSESSMENT
(1 SHEET)



MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.

Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
P : (02) 9521 - 7199
E : admin@mclarentraffic.com.au
www.mclarentraffic.com.au

Client / Project:
4Pillars

Project Address:
Bellfrog Street, Greenacre

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019

Scale @ A3 1:250

Project No:
220557

Drawing Title:
01 - Maximum Loading And Unloading Capacity

Revision History		
Version	Date	Notes
A	25/07/2025	

Filename: da.01.02.dwg

ANNEXURE E: QUEUEING ANALYSIS
(2 SHEETS)

Multi-Server Queue Worksheet

Service Bays	2	Arrival Rate (vehicles/hour)	19.39	Wait Time in Each Bay (seconds)	123.6
Vehicles/Second IN	0.0054	Vehicles/Second OUT (per bay)	0.0081		
P0	0.5005	rho (M/M/c and M/M/1) Non-Random Service Bays Minimum	0.666	rho (M/M/1 only)	0.3329

	CCC Average Lengths of Stay			
	TEF AM (LDCC)	TEF PM (LDCC)	Guide Avg (General)	Guide Avg (LDCC)
Wait Time	341	496	408	468
Traffic Gen to Use	0.8	0.7	0.8	0.7

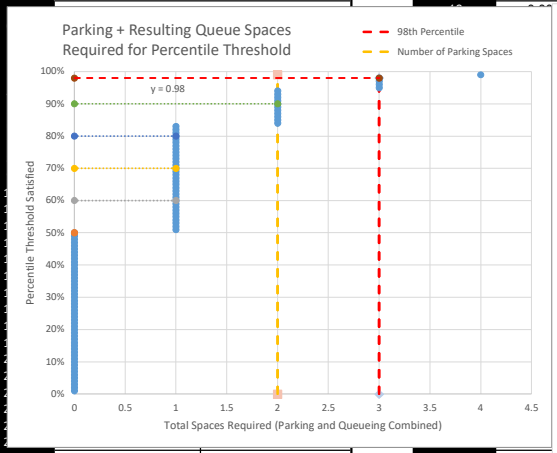
n	1st Term	Pn	P(>n)	Alternate (P>n)
0	1.00E+00	0.501	49.9%	48.61%
1	6.66E-01	0.333	16.6%	14.40%
2	2.22E-01	0.111	5.5%	3.01%
3	4.92E-02	0.037	1.8%	0.48%
4	8.18E-03	0.012	0.6%	0.06%
5	1.09E-03	0.004	0.2%	0.01%
6	1.21E-04	0.001	0.1%	0.00%
7	1.15E-05	0.000	0.0%	0.00%
8	9.57E-07	0.000	0.0%	0.00%
9	7.08E-08	0.000	0.0%	0.00%
10	4.71E-09	0.000	0.0%	0.00%
11	2.85E-10	0.000	0.0%	0.00%
12	1.58E-11	0.000	0.0%	0.00%
13	8.10E-13	0.000	0.0%	0.00%
14	3.85E-14	0.000	0.0%	0.00%
15	1.71E-15	0.000	0.0%	0.00%
16	7.11E-17	0.000	0.0%	0.00%
17	2.79E-18	0.000	0.0%	0.00%
18	1.03E-19	0.000	0.0%	0.00%
19	3.61E-21	0.000	0.0%	0.00%
20	1.20E-22	0.000	0.0%	0.00%
21	3.81E-24	0.000	0.0%	0.00%
22	1.15E-25	0.000	0.0%	0.00%
23	3.34E-27	0.000	0.0%	0.00%
24	9.25E-29	0.000	0.0%	0.00%
25	2.46E-30	0.000	0.0%	0.00%
26	6.31E-32	0.000	0.0%	0.00%
27	1.56E-33	0.000	0.0%	0.00%
28	3.70E-35	0.000	0.0%	0.00%
29	8.49E-37	0.000	0.0%	0.00%
30	1.88E-38	0.000	0.0%	0.00%
31	4.05E-40	0.000	0.0%	0.00%
32	8.42E-42	0.000	0.0%	0.00%
33	1.70E-43	0.000	0.0%	0.00%
34	3.33E-45	0.000	0.0%	0.00%
35	6.32E-47	0.000	0.0%	0.00%
36	1.17E-48	0.000	0.0%	0.00%
37	2.10E-50	0.000	0.0%	0.00%
38	3.69E-52	0.000	0.0%	0.00%
39	6.29E-54	0.000	0.0%	0.00%
40	1.05E-55	0.000	0.0%	0.00%
41	1.70E-57	0.000	0.0%	0.00%
42	2.70E-59	0.000	0.0%	0.00%
43	4.17E-61	0.000	0.0%	0.00%
44	6.31E-63	0.000	0.0%	0.00%
45	9.34E-65	0.000	0.0%	0.00%
46	1.35E-66	0.000	0.0%	0.00%
47	1.91E-68	0.000	0.0%	0.00%
48	2.66E-70	0.000	0.0%	0.00%

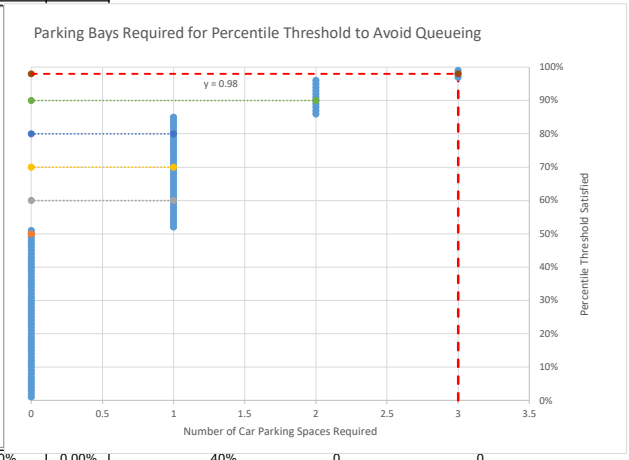
Percentile	Number of Vehicles in System	Number of Vehicles Queued
0%	0	0
50%	0	0
60%	1	0
70%	1	0
80%	1	0
90%	2	0
98%	3	1
99.90%	6	4
	Erlang	
	Erlang-B (Blocking)	Erlang-C (Queueing)
		Average Queue Time = 13.9 seconds
	Probability of Overspill	Probability of Arriving Driver Having to Queue
	11.7%	15.0%
Lamda	19.39	
mu	29.12621359	
Erlangs	0.665723333	
26		
27		
28		
29		
30		
31		

Single Bay System Only		
n	Pn	P(>=n)
0	66.71%	33.29%
1	22.21%	11.08%
2	7.39%	3.69%
3	2.46%	1.23%
4	0.82%	0.41%
5	0.27%	0.14%
6	0.09%	0.05%
7	0.03%	0.02%
8	0.01%	0.01%
9	0.00%	0.00%
10	0.00%	0.00%
11	0.00%	0.00%
12	0.00%	0.00%
13	0.00%	0.00%
14	0.00%	0.00%
15	0.00%	0.00%
43	0.00%	0.00%
44	0.00%	0.00%
45	0.00%	0.00%
46	0.00%	0.00%
47	0.00%	0.00%
48	0.00%	0.00%

	Vehicles in System	Number Vehicles Queued
98th Percentile Queue (Single Bay System)	2.6	1
98%	3	1

0%		
1%	0	0
2%	0	0
3%	0	0
4%	0	0
5%	0	0
6%	0	0
7%	0	0
8%	0	0
9%	0	0
10%	0	0
11%	0	0
12%	0	0
40%	0	0
41%	0	0
42%	0	0
43%	0	0
44%	0	0
45%	0	0





In the single-line, multiserver, single-phase model, customers form a single line and are served by the first server available. The model assumes that there are s identical servers, the service time distribution for *each server* is exponential, and the mean service time is $1/\mu$. Using these assumptions, we can describe the operating characteristics with the following formulas:

s = the number of servers in the system

$p = \frac{\lambda}{s\mu}$ = the average utilization of the system

$P_0 = \left[\sum_{n=0}^{s-1} \frac{(\lambda/\mu)^n}{n!} + \frac{(\lambda/\mu)^s}{s!}\left(\frac{1}{1-p}\right)\right]^{-1}$ = the probability that no customers are in the system

$L_Q = \frac{P_0(\lambda/\mu)^s p}{s!(1-p)^2}$ = the average number of customers waiting in line

$W_Q = \frac{L_Q}{\lambda}$ = the average time spent waiting in line

$W = W_Q + \frac{1}{\mu}$ = the average time spent in the system, including service

$L = \lambda W$ = the average number of customers in the service system

$P_n = \begin{cases} \frac{(\lambda/\mu)^n}{n!} P_0 & \text{for } n \le s \\ \frac{(\lambda/\mu)^n}{s!s^{n-s}} P_0 & \text{for } n > s \end{cases}$ = the probability that n customers are in the system at a given time

Single-server, s

Single-server, r

Multiserver, sin
single-phase

Multiserver, mu
single-phase

Multiserver, mu

Multi-Server Queue Worksheet

Service Bays	6	Arrival Rate (vehicles/hour)	14.7	Wait Time in Each Bay (seconds)	363.6
Vehicles/Second IN	0.0041	Vehicles/Second OUT (per bay)	0.0028		
P0	0.2265	rho (M/M/c and M/M/1) Non-Random Service Bays Minimum	1.485	rho (M/M/1 only)	0.2475

	CCC Average Lengths of Stay			
	TEF AM (LDCC)	TEF PM (LDCC)	Guide Avg (General)	Guide Avg (LDCC)
Wait Time	341	496	408	468
Traffic Gen to Use	0.8	0.7	0.8	0.7

n	1st Term	Pn	P(>n)	Alternate (P>n)
0	1.00E+00	0.227	77.3%	77.34%
1	1.48E+00	0.336	43.7%	43.70%
2	1.10E+00	0.250	18.8%	18.73%
3	5.45E-01	0.124	6.4%	6.37%
4	2.02E-01	0.046	1.8%	1.79%
5	6.01E-02	0.014	0.4%	0.42%
6	1.49E-02	0.003	0.1%	0.09%
7	3.16E-03	0.001	0.0%	0.02%
8	5.86E-04	0.000	0.0%	0.00%
9	9.66E-05	0.000	0.0%	0.00%
10	1.43E-05	0.000	0.0%	0.00%
11	1.94E-06	0.000	0.0%	0.00%
12	2.40E-07	0.000	0.0%	0.00%
13	2.74E-08	0.000	0.0%	0.00%
14	2.90E-09	0.000	0.0%	0.00%
15	2.87E-10	0.000	0.0%	0.00%
16	2.66E-11	0.000	0.0%	0.00%
17	2.33E-12	0.000	0.0%	0.00%
18	1.92E-13	0.000	0.0%	0.00%
19	1.50E-14	0.000	0.0%	0.00%
20	1.11E-15	0.000	0.0%	0.00%
21	7.87E-17	0.000	0.0%	0.00%
22	5.31E-18	0.000	0.0%	0.00%
23	3.43E-19	0.000	0.0%	0.00%
24	2.12E-20	0.000	0.0%	0.00%
25	1.26E-21	0.000	0.0%	0.00%
26	7.19E-23	0.000	0.0%	0.00%
27	3.96E-24	0.000	0.0%	0.00%
28	2.10E-25	0.000	0.0%	0.00%
29	1.07E-26	0.000	0.0%	0.00%
30	5.31E-28	0.000	0.0%	0.00%
31	2.55E-29	0.000	0.0%	0.00%
32	1.18E-30	0.000	0.0%	0.00%
33	5.31E-32	0.000	0.0%	0.00%
34	2.32E-33	0.000	0.0%	0.00%
35	9.84E-35	0.000	0.0%	0.00%
36	4.06E-36	0.000	0.0%	0.00%
37	1.63E-37	0.000	0.0%	0.00%
38	6.36E-39	0.000	0.0%	0.00%
39	2.42E-40	0.000	0.0%	0.00%
40	8.99E-42	0.000	0.0%	0.00%
41	3.26E-43	0.000	0.0%	0.00%
42	1.15E-44	0.000	0.0%	0.00%
43	3.97E-46	0.000	0.0%	0.00%
44	1.34E-47	0.000	0.0%	0.00%
45	4.43E-49	0.000	0.0%	0.00%
46	1.43E-50	0.000	0.0%	0.00%

Percentile	Number of Vehicles in System	Number of Vehicles Queued
0%	0	0
50%	1	0
60%	2	0
70%	2	0
80%	2	0
90%	3	0
98%	4	0
99.90%	7	1

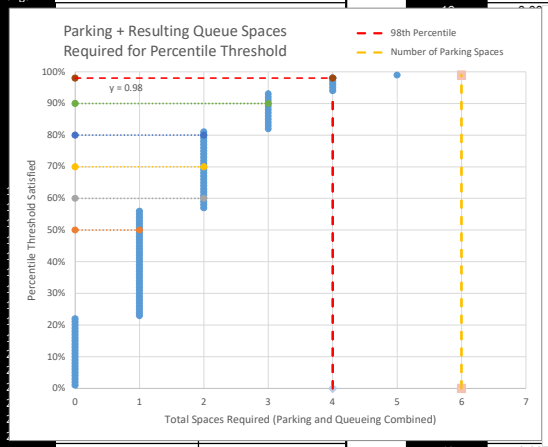
Erlang	
Erlang-B (Blocking)	Erlang-C (Queueing)
	Average Queue Time = 0.2 seconds
Probability of Overspill	Probability of Arriving Driver Having to Queue
0.3%	0.4%

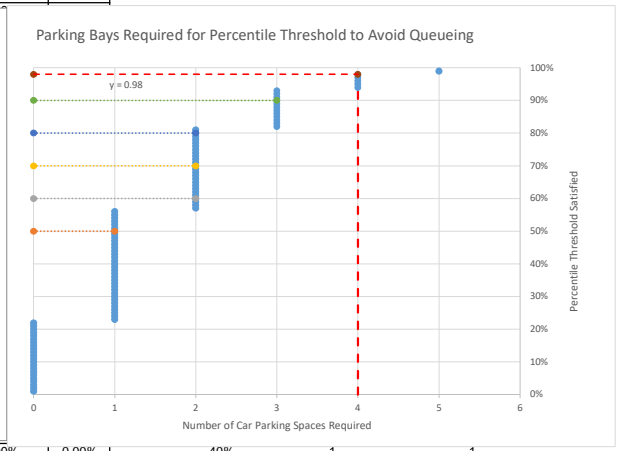
Lamda	14.7
mu	9.900990099
Erlangs	1.4847

Single Bay System Only		
n	Pn	P(>=n)
0	75.26%	24.75%
1	18.62%	6.12%
2	4.61%	1.52%
3	1.14%	0.37%
4	0.28%	0.09%
5	0.07%	0.02%
6	0.02%	0.01%
7	0.00%	0.00%
8	0.00%	0.00%
9	0.00%	0.00%
10	0.00%	0.00%
11	0.00%	0.00%
12	0.00%	0.00%
13	0.00%	0.00%
14	0.00%	0.00%
15	0.00%	0.00%
43	0.00%	0.00%
44	0.00%	0.00%
45	0.00%	0.00%
46	0.00%	0.00%

	Vehicles in System	Number Vehicles Queued
98th Percentile Queue (Single Bay System)	1.8	0
98%	2	0

0%		
1%	0	0
2%	0	0
3%	0	0
4%	0	0
5%	0	0
6%	0	0
7%	0	0
8%	0	0
9%	0	0
10%	0	0
11%	0	0
12%	0	0
40%	1	1
41%	1	1
42%	1	1
43%	1	1





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Single-server, single-p

Single-server, multiph

Multiserver, single-line single-phase

Multiserver, multiline single-phase

Multiserver, multiphas