

Macedon BESS

Traffic Impact Assessment

Macedon BESS Development Pty Ltd

Reference: 527802

Revision: 2

2026-03-18

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

Document control record

Document prepared by:

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre

Level 8, 850 Collins Street

Docklands, Melbourne VIC 3008

PO Box 23061

Docklands VIC 8012

Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

**ADVERTISED
PLAN**

A person using Aurecon documents or data accepts the risk of:

- a) Using the documents or data in electronic form without requesting and checking them for accuracy against the original hard copy version.
- b) Using the documents or data for any purpose not agreed to in writing by Aurecon.

Document control		aurecon				
Report title		Traffic Impact Assessment				
Document code			Project number		527802	
File path						
Client		Macedon BESS Development Pty Ltd				
Client contact		Linh Nguyen	Client reference			
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
0	2026-02-26	Draft	Sotiri Poullos	Tegan Ross	Gillian Austin	Bez Hasenfratz
1	2026-03-13	Update	Tegan Ross	Gillian Austin	Gillian Austin	Bez Hasenfratz
2	2026-03-18	Final	Tegan Ross	Gillian Austin	Gillian Austin	Bez Hasenfratz
Current revision		2				

Approval			
Author signature		Approver signature	
Name	Tegan Ross	Name	Bez Hasenfratz
Title	Civil Engineer	Title	Manager, Environment and Planning

Contents

ADVERTISED PLAN

Executive Summary	1
Abbreviations.....	2
1 Introduction.....	3
1.1 Purpose	3
1.2 Project Site and surrounds	3
1.3 Assumptions and limitations	3
2 Project Description.....	6
3 Existing conditions	8
3.1 Land use	8
3.2 Road network	8
3.2.1 Calder Freeway	8
3.2.2 Mount Macedon Road	9
3.2.3 Macedon-Woodend Road	9
3.2.4 Allison Lane	9
3.3 Public transport network	9
3.4 Active transport network	9
3.5 Crash history	9
4 Development proposal.....	11
4.1 Site access	11
4.1.1 Site access options consultation	11
4.2 Construction phase.....	12
4.2.1 Construction vehicle types	12
4.2.2 Vehicle origins and access routes	13
4.3 Operations phase	13
4.3.1 Vehicle origins and access routes	14
4.3.2 Parking	14
4.4 Decommissioning	14
5 Car parking and access	15
5.1 Car parking	15
5.1.1 Statutory requirements	15
5.1.2 Parking demand assessment	15
5.1.3 Parking layout.....	15
5.2 Site access	15
5.2.1 Sight distance	15
5.2.2 Swept path assessment	16
5.3 Heavy vehicle access	17
5.4 OSOM height clearance	17
5.5 Emergency vehicle access.....	18
6 Traffic impact assessment	19
6.1 Construction phase.....	19
6.1.1 Traffic generation.....	19
6.1.2 Traffic impact on local road network.....	19
6.2 Operations and maintenance phase	20
6.3 Decommissioning phase	20

**ADVERTISED
PLAN**

Figures

Figure 1-1 Project Site

Figure 2-1 Proposed Site Layout Plan (EHV-MBESS-EL-DR-0109, EHV Consulting and Design, Rev A, 27/10/2025)

Figure 3-1 Zoning map

Figure 3-2 Crashes in last five-year reporting period in proximity to the Site (Basemap source: Open Street Map)

Figure 4-1 Macedon BESS proposed site layout (EHV-MBESS-EL-DR-0109, EHV Consulting and Design, Rev A, 27/10/2025)

Figure 5-1 Swept paths for 19 m semi-trailer, Allison Lane access (Basemap: VicPlan)

Tables

Table 4-1 Expected construction vehicle types

Table 6-1 Total construction phase traffic generation

**ADVERTISED
PLAN**

Executive Summary

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Macedon BESS Development Pty Ltd to facilitate the environmental and planning assessments and approvals for the Macedon Battery Energy Storage System (BESS).

The Project includes the development of a BESS on the Site located on Macedon-Woodend Road (also referred to as Black Forest Drive), Macedon. Two accesses to the Site are proposed: a primary access off Allison Lane to the north of the Site for construction and operations, and a secondary (emergency only) access towards the southern end of the Site off Macedon-Woodend Road in accordance with Country Fire Authority requirements to have a minimum of two accesses for BESS sites.

As a permit is required to create or alter access to Macedon-Woodend Road, early engagement was undertaken with DTP regarding site access options. DTP advised the Proponent to avoid creating additional entrances along Macedon-Woodend Road. Consequently the Proponent engaged with Powercor about the possibility of sharing the existing Gisborne Substation access off Macedon-Woodend Road. However, Powercor ultimately rejected the shared access proposal due to the impact it would have on their assets and property. Therefore, the only remaining option to provide a secondary (emergency only) access to the Site to meet the minimum CFA requirements for a BESS is to create a new access directly off Macedon-Woodend Road.

Preliminary sight distance checks show that both accesses are compliant, with further assessment of sight distance to be undertaken during the detailed design stage. Swept path analysis of the construction access shows that it can accommodate two-way simultaneous movements of 19 m semi-trailers.

Peak traffic generation for the project will occur during construction as BESS facilities typically have limited operational workforce demands. The construction phase is expected to span approximately 12-15 months, with up to approximately 100 light vehicles and 30 heavy vehicles accessing the site per day during the peak of construction. The estimated temporary 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. Oversize overmass (OSOM) deliveries are not expected to have a material impact along the Calder Highway, with access via Macedon-Woodend Road and OSOM movements managed through a permit application process.

During the operational phase, regular traffic movements will be limited to a small team visiting the site periodically for routine inspections and maintenance. Three permanent parking spaces will be provided for use during the operational phase. The estimated increase in traffic volumes on the key access roads due to the operation of the Site is not expected to notably impact the operation of these roads.

**ADVERTISED
PLAN**

Abbreviations

Term	Definition
The Applicant	Macedon BESS Development Pty Ltd
ASD	Approach Sight Distance
Aurecon	Aurecon Australasia Pty Ltd.
BESS	Battery Energy Storage System
CBD	Central Business District
CFA	Country Fire Authority
EES	Environment Effects Statement
ha	hectares
HV	Heavy vehicle
km	kilometres
kV	Kilovolt
LGA	Local Government Area
LV	Light vehicle
m	metre
MGSD	Minimum Gap Sight Distance
mm	millimetre
MW	Megawatts
MWh	Megawatt hours
OSOM	Oversize Overmass
PCS	Power conversion systems
RAP	Registered Aboriginal Party
SISD	Safe Intersection Sight Distance
The Project	Macedon Battery Energy Storage System
TIA	Traffic Impact Assessment
vpd	vehicles per day
WWCHAC	Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation

**ADVERTISED
PLAN**

1 Introduction

1.1 Purpose

Aurecon Pty Ltd (Aurecon) has been engaged by Macedon BESS Development Pty Ltd to prepare this Traffic Impact Assessment (TIA) for the Macedon Battery Energy Storage System (BESS) (the Project). The purpose of this TIA report is to identify traffic and parking impacts of the proposal to accompany a Planning Permit application to the Department of Transport and Planning (DTP). This report sets out a desktop assessment of the transport aspects 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, and decommissioning phases.
- adequacy of the Project's proposed car parking provision and layout arrangements.

Over the course of preparing this assessment, a desktop review of the subject site and its environs has been completed, and concept plans and relevant available traffic data sourced and analysed. Relevant standards and guidelines relied upon are noted and referenced as necessary throughout this report.

1.2 Project Site and surrounds

The proposed Site is located on Macedon-Woodend Road (also referred to as Black Forest Drive), Macedon and is formally known as Lot 2 on Plan of Subdivision 444155 (refer to Figure 1-1). The Site has an area of approximately 7.28 ha and is located in the Macedon Ranges Shire, approximately 59 km north-west of Melbourne's CBD. The Site is bordered by Allison Lane to the north, Macedon-Woodend Road to the east, the Gisborne Substation to the south, and the Calder Freeway to the west.

Mature vegetation surrounds the Site's boundaries. The central portion of the Site comprises flat topography, with small patches of mature canopy trees and understorey vegetation. There is an unnamed waterway located within the western portion of the Site.

The Site surrounds are largely characterised by cleared, vacant land on the south side of the Calder Freeway and agricultural land on north side of Macedon-Woodend Road. The Site is situated in a rural setting and away from established neighbourhoods. Low density rural residences are visible within the broader landscape to the north with the nearest dwelling being opposite Macedon-Woodend Road approximately 65 m to the east. The closest township is New Gisborne, approximately 2.3 km to the south-east of the Site. The Site is located within the Macedon Ranges Shire Council.

The Registered Aboriginal Party (RAP) associated with the Site is Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC).

1.3 Assumptions and limitations

The following assumptions and limitations apply to this report.

- This report is preliminary due to the early stage of the Project and information available but is considered suitably advanced for planning purposes. Further traffic assessment may be required in subsequent stages as the design and planning of construction vehicle movements evolves.
- This report is based on a desktop review using publicly available information and information provided by the Proponent. No site visit or data collection was undertaken.
- It is assumed that all data provided by the Proponent is correct at the time of writing (but may change as the Project progresses and is refined).

- A staged schedule and breakdown of construction workers, vehicle volumes and types per activity/location has not been defined at this stage. Actual volumes may be different depending on construction schedule and requirements.

**ADVERTISED
PLAN**

ADVERTISED PLAN



Figure 1-1 Project Site



2 Project Description

The following section provides a summary of the proposal and should be read in conjunction with the accompanying Concept Design prepared by EHV Consulting and Design as shown in Figure 2-1.

The Project will comprise the following.

- Site establishment works including removal of vegetation within the construction area.
- Construction of a BESS with a 501 MWh capacity featuring the following design components:
 - 123 Battery Cell Containers (BCCs) and 41 Power Conversion Units (PCUs)
 - Ancillary electrical equipment including sub-station, control rooms, harmonic filter, and connecting ancillary equipment
- Construction of two site access points connecting to Allison Lane and Macedon-Woodend Road respectively, and associated business identification signage.
- Underground or overhead cabling (66kV) to connect the onsite substation to the adjoining Powercor Gisborne Substation (66/22kV).
- An Operations and Maintenance (O&M) Facility.
- Temporary construction facilities including site offices and stores, laydown and hardstand area and construction carpark.
- Water storage including two water supply tanks and pump house.
- Fencing around the perimeter of the BESS and collector substation.
- Three permanent car parking spaces for operational staff.
- Installation of a noise wall up to 4m in height on the north east boundary the BESS.
- Construction of two (2) lightning masts up to 21.4m in height adjacent to the collector substation.
- Construction of light poles up to 10.6m in height around the perimeter of the BESS.
- Construction of a firewater holding pond.

**ADVERTISED
PLAN**



3 Existing conditions

ADVERTISED PLAN

3.1 Land use

The Site is located on land zoned Rural Conservation Zone (RCZ) under the Macedon Ranges Planning Scheme. It is bordered by RCZ to the southeast and north, and Transport Zone 2 (TRZ2) to the southwest (Calder Freeway) and east (Macedon-Woodend Road). The land use zoning is shown in Figure 3-1.

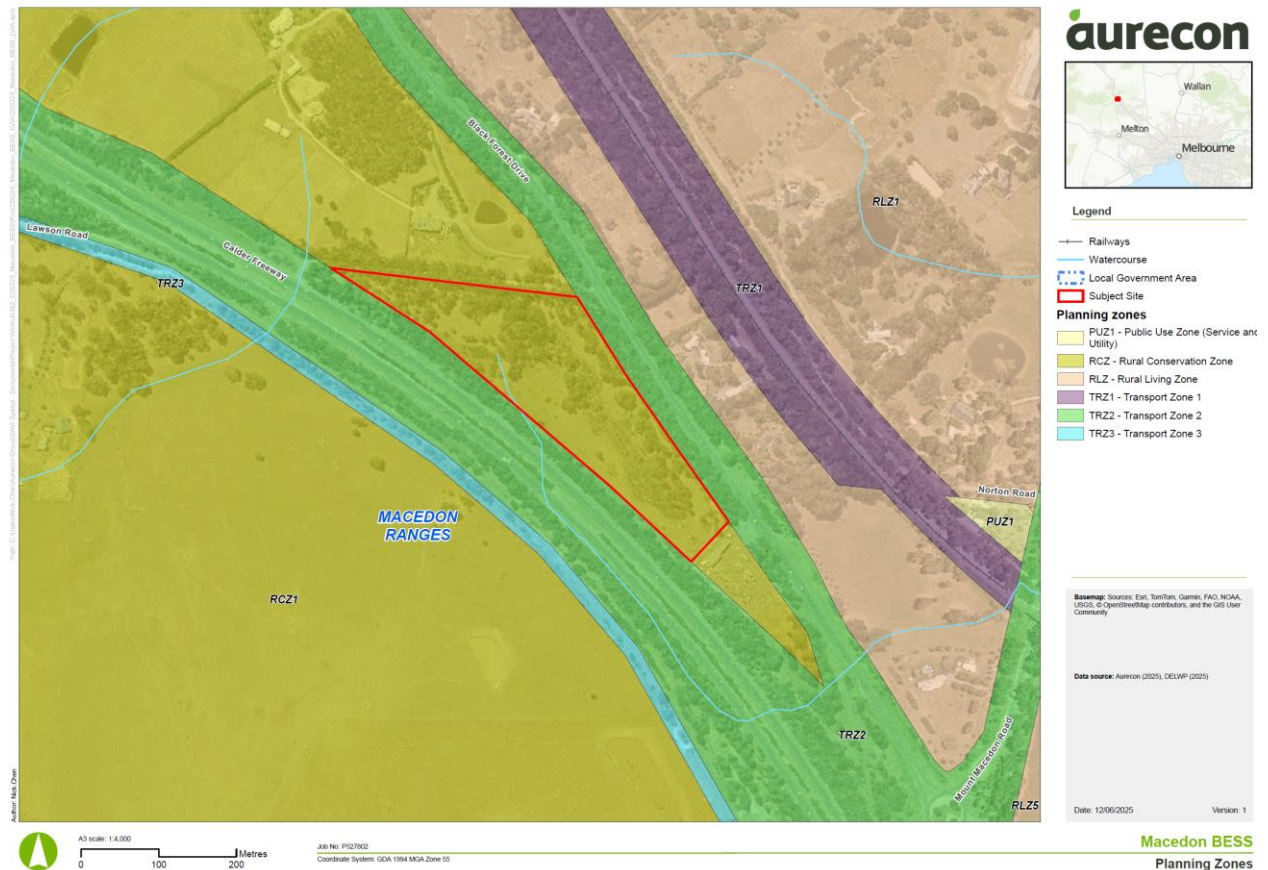


Figure 3-1 Zoning map

3.2 Road network

There are three key roads in the vicinity of the Site that will be used by construction traffic and workforce in accessing the site. The key roads are described in the following sections. Mount Macedon Road and Macedon-Woodend Road intersect at a large roundabout approximately 550 m southeast of the Site. The roundabout has a single circulating lane, with a central island approximately 44 m in diameter.

3.2.1 Calder Freeway

The Calder Freeway is a divided, four-lane, two-way DTP managed freeway running in a northwest-southeast alignment in the vicinity of the Site. The road has sealed lanes approximately 3.5 m wide and sealed outer shoulders approximately 2.8 m wide. There is a total sealed width of approximately 11.5 m in each direction, separated by a vegetated median strip approximately 16.0 m wide. The road has a posted speed limit of 110 km/h. In proximity to the Site, the Calder Freeway carries in the order of 11,510 vehicles per day¹ (vpd) southbound (9% heavy vehicles (HV)) and 11,410 vpd northbound (12% HV) and is pre-approved for B-double and oversize overmass (OSOM) vehicles.

¹ Source: Transport Victoria, Annual Average Daily Traffic Volume 2019

ADVERTISED PLAN

Ramps

At the interchange closest to the Site, the southbound entry ramp to the Calder Freeway is accessed via the roundabout at the intersection of Mount Macedon Road and Macedon-Woodend Road. The northbound exit ramp from Calder Freeway joins up to Mount Macedon Road at a priority-controlled T-intersection with physically separated left and right turn lanes. Both ramps have lane widths of approximately 3.6 m and shoulders of approximately 2.6 m width.

There are no southbound exit or northbound entrance ramps present at this interchange. The nearest ramps are located at the Station Road interchange, approximately 2.4 km southeast. However, the Macedon-Woodend Road interchange approximately 6.1 km to the northwest would provide a shorter and more direct route to the Site for traffic going to / coming from the north of the Site.

3.2.2 Mount Macedon Road

Mount Macedon Road is an undivided, two-lane, two-way DTP managed arterial road running in an approximate north-south alignment. The road has sealed lanes approximately 3.4 m wide and sealed shoulders between 1.5 m to 2.0 m wide. The road has a posted speed limit of 80 km/h. In proximity to the Site, Mount Macedon Road carries in the order of 1,930 vpd¹ northbound (4% HV) and 2,020 vpd southbound (4% HV). For B-doubles, Mount Macedon Road is restricted between Lawson Road and Macedon-Woodend Road, conditionally approved between Macedon-Woodend Road and Hamilton Road, and restricted north of Hamilton Road. For OSOM vehicles, Mount Macedon Road is conditionally approved between Macedon-Woodend Road and Hamilton Road, with no pre-approval or restriction along the rest of the road.

3.2.3 Macedon-Woodend Road

Macedon-Woodend Road (also known as Black Forest Drive) is an undivided, two-lane, two-way DTP managed arterial road running in a northwest-southeast alignment. The road has sealed lanes approximately 3.6 m wide, sealed bicycle lanes approximately 1.8 m wide, gravel shoulders approximately 0.5 m wide, and a painted median strip approximately 3.1 m wide. The road has a posted speed limit of 80 km/h. In proximity to the Site, Macedon-Woodend Road carries in the order of 1,750 vpd¹ northbound (3% HV) and 1,900 vpd southbound (5% HV) and is approved for B-double and OSOM vehicles.

3.2.4 Allison Lane

Allison Lane is a single lane gravel road approximately 2.7 m wide, running in an east-west alignment. It has no posted speed limit and ownership of the road is currently unknown, however it is not on the Public Road Register. There are no pre-approvals for B-double or OSOM vehicles.

3.3 Public transport network

There are no regular public transport service stops in the vicinity of the Site.

3.4 Active transport network

There are on-road bicycle lanes on both sides of Macedon-Woodend Road. The lanes are approximately 1.8 m in width and the northwest bound lane is shaded green where it crosses Allison Lane.

3.5 Crash history

Within the vicinity of the Site, there have been seven crashes reported in the last five years of available data² (1 July 2020 to 30 June 2025). Of these crashes, there are four 'serious injury' and three 'other injury'

² Source: DataVic – Victoria Road Crash Data

crashes (as shown in Figure 3-2). Two of the crashes involved vulnerable road users (in these cases, cyclists). Crash number one was a sole cyclist with no motor vehicles present. Crash number three was a collision between a passenger vehicle and a cyclist, resulting in a single serious injury. No trends have been identified.

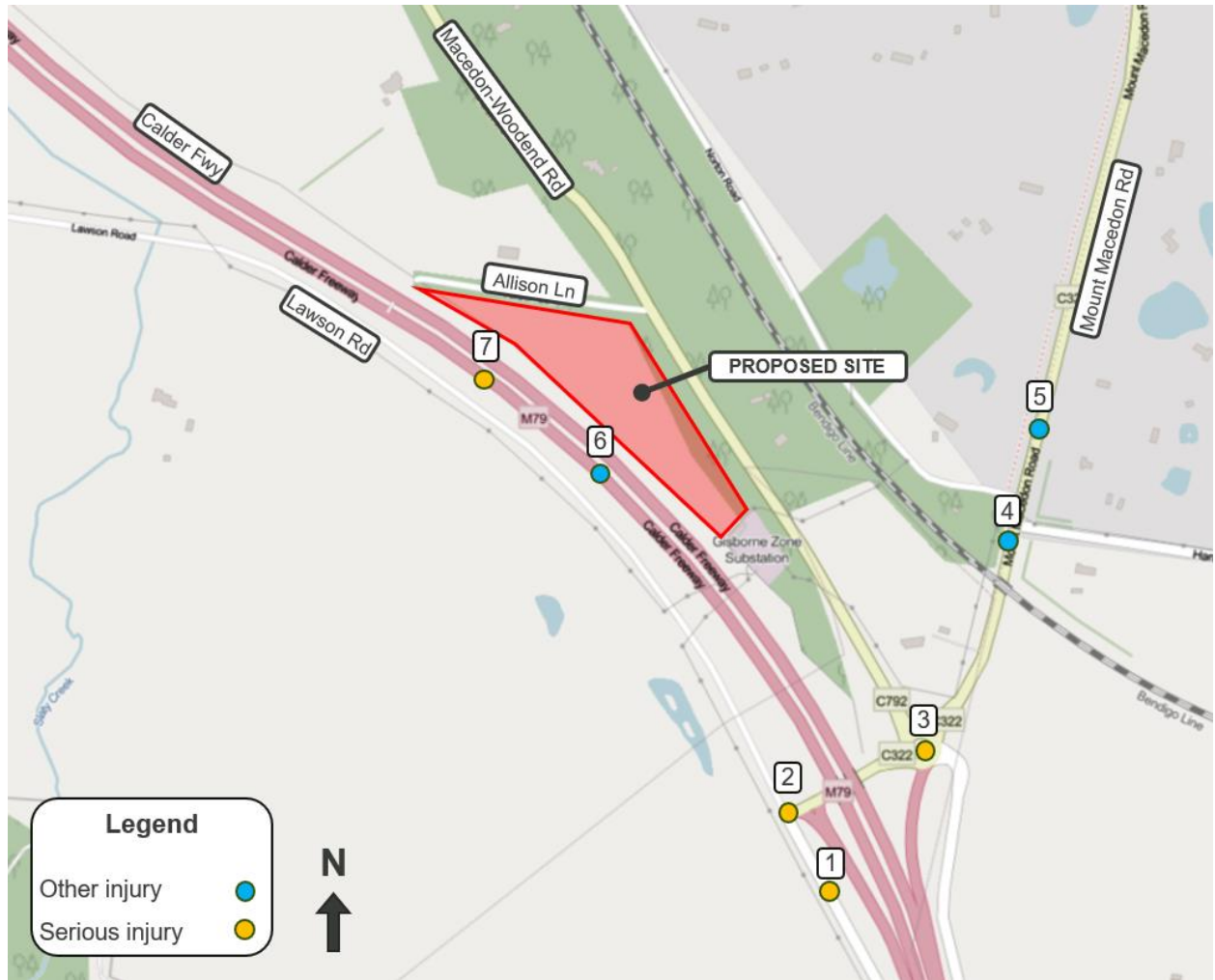


Figure 3-2 Crashes in last five-year reporting period in proximity to the Site (Basemap source: Open Street Map)

**ADVERTISED
PLAN**

4 Development proposal

4.1 Site access

Access between the development and the wider road network is proposed via Macedon-Woodend Road. The Proponent engaged EHV Consulting and Design to develop a preliminary site layout, shown in Figure 4-1, which was developed with input from Aurecon. Two accesses are proposed for the site, a primary access at the north of the site off Allison Lane used during both construction and operation phases of the project and a secondary emergency only access towards the southern end of the Site off Macedon-Woodend Road.

The proposal includes widening of the existing Allison Lane / Macedon-Woodend Road intersection to facilitate access by construction vehicles. The proposed works to facilitate the access off Allison Lane are in the vicinity of the existing access to the private property to the north. The design will ensure that this private property access is maintained.



Figure 4-1 Macedon BESS proposed site layout (EHV-MBESS-EL-DR-0109, EHV Consulting and Design, Rev A, 27/10/2025)

4.1.1 Site access options consultation

As Macedon-Woodend Road is zoned TRZ2, a permit is required to create or alter access to Macedon-Woodend Road, as per Macedon Ranges Planning Scheme Clause 52.29. Early engagement with DTP was undertaken regarding site access options, noting it is a Country Fire Authority (CFA) requirement for a minimum of two accesses to be provided to a BESS facility. Aurecon and the Proponent met with DTP on 12 June 2025 where DTP advised to avoid creating entrances along any arterial road, in this case Macedon-Woodend Road.

**ADVERTISED
PLAN**

In response to DTP's advice:

- the Proponent has designed the primary access to be via Allison Lane rather than Macedon-Woodend Road
- the Proponent engaged with Powercor about the possibility of sharing the existing Gisborne Substation access off Macedon-Woodend Road for use by emergency vehicles access only to meet the CFA requirements for this Site. However, Powercor ultimately rejected the shared access proposal due to the impact it would have on their assets and property.

Therefore, the only remaining option to provide a secondary (emergency only) access to the Site to meet the CFA requirements for a BESS is to create a new access directly off Macedon-Woodend Road.

4.2 Construction phase

The construction phase is expected to commence in the first quarter of 2027 and last approximately 12-15 months from procurement to commissioning. There will be four stages, which may overlap and/or run concurrently. The stages and approximate durations are as follows.

- Procurement: 6 months
- Site preparation: 1 month
- Equipment delivery and installation: 6-8 months
- Testing and commissioning: 2-3 months

**ADVERTISED
PLAN**

4.2.1 Construction vehicle types

Core equipment such as battery enclosures and power conversion system (PCS) units are 20-foot containerised units and are expected to be delivered using standard flatbed or container trucks. Daily traffic during peak periods is expected to include equipment deliveries, concrete and earthmoving trucks, and light commercial vehicles. Workers are expected to arrive on site in light vehicles. Typical construction loads and expected vehicle types are summarised below in Table 4-1.

Table 4-1 Expected construction vehicle types

Load Type	Vehicle Type
Construction workers	Light vehicle (LV)
Mobile plant	Low loader
Site office, site equipment containers, high voltage equipment, fuel	Semi-trailer
Concrete	Concrete agitator
Potable water	Heavy rigid water truck
Gravel	Truck and dog
Miscellaneous equipment and supplies	Heavy rigid vehicle
Main transformer	Platform trailer combination (see below figure)
Battery enclosures, PCS	Flatbed/container truck
BESS equipment	GML B-Double

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 required to accommodate its weight.

Construction vehicle types will be confirmed following selection of a BESS 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 OSOM vehicles such as the transformer delivery vehicle.

4.2.2 Vehicle origins and access routes

Construction delivery vehicles

The delivery of imported materials will most likely be via the Port of Melbourne. Non-imported materials are expected to be sourced from Melbourne or 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 the Site is provided below.

- *Port of Melbourne → ... (various routes) ... → M79 Calder Freeway → Macedon-Woodend Road (C792) (north of the site)*

The transformer delivery vehicle access route will depend on the characteristics of the confirmed vehicle and consultation with the relevant authorities including the National Heavy Vehicle Regulator (NHVR), Regional Roads Victoria, and DTP. Along the above route from the Port of Melbourne to the Site, many roads are pre-approved routes for low loaders and OSOM vehicles. Depending on the final vehicle configuration, there may be conditions attached to structures that could limit travel time, speeds and other vehicle conditions and will require further analysis and planning by the specialist haulage company post development application approval.

Specific access routes will be confirmed following selection of a preferred transformer supplier and construction contractor and detailed in an appropriate TMP.

Construction workers

It is expected that construction workers will travel to/from local towns or Melbourne. The assumed access routes are summarised below noting they will be confirmed following selection of a construction contractor and detailed in an appropriate TMP.

- *Melbourne and south of the Site: (various routes) → M79 Calder Freeway → Mount Macedon Road → Macedon-Woodend Road (C792)*
- *Macedon:*
 - *Mount Macedon Road → Macedon-Woodend Road (C792)*
 - *McBean Avenue Freeway → Macedon-Woodend Road (C792)*
- *North of the Site: (various routes) → M79 Calder Freeway → Macedon-Woodend Road (C792)*

Light vehicles will utilise local and regional roads to access the Site with a preference to use major and arterial roads.

4.3 Operations phase

BESS facilities typically operate 24/7 and are monitored remotely in real-time and do not require dedicated staff to be on-site at all times. Staff will access the Site periodically for inspections and maintenance activities with approximately 2-3 full-time staff typically on-site during business hours for rolling maintenance and troubleshooting activities. It is anticipated that no more than two staff will be on site at any one time. Vehicles accessing the Site will mostly comprise of light vehicles (e.g. passenger cars, utility vans). Some heavy vehicles will require access to the site during operation for the purpose of major maintenance, however this is not expected to be a frequent or regular occurrence. Details of operational access will be included in the TMP.

**ADVERTISED
PLAN**

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. Staff access routes to the Site in the vicinity of the Site are expected to be the same as construction worker access routes; either along Mount Macedon Road from the west, Macedon-Woodend Road from the north or the Calder Freeway from the north or south of the Site.

4.3.2 Parking

Three permanent parking spaces (as shown in Figure 2-1) will be provided adjacent to the operations and maintenance building for use during the operational phase.

4.4 Decommissioning

The Project is expected to be decommissioned approximately 20 years post commissioning, following which, the land will be returned to its existing use. This will include the removal of all above ground non-operational equipment, in consultation with the landholder.

**ADVERTISED
PLAN**

5 Car parking and access

**ADVERTISED
PLAN**

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 Macedon Ranges 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.

5.1.2 Parking demand assessment

During the operational phase there is expected to be limited operational vehicles, with a small team of two to three staff visiting the Site periodically for routine inspections and maintenance. Three permanent parking spaces (as shown in Figure 2-1) will be provided adjacent to the operations and maintenance building to accommodate this demand.

5.1.3 Parking layout

Design of the parking layout will be refined 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 Macedon Ranges Planning Scheme and/or AS 2890.1 - Off-street car parking.

5.2 Site access

As noted in Section 4.1, two new site access points are proposed, with the access off Allison Lane for both construction and operation vehicle movements, and the access off Macedon-Woodend Road reserved for emergency vehicle movements only (noting it is a CFA requirement for two accesses to be provided at a BESS facility). Aurecon has reviewed the concept designs and relevant design discussion is provided in the following sections.

5.2.1 Sight distance

Sight distances at accesses and intersections should aim to comply with the sight distance requirements as set out in *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (AGRD4A)* Section 3.2 for intersections and Section 3.4 for private accesses. For intersections, *AGRD4A* provides safe intersection sight distance (SISD), minimum gap sight distance (MGSD) and approach sight distance (ASD). For private accesses, *AS 2890.1*, provides distances for MGSD and SSD.

The proposed access off Allison Lane is approximately 20 m west of the Allison Lane / Macedon-Woodend Road intersection. As such, traffic is expected to be entering Allison Lane at low speeds and sight distance is expected to be sufficient.

The intersection of Allison Lane and Macedon-Woodend Road has recently been upgraded and includes the addition of a channelised right turn into Allison Lane, wide centreline treatment, and dedicated bicycle lanes. As part of this development, widening of the Allison Lane splay at Macedon-Woodend Road has been proposed to accommodate construction vehicle swept paths. Therefore, preliminary sight distance checks for this intersection have been undertaken.

The proposed secondary site access is a private access rather than an intersection, intended for emergency vehicle access only. Requirements for sight distance at property entrances is set out in *AGRD4A* Section 3.4. The minimum requirement for non-domestic accesses is as per *AS 2890.1*, which provides distances for

MGSD with a desirable 5 s gap and minimum SSD based on a 2 s reaction time. Additionally under AGRD4A, sight distances at accesses should aim to comply with the sight distance requirements for intersections if possible, namely SISD, MGSD and ASD, noting that it is not always possible due to constraints and therefore not mandatory.

Minimum gap sight distance

A preliminary check for the MGSD requirements for a 5 s gap was undertaken as a desktop assessment using publicly available information for an 80 km/h speed limit. This assessment found that the proposed access location is likely to meet or exceed the minimum requirements.

- The minimum desirable MGSD is 111 m in both directions.
- Preliminary assessment indicates that the MGSD is met at Allison Lane in both directions.
- Preliminary assessment indicates that the MGSD is met at the emergency access off Macedon-Woodend Road in both directions.

Safe intersection sight distance

SISD is the minimum sight distance that should be provided on the major road at any intersection. While not mandatory, it is desirable at property accesses (such as the site accesses), as set out in AGRD4A. The SISD input parameters were 80 km/h, reaction time 2 seconds, and a 3% uphill grade of road estimated from Google Earth.

- The maximum required SISD is in the order of 244 m (trucks travelling 3% downgrade).
- Preliminary assessment indicates that the SISD is met at Allison Lane in both directions.
- Preliminary assessment indicates that the SISD is met at the emergency access off Macedon-Woodend Road in both directions.

Approach sight distance

ASD along the major road is the minimum level of sight distance available on road approaches at intersections to ensure that drivers are aware of the presence of an intersection. It is not mandatory at property accesses (such as the site accesses) but is desirable. The ASD input parameters were 80 km/h, reaction time 2 seconds, and a 3% uphill grade of road estimated from Google Earth.

- The maximum required ASD is in the order of 177 m (trucks travelling 3% downgrade).
- Preliminary assessment indicates that the ASD is met at Allison Lane in both directions.
- Preliminary assessment indicates that the ASD is met at the emergency access off Macedon-Woodend Road in both directions.

ADVERTISED PLAN

Sight distance summary

In summary, based on preliminary desktop assessment the Allison Lane / Macedon-Woodend Road intersection meets both mandatory and desirable sight distances. The proposed emergency access off Macedon-Woodend Road is a private access rather than an intersection, and has been assessed for MGSD, SISD, and ASD along the major road. This preliminary assessment indicates that the private access meets all requirements for sight distance for trucks and cars. A preliminary check of sight distance for the northbound bicycle lane indicates that sight distance is sufficient. It is recommended that comprehensive sight distance checks are undertaken during detailed design.

5.2.2 Swept path assessment

As noted in Section 4.2.1, the expected construction vehicle types regularly accessing the Site during construction include vehicles up to and including 19 m semi-trailers. In addition to these regular construction vehicles, B-doubles and an OSOM vehicle will infrequently access the Site for larger deliveries. Allison Lane

is proposed to be used for construction vehicle access, with the secondary access off Macedon-Woodend Road reserved for emergency vehicles only.

Swept path assessments for the proposed Allison Lane intersection layout (shown in Figure 5-1) were undertaken for 19 m semi-trailers. The swept path assessment shows that simultaneous entry and exit is possible.

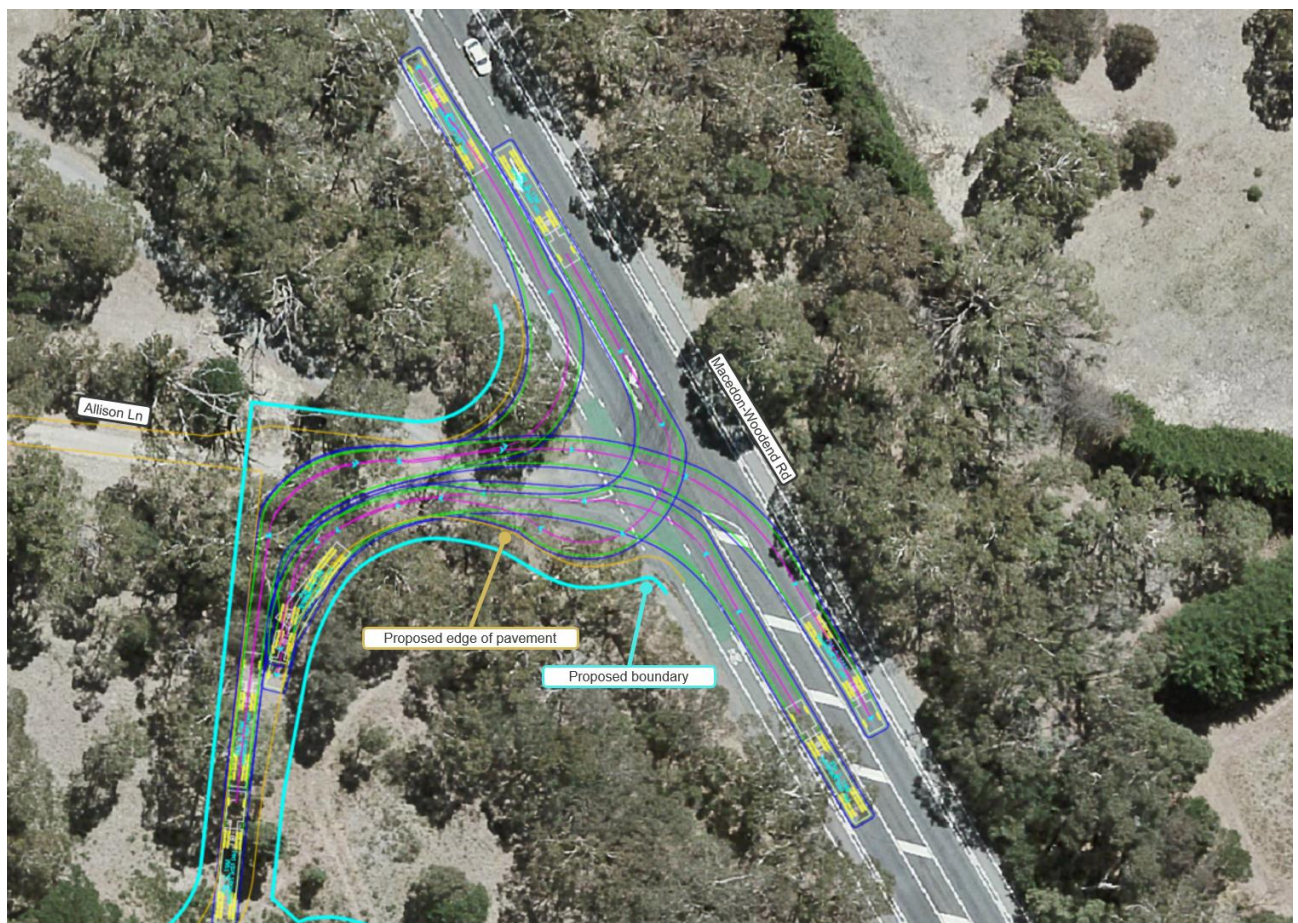


Figure 5-1 Swept paths for 19 m semi-trailer, Allison Lane access (Basemap: VicPlan)

The above is expected to account for the majority of turning vehicles during the construction period. Should any additional swept paths be required, these will be undertaken during detailed design. Management of construction traffic will be detailed in the TMP.

ADVERTISED PLAN

5.3 Heavy vehicle access

For vehicles travelling to the Site along the Calder Freeway from Melbourne the closest exit is the Mount Macedon Road exit. However, the section of Mount Macedon Road between Lawson Road/Ross Watt Road (including the Calder Freeway outbound off ramp) and Macedon-Woodend Road is restricted for B-doubles due to “geometry” as per the NHVR map for Victoria’s gazetted B-double network. It has no pre-approval on the OSOM network. An alternate route for B-doubles and larger vehicles is to continue up the Calder Freeway to the following exit at Macedon-Woodend Road, which is pre-approved in both the B-double network and OSOM network.

5.4 OSOM height clearance

The transformer delivery vehicle may have a minimum vertical clearance requirement in excess of 5 m, noting that transformers range in size and the transformer and delivery vehicle are unknown at this stage. Larger height loads may impact overhanging vegetation, structures and / or breach clearance zones around power lines. For any vehicles exceeding regulatory height levels, permits will be required to ensure that passage can be managed appropriately

5.5 Emergency vehicle access

As noted in Section 4, there will be two site accesses (with internal roads approximately 5 m wide) to the BESS facility.

Internal access to the proposed BESS facility is expected to comply with the access requirements of the CFA *Design Guidelines and Model Requirements, Renewable Energy Facilities, Version 4, August 2023* noting the compliances and/or recommended changes associated with transport specifically.

Whilst the design is not yet at a stage where it can be assessed against these requirements, the Proponent will ensure these requirements are reflected in the detail design phase of the project in consultation with the CFA.

- Construction of a minimum four (4) metre perimeter road within the perimeter fire break.
- Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes.
- Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire vehicles.
- Average grades should be no more than 1:7 with a maximum of 1:5 of no more than 50 metres.
- Dips in the road should have no more than a 1:8 entry and exit angle.
- Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay must be incorporated.
- Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, battery energy storage systems and related infrastructure, substations and grid connection areas.
- Provision of at least two (2) but preferably more access points to each part of the facility. The number of access points must be informed through a risk management process, in consultation with CFA.

**ADVERTISED
PLAN**

6 Traffic impact assessment

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

6.1 Construction phase

6.1.1 Traffic generation

Construction work is expected to be undertaken six days per week (Monday to Saturday) and will generally occur during between 7:00 am and 5:30 pm (with occasional overtime or night shifts for critical activities).

Workers (LVs)

During the peak construction period there is expected to be up to 70-100 workers on site per day. To determine the weekday peak hour worst-case LV traffic volumes generated by the project, it is assumed that all workers will travel in individual light vehicles, travelling to the Site between 6:00 am and 7:00 am, and from the Site between 5:30 pm and 6:30 pm (representing the AM and PM project peak hours for workers). Therefore, the peak traffic generation for LVs is:

- 100 travelling to the Site in the AM peak hour.
- 100 travelling from the Site in the PM peak hour.
- 200 LV movements per day (two-way).

Construction delivery vehicles (HVs)

Construction delivery vehicles are expected to be HVs (i.e., not passenger cars, utes, vans, or similar). The average daily number of HVs accessing the Site is 30 vehicles.

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.

Total traffic generation

The total traffic generation for a typical peak construction day and weekday peak hours are summarised in Table 6-1.

Table 6-1 Total construction phase traffic generation

Vehicle type	AM peak (one-way)	PM peak (one-way)	Daily (two-way)
LV	100	100	200
HV	-	-	60
Total	100	100	260

6.1.2 Traffic impact on local road network

As discussed in Section 4.2.2, the expected worker origins are Melbourne and other localities near the Site. At this stage, the approximate split of worker origins is unknown. Considering the existing traffic volumes on Mount Macedon Road (approximately 1,900 vpd per direction) and Macedon-Woodend Road (approximately 1,800 vpd per direction) and that both roads are sealed roads with marked lanes, the estimated temporary

increase in traffic volumes due to construction activities is not expected to notably impact the operation of the local road network.

A temporary parking area will be provided on site for the construction workforce, which will accommodate all construction worker vehicles on the site at any one time. No construction worker vehicles will be parked on surrounding roads.

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.

6.2 Operations and maintenance phase

During the operation and maintenance phase, the Site will be monitored remotely, eliminating the need for a continuous presence of workers on the Site. A small team will access the Site periodically 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.

6.3 Decommissioning phase

Decommissioning is expected to occur 20 years from commissioning. It is expected that the decommissioning phase will generate less traffic than the construction phase and will therefore have a lesser impact.

Details of the decommissioning process and the associated traffic impacts will be outlined in a Decommissioning Management Plan that will be prepared prior to the commencement of decommissioning.

**ADVERTISED
PLAN**

7 Summary

Based on the above discussion and analysis, the following is summarised for the traffic and transport considerations for the project.

- The Site is proposed off Macedon-Woodend Road, northwest of the existing adjacent Gisborne Substation, with primary vehicle access proposed via a new access off Allison Lane (for both construction and operations vehicles) and a second new vehicle access off Macedon-Woodend Road (reserved for emergency vehicle use).
- Preliminary layouts for the two site access locations were developed by EHV Consulting and Design based on discussions and input from Aurecon.
 - Preliminary sight distance checks were undertaken by Aurecon for the two site access locations. Preliminary assessment indicates that sight distances have been met for cars and trucks in both directions for both proposed accesses.
 - Swept paths for 19 m semi-trailers show that the proposed upgraded Macedon-Woodend Road / Allison Lane intersection and site access can accommodate two-way simultaneous access. Any additional swept paths required will be undertaken during the detailed design stage.
- 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 impact the capacity or safety of the surrounding road network.
 - Three permanent parking spaces will be provided for use during the operations phase.
- During the peak construction period the project is estimated to generate the following vehicle movements.
 - Up to 100 'in' light vehicles in the AM peak
 - Up to 100 'out' light vehicles in the PM peak
 - Up to 30 'in' and 30 'out' heavy vehicles per day across construction hours.
- Construction phase movements are expected to originate from surrounding towns including Melbourne, Macedon, and various suburbs to the north and south of the Site.
- 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.
- A temporary parking area will need to be provided on site for the construction workforce, which will accommodate all construction worker vehicles on the site at any one time. No construction worker vehicles will be parked on surrounding roads.
- 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 on roads.
- 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, many of the roads are pre-approved routes for platform trailer vehicles. However, there are numerous structures along the route with varying approval conditions or restrictions, depending on the vehicle configuration. Specific access routes will be confirmed following selection of a preferred transformer supplier and construction contractor and detailed in an appropriate TMP.

**ADVERTISED
PLAN**

Document prepared by

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre

Level 8, 850 Collins Street

Docklands, Melbourne VIC 3008

PO Box 23061

Docklands VIC 8012

Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

**ADVERTISED
PLAN**