Transport Impact Statement

Project:	Proposed Battery Energy Storage System Lot 5 Robartson Road, Merredin
Client:	Merredin Big Battery Nominee Pty Ltd ATF the Merredin Big Battery Trust
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1 Introduction

1.1 Proponent

Merredin Big Battery Nominee Pty Ltd ATF the Merredin Big Battery Trust are proposing to establish a new Battery Energy Storage System in Merredin.

Shawmac has been requested to prepare a Transport Impact Statement (TIS) in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 4 – Individual Developments*. The assessment considers the following key matters:

- Details of the proposed development.
- Vehicle access and parking.
- Provision for service vehicles.
- Hours of operation.
- Daily traffic volumes and vehicle types.
- Traffic management on frontage streets.
- Site specific and safety issues.

1.2 Site Location

The site is located on Lot 5 Robartson Road in Merredin. The local authority is Shire of Merredin.

The general site location is shown in **Figure 1**. An aerial view of the existing site is shown in **Figure 2**.

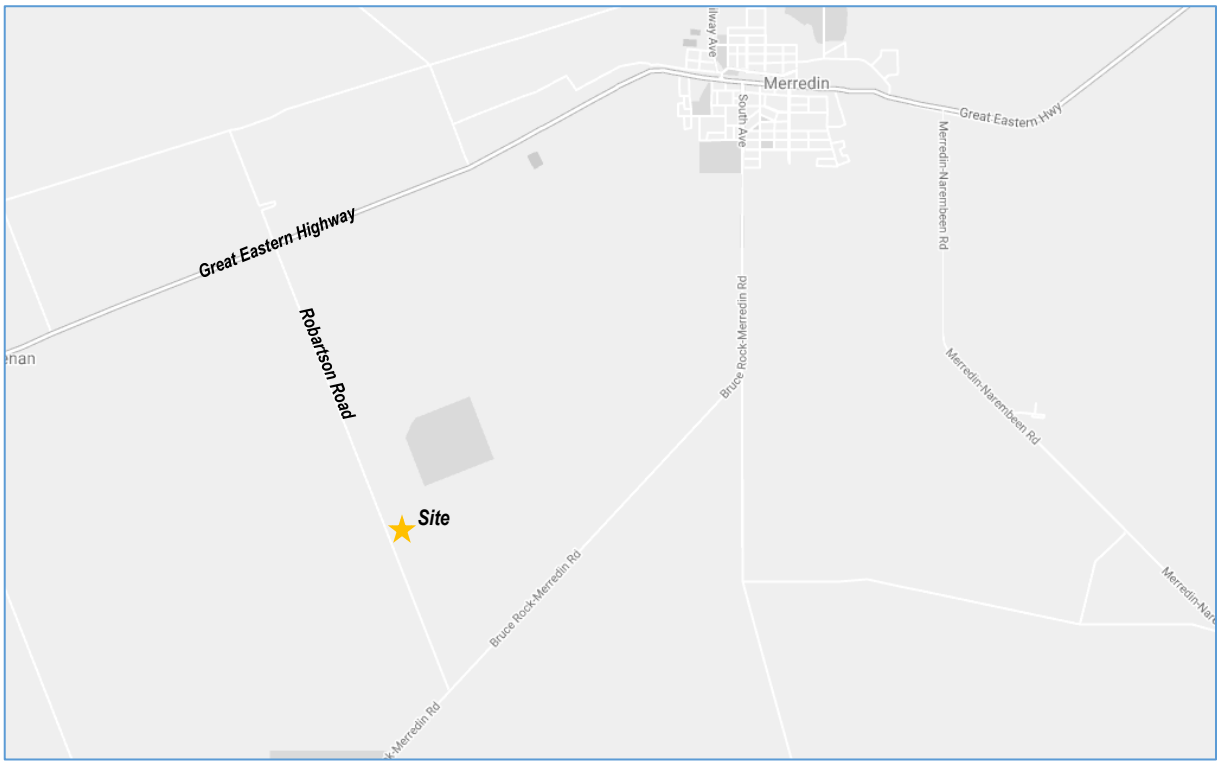


Figure 1: Site Location

Figure 2: Aerial View (Sourced from Locate V5)

2 Proposed Development

2.1 Land Use

It is proposed to construct a new Battery Energy Storage System.

Access to the site is proposed via the existing unsealed access on Robartson Road.

During construction, working hours will be from 7am to 6pm Monday to Saturday.

The site plan is shown in **Figure 3**.

Figure 3: Site Layout

3 Traffic Management on Frontage Streets

3.1 Road Network

The layout and hierarchy of the existing local road network according to the Main Roads WA *Road Information Mapping System* is shown in **Figure 4**.

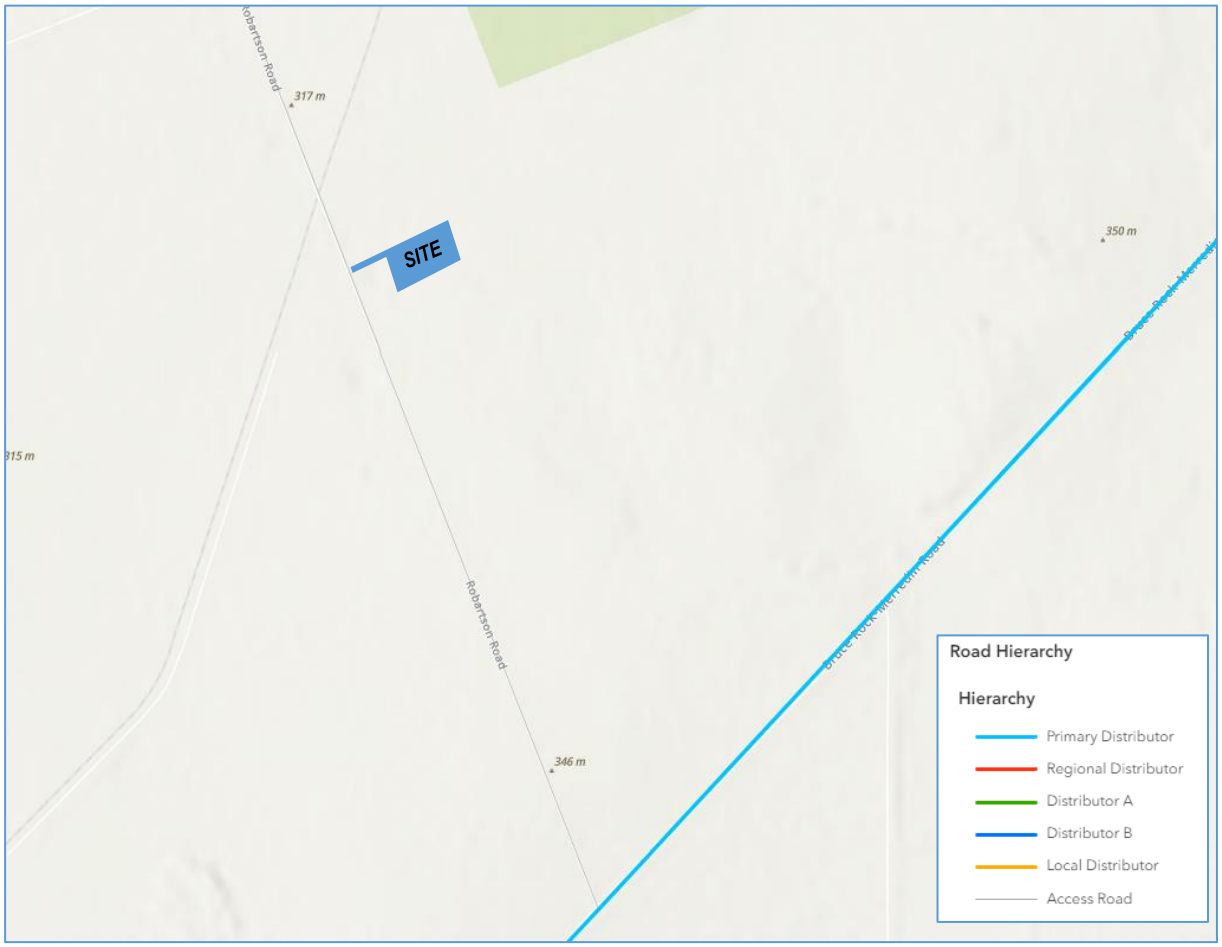


Figure 4: Existing Road Network Hierarchy

As shown, Robartson Road is an Access Road under the jurisdiction of the Shire of Merredin.

3.2 Speed Limits

The existing speed limits on the surrounding roads are shown in **Figure 5**.

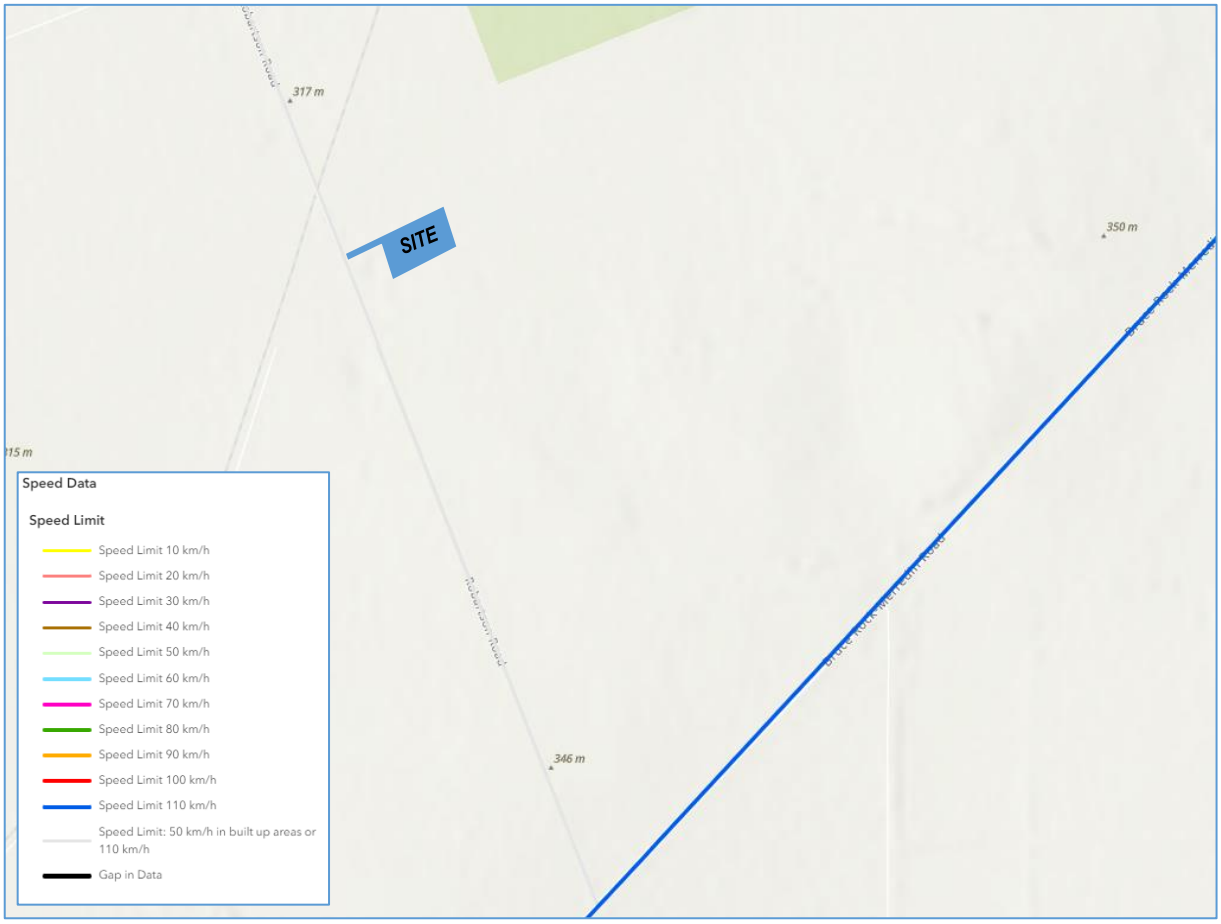


Figure 5: Existing Speed Limits

As shown, Robartson Road will be operating on a 110km/h speed limit as it is located outside built up areas.

3.3 Traffic Volumes

The available traffic volumes were sourced from Main Roads WA's Traffic Map as shown in **Figure 6**.

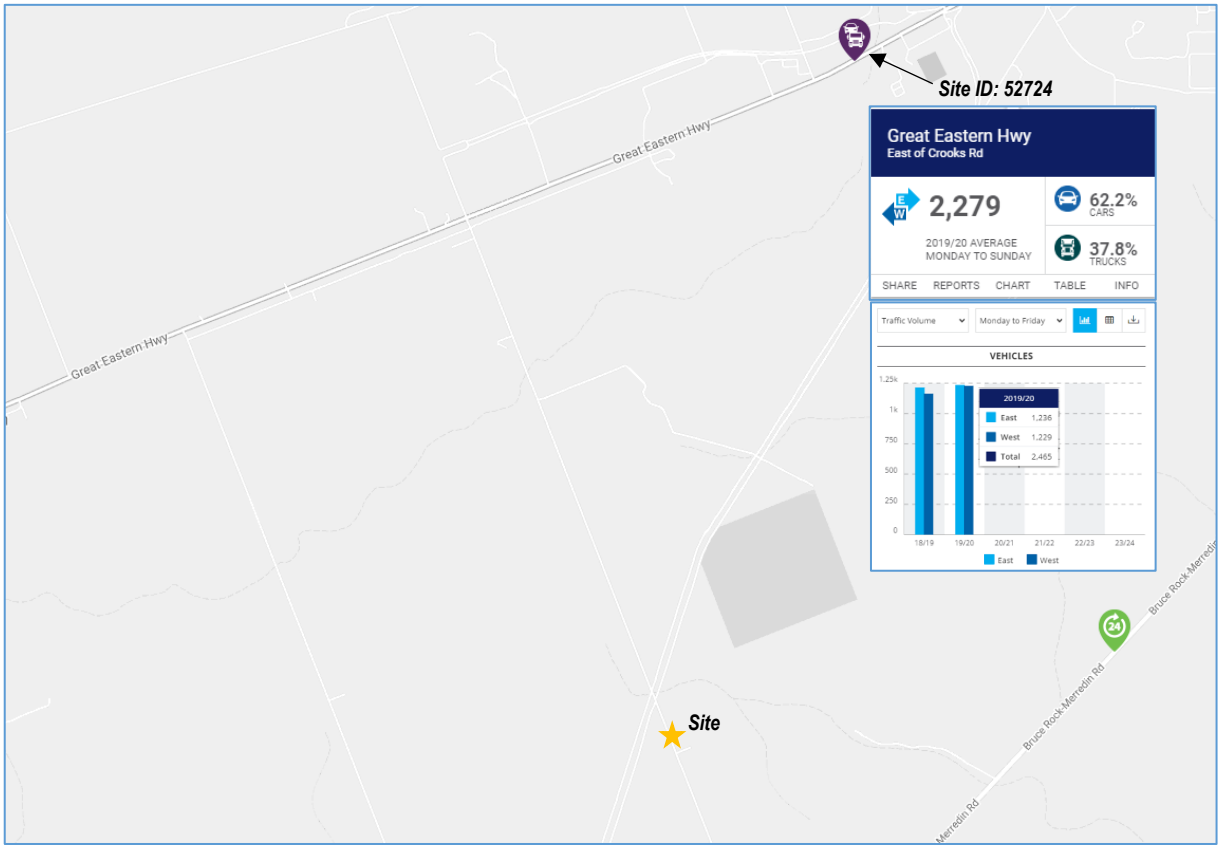
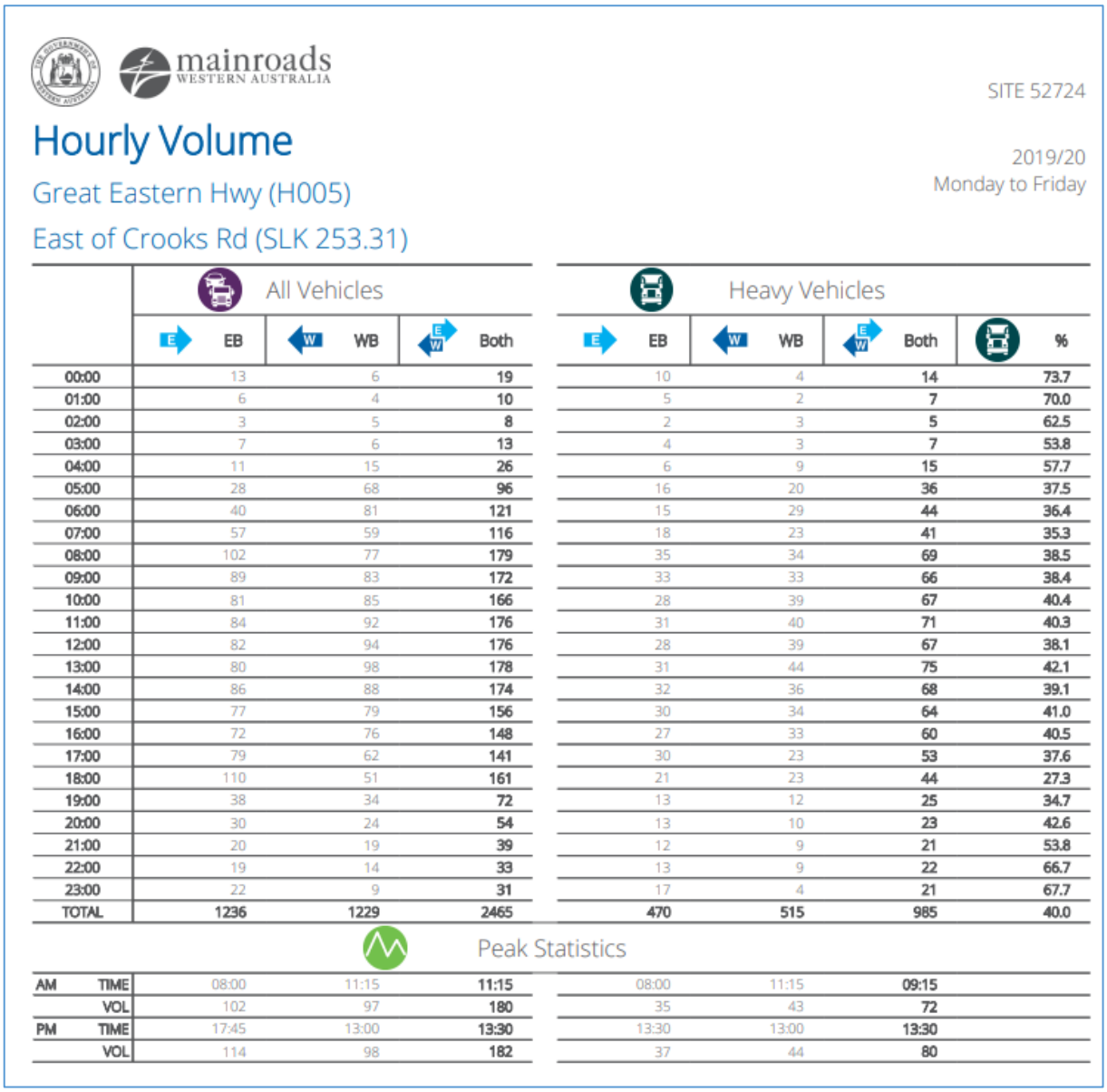


Figure 6: Main Roads WA's Trafficmap Available Traffic Volumes

In the absence of traffic volumes near the site, the traffic count on Great Eastern Highway in Merredin (Site ID: 52724) has been used for assessment as shown in **Figure 7**.

The actual volumes along Robartson Road are likely to be much lower.



mainroads WESTERN AUSTRALIA

SITE 52724

Hourly Volume

Great Eastern Hwy (H005)

East of Crooks Rd (SLK 253.31)

2019/20
Monday to Friday

	All Vehicles			Heavy Vehicles			
	EB	WB	Both	EB	WB	Both	%
00:00	13	6	19	10	4	14	73.7
01:00	6	4	10	5	2	7	70.0
02:00	3	5	8	2	3	5	62.5
03:00	7	6	13	4	3	7	53.8
04:00	11	15	26	6	9	15	57.7
05:00	28	68	96	16	20	36	37.5
06:00	40	81	121	15	29	44	36.4
07:00	57	59	116	18	23	41	35.3
08:00	102	77	179	35	34	69	38.5
09:00	89	83	172	33	33	66	38.4
10:00	81	85	166	28	39	67	40.4
11:00	84	92	176	31	40	71	40.3
12:00	82	94	176	28	39	67	38.1
13:00	80	98	178	31	44	75	42.1
14:00	86	88	174	32	36	68	39.1
15:00	77	79	156	30	34	64	41.0
16:00	72	76	148	27	33	60	40.5
17:00	79	62	141	30	23	53	37.6
18:00	110	51	161	21	23	44	27.3
19:00	38	34	72	13	12	25	34.7
20:00	30	24	54	13	10	23	42.6
21:00	20	19	39	12	9	21	53.8
22:00	19	14	33	13	9	22	66.7
23:00	22	9	31	17	4	21	67.7
TOTAL	1236	1229	2465	470	515	985	40.0

Peak Statistics

AM	TIME	08:00	11:15	11:15	08:00	11:15	09:15
	VOL	102	97	180	35	43	72
PM	TIME	17:45	13:00	13:30	13:30	13:00	13:30
	VOL	114	98	182	37	44	80

Figure 7: Great Eastern Highway, East of Crooks Road Traffic Volumes – Average Weekday

According to Austroads *Guide to Traffic Management Part 3: Transport Study and Analysis Methods*, the capacity of a two-lane highway is 1,700 passenger cars per hour for each direction of travel. The above volumes are well within the capacity of Great Eastern Highway.

3.4 RAV Network

3.4.1 Tandem Drive Network

The Tandem Drive network according to Main Roads WA's Heavy Vehicle Services (HVS) network mapping tool is shown in **Figure 8**.

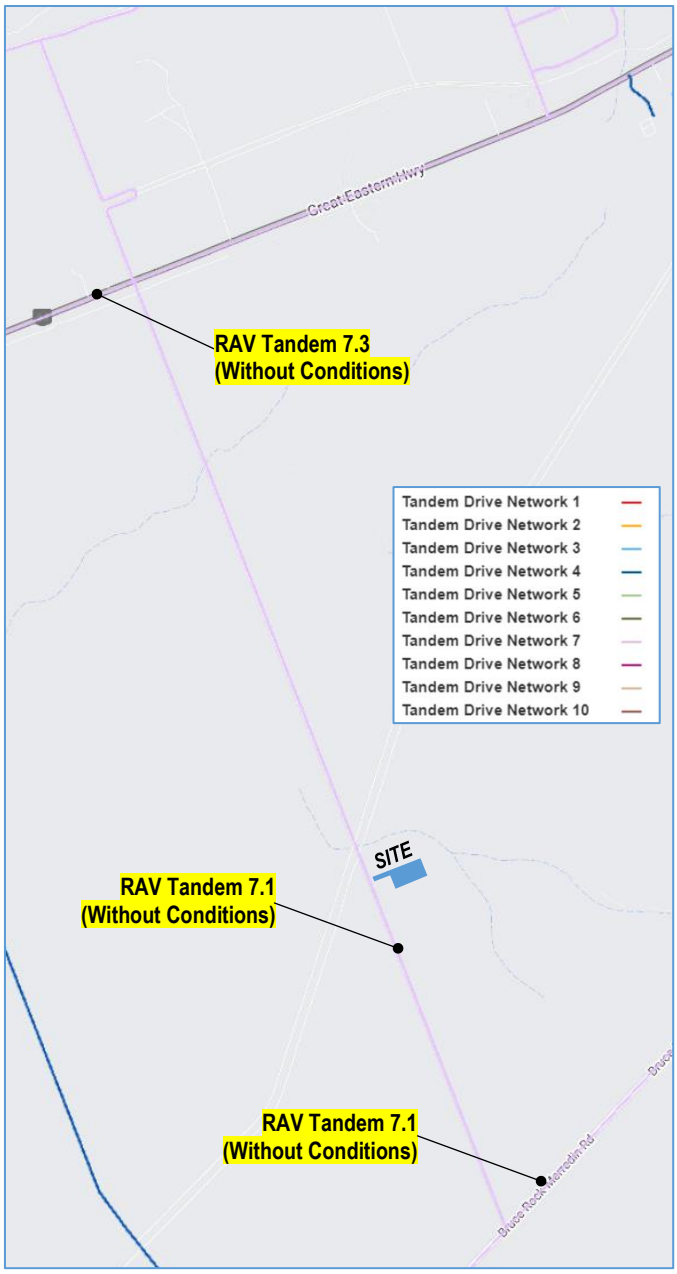


Figure 8: Tandem Drive RAV Network

The largest RAV vehicle able to travel along Robartson Road is a 36.5m Tandem Drive 7.1 road train.

3.4.2 Tri-Drive Network

The Tri Drive network according to Main Roads WA's HVS network mapping tool is shown in **Figure 9**.

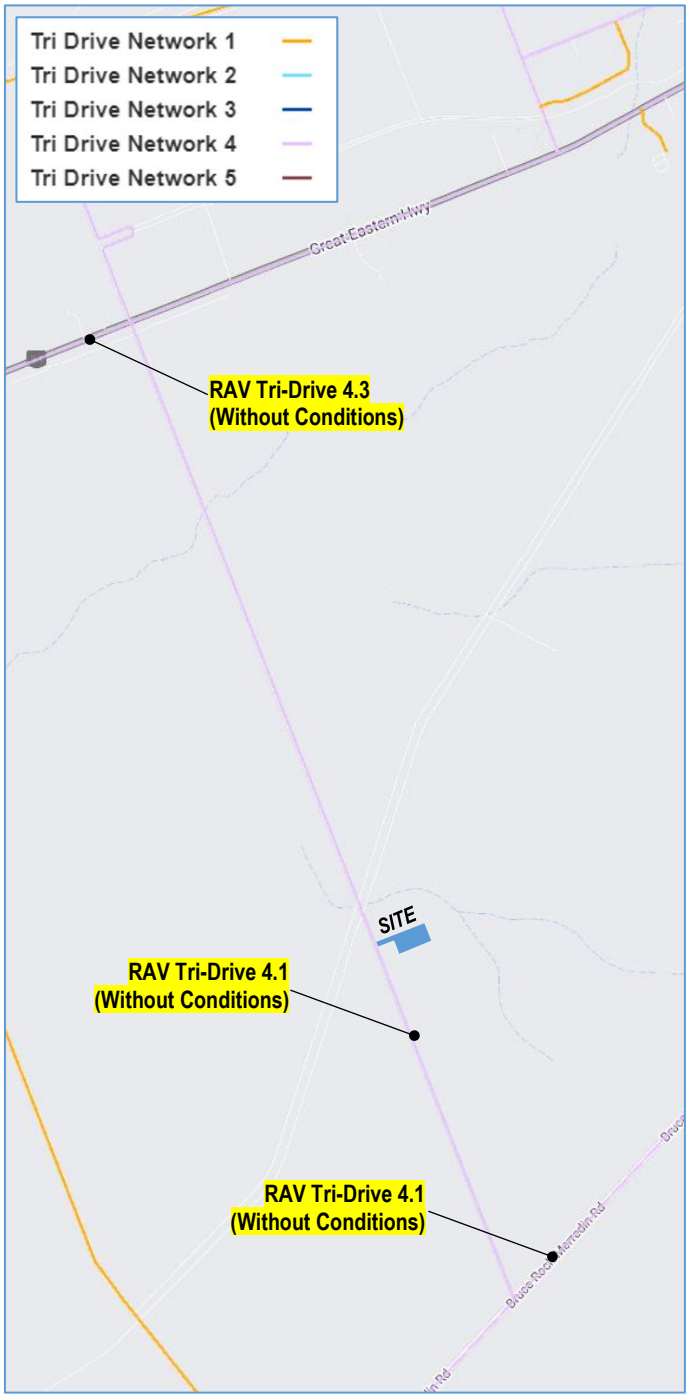


Figure 9: Tri Drive RAV Network

As shown, the largest RAV vehicle able to travel along Robartson Road is a 36.5m Tri-Drive 4.1 road train.

4 Traffic Impact

4.1 Assessment Period

The site will generate the most traffic during the construction phase which is estimated by the client to last approximately 12 to 18 months. The client has also confirmed that construction will occur from 7am to 6pm Monday to Saturday.

Once constructed and operational, the site will be unmanned and will generate no traffic other than for occasional maintenance which is expected to occur a few times per year. This assessment therefore focusses on the traffic impact of the construction phase.

The peak hours are assumed to be from 6am to 7am when most staff arrive and from 6pm to 7pm when most staff leave. Only the weekday scenarios have been tested as the background traffic is slightly lower on the weekends.

4.2 Proposed Construction Vehicle

During the construction phase, materials such as Tesla modules, batteries and megapacks will be delivered to the site using large articulated trucks. It is advised that the largest truck used during construction will be truck and trailer combinations over 23m long as shown in **Figure 10**. The proposed construction vehicles are well within the maximum RAV roads trains authorised on Robartson Road.

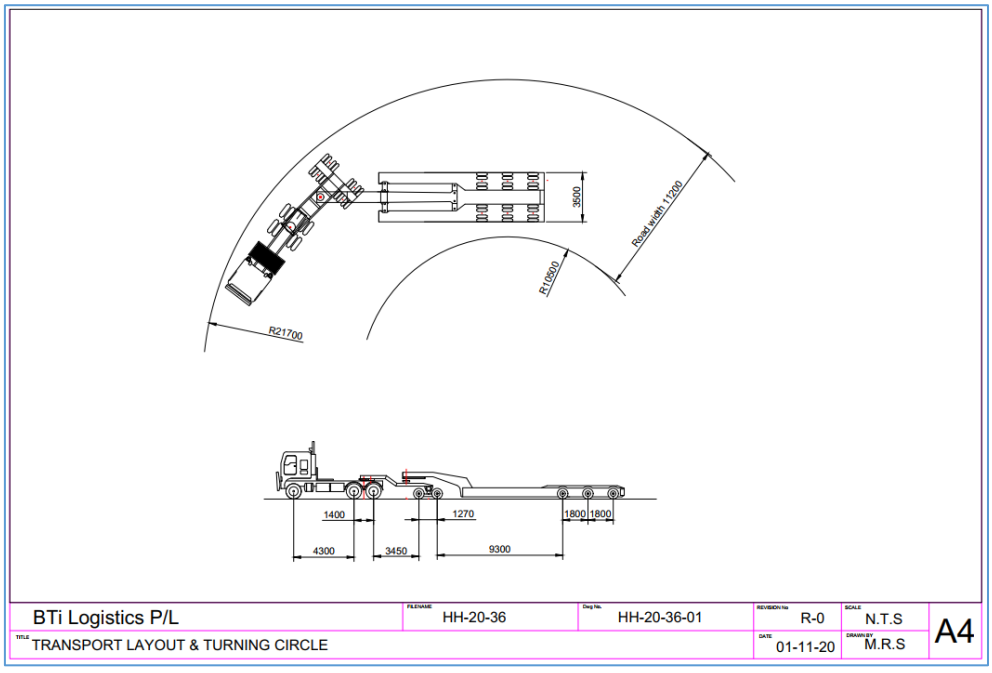


Figure 10: Largest Construction Truck

4.3 Traffic Generation

4.3.1 Trucks

The construction phase will generate a maximum of 10 trucks per day (20 truck movements). Truck movements will be spread out evenly over the day between 7am to 6pm and so approximately 2 to 4 trucks movements are expected to occur during any one hour. The client has also advised that the majority of truck movements will be generated to and from the north along Robartson Road to access Great Eastern Highway.

4.3.2 Staff

Staff will travel to and from the site via light vehicles, vans, and buses. All staff are expected to arrive from 6 to 7am and leave from 6 to 7pm. For assessment purposes, it is assumed as a worst-case scenario that all staff movements will occur within a peak hour. The client has advised that there would be a maximum of 50 staff on site at any given point and that staff movements will generate up to 25 inbound vehicle movement in the morning and 25 outbound vehicle movement in the afternoon.

4.3.3 Total Traffic Generation

Based on the above, the peak traffic generation during the construction period is estimated to be:

- 20 truck movements and 50 light vehicle movements per day.
- Total of 29 (25 light vehicles+ 4 trucks) movements during the arrival period (6 to 7am).
- Total of 29 movements during the departure period (6 to 7pm).

4.4 Road Capacity

According to the WAPC TIA guidelines, an increase of between 10 to 100 peak hour vehicles is considered to have a low to moderate impact and is generally deemed acceptable without requiring detailed capacity analysis. The estimated 29 vehicles per hour is at the lower end of this range and so the construction traffic is considered to have a low impact and can be accommodated within the existing capacity of the road network.

As mentioned previously, there are currently no available vehicle volumes on Robartson Road. The traffic count on Bruce Rock – Merredin Road in Merredin (Site ID:7175) are well within the mid-block capacity of the road. With the construction traffic added to the background traffic, the peak hour traffic volumes along the adjacent roads would still remain well within capacity. It is also noted that the peak hours of construction traffic are unlikely to coincide with the peak hours of the road network. The current peak hours along Bruce Rock – Merredin Road are from 9:45 to 10:45am during the AM peak hour and 12:45 to 1:45pm during the PM peak hour during the weekdays.

5 Vehicle Access Assessment

5.1 Access Arrangements

Vehicle access to the site is via Robartson Road as shown in **Figure 11**.

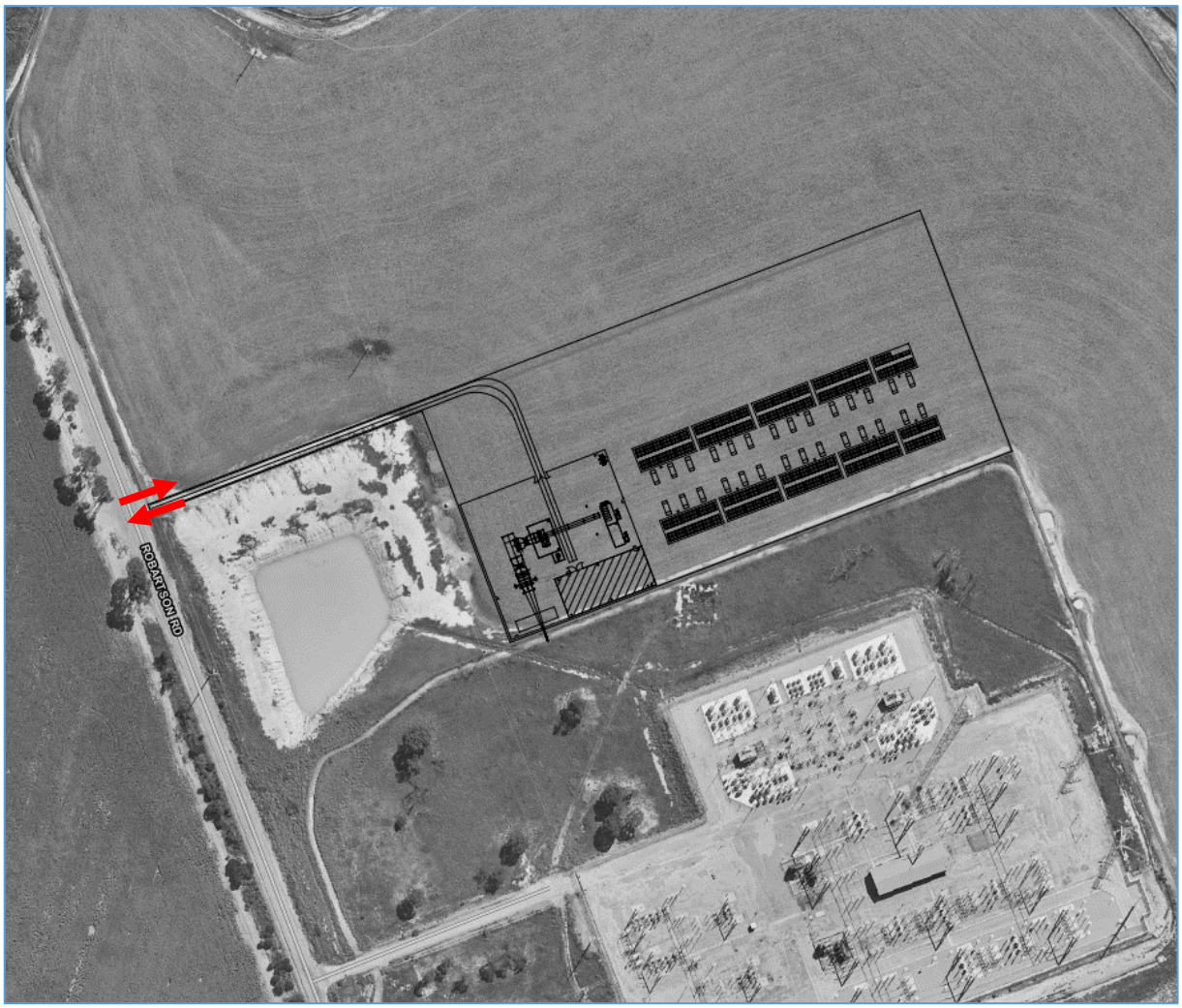


Figure 11: Site Access On Robartson Road

As shown, access to the site along Robartson Road is via an existing 6.5m wide unsealed access.

The proposed site access is shown in **Figure 12**.

Figure 12: Existing Site Access

5.2 Sight Distance

Sight distance requirements from vehicle exit points for RAV trucks are defined in Main Roads WA's Standard Restricted Access Vehicle (RAV) Route Assessment Guidelines as shown in **Figure 13**.

The vertical alignment of Robartson Road is relatively flat based on contours from Landgate V5.

Appendix D: Required Sight Distances

Posted Speed km/h	Downhill				Level	Uphill			
	-8%	-6%	-4%	-2%		2%	4%	6%	8%
40	74	72	70	68	66	65	64	62	61
50	102	98	95	92	89	87	85	84	82
60	134	128	123	119	116	112	110	107	105
70	170	162	155	149	144	140	136	133	130
80	209	198	190	182	176	170	165	161	157
90	252	239	228	218	Both	203	197	191	186
100	308	290	275	263	252	242	234	227	220

Figure 13: RAV Guidelines - Sight Distance

As shown, the proposed site access is required to provide a minimum of 252m of sight distance in both directions.

The available sight distance on the existing site access is shown in **Figure 14**.

Figure 14: Available Sight Distance

As shown, the existing site access achieves the minimum RAV sight distance requirement in both directions.

Site photos of the available sight distance towards the north and south is shown in **Figure 15** and **Figure 16**.

Figure 15: Proposed Site Access - Looking North

Figure 16: Proposed Site Access - Looking South

5.3 Access Geometry

The vehicle access is likely to require widening to accommodate the turning movement of the proposed construction trucks. It is understood that the northern part of the access road is currently under the ownership of a separate entity and the client is in the process in acquiring the relevant documents to provide temporary widening to allow up to 27.5m road trains during the construction phase.

To reduce the widening required to the existing 6.5m wide access, it is proposed to allow 27.5m road trains to utilise the opposite lane to enter the site via Robartson Road. It is advised that the client has made the Shire of Merredin aware of this arrangement and requested further information regarding potential justification on the use of the opposite lane such as:

- In accordance with Western Australia – Road Traffic Code 2000, a driver can cross the centre of the road provided there is sufficient sight distance, and the manoeuvre can be done safely. Refer to clause 115 (1) and (2).
- There is clear visibility to the south for drivers to see oncoming vehicles.
- Robartson Road is classified as an Access Road, and it is anticipated that it will carry relatively low traffic volumes only.
- It is advised by the client that appropriate traffic management plan will be adopted for all truck entry movements.
- 27.5m road trains are only for the construction phase which is estimated by the client to last approximately 12 to 18 months. Once constructed and operational, the site will be unmanned and will generate no traffic other than for occasional maintenance which is expected to occur a few times per year.

Based on the above justification, the proposed use of the opposite lane for 27.5m road trains entry movements via Robartson Road is considered acceptable.

A preliminary vehicle swept path analysis has been undertaken to indicate the likely extent of the crossover on Robartson Road. The analysis has been undertaken in AutoTURN vehicle tracking software using the Main Roads WA 27.5m B-Double template. The proposed construction vehicle is shorter than the B-double and is therefore likely to manoeuvre better than shown using the B-double templates.

As trucks are only proposed to travel to and from the north along Robartson Road, only these movements have been shown.

The swept paths are attached as **Appendix A**.

6 Site Specific Issues and Safety Issues

6.1 Crash History

The crash history of the adjacent road network was sourced from the Main Roads WA's Reporting Centre. The crashes recorded over the five-year period from January 2019 to December 2023 are shown in **Figure 17**.

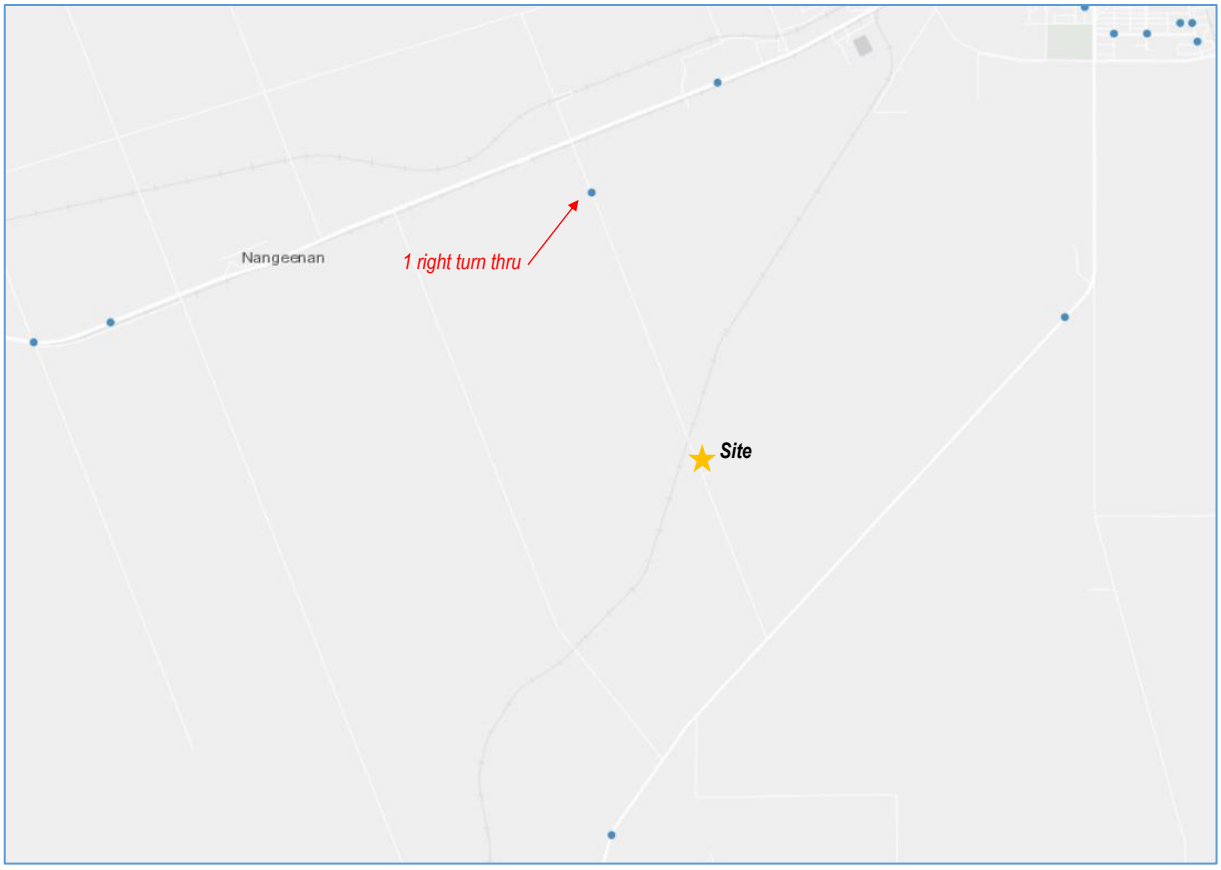


Figure 17: Main Roads WA's Crash Information (2019 – 2023)

As shown, only one crash has been reported along Robartson Road. The crash history does not appear to indicate any major safety issue.

The proposed development will generate a low volume of additional traffic over a limited period of time and is unlikely to increase the risk of crashes unacceptably.

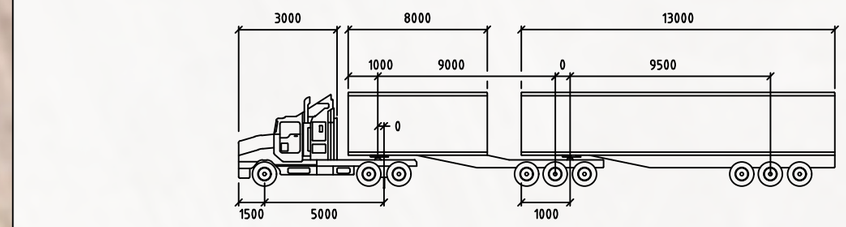
7 Conclusion

This Transport Impact Statement for the proposed Battery Energy Storage System in Merredin concluded the following:

- The peak daily traffic generation during the construction period is estimated to be 20 truck movements and 50 light vehicle / bus movements per day.
- The peak hour traffic generation is estimated to be:
    - Total of 29 (25 light vehicles + 4 trucks) movements during morning arrival period.
    - Total of 29 movements during the departure period.
- The volume of traffic generated during the construction period is low and can be accommodated within the capacity of the road network. Once constructed and operational, the development will generate little or no traffic.
- The minimum required sight distance for the site access located on Robartson Road is achieved in both directions at the proposed access.
- The crash history of the adjacent road network does not indicate any major safety issues.
- The vehicle access is likely to require widening to accommodate the turning movement of the proposed construction trucks. To reduce the widening required to the existing 6.5m wide access, it is proposed to allow 27.5m road trains to utilise the opposite lane to enter the site via Robartson Road. It is advised that the client has made the Shire of Merredin aware of this arrangement and requested further information regarding potential justification on the use of the opposite lane such as:
    - In accordance with Western Australia – Road Traffic Code 2000, a driver can cross the centre of the road provided there is sufficient sight distance, and the manoeuvre can be done safely.
    - There is clear visibility to the south for drivers to see oncoming vehicles.
    - Robartson Road is classified as an Access Road, and it is anticipated that it will carry relatively low traffic volumes only.
    - It is advised by the client that appropriate traffic management plan will be adopted for all truck entry movements.
    - 27.5m road trains are only for the construction phase which is estimated by the client to last approximately 12 to 18 months. Once constructed and operational, the site will be unmanned and will generate no traffic other than for occasional maintenance which is expected to occur a few times per year.
- The proposed use of the opposite lane for 27.5m road trains entry movements via Robartson Road is considered acceptable.
- A swept path analysis using Main Roads WA's RAV vehicle templates will need to be undertaken when

designing the access to determine the exact geometry.

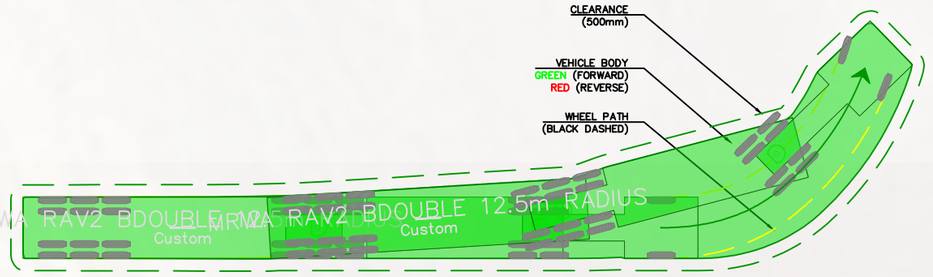
Appendix A – Preliminary Swept Paths

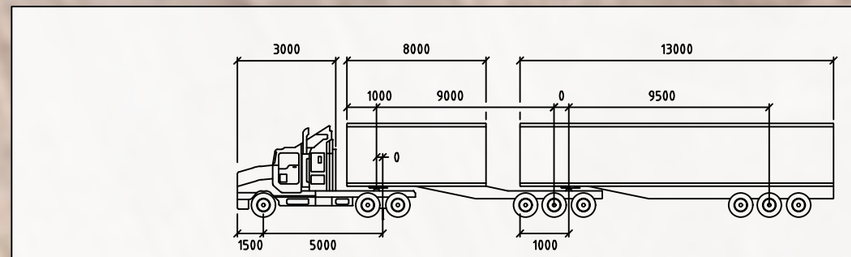


MRWA RAV2 BDOUBLE 12.5m RADIUS

mm

Tractor Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 26.1
Tractor Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		





MRWA RAV2 BDOUBLE 12.5m RADIUS

mm

Tractor Width	:	2500	Lock to Lock Time	:	6.0
Trailer Width	:	2500	Steering Angle	:	26.1
Tractor Track	:	2500	Articulating Angle	:	70.0
Trailer Track	:	2500