

# North Yarragon BESS

Traffic Impact Assessment

ZEN Energy Future Pty Ltd

Reference: 528157

Revision: D

2026-01-30

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## Contents

<b>Glossary</b> .....	<b>1</b>
<b>1 Introduction</b> .....	<b>2</b>
1.1 Purpose .....	2
1.2 Assumptions and limitations .....	2
<b>2 The Project</b> .....	<b>3</b>
2.1 Project description .....	3
2.2 Project area .....	3
<b>3 Existing conditions</b> .....	<b>6</b>
3.1 Land use .....	6
3.2 Road network .....	6
3.2.1 Yarragon-Shady Creek Road .....	6
3.2.2 Princes Highway .....	8
3.3 Public transport network .....	8
3.4 Active transport network .....	8
3.5 Crash history .....	9
<b>4 Development proposal</b> .....	<b>11</b>
4.1 Site access .....	11
4.2 Construction phase.....	11
4.2.1 Construction vehicle types .....	11
4.2.2 Vehicle origins and access routes .....	12
4.3 Operations phase .....	13
4.3.1 Vehicle origins and access routes .....	13
4.3.2 Parking .....	13
4.4 Decommissioning .....	13
<b>5 Car parking and access</b> .....	<b>14</b>
5.1 Car parking .....	14
5.1.1 Statutory requirements .....	14
5.1.2 Parking demand assessment .....	14
5.1.3 Parking Layout.....	14
5.2 Access and routes .....	14
5.2.1 Layout.....	14
5.2.2 Sight distance .....	14
5.2.3 Preliminary swept path assessment.....	15
<b>6 OSOM vehicles</b> .....	<b>17</b>
6.1 OSOM transformer delivery vehicle .....	17
6.2 OSOM constraints along Yarragon-Shady Creek Road.....	17
6.2.1 Height clearance.....	17
6.2.2 Trees and vegetation .....	17
6.2.3 Weight limits .....	18
6.2.4 Other considerations .....	18
<b>7 Traffic impact assessment</b> .....	<b>19</b>
7.1 Construction phase.....	19
7.1.1 Traffic generation.....	19
7.1.2 Traffic distribution .....	20

7.1.3	Traffic impact summary .....	20
7.2	Operations and maintenance phase .....	21
7.3	Decommissioning phase .....	21
<b>8</b>	<b>Summary .....</b>	<b>22</b>
<b>9</b>	<b>References .....</b>	<b>23</b>

## Figures

Figure 2-1	Project Area and indicative layout
Figure 3-1	Northern Project Boundary – facing west towards the creek
Figure 3-2	Yarragon-Shady Creek Road facing north near existing site access
Figure 3-3	Yarragon-Shady Creek Road facing south at existing site access
Figure 3-4	Crashes in past five years (to 31 July 2024)
Figure 5-1	Main access 19 m semi left-in, right-out
Figure 5-2	Main access 19 m semi right-in
Figure 5-3	Main access 19 m semi left-out
Figure 5-4	Main access 12.5 m HRV left-out
Figure 5-5	Fire emergency access 8.8 m MRV turns in and out
Figure 6-1	Rural road typical vegetation envelope [3]
Figure 7-1	Average number of vehicle trips (one-way) per day during construction

## Tables

Table 2-1	Project land terms
Table 4-1	Expected construction vehicle types
Table 5-1	Preliminary MGSD check
Table 7-1	Total typical peak construction period daily traffic generation

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## Acknowledgement of Country

Aurecon acknowledges the Traditional Custodians of the lands, waters and skies where we work, live and play. We celebrate the diversity of Aboriginal and Torres Strait Islander peoples and their ongoing cultures and connections to lands, water and skies across Australia. In particular, we acknowledge their ongoing connection to Country and continuing environmental stewardship.

We acknowledge the Aboriginal and Torres Strait Islander Custodians of these lands and we pay our respects to Elders past and present.

*This imagery was created by Shanán Costello, a Sydney-based Aboriginal artist commissioned by Aurecon. Her fluid, colourful, and engaging digital drawings are a contemporary expression of Aboriginal art. This artwork reflects connection, partnership and growth and aims to illustrate Aurecon's genuine respect for Aboriginal Australians across the country.*

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# Glossary

Acronym	Definition
AADT	Annual Average Daily Traffic
Aurecon	Aurecon Australasia Pty Ltd.
BESS	Battery Energy Storage System
BMO	Bushfire Management Overlay
CTMP	Construction Traffic Management Plan
db	Decibel
db(A)	A-Weighted decibel
DTP	Department of Transport and Planning
EPA	Environment Protection Authority
FZ	Farming Zone
GW	gigawatt
ha	hectares
HML	Higher Mass Limit
HV	Heavy vehicle
HV%	Percentage of heavy vehicles
km	kilometres
kV	Kilovolt
LV	Light vehicle
m	Metres
MW	Megawatts
MWh	Megawatt hours
OD	Over Dimension
OSOM	Over Size Over Mass
Project Area	The proposed subdivided land proposed to be used for the Project. This is proposed to be 18.31ha.
Property Boundary	This refers to the boundary of the Site.
(the) Proponent	ZEN Energy Future Pty Ltd (ZEN Energy)
RA	Responsible Authority responsible for considering and determining the application. The RA for the Project is the Minister for Planning.
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
(the) Site	The property at 713 Yarragon-Shady Creek Rd, Yarragon VIC 3823.

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# 1 Introduction

Aurecon Pty Ltd (Aurecon) was commissioned by ZEN Energy Future Pty Ltd (ZEN Energy, the Proponent) to undertake a Traffic Impact Assessment (TIA) to inform the development of a Battery Energy Storage System (BESS) in Yarragon, Victoria called North Yarragon BESS (herein referred to as 'the Project').

The Project is part of a joint venture called ZEBRE, a joint venture between Taiwan Stock Exchange listed HD Renewable Energy (HDRE) and Australia's ZEN Energy, formed to build new renewable energy assets in Australia. ZEN Energy is currently progressing the development of the Project on behalf of the joint venture.

## 1.1 Purpose

The purpose of this Traffic Impact Assessment (TIA) is to identify traffic and parking impacts of the proposal and to accompany a Planning Permit application to the Department of Transport and Planning (DTP). This report sets out a desktop assessment of the anticipated traffic and transport implications and parking requirements of the Project, including:

- traffic movements generated by the Project during construction, operations and maintenance, and decommissioning phases.
- adequacy of proposed access arrangements and impacts to the wider local road network, during the construction, operations and maintenance, recommissioning, and decommissioning phases.
- adequacy of the Project's proposed car parking provision and layout arrangements.

## 1.2 Assumptions and limitations

The following assumptions and limitations apply to this report.

- The information noted below was provided by the Proponent for the purposes of this assessment, unless stated otherwise in this report.
  - Construction phase stages and durations.
  - Construction vehicle types and number of movements during each stage.
  - Construction worker origins and number of workers for each stage.
- Assumptions noted in this report have been made by Aurecon for the purposes of this assessment.
- This traffic assessment was undertaken via a desktop review only.
- All photographs in this report were taken by Aurecon unless noted otherwise.

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## 2 The Project

### 2.1 Project description

The Project proposes a Battery Energy Storage System (BESS) with a nominal installed capacity of up to 210 MW / 1680 MWh.

The Project works include:

- BESS modules, inverters and transformers.
- Construction of internal access roads and access (and egress) points including a culvert bridge over the creek.
- Underground cabling to provide a connection between the battery modules and inverters and on-site substation.
- On-site substation including transformer to step up from 33 kV to the connection voltage of 220 kV.
- Cabling (33kV) to connect the onsite substation to the Hazelwood Terminal Station to Rowville Terminal 220kV transmission line.
- An Operations and Maintenance Facility.
- Water storage (including firefighting water supply and fire water runoff containment).
- Fencing around the perimeter of the BESS facility.
- Car parking.
- Business identification signage, at site entry.

### 2.2 Project area

The Site is located at 713 Yarragon-Shady Creek Road, Yarragon VIC 3825, approximately 125 km from Melbourne. The nearest town is Yarragon, approximately 7.5 km south of the Project Area.

The Site is defined by Yarragon-Shady Creek Road to the east, extending 1.3 km to the west and is approximately 51 hectares.

The Project Area is approximately 18.31 ha and is located in the north-west corner of the broader Site. A dwelling is located within the Site on the eastern side, with access from the dwelling to Yarragon-Shady Creek Road. The Project Area will be subdivided from the Site.

Shady Creek, running north to south, is located approximately 1km east of the Site. A tributary of Shady Creek runs through the north-east section of the Site and a small section of the Project Area. The Hazelwood Terminal Station to Rowville Terminal 220kV transmission line runs east to west through the south-western corner of the Site.

The terrain of the Project Area comprises undulating cleared open paddocks, currently used for livestock grazing. Vehicle access to the Project Area is proposed from Yarragon-Shady Creek Road with an access road running along the north side of the Site.

The exact location of the BESS infrastructure will be determined through detailed design, once a BESS supplier and construction contractor has been selected and will be in accordance with commitments made in this planning application. The Project Area and indicative layout is shown in Figure 2-1, below.

Terms used to define land for the Project are outlined in Table 2-1, below:

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**Table 2-1**      **Project land terms**

Term	Definition
Site	The property at 713 Yarragon-Shady Creek Rd, Yarragon VIC 3823.
Property Boundary	This refers to the boundary of the Site (used within figures).
Project Area	The proposed subdivided land proposed to be used for the Project. This is proposed to be 18.31ha.

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**Legend**

- Road
- Watercourse
- Proposal Area
- Property Boundary
- Transmission Line 220kV
- Alternate Fire Access Route
- HV Cabling 220kV
- Storm Water Detention Basin
- Water Tanks
- Substation Area
- Terminal Station
- Temporary Construction Facilities
- Battery Yard
- O&M Buildings / Storage & Parking
- New Transmission Tower 220kV
- Transmission Tower 220kV
- 220kV Easement
- BESS & PCS

**Notes:**

**Basemap:** Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. We request attribution as © Commonwealth of Australia (Bureau of Meteorology) 2022. © Commonwealth of Australia © (Cosceneo Australia) 2021. The product is released under the Creative Commons Attribution 4.0 International Licence. <http://creativecommons.org/licenses/by/4.0/>

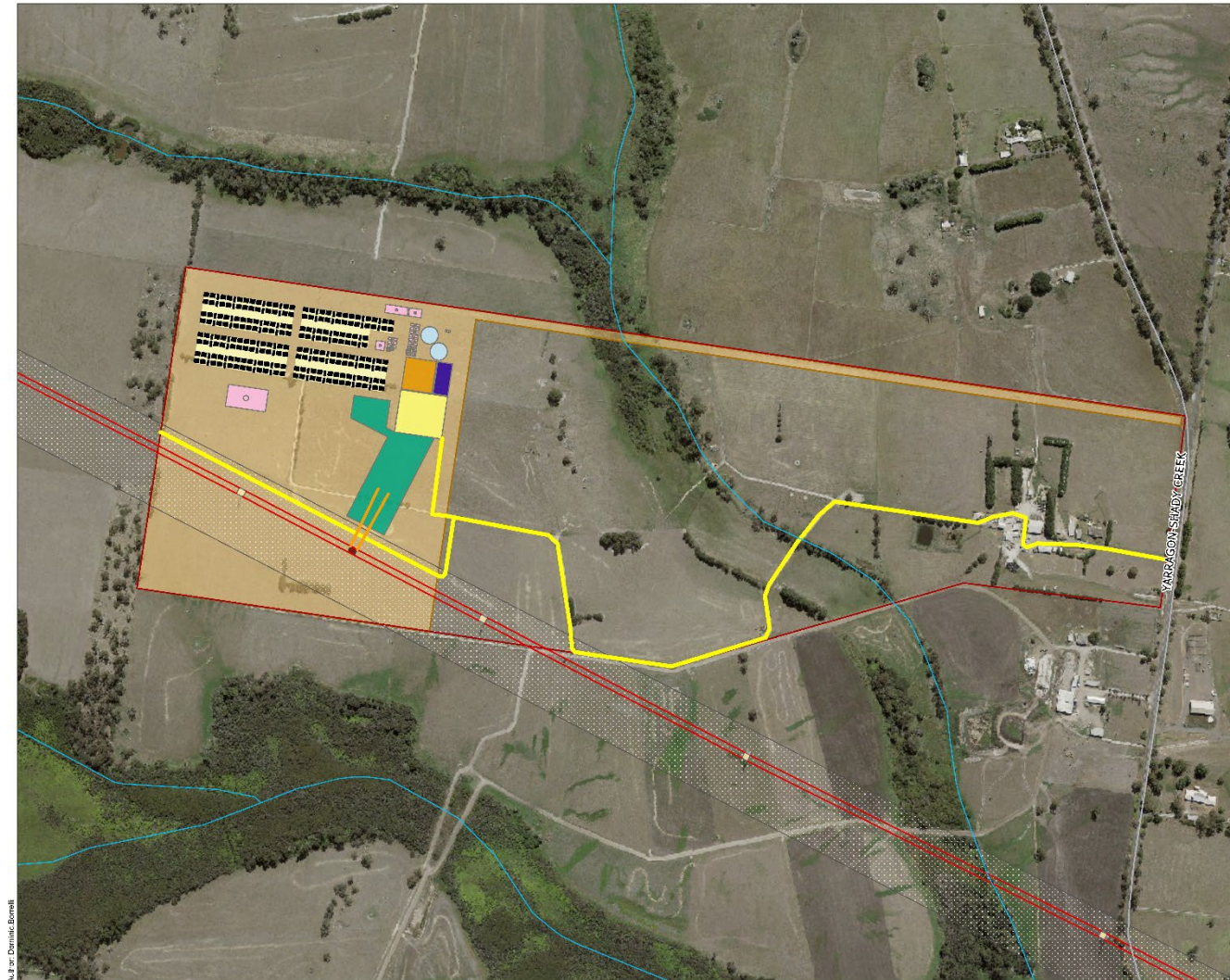
**Other data:** DEECA, Aurecon

Date: 2/02/2026

Version: 7

**North Yarragon BESS**

**Indicative Layout Design and Proposal Area**



A3 per Domestic Bound



A3 scale: 1:5,000  
0 100 200 Metres

Job No: P528157  
Co-ordinate System: CDA222 MCA Zone 59

Figure 2-1 Project Area and indicative layout

## 3 Existing conditions

### 3.1 Land use

The Project Area is located on and surrounded by land within the Farming Zone (FZ), under the Baw Baw Planning Scheme. The land is undulating and generally grassed with isolated groups of trees, as shown in Figure 3-1.



Figure 3-1 Northern Project Boundary – facing west towards the creek

### 3.2 Road network

#### 3.2.1 Yarragon-Shady Creek Road

Yarragon-Shady Creek Road is a sealed two lane, two-way undivided local road managed by Baw Baw Shire Council. It is generally aligned north-south in the vicinity of the Project Area. The road connects the Old Sale Road in the north to the Princes Highway in the south. It comprises a 4.5 m to 5 m wide carriageway set within a 20 m road reserve (varies and approximate). There are gravel/grassed shoulders present along the road, and verges consist of grass or dirt batter with intermittent vegetation.

The southern end of Yarragon-Shady Creek Road has a posted speed limit of 60 km/h (approximately 700 m long section in the vicinity of the town). The remainder of the road, including in the vicinity of the site, has a posted speed limit of 100 km/h. It is pre-approved for B-Double and higher mass limit (HML) vehicles. It is not a pre-approved over-size over-mass (OSOM) route. There are no provisions for active transport along Yarragon-Shady Creek Road.

Immediately north of the Princes Highway / Yarragon-Shady Creek Road signalised intersection there is a level crossing with the Gippsland Line. The crossing is an active level crossing (with boom gates and flashing lights) that is also part of the signalised intersection.

Yarragon-Shady Creek Road carries in the order of 60 vehicles northbound and 65 vehicles southbound in the AM peak hour, and in the order of 90 vehicles northbound and 90 vehicles southbound in the PM peak hour [1]. It is noted that this was counted at the intersection with Princes Highway, so includes vehicles going to/from Yarragon town centre that may not necessarily travel along Yarragon-Shady Creek Road past the

site. Therefore, the traffic volumes past the site are expected to be lower than at the intersection with Princes Highway.

Photos of Yarragon-Shady Creek Road are provided in Figure 3-2 and Figure 3-3, below.



Figure 3-2 Yarragon-Shady Creek Road facing north near existing site access

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Figure 3-3 Yarragon-Shady Creek Road facing south at existing site access

## 3.2.2 Princes Highway

The Princes Highway/Freeway is a sealed four lane, two-way divided road managed by the Department of Transport and Planning (DTP), generally aligned east-west in the vicinity of the Project Area. Near Yarragon it is classed as an arterial road. Between Melbourne and Yarragon it is classed as a freeway. It is a major route between Adelaide and Sydney via Melbourne (approximately 120 km west of the site), connecting towns along the way.

In the vicinity of the site, the Princes Highway comprises a 7.5 m to 8.5 m wide dual separated carriageway set within a 58 m road reserve (varies and approximate). There are asphalt, gravel, and grassed shoulders present along the road and verges consist of grass and vegetation. The carriageways are separated by an 18.5 m wide median comprising grass or dirt batter with intermittent vegetation.

The Princes Highway predominantly has a posted speed limit of 110 km/h and through towns (such as Yarragon) the speed limit is generally reduced to 60 km/h or 80 km/h. Various height limits apply along the Princes Highway due to existing overhead structures.

## 3.3 Public transport network

There are no public transport services that operate along Yarragon-Shady Creek Road. The closest public transport stops to the site are at the Yarragon Railway Station in the Yarragon Township (approximately 7.5 km south of the site). The Gippsland Line (Traralgon to Melbourne and Melbourne to Bairnsdale) V/line services stop at the Yarragon Railway Station. Five Public Transport Victoria bus routes servicing nearby towns stop at the bus stop at the railway station.

## 3.4 Active transport network

This is no existing or proposed active transport infrastructure along Yarragon-Shady Creek Road in the vicinity of the Project Area.

## 3.5 Crash history

There were six crashes reported in the vicinity of the site and access routes in the last five years of available records (to 31 July 2024) [2]. All of these crashes occurred at or near the Yarragon-Shady Creek Road / Princes Highway intersection, as shown in Figure 3-4. The key crash characteristics are summarised below. No trends were identified.

- Crash severity:
  - 3 ‘serious injury’ crashes
  - 3 ‘other injury’ crashes
- Crash type:
  - 4 rear end (vehicle in same lane)
  - 1 cross traffic (side on crash in intersection)
  - 1 struck train (vehicle was stopped on tracks)
- Vehicles involved:
  - no heavy vehicles
  - no motorcycles
  - no pedestrians

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**Legend**

- Road
  - Watercourse
  - Railways
  - Project area
  - Property boundary
  - Local government area
- Crashes in past five years (to 31 July 2024)**
- Other injury
  - Serious injury

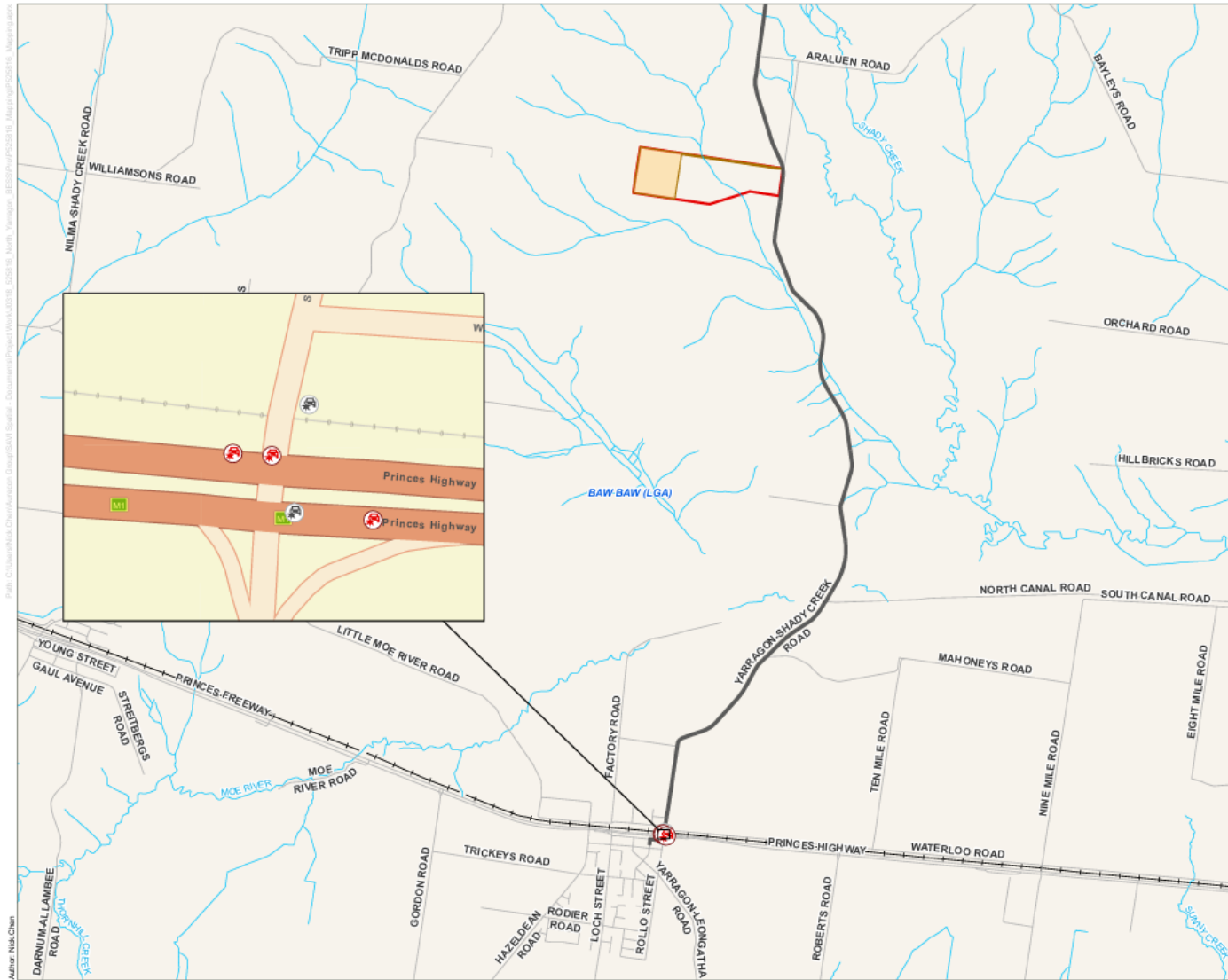
**Notes:**

Basemap: Sources: Esri, TomTom, Garmin, FAD, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Other data: DEECA, Aurecon

Date: 23/07/2025

Version: 2



Job No: P528157  
Coordinate System: GDA2020 MGA Zone 55

**North Yarragon BESS**

Crashes in past five years (to 31 July 2024)

Figure 3-4 Crashes in past five years (to 31 July 2024)

# 4 Development proposal

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## 4.1 Site access

Access to the site will be via Yarragon-Shady Creek Road at the eastern site boundary. The main site access point (for both construction and operations) is proposed to be via a new crossover at the northern end of the eastern property boundary and an alternate access point for fire emergency access is proposed via the existing residential access driveway approximately 70 m from the southern end of the eastern property boundary.

The internal road from the main access point to the BESS development (approximately 1 km long) and all internal roads within the site are proposed to be 6 m wide.

## 4.2 Construction phase

Methodology, program and timing of the construction works are currently indicative and dependent upon planning approvals and the selected contractor. It is anticipated that the construction activities will take place over a 24-month timeframe and will involve the following key works:

- Site mobilisation, installation of a perimeter fence
- Construction of main site access road, watercourse crossing
- Earthworks to level the site and create bench surfaces for the BESS equipment, storage and removal of spoil (including the treatment of contaminated soil, where required), drainage, establishment of laydown area
- Civil works to prepare internal access roads, equipment foundations and trenches for electrical and communications cabling
- Delivery, installation and connection of batteries, inverters and associated infrastructure
- Construction of substation and connection to the transmission network
- Installation of operation & maintenance building including storage area and site office
- Testing and commissioning

Construction work is expected to be undertaken six days per week and will generally occur during the following construction hours.

- Monday to Friday: 6:00 am – 6:00 pm
- Saturday: 7:00 am – 1:00 pm (assumed standard construction hours on Saturdays)

### 4.2.1 Construction vehicle types

The vehicle types expected to access site during construction are summarised below in Table 4-1.

Table 4-1 Expected construction vehicle types

Load Type	Vehicle Type
Construction workers	Light vehicle (LV)
Bulk earthworks	Truck and Dog
Steel (reinforcing)	Semi-trailer
Blue metal/gravel	Truck and Dog
Transformer	Transformer OSOM

Steel (structural)	Semi-trailer
BESS Units	Semi-trailer
PCS Units	Semi-trailer
Cable & high voltage conductors	Semi-trailer
Other equipment & materials	Semi-trailer
Control building & switch room	Other OSOM
Concrete	Special Purpose Vehicle
Site demobilisation	Semi-trailer

The delivery of the transformer is expected to be via an OSOM vehicle such as a prime mover truck with a multiple axle low platform 'gooseneck' trailer. However, this will depend on the detailed design of the transformer, and the transport vehicle and trailer combination.

Construction vehicle types will be confirmed following selection of a transformer supplier and construction contractor (following planning approval). At the post permit approval stage, specific traffic management measures will be identified as required, and detailed in an appropriate Traffic Management Plan (TMP). This would include OD/OSOM (Over Dimension/Over Size Over Mass) vehicles such as the transformer delivery vehicle. Further, temporary traffic management measures for the construction phase (including temporary speed limits and active traffic control personnel) will be address as part of the Construction Traffic Management Plan (CTMP).

## 4.2.2 Vehicle origins and access routes

### Construction delivery vehicles

The delivery of imported materials (BESS and HV equipment) will most likely be via the Port of Melbourne. Non-imported materials are expected to be sourced from nearby towns.

There are pre-approved OSOM and B-double routes available from the Port of Melbourne to the site. An example route from the Port of Melbourne to site is provided below. All the below roads are part of the Victorian OSOM network except for Yarragon-Shady Creek Road.

*Port of Melbourne → West Gate Freeway → City Link → Monash Freeway → Princes Freeway/Highway → Yarragon Shady Creek Road*

The transformer delivery vehicle access route will depend on the characteristics of the confirmed vehicle (which may exceed the 'OSOM route' vehicle) and consultation with the relevant authorities including the National Heavy Vehicle Regulator (NHVR), Regional Roads Victoria, Council, and DTP. Specific access routes will be confirmed following selection of a preferred transformer supplier and construction contractor and detailed in an appropriate TMP.

### Construction workers

At its peak, construction of the BESS would have a maximum of 60 staff on site. It is expected that construction workers will travel to/from local towns comprising approximately 20% of workers from Yarragon/Latrobe Valley and 80% from Melbourne (noting it is not yet known if workers from Melbourne will access accommodation nearby to the site or commute to/from Melbourne each day). It is assumed that almost all the construction workers will access the site from the south via Yarragon-Shady Creek Road from either the Princes Highway or the local area south of the Princes Highway, noting this will be confirmed following selection of a construction contractor and detailed in an appropriate TMP. Light vehicles will utilise local and regional roads to access the site with a preference to use major and arterial roads.

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## 4.3 Operations phase

During the operations phase a minimal workforce is expected to be required, with approximately two full-time staff on the site, along with two to four maintenance contractors that will visit the site five days a month for inspections and maintenance activities. Vehicles accessing the site will mostly include light vehicles (e.g. passenger cars, utility vans), with the chance of a small bus transporting visitors to the site for bespoke project displays. Some heavy vehicles will likely be required during the operational period for major maintenance. Details of operational access will be included in the TMP.

### 4.3.1 Vehicle origins and access routes

Operations staff vehicle origins and access routes will depend on where staff live, which is expected to be highly varied. However, given the location of the site, it is expected that the majority of staff will access the site from the south, via Yarragon-Shady Creek Road (via the same routes as the construction workers vehicles).

### 4.3.2 Parking

Parking will be provided on site for the operations phase. Car parks are shown indicatively on the plan next to the 'O&M building'. The final number, location, and layout of parking spaces for the operations phase will be determined through detailed design.

## 4.4 Decommissioning

It is expected that that the Project will be operating for approximately 30 years. Following this period, there will be a decision to recommission (refurbish the current project, or deploy an alternative project on site) or decommissioning of site will occur.

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# 5 Car parking and access

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## 5.1 Car parking

### 5.1.1 Statutory requirements

Requirements for the provision of car parking are set out in Clause 52.06 of the Baw Baw Planning Scheme. The scheme does not provide guidance on parking rates for BESS facilities (Utility Installation land use). In such circumstances, the scheme notes that car parking spaces must be provided to the satisfaction of the Responsible Authority. The Responsible Authority (RA) is responsible for considering and determining planning applications. The RA for the Project is the Minister for Planning.

### 5.1.2 Parking demand assessment

During the operational phase there is expected to be limited operational vehicles, with approximately two full-time staff on site plus a small team (two to four staff) visiting the site periodically for routine inspections and maintenance. Therefore, a minimum of six parking spaces are expected to be required during the operations phase. The number of car parking spaces will be finalised during detailed design. Notwithstanding, it is expected that more than sufficient space will be available on the site to accommodate the parking demands generated during the operational phase of the BESS facility, to the satisfaction of the Responsible Authority.

### 5.1.3 Parking Layout

Design of the parking layout will be undertaken during detailed design and provided to the satisfaction of the Responsible Authority. Notwithstanding, the design of parking should comply with the relevant requirements in the Baw Baw Planning Scheme and AS 2890.1 - Off-street car parking, including but not limited to the minimum dimensions of parking spaces and accessways in accordance with Table 2 to Clause 52.06-9 of the Baw Baw Planning Scheme.

## 5.2 Access and routes

### 5.2.1 Layout

At this stage of the project there is no design for the layout of the main site access. In addition to the standard considerations (such as sight distance and swept paths), the following should be considered during the design of the main site access.

- Drivers exiting the site may be confused by the road layout with the Y-intersection (shown in Figure 5-1) and mistake the grass between Yarragon-Shady Creek Road and Araluen Road for a centre median (i.e. assume it is one four-lane road with a divided carriageway rather than two separate two-way roads). Mitigations should be considered such as signage to inform drivers that Yarragon-Shady Creek Road is a two-way road.
- Turn restrictions for certain sized vehicles to left-in, right-out only (i.e. movements to/from the south only) may be required to avoid the need for a very large splay to the north due to the angle of intersection between Yarragon-Shady Creek Road and the main site access road. Refer to preliminary swept path assessment in Section 5.2.3 for more detail.

### 5.2.2 Sight distance

As this is a rural property access, the absolute minimum sight distance requirement is minimum gap sight distance (MGSD) of 5 s (AGRD04, AGRD04A). A preliminary desktop review of the available sight distance at both site accesses has been undertaken to identify potential sight distance constraints in advance of the

sight distance checks to be undertaken during detailed design. The results of this check are summarised in Table 5-1. Notwithstanding this assessment, sight distance constraints and mitigations will be confirmed during detailed design.

**Table 5-1 Preliminary MGSD check**

Access point	Direction	Potential sight distance constraints
Main	Left out (check to right)	One roadside tree may require trimming to meet sight distance
	Right out (check to left)	One roadside tree may require trimming or removal to meet sight distance
Emergency	Left out (check to right)	No constraints identified
	Right out (check to left)	No constraints identified

$t_a = 5 \text{ s}$ , 85<sup>th</sup> %ile speed = 100 km/h, D = 139 m

### 5.2.3 Preliminary swept path assessment

A preliminary swept path assessment was undertaken at the main site access on the indicative access layout for a 19 m semi-trailer truck as the largest regular construction vehicle, as well as a 12.5 m HRV and a car (B99). The swept path assessment indicates the following with respect to the proposed main site access.

- A 19 m semi-trailer truck can turn left-in and right-out of proposed main site access within the proposed subdivision boundary (refer to Figure 5-1).
- Providing a crossover for 19 m semi-trailer trucks to turn right-in would require a slightly wider subdivision boundary than proposed (refer to Figure 5-2).
- Providing a crossover for 19 m semi-trailer trucks to turn left-out would require a wider subdivision boundary than proposed to avoid encroaching on the northern property boundary, and would require a very wide crossover splay that would encroach on the unsealed crossover of the property to the north (refer to Figure 5-3).
- Even providing a crossover limited to 12.5 m HRVs turning left-out would require a very wide crossover splay that would encroach on the unsealed crossover of the property to the north (refer to Figure 5-4).
- Due to the wide crossover splay that would otherwise be required, is recommended that for heavy vehicles there be no left turn out onto Yarragon-Shady Creek Road. The Proponent agrees with committing to the traffic management recommendation to limit heavy vehicles to only turn right out onto Yarragon-Shady Creek Road.

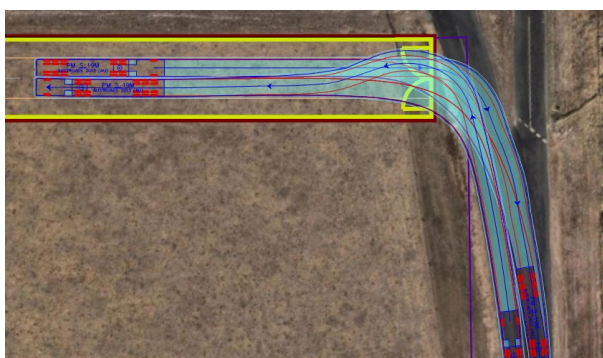


Figure 5-1 Main access 19 m semi left-in, right-out



Figure 5-2 Main access 19 m semi right-in

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Figure 5-3 Main access 19 m semi left-out



Figure 5-4 Main access 12.5 m HRV left-out

A preliminary swept path assessment was also undertaken at the alternate fire emergency access for 8.8 m MRVs as an approximation for a CFA pumper/tanker vehicle. The swept paths indicate that an MRV can turn in and out in both directions using the existing crossover. It is noted that an MRV will use the whole road width to turn left-out. However, given this is a secondary access for emergency vehicle use in emergencies only if the primary access cannot be used this is considered acceptable.

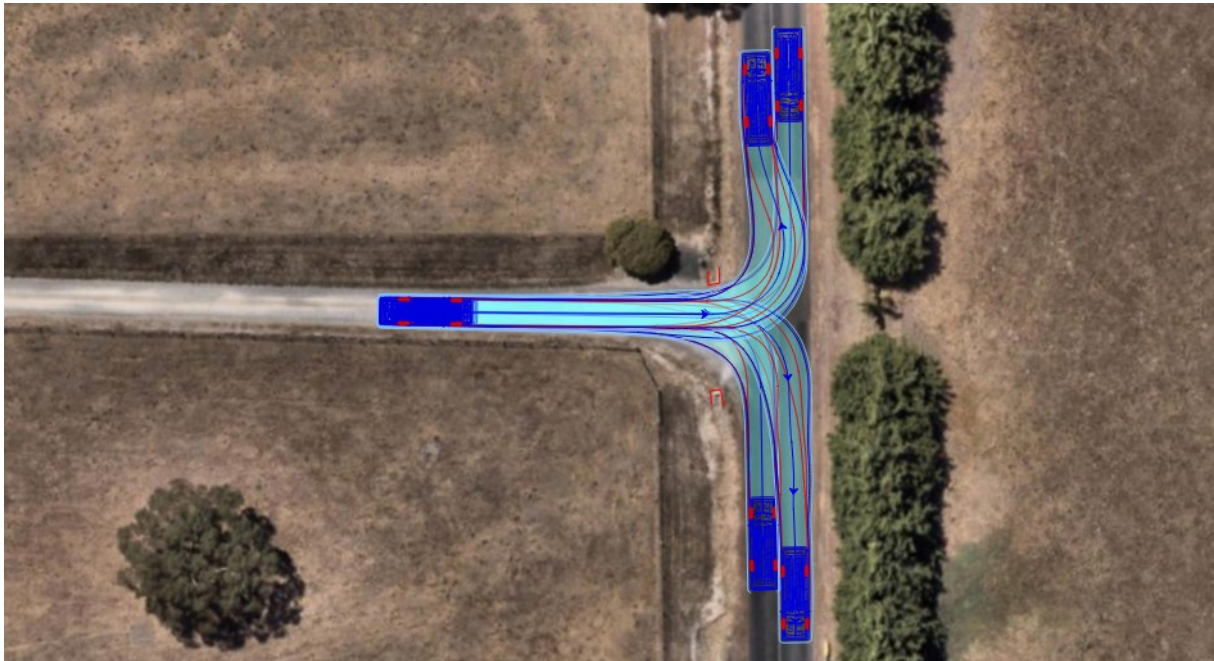


Figure 5-5 Fire emergency access 8.8 m MRV turns in and out

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## 6 OSOM vehicles

### 6.1 OSOM transformer delivery vehicle

The transformer delivery vehicle has not yet been confirmed, but given its purpose it is anticipated to be a larger scale transformer. A typical vehicle configuration used for large transformer deliveries is a prime mover truck with a multiple axle low platform 'gooseneck' trailer, which spreads the weight of the transformer across multiple axles. These vehicles typically have a minimum vertical height in the order of 5 m, but can be greater. Available height clearances along relevant access routes (including overhead powerlines) for construction delivery vehicles will be assessed once a construction contractor and transformer supplier has been selected and detailed in an appropriate TMP, to the satisfaction of the Responsible Authority.

OSOM deliveries from the Port of Melbourne to the Latrobe Valley region have been common for previously constructed projects, examples including Latrobe BESS and Hazelwood BESS. Given this no major OSOM transport issues are expected from the Port of Melbourne to the intersection of Princes Highway and Yarragon-Shady Creek Road.

### 6.2 OSOM constraints along Yarragon-Shady Creek Road

The following sections summarise potential constraints to the transformer OSOM delivery along Yarragon-Shady Creek Road. These items are typical constraints that may require additional assessment and/or mitigation measures to facilitate the transformer delivery. It is expected that any identified constraints can be managed to enable delivery of the transformer to the site.

#### 6.2.1 Height clearance

All vehicles over 4.6 m in height travelling under energy distribution assets, such as power lines, are required to apply for support from the relevant third party responsible for the assets (AusNet in this instance). A preliminary desktop review has identified overhead power lines crossing Yarragon-Shady Creek Road at 19 locations between Princes Highway and the site. Of those, four are 220 kV to 500 kV transmission lines, 12 are 22 kV high voltage lines, and three are 415 V low voltage lines. Depending on the height of the loaded OSOM vehicle and the available clearance under each line temporary mitigations may be required such as temporarily lifting the lines. However, no major issues are expected for OSOM delivery.

#### 6.2.2 Trees and vegetation

Overhead trees and roadside vegetation may restrict overhead clearance on OSOM delivery routes. The Baw Baw Shire Council's Tree Management Plan [3] stipulates a Rural Road Carriageway Vegetation Free Envelope which is a clear distance of 5 m from the high point of the road, 1.5 m from roadside guideposts, and 1 m from table drains as shown in Figure 6-1. Depending on the OSOM vehicle's height and width, further trimming may be required. A preliminary desktop review has not identified any obvious locations that require trimming. However, further investigation is required once the OSOM delivery vehicle has been confirmed.

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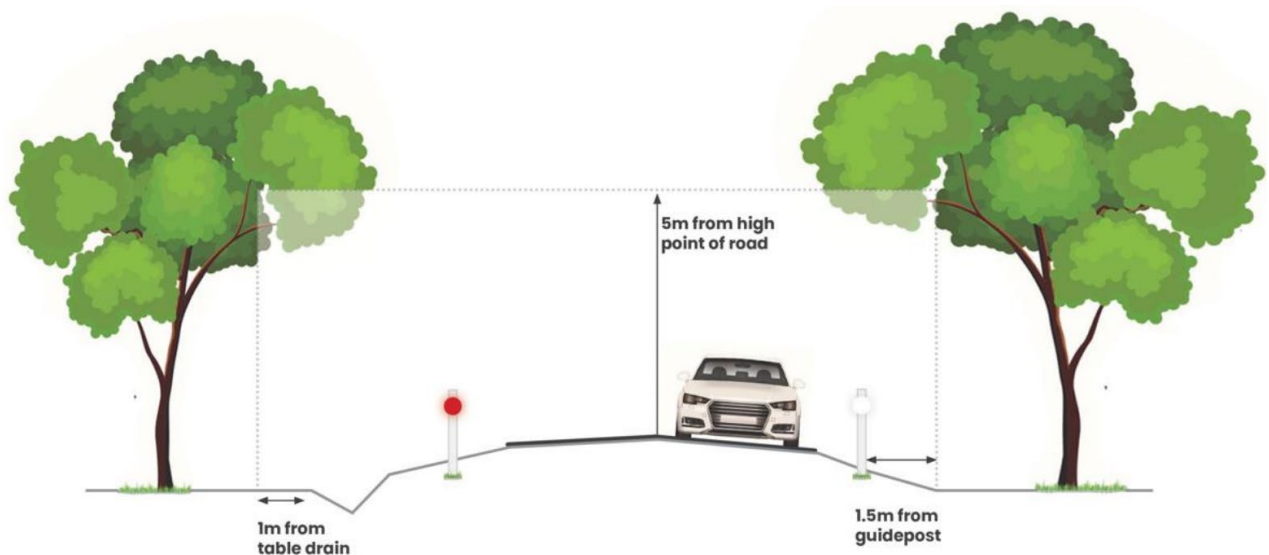


Figure 6-1 Rural road typical vegetation envelope [3]

### 6.2.3 Weight limits

Culverts and bridges (including cattle underpasses) are subject to various weight limits. A preliminary desktop review has identified several culverts along Yarragon-Shady Creek Road. The locations include Contour Drain, Moe Drain, north of Moe Drain (at 333 Yarragon-Shady Creek Road), and south of the site (at 2 Yarragon-Shady Creek Road). The weight limits of these culverts are unknown.

A preliminary desktop review has identified several cattle underpasses along Yarragon-Shady Creek Road. The locations include lots 483, 678, and 713 Yarragon-Shady Creek Road. If these underpasses have been constructed in accordance with VicRoads Standard Drawing SD7000 – 7020 they can allow for vehicles up to 160 tonnes.

Once the vehicle is confirmed further investigation is required to assess the culverts and cattle underpasses and verify their weight limits and any mitigation measures required. Mitigation measures can include but are not limited to travelling slowly over the structure, temporary strengthening, and/or steel plates. Managing the movement of the transformer over culverts and cattle underpasses is an typically mitigation measure addressed by haulage companies that specialise in OSOM transport tasks.

### 6.2.4 Other considerations

There is an active rail level crossing identified on Yarragon-Shady Creek Road immediately north of the Princes Highway intersection. This crossing will require third party approval from the asset manager (V/Line) prior to travel. This is not expected to be a major issue.

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# 7 Traffic impact assessment

The following section sets out the expected traffic volumes, and broad impacts to the road network during the three project phases.

## 7.1 Construction phase

### 7.1.1 Traffic generation

Construction work is expected to be undertaken six days per week and will generally occur during the following construction hours.

- Monday to Friday: 6:00 am – 6:00 pm
- Saturday: 7:00 am – 1:00 pm (assumed standard construction hours on Saturdays)

The average number of vehicle movements (one-way) expected during each week of construction is shown in Figure 7-1. The project construction peak is expected to occur during month 13, with an average of 60 construction worker (LV) vehicles and 16 construction vehicles (HV) accessing the site per day.

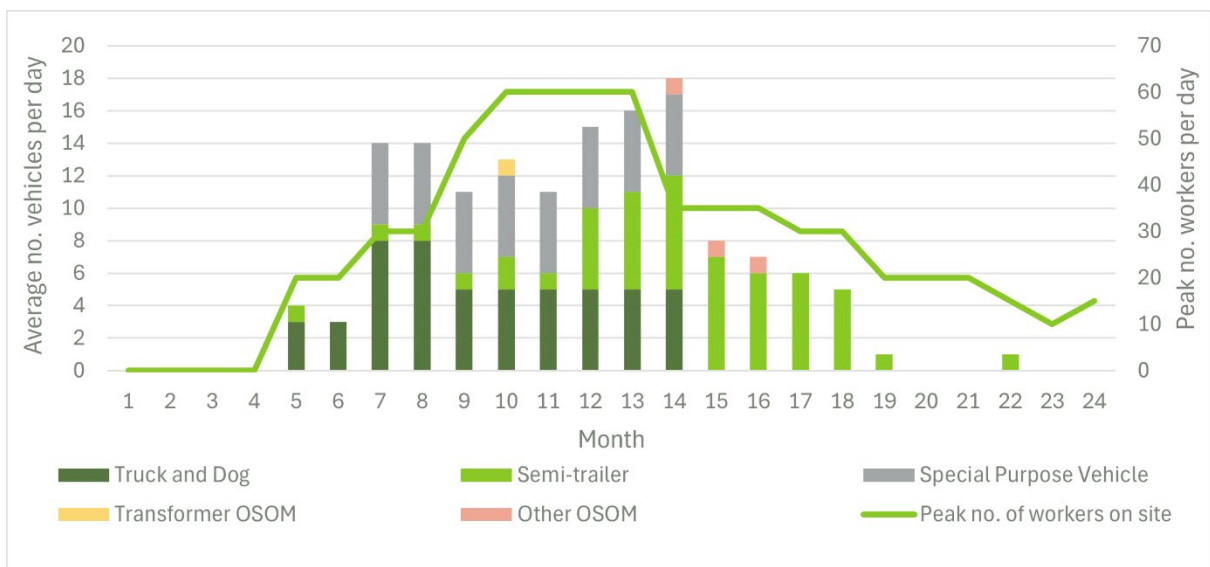


Figure 7-1 Average number of vehicle trips (one-way) per day during construction

### Workers (LVs)

During the peak construction phase there is expected to be up to 60 workers on site per day each travelling to/from the site in individual vehicles (as advised by the Proponent). To determine the weekday peak hour worst-case LV traffic volumes generated by the project, it is assumed that all workers will travel to site between 5:00 am – 6:00 am, and travel from site between 6:00 pm – 7:00 pm (representing the AM and PM project peak hours for workers). Therefore, the peak traffic generation for LVs is:

- 60 travelling to the site in the AM peak hour
- 60 travelling from the site in the PM peak hour
- 120 LV movements per day (two-way).

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## Construction delivery vehicles (HVs)

Construction delivery vehicles are expected to be HVs (i.e., not passenger cars, utes, vans, or similar). The expected total number of (one-way) trips for each vehicle type each month was used to determine the average daily number of HV trips generated by the project for peak construction period. It is assumed that these HV trips will be spread out across the day during construction hours, as they are deliveries of material and equipment, and these are not expected to coincide with LV (construction worker) movements. Therefore, the expected average traffic generation for HVs during the peak construction period is in the order of:

- 16 HV movements to and 16 HV movements from the site per day
- 1-2 HV movements to and 1-2 HV movements from the site each hour.

## Total traffic generation

The total traffic generation for a typical peak construction day are summarised in Table 7-1.

Table 7-1 Total typical peak construction period daily traffic generation

Vehicle type	AM Peak (one-way)	PM Peak (one-way)	Daily (two-way)
LV	60	60	120
HV	-	-	32
<b>Total</b>	<b>60</b>	<b>60</b>	<b>152</b>

### 7.1.2 Traffic distribution

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#### Workers (LVs)

As discussed in Section 4.2, the expected worker origins are approximately 20% from Yarragon and 80% from Melbourne. The key roads workers are assumed to use are both the Princes Highway and Yarragon-Shady Creek Road.

## Construction delivery vehicles (HVs)

It is expected that heavy vehicles will originate from multiple locations depending on what is being delivered. Construction delivery vehicles will use the same site access as construction workers and are expected to use routes similar to construction workers from Yarragon and Melbourne. As there is expected to be an average of 16 HVs per day accessing the site during the peak construction period, there is expected to be up to 32 (two-way) HV trips per day on average on any of those key roads.

### 7.1.3 Traffic impact summary

The estimated traffic generation and distribution for the peak construction period has been applied to the key roads, resulting in approximately 120 LV movements and 32 HV movements per day (with up to 60 movements in the peak hour) expected on the Princes Highway and Yarragon-Shady Creek Road, as discussed in Section 7.1.2. It is expected that both of these roads will be able to accommodate these additional traffic volumes. Actual traffic generation and distribution may vary depending on the final design, construction program, and once a contractor and access routes are confirmed.

It is recommended that suitable road improvements and upgrades, if any, are investigated and documented as part of a TMP to the satisfaction of the Responsible Authority.

Additionally, a TMP will be prepared and implemented to communicate and manage the routes which workers and heavy vehicles will utilise during construction, to reduce and/or manage any potential impact from construction and operations vehicles on roads which are not suitable for use.

## 7.2 Operations and maintenance phase

During the operation and maintenance phase, there is expected to be two full-time workers on the site each day. Additionally, a small team will access the site approximately five days a month to undertake inspections and maintenance activities. Traffic generated during the operation phase is therefore expected to have a negligible impact compared to the construction phase traffic.

## 7.3 Decommissioning phase

Approximately 30 years from commissioning, a decision will be made to either refurbish/deploy an alternative project on the site (recommissioning) or decommission the site. It is expected that the recommissioning and decommissioning phases will generate less traffic than the construction phase and will therefore have a lesser impact.

Details of the recommissioning/decommissioning process and the associated traffic impacts will be outlined in appropriate Management Plans that will be prepared prior to the commencement of recommissioning/decommissioning.

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## 8 Summary

On the basis of the above discussion and analysis, the following is summarised for the traffic and transport considerations for the project.

- The site is proposed west of Yarragon-Shady Creek Road with vehicle access via a new access (for both construction and operations vehicles).
- A secondary access is proposed for fire emergency access via the existing residential driveway.
- At this stage of the project there is no design for the layout of the site accesses.
- During the operations phase staff will only access the site periodically for routine maintenance and inspection activities.
  - The project is expected to generate a small number of light vehicle movements per day during this phase. Therefore, the operations phase is not expected to impact the capacity or safety of the surrounding road network.
  - The provision and layout of car parking for operations staff will be determined through detailed design. It is expected that more than sufficient space will be available on the site to accommodate the parking demand. Car parking should be designed according to the requirements in the Baw Baw Planning Scheme. The number and layout of car parking spaces will be provided to the satisfaction of the Responsible Authority.
- During the peak construction period the project is estimated to generate the following vehicle movements.
  - 60 'in' light vehicles in the AM peak.
  - 60 'out' light vehicles in the PM peak.
  - 16 'in' and 16 'out' heavy vehicles per day across construction hours.
  - Overall daily 152 'in' and 152 'out' movements.
- Construction phase movements are expected to originate from both Melbourne and surrounding towns (such as Yarragon).
- The estimated increase in traffic volumes on the key access roads due to the construction phase traffic is not expected to notably impact the operation of these roads.
- Suitable road improvements and upgrades, if any, will be investigated and documented as part of a TMP to the satisfaction of the Responsible Authority. Additionally, the TMP will be prepared and implemented to communicate and manage the routes which workers and heavy vehicles will utilise during construction to reduce and/or manage any potential impact on roads which are not suitable for use.
- The transformer delivery vehicle access route will depend on the characteristics of the confirmed vehicle and consultation with the relevant authorities. On the example route from the Port of Melbourne to the site most of the roads are pre-approved routes under the Victorian OSOM Network. There are numerous structures along the route with varying approval conditions or restrictions for larger and/or heavier vehicles. However, there are several projects nearby that have used this route for OSOM deliveries so while traversing these constraint points will need to be managed these are not expected to be an issue. Additionally, whilst there are some items along Yarragon-Shady Creek Road that may require additional assessment and/or mitigation measures, these are not expected to restrict delivery of the transformer to the site. Specific access routes will be confirmed following selection of a construction contractor and transformer supplier and detailed in an appropriate TMP.

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## 9 References

[1] onemilegrid, 'Yarragon Township Plan Transport Impact Assessment', [Online] Available: <https://www.bawbawshire.vic.gov.au/files/sharedassets/public/have-your-say/documents/yarragon-township-plan/yarragon-township-plan-traffic-impact-assessment.pdf>.

[2] Transport Victoria, 'Victoria road crash data', [Online] Available: <https://opendata.transport.vic.gov.au/dataset/victoria-road-crash-data>.

[3] Baw Baw Shire Council, 'Tree Management Plan', [Online] Available: <https://www.bawbawshire.vic.gov.au/files/sharedassets/public/v/1/environment/documents/tree-management-plan-and-policy/baw-baw-tree-management-plan-may-2024.pdf>.

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