Prepared for
Star of the South Wind Farm Pty Ltd as trustee for Star of the South Trust
ABN: 68239717297

AECOM

Technical report X: Traffic and transport

Star of the South Offshore Wind Farm

24-Mar-2026
Star of the South Offshore Wind Farm

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ABN: 68239717297

Prepared by

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Executive Summary

Overview

Star of the South is Australia's most advanced offshore wind project. Located off the south coast of central Gippsland, the project comprises an offshore wind farm and supporting transmission infrastructure to transfer energy to the existing electricity network.

A delegate of the Commonwealth Minister for the Environment has decided that the project is a controlled action. This decision is outlined in a notice dated 2 June 2020. As a result, the project must be assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This assessment requires the preparation of an Environmental Impact Statement (EIS). Additionally, the Victorian Minister for Planning has determined that an Environment Effects Statement (EES) is required. This requirement is stated in a notice dated 11 May 2020. The EES must be prepared under the *Environment Effects Act 1978* (EE Act).

The purpose of this report is to assess the potential transport impacts associated with the onshore transmission system scope of the project to inform the preparation of the EIS and EES. The onshore transmission infrastructure extends approximately 30 kilometres from the shore crossing at Reeves Beach to the proposed VicGrid connection hub in Giffard. The wider transport network spanning the area between Morwell, Traralgon, Sale and Yarram has also been included in the assessment.

Existing conditions

The network around the project area is comprised of declared and local roads. The major highway and arterial roads were observed within the study area to be lightly trafficked. The major roads were found to be generally in good condition, with sealed roads, good delineation provided and no apparent pavement defects.

Traffic volume data was collected for the key local roads in the study area via a combination of publicly sourced information and commissioned traffic surveys. Where only average annual daily traffic (AADT) was available the peak traffic periods were derived for the peak operation timeframes identified for the project, these being worker arrivals (6-7am), worker departures (6-7pm) and a nominal midday time period for construction heavy vehicle traffic movements (noting they are assumed to operate over a 10 hour daily working period).

Traffic impact analysis of the local and wider road network was undertaken by reviewing the theoretical mid-block capacity of these roads for both the current (2025) and estimate construction background (assumed 2028) traffic volume years. It was found that all roads are operating within capacity.

There is generally no dedicated pedestrian or bicycle infrastructure provided near the proposed site access points or key local access roads to the project. There are a few dwellings located within the vicinity of the project area, and it is noted that pedestrian and cycling activity may occur on the major roads as there are several parks and reserves located within the study area.

Several school bus services operate across the wider transport network that project vehicles are expected to travel on including the Yarram – Traralgon via Gormandale bus service which operates along Gormandale-Stradbroke Road and Hyland Highway. Bus routes 3 and 7 also operate along Hazelwood Road. Additionally, school bus services are also operating within the study area including on Hyland Highway, Firmins Lane, Flynns Creek Road, Rosedale Longford Road, Prince Street / Woodside Beach Road and South Gippsland Highway.

There are no railway lines or associated stations near the local access roads anticipated to be utilised to access the work sites for the project, however there are several level crossings on roads which are likely to be utilised by project traffic.

Department of Transport and Planning CrashStats was interrogated for the last five years of recorded crashes, between 2020 to 2024. Overall, whilst crash severity, frequency and types varied across the study area, the crash analysis showed that there are no evident crash patterns.

Construction impact assessment

During construction, potential impacts on the transport network include:

- Safety impacts related to the road network capacity to accommodate the project construction traffic, public road network heavy vehicle accessibility including for heavy vehicles
- Disruption impacts on the public road network including public transport impacts due to the proposed road and lane closures
- Road condition impacts from the project heavy vehicles on the public road network.

These would be managed through the implementation of standard traffic management measures typically applied for projects of this scale and nature and incorporated into a Traffic Management Plan (TMP). The key findings of the construction phase impact assessment for the project were as follows:

- Capacity: the analysis included anticipated traffic generated by the project construction across morning peak, afternoon peak and midday peak and flow diagrams were established. The intersections volumes assessed are within acceptable capacity metrics.

  The project traffic is anticipated to have only low impact on the road network operations. There is anticipated to be ample capacity in the road network to carry the minor increase in traffic volumes, which are temporary in nature. Furthermore, the implementation of measures, such as the TMP and alternate routes and access measures will further mitigate the impacts.
- Preliminary heavy vehicle route assessment: preliminary routes for B-Doubles and Oversize Overmass (OSOM) vehicles routes have been established based on the restrictions of the study area roads. Traffic management would be required and should be investigated as part of a TMP. Heavy vehicle transport route assessments are recommended to determine the final vehicle routes for each heavy vehicle type.
- Preliminary site access and road upgrades: review was undertaken of the access points and roads expected to be used by the project during construction. There were access points and road sections identified which would require upgrades or alterations. A site access strategy is to be completed to ensure that each of the access point intersections provide safe access and egress for construction vehicles. This includes considerations for potential road section upgrade and provision of appropriate design for all access points intersecting with the public road network.
- Road and lane closures: all road and lane closures are anticipated to be managed as part of a TMP. This includes traffic detours and traffic management measures such as traffic controllers and signage. Delays to public transport services are expected to occur however local property access is expected to be maintained during the closures.

Overall, impacts to the transport network during construction are expected to be relatively minor and can be managed through measures outlined in a TMP for the project, with the road network capacity found to be sufficient to accommodate anticipated traffic volumes.

Operation impact assessment

Transport impacts identified in the operation phase of the project are considered negligible for the road network and intersection capacity due to the relatively low traffic volumes and minor traffic anticipated to be generated during this phase.

Decommissioning impact assessment

Potential impacts associated with decommissioning works for the project are expected to be the same or similar to those associated with the construction phase. However, the overall level of impact would be lower due to the nature of decommissioning activities with the transmission cables to remain in situ. These impacts will also be managed with the implementation of the same mitigation measures as those proposed for construction impacts and respond to the regulations and standards applicable at the time of works.

Mitigation and contingency measures

Potential impacts on transport due to the project will be avoided, minimised or managed to required standards through the recommended mitigation measures provided in the table below.

Mitigation measures

Measure ID	Mitigation measure	Phase
TTP-M001	**Stakeholder Engagement Plan** Implement a Stakeholder Engagement Plan to guide consultation with stakeholders during project construction, including in relation to transport matters. This includes engagement with relevant road authorities. The plan will include mechanisms to obtain stakeholder input on transport management and protocols to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions associated with works. While the Traffic Management Plan will detail the operational and safety aspects of traffic management and control, the plan will serve a broader function, ensuring transparent and ongoing communication throughout the project lifecycle.	Construction
TTP-M002	**Traffic Management Plan (TMP)** Develop and implement a Traffic Management Plan (TMP) to support onshore construction traffic. The TMP will be established prior to construction commencement and will serve as both a mitigation and monitoring tool. It will contain measures to maintain road safety and to minimise disruption to vehicle movements on roads in the vicinity of the project, parking, on-road public transport and emergency vehicle access. The TMP will be developed in consultation with the relevant road management authorities and consider: • Planning approval conditions relating to traffic management • Relevant policy, regulatory and protocol requirements specific to construction traffic management • Review and verification of existing conditions at the time the TMP is developed • Approved project scope including finalised details on construction extents, staging, vehicle types, origins and destinations for construction materials and spoil) and peaks of construction activity • Cumulative impacts of other major projects in the local area which may change traffic conditions • Verification of the final site access strategy, including staging nodes and secondary access points and crossovers to work sites (see *TTP-M004 - Heavy vehicle transport route assessments*). Upgrades at proposed access points will be subject to approval of relevant road authorities • Other mitigation measures outlined in the transport impact assessment, including primary site access and secondary access requirements and heavy vehicle transport routes. The TMP mitigation measures will include: • Management of temporary road and traffic lane closures to maintain existing connectivity for local access, minimise the number and duration of closures and planning closures to occur outside of peak traffic periods. This includes the provision of adequate notice to local residents and communities and advisory signage such as variable message signs A review of existing bus services should also be undertaken to confirm public and/or school bus services that may be affected prior to construction commencement and ensure minimal disruptions to school bus operation • Development of suitable measures to ensure emergency service access (notably fire) is not inhibited by project construction activities. This will be done through engagement with emergency services to ensure access is	Construction

Measure ID	Mitigation measure	Phase
	maintained, especially during any public road and traffic lane closures. These requirements should be included as part of any broader emergency management plan that may be developed for the project • Management of car parking associated with construction works to ensure that car parking is contained within the project boundary. If required car share or shuttle bus provisions will be considered • Routes to be used for construction vehicles travelling to and from the construction sites, recognising sensitive receptors, local access requirements and road users' safety to be agreed upon with relevant road authorities • Pre-construction on-site checks to assess route options for safety and clearance to potential obstructions, such as wires, structures and trees for Oversize Overmass vehicles • Requirement for pre-construction dilapidation surveys to be undertaken. This will include documentation of the condition of pavements and other road infrastructure such as bridges and culverts for roads which are to be utilised by construction traffic Consultation with road asset owners will be undertaken to agree on the extent of pre-condition (dilapidation survey) survey extents and survey requirements (specialist vehicle condition or photographic), road maintenance criteria, treatments and response timeframes, post construction surveys, asset hand-back agreements and remediation should the project have an adverse impact on road condition. • Engagement with public and private bus operators (particularly operators of school buses) to provide information on transport changes anticipated as a consequence of construction including road and lane closures • Temporary speed limits as appropriate to maintain intersection safety in the vicinity of primary site access and secondary access points with non-conforming sight distances on local roads, such as a reduced speed limit of 60 - 80km/h, particularly for limited durations during higher-risk construction periods. Temporary speed limit changes are subject to approval from relevant road authorities i.e. councils for local roads and the Department of Transport and Planning for arterial roads • Provision of signage in accordance with Australian Standard AS 1742 indicating: – Locations of temporary speed limits – Movement of trucks from site access points to and from major road connections. – Access points where trucks are not permitted to enter. • Management of the risk of adverse impacts to road condition, operational efficiency and safety for road users associated with heavy vehicle movements on construction traffic routes. Where constraints are identified, mitigation measures such as temporary traffic controls, structural risk management and local road safety enhancements should be developed and managed as part of the project TMP in agreement with road authorities • Provision of safe access to laydown areas and site compounds • Asset maintenance measures in agreement with relevant road authorities along nominated heavy vehicle routes • Consideration of a driver's code of conduct for heavy vehicle drivers in consultation with the nominated transport contractor. The code of conduct is to include information relating to worker behaviour and adherence to the TMP and other matters (i.e. using approved routes, compliance with speed limits, parking in designated areas etc.). A list of measures to be outlined in the code of conduct include: – Inductions to inform workers of safety expectations travelling to and from the site and activities on site	

Measure ID	Mitigation measure	Phase
	– Toolbox talks held at the start of the day/shift to discuss potential hazards – Regular inspections to ensure safe work practices – Vehicle registration numbers to be provided to the project for following up of any driver complaints • Protocols to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions in accordance with *TTP-M001 - Stakeholder Engagement Plan* • Verify operating and working hours for construction. These will be consulted with key stakeholders. Construction will be in accordance with the approvals for unavoidable works as per EPA Victoria Publication 1834.2 • Implementation of control measures to minimise safety risk related to traffic and transport in case of inclement weather • Minimisation of dirt and debris on roads by measures such as street sweeping, covering vehicle loads and vehicle cleaning. Other measures include wheel washes and sealing of access bell mouths • Minimisation of noise and vibration impacts to sensitive receptors such as residences and schools by altering timing of travel to ensure reduced major works impacts where reasonably practicable (for example Woodside Primary School) • Minimisation of the need to transport waste from the site by reuse of materials where reasonably practicable. The TMP would set out a framework for subsequent development of work site specific TMPs by selected construction contractors where required. These specific TMPs would include further detail on the proposed management of transport issues on individual sites.	
TTP-M003	**Road safety audits (RSAs)** Road safety audits (RSAs) will be undertaken during the detailed design phase and prior to construction commencement to confirm the adequacy of roads for the proposed construction activities. These would indicatively occur at: • Access points i.e. staging nodes and secondary access points onto both minor and major roads • Access roads and roads to be used and their intersections with the public road network • Along Hyland Highway (Traralgon Creek Road) and Hazelwood Road due to the crash history. RSAs will include consideration of emergency vehicle access and if road surface upgrades are required. RSAs will be completed by a pre-qualified RSA auditor from the Department of Transport and Planning and be independent to the project.	Construction
TTP-M004	**Heavy vehicle transport route assessments** An assessment of the proposed B-Double and Oversize Overmass transport routes between origins and destinations for oversize, loads, bulk materials and spoil will be undertaken once these have been confirmed. This will be undertaken prior to construction commencement and will include investigation of clearance to potential obstructions, such as wires, structures (bridges and culverts) and trees.	Construction

Measure ID	Mitigation measure	Phase
	The assessment will be completed by a transport specialist and conducted in consultation with relevant road authorities and other stakeholders and will identify any additional mitigation measures required.	
TTP-M005	**Site access strategy** A site access strategy will be developed in consultation with relevant road authorities and other stakeholders such as landowners, prior to construction commencement. The strategy will focus on locations and arrangements for site access points (primary and secondary) that will be investigated further to ensure safe entry and egress for construction vehicles (including heavy vehicles). This will include consideration of potential road section upgrade and appropriate design of access points intersecting with the public road network as required. It will take into consideration the existing local plantation traffic access and movements and other local amenities or facilities (including parks and reserves) in the vicinity of the access points. During detailed design the posted speed limit of roads intersecting with site access points will be reviewed and verified, where appropriate sight distances at site access points cannot be achieved. Any temporary speed limit change that may be considered is noted to be subject to approval from relevant road authorities i.e. councils for local roads and the Department of Transport and Planning responsible for arterial roads.	Construction

Abbreviations

Abbreviation	Term
AADT	Average Annual Daily Traffic
AECOM	AECOM Australia Pty Ltd
ATC	Automatic Traffic Count
AUL	Auxiliary Left Turn
AUR	Auxiliary Right Turn
AWDT	Average Weekday Daily Traffic
BAL	Basic Left Turn
BAR	Basic Right Turn
CHL	Channelised Left Turn
CHR	Channelised Right Turn
DOS	Degree of Saturation
DTP	Department of Transport and Planning
EES	Environment Effects Statement
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
HH	Hyland Highway
HVRN	Heavy Vehicle Road Network
LCC	Latrobe City Council
LOS	Level of service
Km	Kilometre
Km/hr	Kilometres per hour
NHVR	National Heavy Vehicle Regulator
OSOM	Oversize Overmass
PSAVRA	Preliminary Site Access and Vehicle Route Assessment
Ql	Left turning traffic volume from major road
Qm	Major road traffic volume
Qr	Right turning traffic volume from major road
RRV	Regional Roads Victoria
SGH	South Gippsland Highway
SISD	Safe Intersection Sight Distances
Tcu/hr	Through-car units per hour
TMP	Traffic Management Plan
TIA	Transport Impact Assessment
VEHS	Vehicles
WSC	Wellington Shire Council

Glossary

Term	Description
AADT	This measurement provides the total volume of vehicle traffic of a road for a year divided by 365 days.
Access road	Roads/tracks that are existing or to be built by the project to enable access between the existing road network and project site in order to facilitate construction, operation and maintenance.
Average delay	This is the average amount of time it takes a vehicle to negotiate an intersection, including the time to negotiate corners and the time stopped in queues or waiting for a green signal.
DOS	Ratio of demand to capacity. A DOS of 1.0 or more in theory represents saturated conditions where the demand exceeds the capacity. For a signalised intersection, a DOS of 0.9 is usually adopted as the capacity threshold.
Construction corridor	The alignment, easement and construction corridor, including batch laydown areas and access roads.
Landholder	A general term used to refer to the legal owner or manager of a parcel of land. It may be private landholder, Government or private utility, or a Government Agency responsible for management of a particular parcel of Crown land (e.g., National Parks or Forestry areas).
LOS	This is an alpha-numeric rating of the overall performance of an intersection, ranging from LOS A (very good) to LOS F (very poor).
Mid-block	A location around the mid-point between two intersections.
NHVR	The NHVR are Australia's regulator for all heavy vehicles.
Onshore transmission infrastructure	All onshore project components required for the operation of the project.
OSOM vehicle	Victoria has a class 1 gazetted OSOM vehicle network. The VicRoads website details the areas of operation, exemption and prohibited routes and structures that are up to 3.5 metres wide, 4.6 metres high, 25.0 metres long and 49.5 tonnes.
Other injury	Injury sustained in a road crash for which a person did not require hospitalisation.
Primary access point	Key public and private routes which intersect the works that are planned to be utilised for construction in order to access staging nodes.
Priority-controlled intersection	A type of unsignalised intersection which requires drivers on the minor road to yield to those on the major road. This can be controlled by 'Give Way' or 'Stop' signage.
Secondary access point	Additional routes that may be used by construction traffic to access the transmission alignment.
Serious injury	Injury sustained in a road crash for which the person was admitted to hospital.
Site	The onshore project area and transmission alignment, from the shore crossing at Reeves Beach to futue VicGrid connection at Giffard.
Staging node	Strategically positioned worksites, evenly distributed along the cable alignment's length, to offer adaptable construction functionality. Staging nodes are expected to serve as key areas for workforce mobilisation, central hubs for managing equipment and materials logistics, and designated emergency muster points.

Term	Description
Trenchless crossing	A construction method whereby a transmission cable is installed under an intersecting feature (e.g., a waterway, wetland, road or railway) to avoid impact on that feature.
Trenching	Excavation of a trench for burial of a cable system.
Work group	The grouping of the resources allocated to three staging nodes where construction activities will occur concurrently. For the purpose of this assessment, there are two working groups (staging nodes 1-3 and staging nodes 4-6).

1.0 Introduction

The Star of the South Offshore Wind Farm (the project) is Australia's most advanced offshore wind farm. The project is located in Commonwealth waters off the coast of Gippsland, and will connect to the electricity network via the proposed VicGrid connection hub in Giffard.

The project represents a significant opportunity to diversify Australia's energy resources. As Australia's ageing coal fleet retires, new sources of power are needed to address the anticipated gap in electricity generation. The project will address this gap, by harnessing Bass Strait's strong, consistent winds and delivering significant amounts of clean, reliable power to the grid starting in 2032. With a capacity of up to 2.2 gigawatts (GW), the project can meet approximately 20 per cent of Victoria's current electricity demand, enough to power around 1.2 million homes annually.

The project is located within both Commonwealth and Victorian jurisdictions and is subject to planning and environmental assessment and approval under Commonwealth and Victorian legislation.

A delegate of the Commonwealth Minister for the Environment and Water has determined the project is a controlled action (as set out in a notice dated 2 June 2020) and must be assessed and approved under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) through an Environmental Impact Statement (EIS). The Victorian Minister for Planning has determined the project requires an Environment Effects Statement (EES) (as set out in a notice dated 11 May 2020) under the *Environment Effects Act 1978* (Vic) (EE Act).The purpose of this report is to assess the potential transport impacts associated with the onshore transmission component of the project to inform the preparation of the EIS and EES required for the project.

2.0 Project description

Section 2.0 provides a high-level overview of the project in its entirety. Detailed descriptions of project components and construction processes are provided in Chapter 4 – Project description of the EIS for the whole of project assessment across the Commonwealth jurisdiction, and in Chapter 4 – Victorian works project description of the EES for the Victorian jurisdiction. Specific project parameters that have informed the transport impact assessment are detailed in Section 10.1 of this report.

2.1 Project overview

The offshore wind farm will be installed within a 586-square-kilometre offshore wind farm area, located approximately 10 to 40 kilometres off the coast of Gippsland, as shown in Figure 2-1.

The project comprises an offshore wind farm and supporting transmission infrastructure to generate and transfer power to the grid. The offshore infrastructure extends from the shore crossing at Reeves Beach, to the offshore wind farm area.

The onshore infrastructure primarily comprises of an underground cable system that will connect the project to the proposed VicGrid connection hub in Giffard (also referred to as 'proposed Giffard terminal station area'). The onshore transmission infrastructure is located in Central Gippsland, extending approximately 30 kilometres from Reeves Beach to the proposed VicGrid connection hub.

This technical report focusses on construction, operation and decommissioning of the onshore transmission system, within the onshore project area shown in Figure 2-3.

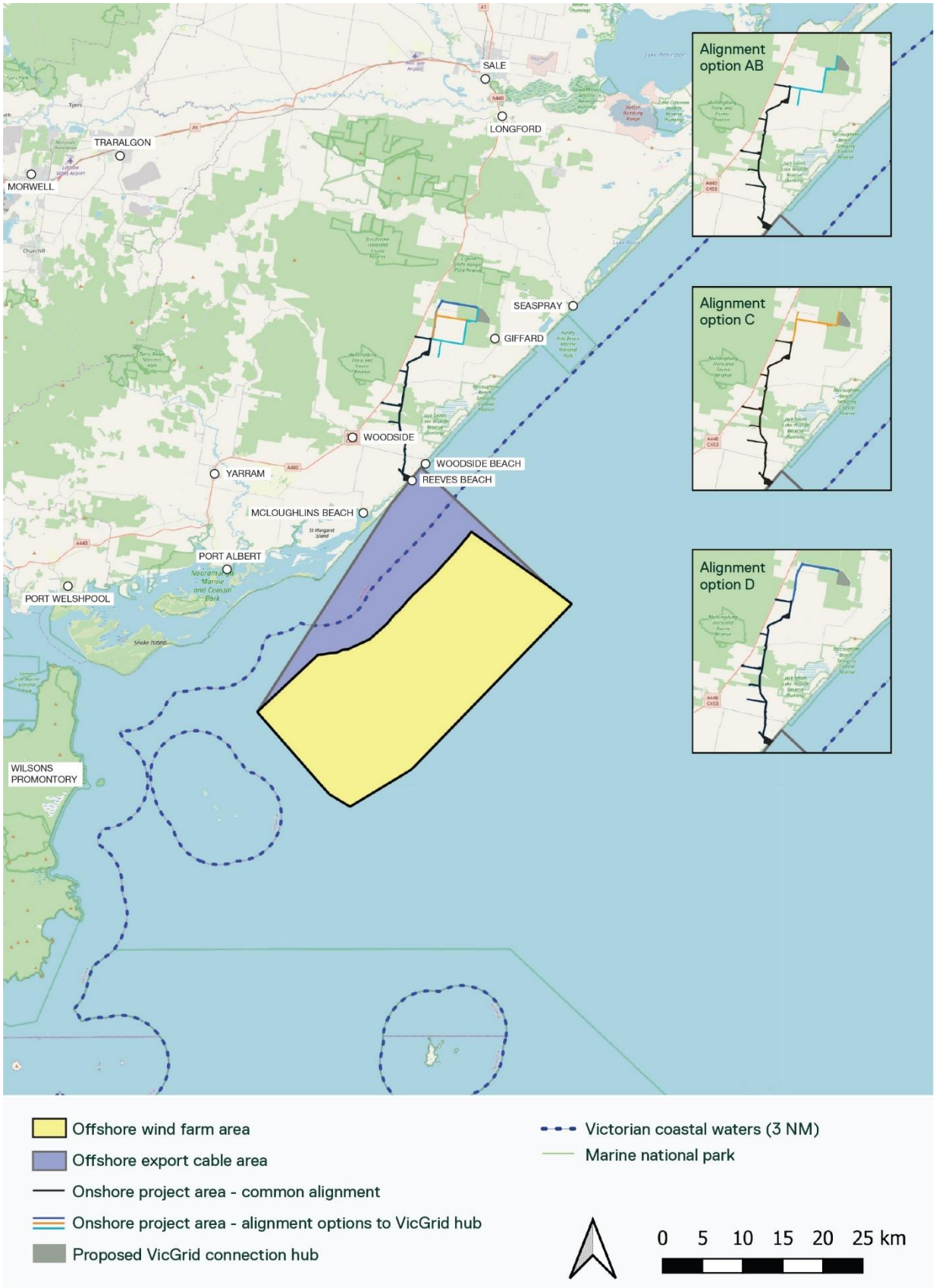


Figure 2-1 Project location

2.2 Project development

Over several years of project development, opportunities to avoid and minimise environmental impacts have been realised in accordance with the mitigation hierarchy shown in Figure 2-2. The assessment framework has also enabled the identification and adoption of further avoidance and minimisation measures as part of the planning and environmental approvals process.

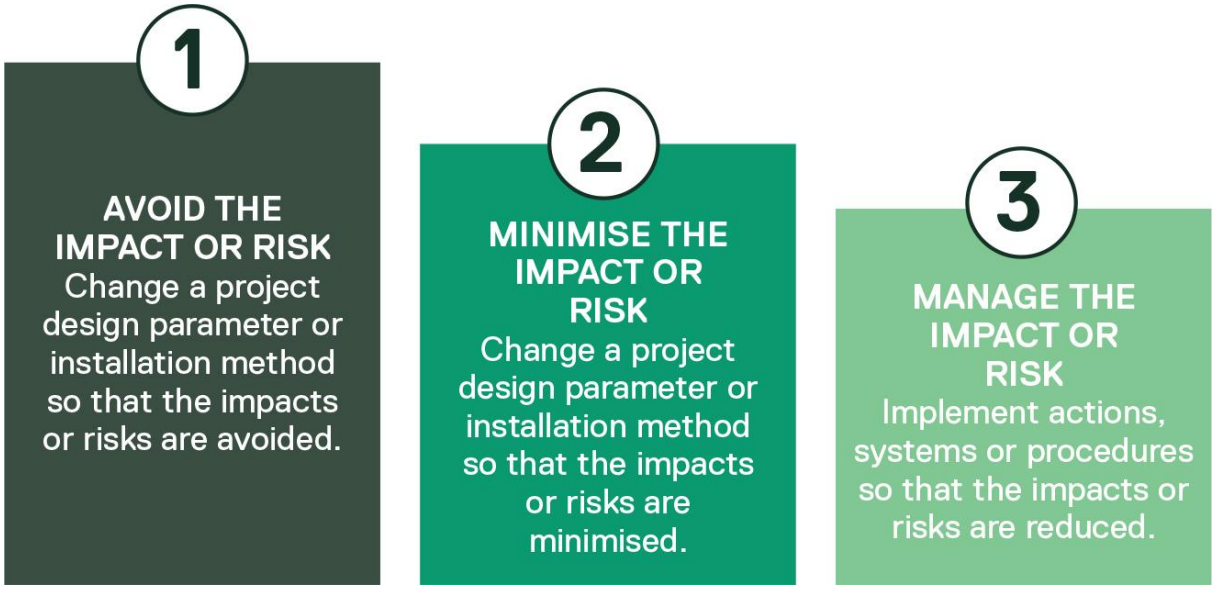


Figure 2-2 Mitigation hierarchy

Avoidance and minimisation of social and environmental impacts is central to the project's decision making and as such, the project will continue to be refined in response to technical requirements and potential environmental and social impacts identified during the development phase.

This was considered in the preparation of a project description which is in Chapter 4 – Project description of the EIS for the whole of project assessment across the Commonwealth jurisdiction and Chapter 4 – Victorian works project description of the EES for the Victorian jurisdiction. A description of how avoidance of impact has informed the design in relation to Transport can be found in Section 6.6.

Examples of this include the decision to design the shore crossings without directly impacting coastal areas, utilising existing roads for construction site access where reasonably practicable and adopting construction techniques which avoid impacts on sensitive receptors such as waterways.

Once avoidance and minimisation measures are exhausted, residual impacts and risks are managed. In the case of risks, mitigation measures can be applied both before and after an event occurs. Residual impacts and risks are then evaluated against the assessment criteria to ensure they are at an acceptable level.

2.3 Project area

The project area is shown in Figure 2-3 has been broken down into three main sections - offshore, shore crossing, and onshore areas.

1. Offshore project area, comprising:
   - Offshore wind farm area: A 586 square kilometre area extending approximately 10 to 40 kilometres offshore from the shore crossing. Includes offshore wind turbines installed on foundations, offshore substations and offshore transmission cables. This area is in Commonwealth waters.
   - Offshore export cable area: A 232 square kilometre area extending from the offshore wind farm area to the shore crossing. Includes offshore export cables to connect the wind farm to land. This area traverses Commonwealth waters and Victorian coastal waters.

2. Shore crossing: Located at Reeves Beach, this is where the offshore export cables will transition to land and connect to the underground cable system onshore.
3. Onshore project area: An approximately 30 kilometre corridor extending from the shore crossing to the proposed VicGrid connection hub. Includes an underground cable system within a (common) alignment to Giffard West, at which point there are three alignment options (AB, C and D) to reach the proposed VicGrid hub in Giffard.

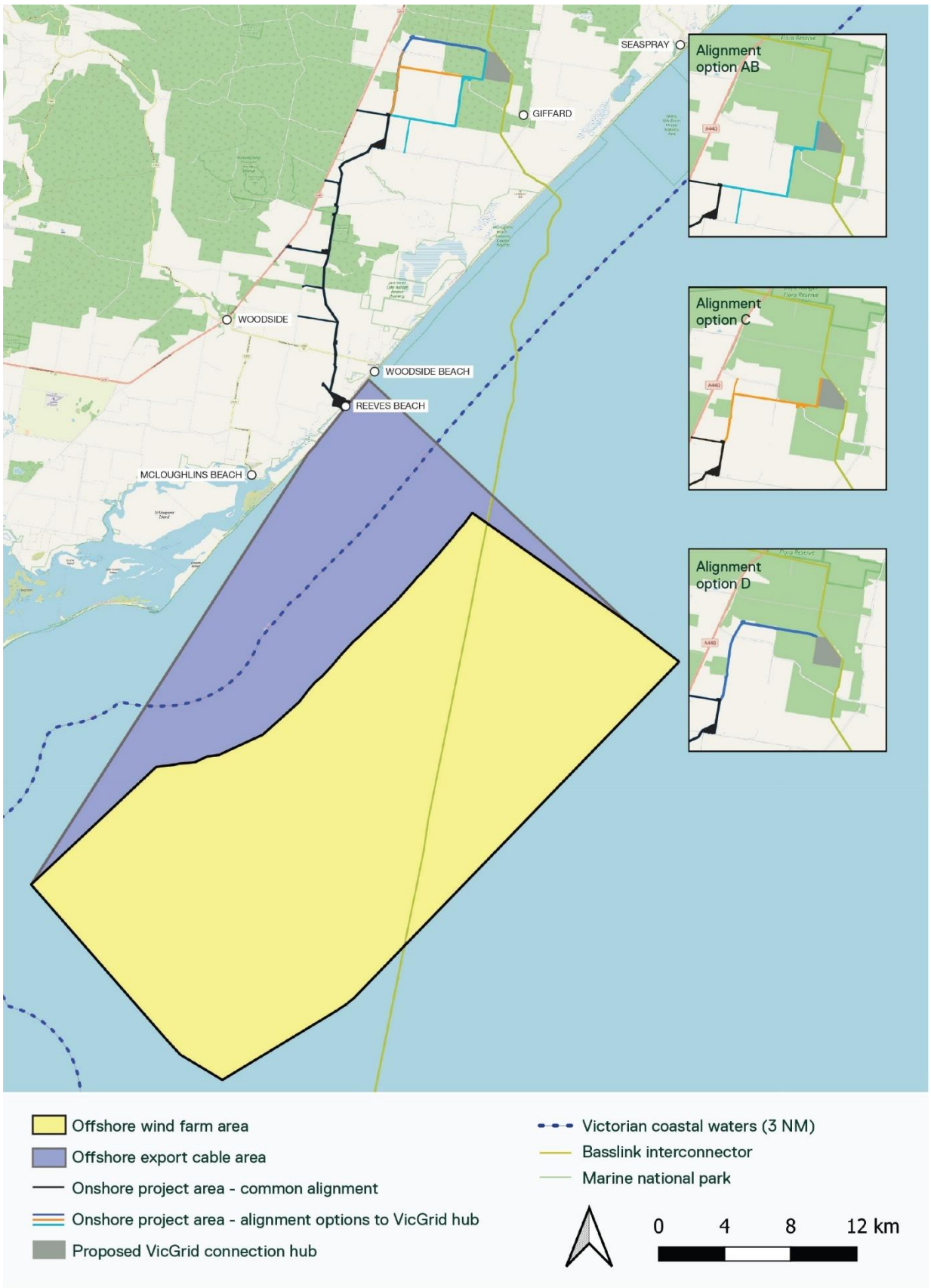


Figure 2-3 Project overview

2.4 Key project components

The key components that make up the project are the offshore wind farm and transmission infrastructure (inter-array cables, offshore substations and offshore export cables), the shore crossing infrastructure and onshore transmission infrastructure.

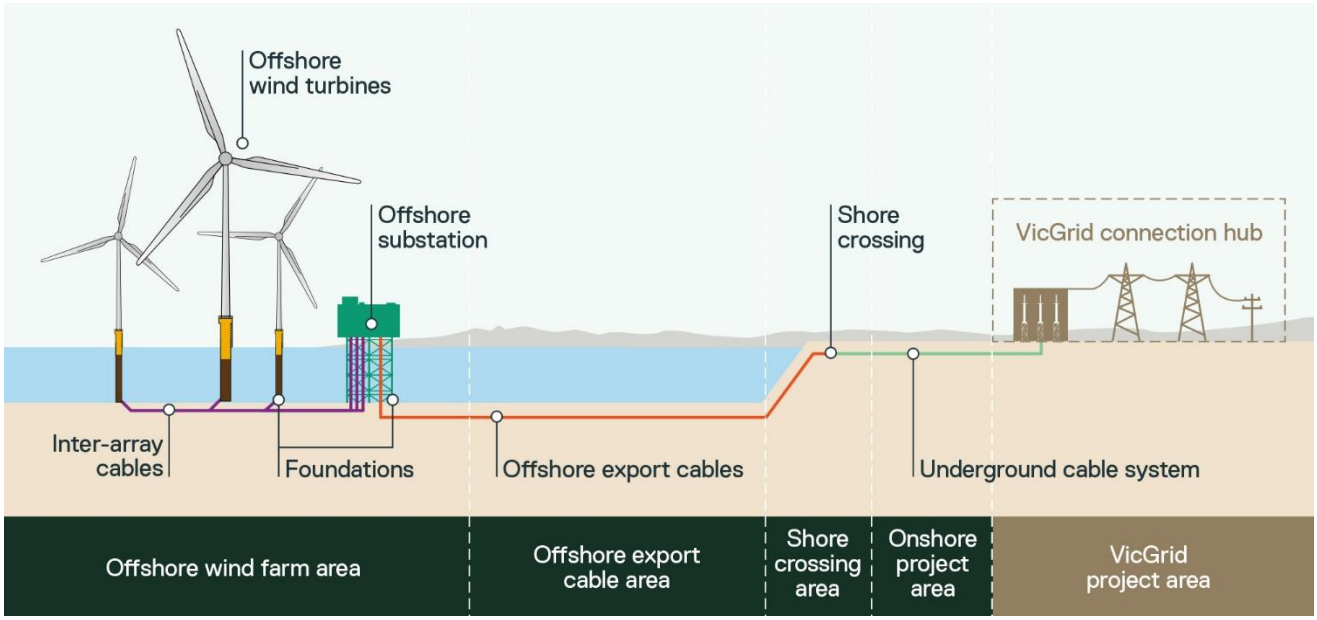


Figure 2-4 Project components

Key components are shown in Figure 2-4 and include:

- Offshore wind farm and transmission infrastructure:
  - Up to 147 offshore wind turbines installed on foundations with connecting inter-array cables
  - Up to five offshore substations and three interlink cables
  - Up to eight offshore export cables.
- Shore crossing infrastructure:
  - Up to eight trenchless crossings containing the offshore export cables.
- Onshore transmission infrastructure, which consists of:
  - An underground cable system connecting to the proposed VicGrid connection hub

2.5 Construction approach

The construction of the shore crossing and onshore transmission system would involve the following key activities:

- Site establishment
- Cable system construction (including trenching, installation and jointing)
- Pre-commissioning and commissioning of the cable system
- Demobilisation and rehabilitation of areas disturbed by construction.

2.6 Project timeline

The project has been under development for approximately seven years. If approvals are obtained in the next few years, construction could start around 2030 and electricity generation from 2032. The

operational life of the project is approximately 30 years, with the possibility of repowering to extend its life, if deemed appropriate by Star of the South and regulators closer to the time.

Figure 2-5 Project timeline

2.7 Construction schedule

The project is expected to take up to seven years to construct, if built to its full capacity in a single stage. The project could also be built in two stages, depending on energy market and government requirements and timing. Figure 2-6 shows the order and maximum duration of construction for key components.

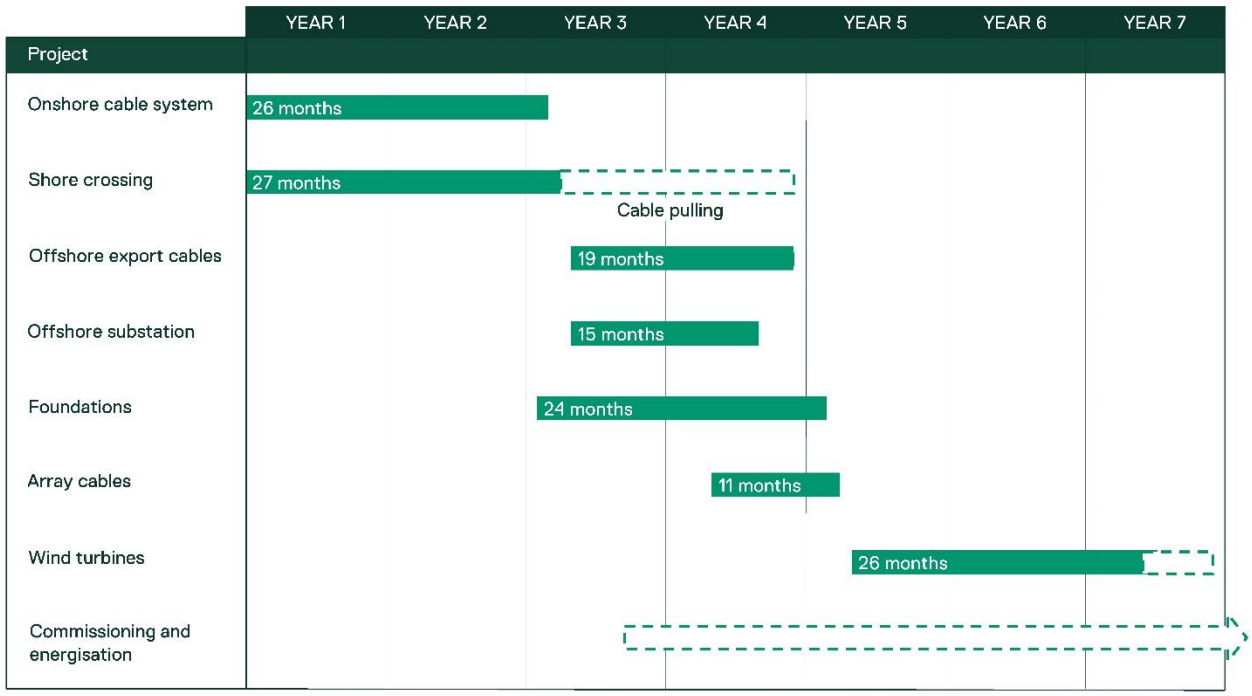


Figure 2-6 Indicative project construction schedule

2.8 Operational requirements

The underground cable system will be remotely monitored through control and condition monitoring systems. Routine access will be minimal, with testing required once or twice a year at the link pits located at each joint bay.

A small workforce will undertake periodic inspections and routine maintenance of the cable system using light service vehicles, including cable easement inspections to monitor and control vegetation and confirm compliance with easement terms.

2.9 Decommissioning

Decommissioning of onshore components will be planned and carried out in accordance with regulatory and landholder requirements current at the time. The decommissioning approach is expected to be agreed with regulators before project operations cease. The assessment of the project assumes current industry practices will be adopted.

To minimise disturbance, most below-ground infrastructure is expected to be left in place, with cable ends cut, sealed and securely buried. Surface infrastructure such as signage, markers, link and fibre pits may be removed if required by landholders or if environmental impacts arise.

3.0 Scoping

3.1 Study objective

The objective of this study is to:

- *To assess, avoid and minimise adverse effects on traffic and transport during construction and operation.*

This objective guides the approach to assessments and the avoidance and minimisation of potential impacts.

3.2 EIS guidelines

The Guidelines for the Content of a Draft Environmental Impact Statement for Star of the South Offshore Wind Farm Project ('the guidelines') set out the requirements to allow the Commonwealth Minister for the Environment to make an informed decision on the approval of the project under the EPBC Act.

The guidelines do not include a specific requirement to consider traffic or transport impacts due to the project (except for in relation to the transport of dangerous goods or waste which are addressed in Technical report J: Soil and waste and Technical report I: Surface water, and in relation to vehicle traffic lighting impacts on wildlife which are addressed in Technical report G: Onshore ecology). Transport impacts generated by the project are unlikely to impact a matter of national environmental significance.

The aspects of the guidelines relevant to the TIA are shown in Table 3-1 as well as where these items have been addressed in this report.

Table 3-1 Relevant EIS requirements addressed within this TIA

Requirement	Sections addressed
Cultural heritage values, people and communities and other relevant social considerations, including the commercial use of the Gippsland Basin and Bass Strait	Sections 9.0, 10.0, 11.0, 12.0 and 13.0

3.3 EES evaluation objectives and scoping requirements

The Scoping Requirements for Star of the South Offshore Wind Farm Environment Effects Statement ('scoping requirements') by the Minister for Planning, set out the specific environmental matters the project must address in order to satisfy the Victorian assessment and approval requirements.

The scoping requirements include a set of evaluation objectives. These objectives identify the desired outcomes to be achieved in managing the potential impacts of constructing and operating the project in accordance with the *Ministerial guidelines for assessment of environmental effects under the EE Act*.

The following evaluation objective is relevant to the TIA:

- *To avoid, or minimise where avoidance is not possible, adverse effects on community amenity and health and safety, with regard to noise, vibration, dust, the transport network, fire risk management and electromagnetic radiation.*

The aspects from the scoping requirements relevant to the evaluation objective are shown in Table 3-2 as well as the location where these items have been addressed in this report.

Table 3-2 Scoping requirements relevant to transport

Aspect	Scoping Requirement	Section addressed
Key issues	Managing traffic disruptions for residents, businesses and travellers during construction of the project.	Construction impacts 10.0 Operation impacts 11.0
	Potential damage to local and regional road surfaces along transport routes and increased risk to road safety on transport routes.	
Priorities for characterising the existing environment	Describe the existing, approved and committed transport network in and around the project, including proposed construction transport route options, in terms of capacity, condition, accessibility and potentially sensitive users.	Existing conditions 7.0 Traffic generation, distribution and assignment 10.1
Design and mitigation measures	Outline any required transport infrastructure works or upgrades required to address adverse impacts of the project construction and operation, including impacts on accessibility (e.g. access road construction and upgrades).	Construction impacts 10.0 Operation impacts 11.0 Mitigation measures 14.0
	Describe and evaluate the proposed traffic management and safety principles to address changed traffic conditions during construction and operation of the project.	
Assessment of likely effects	Assess the potential effects of construction activities on the transport network, including safety, amenity and accessibility impacts.	Construction impacts 10.0 Operation impacts 11.0
	Identify any works required to accommodate project traffic during construction (having regard to the type and dimensions of vehicles and loads) and potential environment effects.	
Approach to manage performance	Describe proposed measures to manage and monitor effects on community amenity, health and safety, the transport network, fire risk management and electromagnetic radiation and identify likely residual effects, including compliance with standards and proposed trigger levels for initiating contingency measures.	Mitigation measures 14.0
	Describe contingency measures for responding to unexpected impacts to community amenity, health and safety, the transport network, fire risk management and electromagnetic radiation resulting from the project during construction and operation of the project.	

4.0 Evaluation framework

The assessment will consider legislation, policy and standards relevant to transport along with specific assessment criteria that have been derived for the purposes of the study.

4.1 Legislation, policy, guidelines and standards

The legislation, policy, guidelines and standards relevant to this assessment are summarised in Table 4-1.

There are no specific transport guidelines in relation to offshore wind farms, however because the project includes onshore transmission infrastructure, guidelines for onshore wind farms are relevant.

Table 4-1 Legislation, policy, guidelines and standards relevant to the assessment

Document title	Summary	Relevance to the project
Commonwealth government		
None		
Victorian government		
Victoria Planning Provisions – 52.32 Wind Energy Facility	The purpose of VPP planning clause 52.32 is to facilitate the establishment and expansion of wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area. With regards to traffic and transport 52.32-4 stated that the as part of the design response that access road options need to be considered. 52.32-6 states that before deciding on an application, in addition to the decision guidelines of Clause 65, the responsible authority must consider several documents and guides as appropriate. The most applicable document to traffic impacts being the Development of Wind Energy Facilities in Victoria, Policy and Planning Guidelines (March 2019).	Access options are to be considered which enable safe access for all vehicle types. Site access options and potential traffic impacts are to be considered in consultation with key stakeholders and agreed, along with associated traffic management measures.
Development of Wind Energy Facilities in Victoria, Policy and Planning Guidelines (March 2019)	Guide set out: • A framework to provide a consistent and balanced approach to the assessment of wind energy projects across the state; • A set of consistent operational performance standards to inform the assessment and operation of a wind energy facility project; and • Guidance as to how planning permit application requirements might be met. With regards to traffic impacts the guide states: • In section 4.2.2 Seek Expert Advice, the document states that an application should be accompanied by an assessment considering the traffic impacts (amongst others) of the proposal, with the assessment undertaken by a suitably qualified person. • Model planning permit conditions for wind energy facilitates are provided in Appendix B of the guidelines with reference to Traffic	Ensuring a suitable TIA and Traffic Management Plan (TMP) are produced for the project in consultation with key stakeholders.

Document title	Summary	Relevance to the project
	Management and the following to be considered as an example to local authorities: - Vehicle access points - Pre-construction public road surveys - Traffic Management Plan (TMP). - Traffic upgrade works.	
Road Management Act 2004 (Victoria)	Road Management Act (General) Regulations 2016. Road Management Act (Works and Infrastructure) Regulations 2015. Code of Practice – Work site Safety Traffic Management.	This Act and associated Regulations must be complied with for all public roads of the Victorian road network. The Act sets out general principles and obligations for which the road authority is responsible for administering. The Road Management Act requires approval for any construction project that may impact or change access of a controlled access road.
Department of Transport and Planning (VicRoads) – Road Management Plan	The VicRoads Road Management Plan details the management and maintenance of roads registered under the VicRoads register of public roads. VicRoads manages its infrastructure in five phases: development of standards and guidelines, development of a maintenance program, implementation of the management program, auditing and review. The VicRoads road management plan also details maintenance inspection and response schedules.	Ensuring site access and maintenance of the road network is to the satisfaction of the Department of Transport and Planning in terms of its own road assets impacted by the project.
Transport Integration Act 2010	The Act provides a legislative framework for transport in Victoria. The Act seeks to integrate land use and transport planning and decision-making by applying the framework to land use agencies whose decisions can significantly impact on transport. The Act requires agencies, including the Department of Transport and Planning Authorities, to consider the potential impact of land use planning proposals on transport.	This Act sets out six transport system objectives and eight decision-making principles. These objectives include triple bottom line assessment: economic prosperity, social and economic inclusion and environmental sustainability. Other objectives include: • Integration of transport and land use • Efficiency, coordination and reliability • Safety and health and wellbeing These objectives and principles need to be considered in the evaluation of this project.
Road Safety Act 1986	Road Safety Road Rules, 2017.	These Rules provide road rules that are substantially consistent across Australia. They also specify behaviour for all road users. This framework is used in this

Document title	Summary	Relevance to the project
		assessment as the basis to assess safe and efficient traffic movements on roads.
	Road Safety (Traffic Management) Regulations, 2009.	These Regulations set out requirements for authorisation for implementing traffic control devices on roads (including for traffic management for work sites) This assessment uses this framework as a reference to prescribe traffic management requirements.
Victorian Road Safety Strategy – 2021-2030 Action Plan	This strategy aims to reduce fatalities by 50 per cent and reduce serious injuries progressively by 2030.	This strategy references making local and busy places safer and using roads more safely. Safety considerations represent a critical focus of this assessment.
Local government		
Wellington Shire Council Plan 2021 – 2025	The Council Plan sets the strategic actions, priorities and key projects to be delivered by the municipality. The objectives and actions align with the community's aspirations and expectations expressed in the *Wellington 2031 Community Vision* through the lenses of communities, services & infrastructure, natural environment, lifelong learning, economy and organisational. The plan centres around five priority areas of climate change, economy in transition, partnering with the Gunaikurnai, sustainable population growth and housing choice and better access to key services.	Relevant objectives and strategies include: • *An inclusive, diverse, and resilient community.* • *Well planned and sustainable towns, facilities, and infrastructure that service community need.* • *The natural environment is valued, protected and accessible. (Mitigate)* • *Increased diversity, investment, and innovation in key industries with a focus on renewable energy.* • *Conserve and protect our natural environment through responsible and sustainable management practices.* • *Build resilience in our communities and landscapes to mitigate risks from a changing climate.'*
Wellington 2031, 2021	*Wellington 2031* outlines the community's vision for the future through the lenses of communities, services & infrastructure, natural environment, lifelong learning and economy	The following visions were identified: • *We know and support each other and have a strong sense of community belonging. Diversity is respected and there are many social and community activities providing opportunities for all people to interact. We strive for good health, feel safe in our*

Document title	Summary	Relevance to the project
		communities and are prepared for natural disasters. • *Wellington has a built environment that is sustainable, appropriate, accessible and responsive to the community. Transport connects people to communities and places. Events and services support our strong communities." Wellington's natural environment and landscape is clean, diverse, beautiful, accessible and protected.* • *Wellington has a broad choice of local training, education and holistic learning and development options that lead to meaningful employment and personal fulfilment.* • *Wellington has a wealth of diverse industries providing employment opportunities for all. There is growth in the Wellington population and economy which is balanced with the preservation of our natural environment and connected communities.*
Wellington Shire Council Planning Scheme	Notable planning clauses relating to traffic and transport, include: • 18.01-2S transport systems • 52.06 car parking	Ensuring project meets required planning application standards with regards to traffic and transport. This includes: • Maintaining a safe and efficient road network Ensuring adequate supply of car parking during both construction and operation phases of the project
Wellington Shire Council Road Management Plan	The Road Management Plan sets out the management of the public roads in Wellington Shire.	The Road Management Plan outlines the road and footpath hierarchies, inspections and condition assessments to manage infrastructure, some of which are expected to be within the study area
Latrobe City Council Plan 2021 - 2025	The Council Plan outlines strategic objectives and sets out measurable actions for the municipality.	Ensuring project meets required planning application standards with regards to traffic and transport.

Document title	Summary	Relevance to the project
		This includes: • Maintaining a safe and efficient road network Ensuring adequate supply of car parking during both construction and operation phases of the project
Latrobe City Council Planning Scheme	Notable planning clauses relating to traffic and transport, include: • 18.01-2S transport systems • 52.06 car parking	Construction traffic and material deliveries for the underground transmission cable are likely to pass through Latrobe City, meaning the project must consider local transport system requirements and parking provisions along the haulage route.
Latrobe City Council Road Asset Management Plan	The Road Management Plan sets out the management of the public roads in Latrobe City Shire.	The Road Management Plan outlines the road and footpath hierarchies, inspections and condition assessments to manage infrastructure, some of which are expected to be within the study area.
Infrastructure Design Manual (2020)	The Infrastructure design manual (IDM) is a standardised set of requirements for the design and development of infrastructure – required by a set of participating Victorian rural and regional councils	The IDM is the standard document used by Latrobe City Council and Wellington Shire Council. Noting Latrobe City Council also has their own supplementary IDM requirements document. Council's may refer to standard requirements with regards to future upgrade works for the project with regards to their respective assets.
Other		
AS1742.3 2009 – Traffic control for works on road	This standard sets out matters to be considered in a TMP including traffic demand, traffic routing, traffic control and special vehicle requirements.	The requirements of the standard will be incorporated into the TMP in the latter stage of the project following this TIA.
Austroads – Guide to Road Design Part 3: Geometric Design	The Guide to Road Design is one of a set of comprehensive Austroads Guides developed to provide a primary national reference for the development of safe, economical and efficient road design solutions.	AGRD Part 3 provides guidance on geometric requirements for Australian Roads. This guide shall be used to determine likely impacts of changes to road profiles and characteristics resulting from the project and its associated traffic.
Austroads – Guide to Road Design Part 4: Intersections and Crossings		AGRD Part 4 provides guidance on intersection design such as design considerations, design process, choice of design vehicle, pedestrian and cyclist crossing treatments,

Document title	Summary	Relevance to the project
		provision for public transport and property access. This is particularly relevant to the project as it is anticipated to potentially impact road access.
Austroads – Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments	Guides planners and engineers with design, develop and manage a variety of land use developments in identifying and managed the impacts on road system arising from these developments. Part 12 presents the land use and transport planning context for the TIA, including travel demand, safety, parking and access management issues. It provides guidance on the need and criteria for impact assessments, and a detailed procedure for identifying, assessing and mitigating traffic impacts. It also covers assessment of safety, infrastructure, and environmental effects, and gives examples of checklists, report structures, traffic generation rates and projects.	Standard guide for the completion of TIAs for projects, ensuring consistency of assessment and treatment of traffic impacts, whilst also considering all road users, road safety and effects on the broader community.

4.2 Reasonably practicable

EPA Victoria Publication 1856 Reasonably Practicable provides guidance as to the factors to consider when defining proportionate controls to minimise harm, as follows:

- Eliminate first: Can you eliminate the risk?
- Likelihood: What's the chance that harm would occur?
- Degree (consequence): How severe could the harm be on human health or the environment?
- Your knowledge about the risks: What do you know, or what can you find out, about the risks your activities pose?
- Availability and suitability: What technology, processes or equipment are available to control the risk? What controls are suitable for use in your circumstances?
- Cost: How much does the control cost to put in place compared to how effective it would be in reducing the risk?

The items above have been considered when assessing the suitability of mitigation measures for the project.

4.3 Assessment criteria

The assessment criteria relevant to this TIA are outlined below.

TIAs include an evaluation against relevant government and industry guidelines (as summarised in Table 4-1) whilst also addressing specific local government planning clauses where applicable. Should the project cause long term negative changes to available road capacities or road infrastructure, increase road safety risk, or prohibit access to private properties or business, this could result in a significant traffic impact.

Ultimately the findings and proposed mitigation measures detailed in the TIA need to be agreed with the relevant road authorities. Once planning approval has been obtained for the project, those stakeholders will be consulted regarding the development of a Transport Management Plan (TMP). Additionally, where secondary approvals are required under transport legislation, these approvals would be sought from the relevant road authorities.

5.0 Consultation and engagement

Star of the South has undertaken extensive engagement with a broad range of stakeholders and communities throughout the project's development phase and preparation of the EIS/EES to communicate project information; obtain, understand and discuss feedback; and identify potential issues and opportunities for consideration in the EIS/EES. A summary of this engagement is documented in Appendix III - EIS/EES Consultation Report.

Consultation specific to traffic and transport has also been undertaken with identified stakeholders to inform this report. A summary of this engagement is provided below.

Engagement activities

- Key activities undertaken between 2019 and 2025 to engage with identified communities include:
- Direct engagement with community members residing the local coastal communities near to the project area
- Direct engagement with landholders along the project's proposed transmission route; including phone calls, emails and meetings
- Discussions with community members through phone calls, emails or visits to the Gippsland office
- Discussions with key stakeholders through phone calls, emails, meetings and briefings
- Presence at community events and pop-up stalls across Gippsland
- Sharing of information via the project's website, social media and monthly e-news
- Community information sessions.

Stakeholders

- Key stakeholders identified and engaged on this report include:
- General community
- Landholders along the project's proposed transmission route
- Latrobe City Council
- Wellington Shire Council
- Parks Victoria
- Department of Transport and Planning / VicRoads.

Table 5-1 lists relevant issues raised by stakeholders and how feedback on these issues have been applied to the assessment of impacts on transport and traffic.

Table 5-1 Summary of consultation issues raised relevant to traffic and transport

Stakeholder/partner and type of response	Issues raised	Response to issues raised and/or where considered within this report or associated appendices.
Local community	Impact to local road quality from increased construction activity	Mitigation measures are to be implemented for monitoring and rectification for roads that may experience deterioration in the quality of their surfaces – see Section 14.1
	Impact to local residents from increased construction traffic	A Traffic Management Plan will be implemented, and stakeholder engagement undertaken so that the impacts are minimised on the local residents – see Section 14.1

Stakeholder/partner and type of response	Issues raised	Response to issues raised and/or where considered within this report or associated appendices.
	Reinstatement of local roads be after construction works.	Reinstatement will be decided between relevant stakeholders including relevant councils – see Section 10.2.8
	Impact to access for areas with only one road in, for example McLoughlins beach.	Access for the public to residences, farmland, and public places such as the beaches would be retained during construction and operation.
Latrobe City Council	Impact of the proposed works on Flynns Creek Road. Dilapidation report to be completed for the length of Flynns Creek Road that may be subject to heavy vehicle traffic for a prolonged period and details of any work that needs to be done to ensure no damage is done to the current road network (if required).	The need for, extents and methodology for dilapidation surveys and onwards monitoring and remediation would be detailed in the project' subsequent TMP in agreement with key stakeholders. The impact to Flynns Creek Road is assessed as part of Section 10.0.
Wellington Shire Council	Road closures will likely require a works permit and a MoA to be approved by Council prior to works commencing. Additionally, contact should be made (where reasonably practicable) with all directly impacted property owners prior to the road closure.	The need and extent of road closures would be verified later in the project, notably verified during the TMP development stage. This would include traffic management methods and local authority / public consultation procedures during such works. Indicative road closures for the project at this planning stage have been identified and outlined in Section 10.2.3.
	Local roads intended for construction access are considered as unsuitable for heavy vehicles, notably due to their gravel surface. Appropriate mitigation measures should be agreed prior to construction. Any traffic measures, involving potential deviation routes using local roads should be agreed upon by DTP and communicated to Council to ensure the suitability of these roads.	The TIA identified the potential need for road upgrades including road surface upgrades to support heavy vehicle movements, particularly on roads not approved for heavy vehicles. This will be addressed through engagement with DTP and Councils, during the TMP development stage to reach an agreed approach.
	Gormandale-Stradbroke Road unsuitable for additional heavy vehicle traffic due to its surface and use by logging truck. Request to avoid using this road or minimise use as much as possible.	Due to change in project alignment, use of this road would be limited. See section 10.2.1.2.
Department of Transport and Planning / VicRoads	Consideration should be given to existing heavy vehicle routes as part of the assessment.	The need and extent of heavy routes were later assessed and any potential upgrade points have been identified. Heavy vehicle routes have been identified and discussed in Section 10.2.2.
	An overview of the updated project area and traffic scope was presented to DTP to gather preliminary feedback for consideration in the revised TIA. Any new access roads constructed for temporary access should be designed	The TIA identified the potential need for new access roads to support heavy vehicle movements during construction stage. The staging node primary access route construction and upgrades are discussed in Section 10.2.3.3.

Stakeholder/partner and type of response	Issues raised	Response to issues raised and/or where considered within this report or associated appendices.
	for heavy vehicle use and also be decommissioned appropriately. This is to ensure that local traffic do not use these roads beyond the project construction period.	

6.0 Methodology

As context to the assessment approach, the Star of the South Offshore Wind Farm is a large project that covers a wide geographic area and has the potential for significant influence across Commonwealth waters and Victorian coastal waters, the state of Victoria and in particular the central Gippsland region. Accordingly, the impacts (both positive and negative) of the project are assessed in terms of their materiality at the scale of Commonwealth waters and Victorian coastal waters, the state of Victoria and the central Gippsland region.

6.1 Overview of assessment framework

This section describes the framework used to assess potential environmental impacts and risks associated with the proposed project.

The assessment has been guided by an evaluation framework that comprises applicable legislation, policy, guidelines and standards, the Commonwealth EIS guidelines and the EES scoping requirements and study-specific assessment criteria. The approach generally aligns with guidance issued by the Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for the Environmental Assessment of Major Offshore Infrastructure (Reference: *Environment Management Plan Content Requirement, 16/12/2022)* and the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (OPGGS Regulations).

An overview of the assessment framework is presented in Figure 6-1.

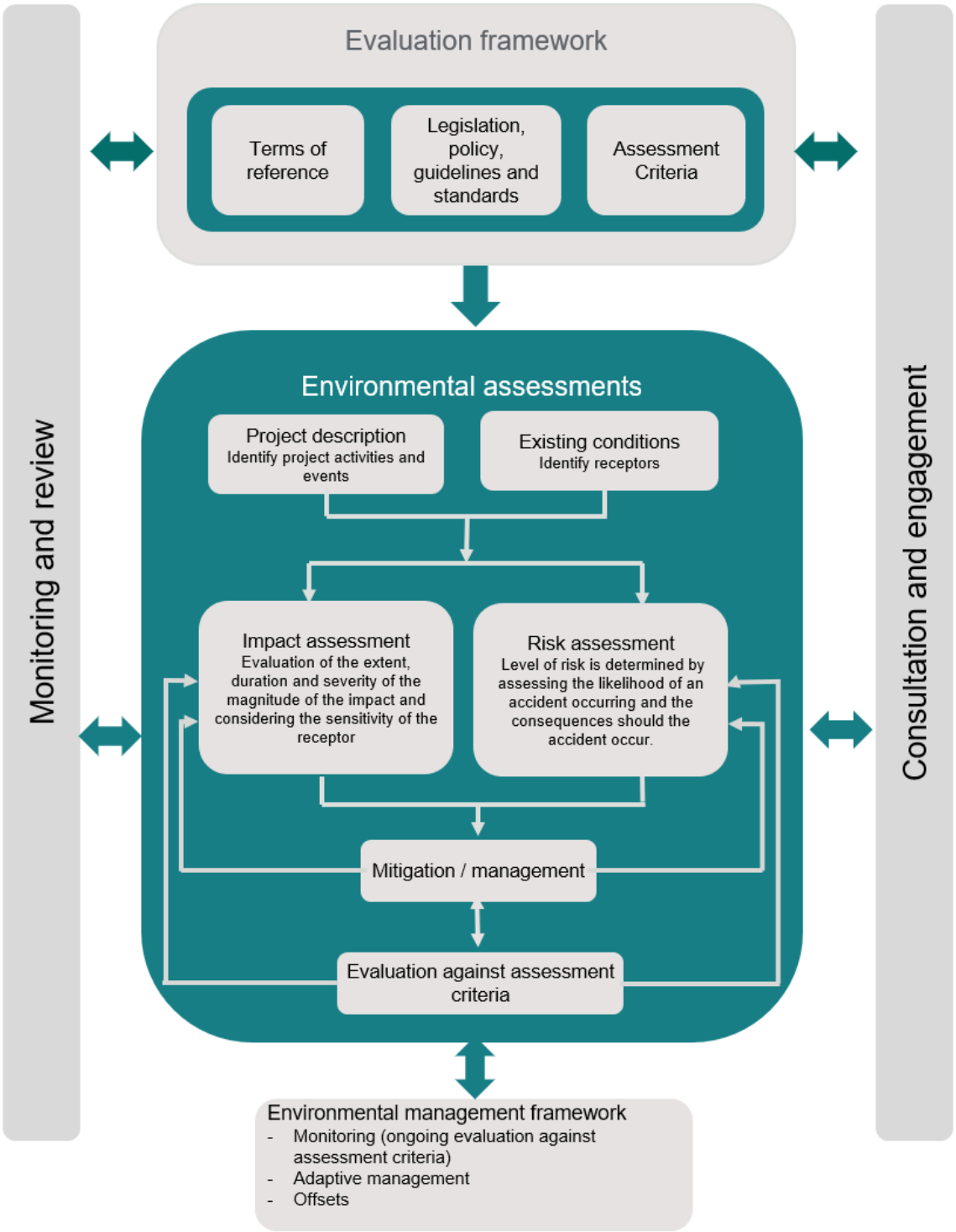


Figure 6-1 Overview of assessment framework

The environmental assessment in relation to Traffic was undertaken according to the following steps:

- **Existing conditions:** Characterisation of existing (baseline) environmental conditions and identification of sensitive assets, values and uses that may be affected by construction, operation and decommissioning of the project.
- **Project description:** Review of the key project components and proposed construction, operation and decommissioning activities to identify potential project interactions with sensitive receptors (i.e. events). This includes identification of the maximum design scenario for the purposes of impact and

risk assessment, taking into account the parameter range within the project design envelope as outlined in Chapter 4 – Project description of the EIS for the whole of project assessment across the Commonwealth jurisdiction and Chapter 4 – Victorian works project description of the EES for the Victorian jurisdiction and selection of the parameter value with potentially greatest impact or risk.

- **Impact assessment:** Assessment of consequences based on the predicted magnitude of the impacts and the sensitivity of potentially affected receptors, taking into account proposed mitigation measures and their likely effectiveness. The impact assessment methodology is described in Section 6.4
- **Risk assessment**: Assessment of likelihood and consequences of accidents (i.e. events that are not certain to occur). The risk assessment methodology is described in Section 6.5.
- **Avoid, mitigate and manage:** Identification of mitigation measures to avoid, minimise and manage impacts or risks and to address the considerations described in Section 6.6.
- **Evaluation against assessment criteria:** Evaluation of predicted residual impacts or risks against assessment criteria set out in Section 6.7. If the impact or risk assessment indicates that the criteria are not met, then changes to the project design are made or further mitigation measures are introduced. Residual impacts and risks are those that remain following the implementation of all mitigation measures committed to by the project, taking into account their expected effectiveness.
- **Monitoring and review:** Continual checking for changes to legislation, policy, guidelines and standards and the project description and subsequent refinement and updating of assessments as required.
- **Consultation and engagement:** Consideration of feedback from community, stakeholders and regulators to ensure that concerns and expectations are met. Stakeholder consultation and engagement will continue throughout the life of the project.

For impacts (expected events) the likelihood of the event is considered to be certain, therefore only an evaluation of consequence is required. For risks (accidental events) both likelihood and consequences need to be considered. The evaluation of consequences for both impacts and risks takes into consideration the nature and scale of the effects, the predicted extent, severity and duration, the likely effectiveness of mitigation measures to reduce consequences as well as the sensitivity of the receptor.

An example, project activity is construction haulage, and in this case the event is increased heavy vehicle movements and the consequence would be increased congestion and safety risks for local road users. Increased heavy vehicle movements are an expected event as they are a planned part of construction logistics that cannot be avoided as part of the activity. These vehicle movements would occur along designated haulage routes and may influence traffic flow within and beyond the project area. It is expected that local road users would encounter these vehicles due to the shared use of public roads. An example of an accidental event is where the project activity is construction vehicle access, and in this case the event is unauthorised use of non-designated local roads and the consequence would be damage to local infrastructure or increased safety risks for pedestrians and cyclists. This event is unlikely to occur but is still possible.

6.2 Study area

The study area is defined as all locations that may potentially be impacted by project activities.

The study area, as shown in Figure 6-2, is defined as all locations where traffic may potentially be impacted by project activities. For the purposes of the TIA, the study area is primarily focused on the local road network associated with the construction and operation of the onshore transmission infrastructure. This report does not assess offshore-related activities as offshore construction related activities are expected to have immaterial transport impacts as explained in Section 6.9.2.

At this project planning stage, it is expected that access to the construction corridor would be provided via a combination of newly constructed temporary access roads on private property, and specific existing public and private tracks to avoid where reasonably practicable the construction of new access roads. It is understood that there would be primary and secondary access points along the corridor with construction traffic anticipated to be mainly accessing the construction corridor via six primary access road locations also referred to as staging nodes.

These staging nodes are strategically positioned worksites which will serve as primary access points into the construction corridor. They will serve as key areas for workforce mobilisation and temporary construction and equipment laydown areas. In some cases, batch plants are expected to be co-located. Each staging node may be connected to the local road network by one to two access roads (a total of 23).

The study area is located between Reeves Beach and Giffard. The study area is predominantly rural in nature, and the onshore transmission alignment does not pass through densely populated areas. Local land use in the vicinity of the alignment is predominantly characterised by tree plantations, farmland and conservation areas. The wider transport network that is assessed in this technical report is located within the area between the townships of Morwell, Traralgon, Sale and Yarram.

The townships that are likely to have direct traffic and transport impacts due to the construction and operation of the onshore transmission alignment are as follows:

- Woodside Beach
- Woodside.

Other townships that may be affected as part of the wider transport network include:

- Morwell
- Traralgon
- Rosedale
- Sale
- Longford
- Yarram
- Gormandale
- Giffard.

The geographical range of interest for species presented below are used to define the existing environment in Section 7.0.

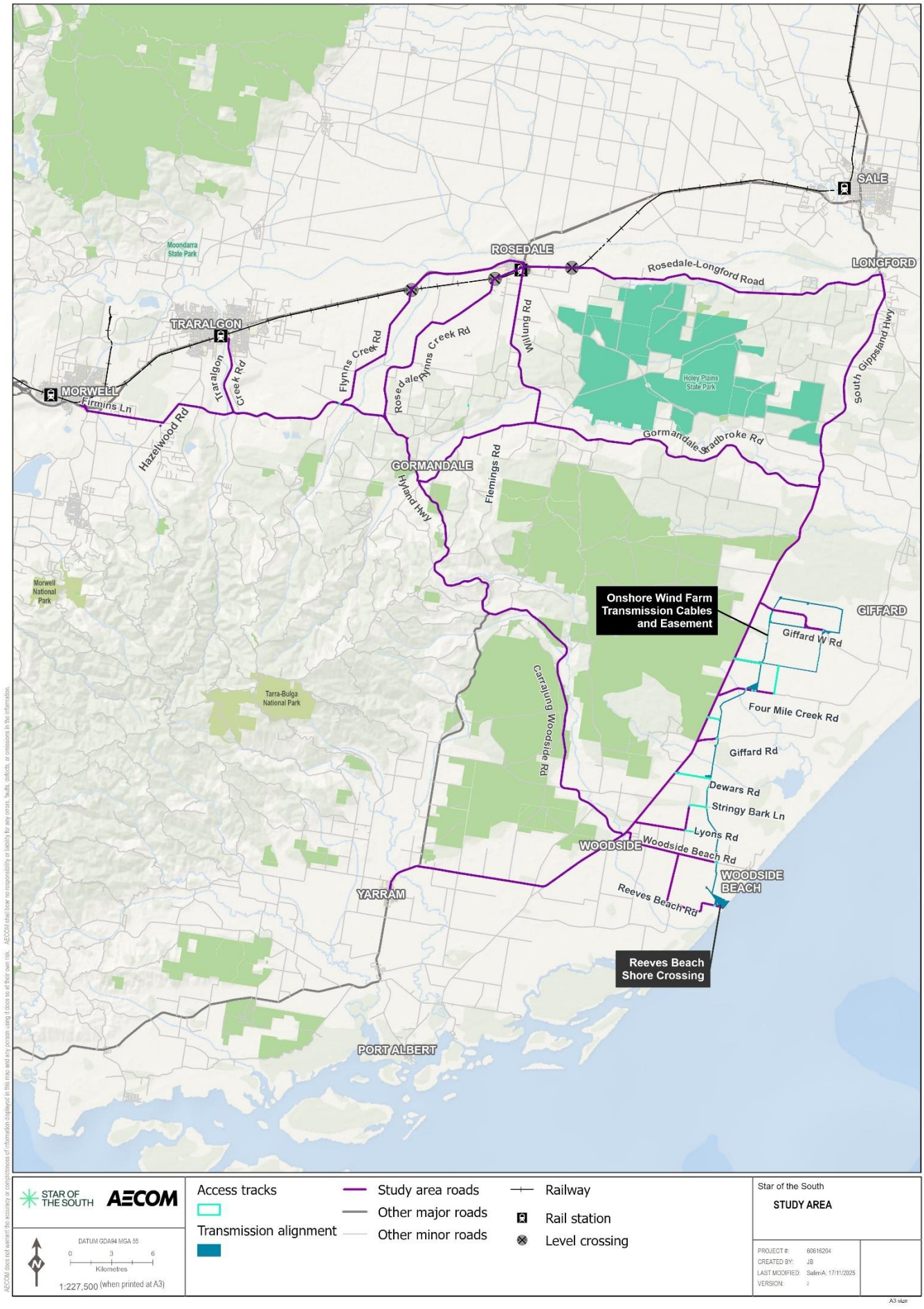


Figure 6-2 Study area

6.3 Methods to determine the existing environment

A comprehensive literature review and an extensive field program was undertaken to inform the environmental impact assessment of the project on transport, including:

- An initial desktop study based on a review of publicly available information.
- Site visits and assessment of the roads within the study area, notably at key intersections and proposed site access points, undertaken by AECOM as follows:
  - From Wednesday 15th to Thursday 16th September 2021
  - From Thursday 8th to Friday 9th September 2022
  - From Wednesday 7th to Thursday 8th February 2024
  - On Wednesday 19th February 2025.
- Review of the local road network, including key infrastructure, sustainable and public transport provisions.
- Investigation of road safety data (sourced from DTP), bus routes (sourced from DTP (PTV)) and designated heavy vehicle routes and restrictions (sourced from DTP and NHVR website).
- Analysis of available traffic data, sourced from DTP and local councils and automatic traffic count (ATC) data sourced from DTP, local councils and subsequently collected by AECOM. This enabled identification of the peak traffic volume time periods associated with the project, development of traffic volume diagrams and road mid-block theoretical capacity analysis.
- Review of any infrastructure upgrades proposed within the study area.
- Consultation with DTP, Wellington Shire Council and Latrobe City Council.

6.4 Impact assessment method

An impact is where a project activity or activities in any of the project phases (construction, operation or decommissioning) results in a change in the existing environment.

The impact assessment has been based on a maximum design scenario which enables a realistic and conservative approach to considering possible impacts that could occur due to the construction, operation or decommissioning of the project. Impacts can be positive or negative, direct or indirect. Impacts are described following the application of mitigation measures (residual impact).

Whether an impact results in a consequence to environmental receptors depends on the sensitivity of receptors and the magnitude of the impact.

- **Sensitivity:** the intolerance of a species or habitat to damage from an external factor and the time taken for its subsequent recovery
- **Magnitude:** the severity, extent and duration of an impact.

As environmental assets, values and uses are interconnected, sometimes an impact will give rise to a follow-on (secondary or indirect) impact which has also been considered as part of the assessment.

The impact assessments have involved identifying the magnitude of changes to the environment, positive or negative, that the project may have on the existing conditions. The method used has been specific to each individual technical study in accordance with relevant guidelines and standards. The technical reports each contain a section that describes their impact assessment method in detail, in particular the modelling or analysis that has been undertaken to predict the changes that may occur due to the implementation of the project.

The factors that have been considered when assessing the consequences of the project are as follows:

- Severity, extent, and duration
- Sensitivity of the affected receptors
- Assessment criteria

- The principles of ecologically sustainable development as defined in the Ministerial guidelines for assessment of environmental effects (DTP 2023) and in section 3A of the EPBC Act
- Stakeholder input and feedback
- The likely effectiveness of measures to avoid, minimise and manage impacts
- Assumptions and uncertainties associated with the assessment.

The impact assessments have considered the potential for combined impacts generated by the project on the one receptor but resulting from different actions. For example, shorebirds and seabirds are potentially affected by the loss of habitat within the transmission corridor, together with bird strike associated with the operation of the wind farm (referred to as inter-related impacts in the technical reports). The combined impact of these changes is assessed within the shorebird and seabird assessment. The approach to cumulative impact assessment is outlined in Section 6.8 below.

For the purposes of the impact assessment the project description defined a project design envelope (PDE). The PDE comprises ranges for certain design parameters (for example, an upper and lower limit for wind turbine generator heights). This allows for flexibility in the eventual design for the project that is necessary within an evolving industry where technology is rapidly changing. The impact and risk assessment has been based on a Maximum Design Scenario (MDS) which enables a realistic and conservative approach to considering possible impacts and risks that could occur due to the construction, operation or decommissioning of the project. The MDS consists of a defined set of project parameters from within the PDE that represent the greatest potential impact to an identified sensitive receptor or receptor group. As the MDS is defined based on specific impacts, the MDS assessed will vary between the impacts and risks assessed. See Section 6.4.1, Section 6.4.2, Section 6.4.3 and Section 6.4.4 for the MDS used for this assessment.

The significance of the impacts has been assessed in accordance with the evaluation framework, based on applicable legislation, policy and standards and the evaluation objectives and environmental significance guidelines arising from the government terms of reference established to guide the assessments.

This study has assessed the impacts of construction and operation of the project on the local transport network and associated assets. An overview of the TIA methodology is provided below:

- The TIA was informed by the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) (see Appendix B) which included the following details:
  - Vehicle types requiring site access.
  - The DTP heavy vehicle road network (HVRN) connecting the wider road network to the site.
  - Indicative vehicle origin and destination requirements.
  - Primary and alternative routes to and from the primary access points.
  - The proposed cable alignment and the location of staging nodes and primary access points.
  - Potential points of restrictions (structures with restricted height clearance, load limited bridges etc) as identified based on DTP HVRN data within the road network surrounding the site.
  - Proposed road network connections and arrangements for each staging node and primary access point.
  - Likely location sources of bulk materials and the surrounding road network that may facilitate access.
  - Locations where the transmission cable alignment is to cross the road network.
  - Indicative arterial road network traffic volumes based on available DTP data.
  - Indicative construction vehicle volumes to and from primary access points.
- The above information was used to inform the following assessments with regards to the construction phase of the project:
  - Access strategy review.

- Traffic estimates and distributions.
- Transport impacts - following identification of the magnitude of impacts on the site access and traffic routes to and from the work sites that would be impacted by the project, an assessment was undertaken that considered:
  - Road link capacity
  - Intersection safety.
  - Network infrastructure.
  - Public transport impacts.
  - Pedestrian and cyclist impacts.
  - Treatments that could avoid, mitigate and manage potential impacts.
  - Residual impact and legacy.
- Construction traffic route assessments:
  - Workers.
  - General construction traffic.
- Primary site access and the need for any road section upgrades.
- Road and lane closures due to onshore construction.

Additionally, the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) provided indicative operational traffic volumes which were used to inform the assessment of traffic generation and road capacity for the operations phase.

6.4.1 Assigning a sensitivity level

To assign a sensitivity level, the existing environment is described and 'receptors' are identified. For example, receptor in the marine environment could include whales and on land, residential areas or native vegetation.

A sensitivity level of high, medium or low is assigned to the receptors based on specific criteria developed by the specialist undertaking the assessment.

A sensitivity level is assigned to the receptors that have been identified in the baseline characterisation presented in Section 7.0. The sensitivity of each of the receptors has been determined to be either high, medium or low according to the descriptions relevant to transport presented in Table 6-1. Assigning receptor sensitivity includes consideration of the following factors:

- Adaptability to disturbances of transport infrastructure network.
- Tolerance to disturbance of transport infrastructure network.
- Recoverability from impacts arising from changes to transport infrastructure network.

Table 6-1 Receptor sensitivity

Sensitivity (to impact)	Description
High	Limited ability for transport network users to adapt behaviour or adopt alternatives within the transport infrastructure network. Limited tolerance –change cannot be readily adsorbed by the transport infrastructure network. Limited ability for transport network users to recover from any impact on transport infrastructure network once the impact has ceased.
Medium	Some ability for transport network users to adapt behaviour or adopt alternatives within the transport infrastructure network. Some tolerance –change can be somewhat absorbed by the transport infrastructure network.

Sensitivity (to impact)	Description
	Some ability for transport network users to recover from any impact on transport infrastructure network once the impact has ceased.
Low	Considerable ability for transport network users to adapt behaviour or adopt alternatives within the transport infrastructure network. Considerable tolerance –change can be readily absorbed by transport infrastructure network. Considerable ability for transport network users to recover from any impact on the transport infrastructure network once the impact has ceased.

6.4.2 Assigning a magnitude level

The magnitude of the impact on the environment includes consideration of the following factors:

- Extent – site, local, regional or widespread
- Duration – short, medium or long term (also considering frequency and permanence)
- Severity – degree of change from existing condition

The magnitude of a specific impact is based on clear criteria determined by the specialist undertaking the assessment and are defined relevant to Transport in Table 6-2. Magnitude is assigned for the maximum credible consequence with consideration of mitigation and management measures according to the levels presented in Table 6-3.

Table 6-2 Magnitude criteria

Terms		Description
Extent	Localised	Within the onshore transport infrastructure network.
	Medium scale	Within one kilometre of the onshore transport infrastructure network.
	Large scale	The broader transport infrastructure network within the City of Latrobe and the Shire of Wellington.
	Regional	Gippsland region transport infrastructure network.
Duration	Short-term	Less than one month.
	Medium-term	One month to one year.
	Long-term	Greater than one year.
Severity	Permanent	Irreversible change, substantial change to the transport infrastructure network.
	Reversible	Changes to transport infrastructure network are reversible once activity has ceased.
	Unlikely to be detectable	Changes to transport infrastructure network are within normal variability.

Table 6-3 Magnitude description

Magnitude	Description
Negligible	The impact is localised and short-term, and changes to the receptor are unlikely to be detectable above natural conditions.
Low	The impact is within the proximity of onshore transport infrastructure network (medium scale) and is medium-term, and results in reversible changes to the receptor once the activity has ceased.
Medium	The impact extends to the broader transport infrastructure network (large scale) and is medium-term, and results in reversible changes to the receptor once the activity has ceased.

Magnitude	Description
High	The impact extends to the broader transport infrastructure network (large scale) and long-term, and results in reversible changes to the receptor once the activity has ceased.
Very high	The impact is regional and long-term, and results in substantial and possibly irreversible change (permanent) to the receptor.

6.4.3 Assigning a consequence level

Consequence is the potential outcome of an event affecting a receptor. It is determined by combining magnitude of the impact and sensitivity of the receptor. The consequence level is assigned based on the receptor sensitivity level and magnitude level using the matrix in Table 6-4.

Consequences are assigned based on the maximum credible impact for each pathway. Where uncertainty exists, a conservative approach to assessing consequence is adopted.

Table 6-4 Consequence level matrix

Magnitude	Sensitivity		
	Low	**Medium**	**High**
Negligible	Negligible (E)	Negligible (E)	Minor (D)
Low	Negligible (E)	Minor (D)	Moderate (C)
Medium	Minor (D)	Moderate (C)	Major (B)
High	Moderate (C)	Major (B)	Severe (A)
Very High	Major (B)	Severe (A)	Severe (A)

6.4.4 Residual impacts

While there are clear steps in the assessment process, it may not always follow a linear progression. Typically, assessment requires multiple iterations of impact evaluation considering the assessment criteria and application of mitigation measures as the technical studies progress and additional information becomes available. The completed impact assessments are based on the final mitigation measures that will be implemented, and therefore describe the residual impacts. The residual impacts constitute the predicted consequences following the implementation of the mitigation measures and also taking into account the expected effectiveness of these measures.

6.5 Risk assessment method

A risk is where a project activity or activities could result in an unexpected (accidental) event in any of the project phases (construction, operation or decommissioning) that causes a change to the existing environment.

The level of risk is determined by combining the likelihood of an accident occurring and the consequences should the accident occur. The assignment of consequence level follows the process outlined above.

The following steps were undertaken to identify, analyse and evaluate risks:

- Develop a risk matrix based on the likelihood of an accident occurring and the consequences, should the accident occur
- Identify controls and requirements to mitigate identified risks
- Assign likelihood and consequence ratings for each risk to determine risk ratings considering design, proposed activities and mitigation.

6.5.1 Assigning a likelihood level

Likelihood is the probability of an unexpected (accidental) event occurring. The likelihood criteria range from 'rare' where the event may occur only in exceptional circumstances to 'almost certain' where the event is expected to occur in most circumstances.

Likelihoods are assigned with consideration of mitigation and management measures according to the levels presented in Table 6-5.

Table 6-5 Guide to likelihood levels

Level	Description
Rare	The event may occur only in exceptional circumstances
Unlikely	The event could occur but is not expected
Possible	The event could occur
Likely	The event will probably occur in most circumstances
Almost certain	The event is expected to occur in most circumstances

6.5.2 Risk matrix

Risk is defined as combination of the likelihood of an event occurring (using Table 6-5) and the consequence of that event occurring (using Table 6-4).

A risk rating is then determined by these factors using the risk matrix, presented in Table 6-6.

The level of detail of the assessment undertaken for each risk pathway is proportionate to the identified level of risk (i.e. risk ranking).

Table 6-6 Risk matrix

Likelihood rating	Consequence				
	Negligible (E)	Minor (D)	Moderate (C)	Major (B)	Severe (A)
Rare	Very low	Very low	Low	Medium	Medium
Unlikely	Very low	Low	Low	Medium	High
Possible	Low	Low	Medium	High	High
Likely	Low	Medium	Medium	High	Very high
Almost certain	Low	Medium	High	Very high	Very high

6.6 Avoidance and minimisation through design

The impact assessment process is iterative and the design of the transmission alignment has been informed by earlier versions of environmental assessments in order to avoid and minimise potential impacts, including during:

- Pre-referral corridor selection
- Post-referral corridor selection
- Post feasibility licence award
- Post VicGrid establishment corridor selection.

At each decision point, the project, where reasonably practicable has sought to avoid and minimise impacts to a suite of environmental, heritage, socio-economic and landholder values. Avoid and minimise principles have materialised through reduced construction footprints and re-routing where sensitive values have been identified. These strategic considerations, informed by site validation have resulted in the footprint under which the onshore project is being assessed.

Relevant to this topic, the following measures have been adopted in relation to the design, construction and operation of the project to avoid and minimise impacts:

- Minimising additional infrastructure to be built by connecting into the electricity network at the VicGrid connection hub at Giffard.
- Use of existing roads to access the project area to the extent possible.
- Construction of the transmission infrastructure in stages sequentially to contain the disruption to individual localities to reasonable periods.
- Proposed new temporary construction access roads are to avoid or limit heavily vegetated areas to prevent vegetation removal.
- Installation of the onshore transmission infrastructure largely during normal working hours (0700 to 1800 hours Monday to Friday and 0700 to 1300 hours on Saturday). Construction would only occur outside normal working hours where unavoidable or for safety reasons. The batch plant operations may be outside of these hours and likewise trenchless shore and waterway crossings.
- Use of arterial roads such as the Princes Highway, Hyland Highway and the South Gippsland Highway to the maximum extent possible to minimise impacts to local roads.

6.7 Avoidance, mitigation and management

Once avoidance and minimisation measures have been exhausted, the next step is management of the residual impacts and risks. In the case of risks, the mitigation measures can be applied prior to the event occurring and/or after the event. The residual impacts and risks are evaluated against the assessment criteria to ensure impacts and risk are of an acceptable level.

The assessments describe the impacts and risks with all the mitigation measures implemented i.e. with both initial and final mitigations. Initial mitigation measures are defined as the standard suite of mitigation measures that will be implemented by the project such as measures required under legislation, national or international standards and standard measures implemented on similar projects. Final mitigation measures are any additional mitigation measures adopted to address the findings of impact/risk assessments to further reduce impacts and risks to acceptable levels. The completed impact and risk registers for this technical report are presented in Appendix D and show the reduction in impact/risk that occurs between the initial rating and final rating due to the application of final mitigation measures.

6.8 Cumulative impact assessment

Cumulative impacts arise when the effects of a single project on a single receptor are considered alongside the effect of other projects on the same receptor. The project has considered the potential for cumulative impacts associated with other proposed projects. It is noted that projects that are operational are considered as part of the baseline environment, and the cumulative impact assessment focuses on proposed or future actions.

A staged approach to cumulative impact assessment has been adopted. This approach is split into four stages:

- Stage 1 Identifying potentially cumulative projects or actions
- Stage 2 Shortlisting identified projects or actions
- Stage 3 Gathering information
- Stage 4 Assessment.

This approach is focused on the assessment of potential adverse cumulative effects on receptors or similar groups of receptors, as relevant. The availability of information necessary to conduct a cumulative impact assessment depends on the status of the proposed project or action within the planning and approval regulatory steps. Therefore, a level of certainty reflecting the availability of detail and information necessary for the assessment is assigned to each proposal:

- Tier 1 High certainty – Project planning application/EIS/EES has been submitted to regulators, or the project has been approved, or the project is under construction.
- Tier 2 Medium certainty – Project referrals have been submitted to the regulators.
- Tier 3 Low certainty – Project is in the proposal stage and little information is publicly available.

The cumulative impact assessment has followed a staged approach (as shown in Figure 6-3 and described in detail in EIS Chapter 6 - Assessment Framework and EES Chapter 6 - Assessment Framework).

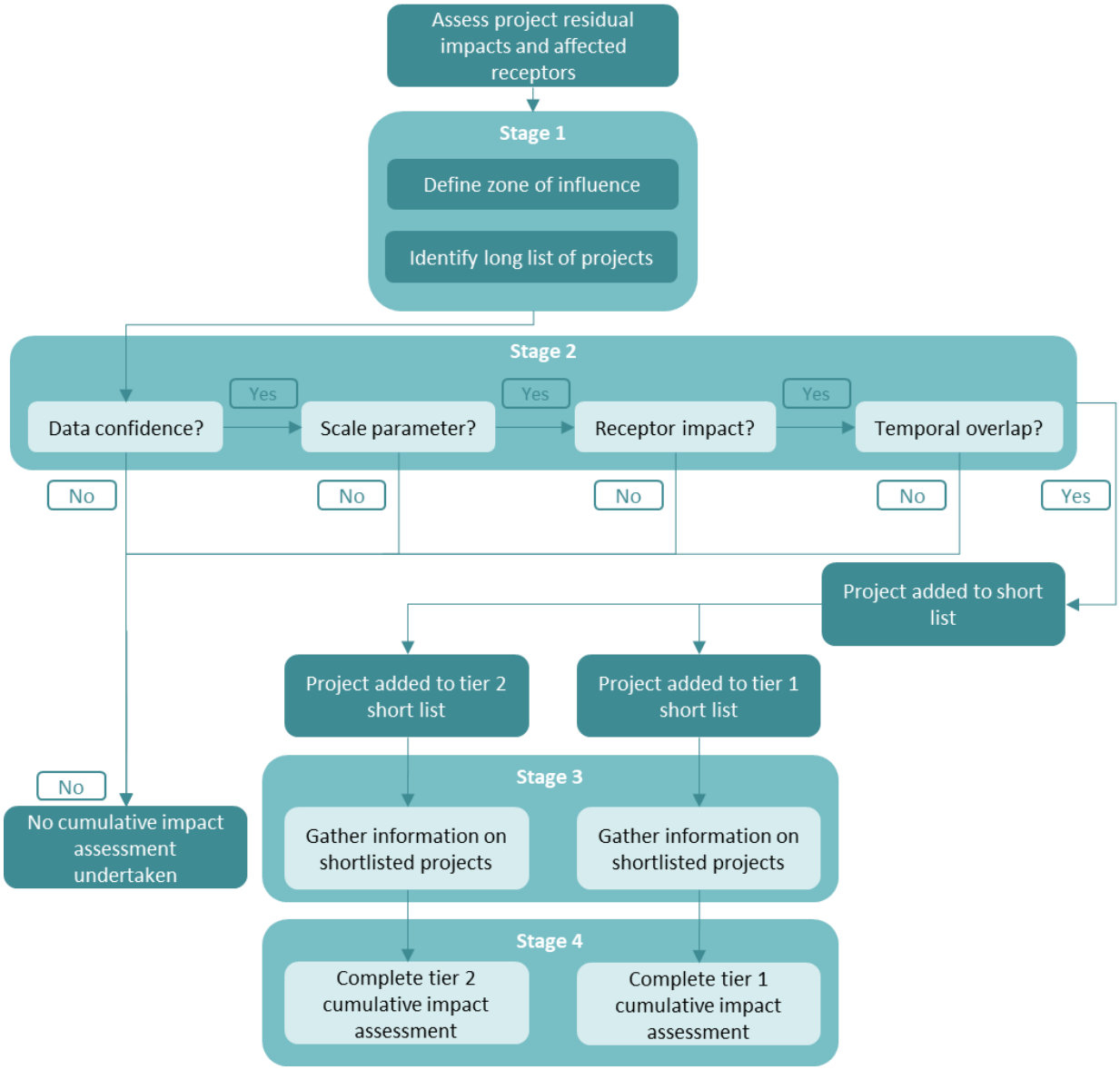


Figure 6-3 Cumulative impact assessment process

The EIS scoping guidelines for the project states that the assessment should 'address the potential cumulative impact of the proposed action on ecosystem resilience'. Both the EIS and EES scoping guidelines state that climate change impacts must also be considered. Ecological resilience is generally defined as "the ability of ecosystems to resist permanent structural change and maintain ecosystem functions" (DAWE, 2016).

6.9 Limitations, uncertainties and assumptions

The following section outlines the limitations, uncertainties and assumptions that apply to this assessment:

6.9.1 TIA limitations and uncertainties

This TIA has been based on the project description in Chapter 4 of the EIS/EES and information pertaining to matters such as construction and operation workforce, vehicle movements and type, construction equipment set out in the document titled *SOTS - Preliminary Site Access and Vehicle Route Assessment (PSAVRA)* (reference PS119484-WSP-MEL-TDP-MEM-006 Rev0, dated 20/02/2025, provided in Appendix B).

The PSAVRA provided conservative inputs to enable assessment of the maximum potential cumulative project traffic generation during both construction and operation phases. This methodology is intended as a cautious approach to evaluate and manage the uncertainty inherent to impact assessments at the planning stage.

Existing traffic volumes and turning counts were sourced from either DataVic or directly requested from Councils. Where data was unavailable, appropriate assumptions were made and are documented in Table 6-7. It is noted that traffic survey data was collected during a period of COVID-19 restrictions. To address potential under-representation of current day traffic volumes, this assessment has considered the latest Average Annual Daily Traffic data sourced from DTP and applied growth factors to the data.

This TIA will form an input into a subsequent TMP, to be developed based on the final proposed design and construction methodology once a contractor has been selected to undertake the works.

6.9.2 TIA assumptions

Several assumptions were made –in the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) (attached in Appendix B) and by AECOM to inform this TIA. These assumptions are summarised in Table 6-7.

Table 6-7 TIA assumptions

No	Assumption	Assumption source
Overall		
1.	For the purpose of the assessment, i.e. to derive existing and project traffic generation volumes, it is assumed that construction activities are to begin in 2028.	AECOM
2.	A growth factor of 1.5% per annum has been applied to base year traffic volumes to consider growth between the base survey year (2020) and end construction year (assumed 2028). This growth factor is consistent with the 1.5% growth rate for public roads typically adopted by TIA studies in the absence of informed datasets or strategic model inputs.	AECOM
3.	The staging nodes were identified the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) (PSAVRA) (see Appendix B). Noting that the PSAVRA is based on Option C only. These staging nodes have been distributed based on accessibility to a localised laydown area (including car parking for workers), the operation easement, and where required, batch plants. The staging nodes are located at approximately three-to-four-kilometre intervals along the onshore transmission alignment. Staging nodes are primary access points where access to a section of the cable alignment is understood be achieved during construction. These locations are understood to be co-located with temporary laydown areas and in some cases, batch plants. While it is noted that there are additional access roads along the transmission cable alignment which are noted to be secondary access points, the assessment focuses on	PSAVRA (App B)

No	Assumption	Assumption source
	these primary access points i.e. staging node locations anticipated to be used by the majority of construction traffic. Where long sections of the alignment exist without intersecting an existing public or private access road, or there are known constraints evident (such as visual obstructions), new access roads have been tentatively proposed subject to various studies and approvals.	
4.	Local council access roads categorised as B and C class roads have been assumed to have an existing AADT two-way traffic volume of 20 vehicles. Local council roads categorised as collector have been assumed to have an existing AADT two-way traffic volume of 500 vehicles.	AECOM
5.	Seasonal fluctuations which may occur during holiday periods or plantation logging season have not been accounted for in the estimation of baseline traffic volumes.	AECOM
Construction phase assessment		
6.	For the purpose of the assessment, construction is assumed to occur linearly, beginning at the shore crossing at Reeves Beach (access point 1) and continuing north-west along the alignment to Giffard West (access points 18 to 22).	AECOM
7.	The assessment does not consider the onshore substation and any infrastructure at the VicGrid connection hub, as it is part of VicGrid's scope and is outside the scope of this assessment.	AECOM
8.	Construction of the project is assumed to follow the staging detailed in Section 9.1. Exact construction staging and timing will be determined once a contractor is appointed.	AECOM
9.	Vehicles relating to the mobilisation and demobilisation of the workforce are generally considered to be standard vehicles for which roads are designed to accommodate and as there is no need for special consideration to be given to these movements with respect to the route required to be used. It is also considered that these movements will generally be undertaken at the start and end of the project and as such will primarily comprise standalone movements. As such, these movements are considered to occur outside the typically daily movements that will be generated by the construction of the alignment.	PSAVRA (App B) & AECOM
10.	Construction vehicle access routes were informed by the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) (see Appendix B). Vehicle access routes considered the following: • Route directness between construction worker / material sources and soil disposal locations and access points. Where reasonably practicable, travelling through regional town centres would be avoided. • DTP heavy vehicle approved networks. • Location of potential height or weight restricted structures.	PSAVRA (App B)
11.	Heavy vehicle movements are to follow the most direct route, via roads designated as part of the defined VicRoads heavy vehicle road network, between the indicatively material source locations and the projects proposed primary site access points.	AECOM
12.	Light vehicle movements which would be generated by the workforce are assumed to be travelling from the surrounding regional towns near the project area, i.e., Sale, Longford, Traralgon, Morwell, Yarram and Woodside. Drivers are assumed to utilise the most direct transport routes via the major roads to the proposed staging nodes and assumed to park near the respective laydown areas. It is understood that following further project planning that more site access points may be available to gain access to project works to limit travel distances or for more localised works associated with the transmission cable construction.	PSAVRA (App B) & AECOM

No	Assumption	Assumption source
13.	The distribution of light vehicle movements was estimated based on the population of the surrounding regional towns, as outlined below: • Traralgon and Morwell – North-west of alignment – 69% • Sale and Longford– North-east of alignment – 27% • Yarram and Woodside – South-west of alignment – 4% Given the extent of the transmission infrastructure to be constructed, workers may relocate as works progress to reduce travel time. Accordingly, some minor adjustments to construction worker travel movements have also been factored from the baseline distributions given above.	PSAVRA (App B) & AECOM
14.	To develop the workforce traffic volumes for the project the following was assumed: • A worker laydown area is to be provided at each site staging node, with sufficient car parking capacity for all workers. • All site management personnel and technicians are on site at once. • Each worker would travel to site using an individual light vehicle to and from the respective work site each day. The works contractor may organise for construction workers to be transferred via bus to reduce vehicle volumes due to the project. • Workers would travel directly to the site staging node and park at the respective works compound for toolbox talks before departing to work on site further along the construction corridor or to a designated working area. • During project inductions, drivers would be instructed on the roads they can and cannot use to ensure impacts are reduced and that safe routes are used.	AECOM
15.	To estimate the peak hour traffic impacts expected at each of the proposed primary site access points the following has been assumed: • Construction sites operate six days a week on Monday to Friday between 7.00am - 6.00pm and Saturday between 7.00am – 1.00pm. • Workforces arrive in the morning peak period on Monday to Friday between 6:00am – 7:00am and depart site in the evening peak period between 6:00pm – 7:00pm. • Heavy vehicle traffic movements, including OSOM and B-Double heavy vehicles, to occur Monday to Friday, evenly distributed throughout the day between 7:00am and 5:00pm. It is assumed that travel to and from the site will occur during the above peak hours coinciding with shift start and end times, however it is noted that some construction activities may generate traffic movements outside the hours outlined above, depending on specific construction activities or scheduling requirements. Only weekday conditions have been considered, as they are more likely to coincide with the road network peak traffic periods.	AECOM
16.	AECOM commissioned traffic surveys on roads within the study area to determine 2028 background traffic volumes (see Section 7.2.3 for additional information and Appendix C for traffic flow diagrams for construction which includes survey based volumes). Using the survey data, the peak hour background traffic volume as a percentage of total daily trips was calculated for each of the following time periods: - AM Peak 6am – 7am peak hour = equivalent to 4.2% of total daily trips - PM Peak 6pm – 7pm peak hour = equivalent to 11.3% of total daily trips - Midday Peak hour = 4.7% of total daily trips	AECOM

No	Assumption	Assumption source
	The above percentages were only applied to roads where the AADT volume was known to derive the respective mid-block road background traffic volumes. Note that seasonality in the background traffic volumes has not been considered.	
17.	The number of heavy vehicle movements generated by construction material transportation were determined based on the type, classification and volume capacity of the various heavy vehicles anticipated to be used. These were first estimated in the *Preliminary Site Access and Vehicle Route Assessment* (WSP, 2025) (see Appendix B) and reflect anticipated peak monthly volumes during construction. These estimates were used as the basis of this assessment to establish construction traffic generation and distribution. It is acknowledged that actual vehicle movements may vary across the construction period and are likely to be lower than those presented during most periods.	PSAVRA (App B) & AECOM
18.	It is understood that all staging nodes would generate traffic during project delivery as they are expected to be primary access points to the transmission cable alignment. For the purposes of this assessment, it has been assumed that volumes would be evenly distributed across each of the staging nodes, with some variation allowed for depending on the uses occurring at each node.	PSAVRA (App B)
19.	Typical heavy vehicle types and capacities were assumed to calculate the traffic generated to transport the volume of materials identified	PSAVRA (App B)
20.	The exact quantities of bulk material to be extracted for the project has not been verified yet as this may be subject to change during detailed design stage. However, the assessment has included the following assumptions to estimate impacts: • The PSAVRA report (see Appendix B) estimated the peak quantity values for the purposes of determining the potential peak number of vehicle trips required. At this planning stage given the number of unknowns the base volumes were adopted for impact assessment. • The estimated number of bulk material trips to be generally distributed evenly across each of the site staging nodes. • As the extraction and disposal site locations for bulk materials are still to be determined, possible directions of travel to/from each site staging nodes were adopted based on the PSAVRA report (see Appendix B). • All movements to and from the bulk material sourcing locations are to be undertaken via conventional ‘truck and dog trailer’ haulage vehicles.	PSAVRA (App B) & AECOM
21.	SIDRA models have been developed as follows: • All measurements taken from Google earth aerial imagery. • Access roads assumed to be 60km/hr and major roads are modelled as 100km/hr although TMP measures are likely to reduce the speed in the vicinity of access points. • Traffic volumes turning movements have been estimated based on balancing link volumes, no turning movement surveys have been sourced. • Basic Saturation flows were kept as per SIDRA default at 1950 tcu/h as it is considered that the intersections investigated are in an ideal area type.	AECOM
22.	Full road closures are assumed to occur for up to a maximum duration of 3 days. Partial closures are assumed to occur for a maximum duration of 6 days, with each lane closed for 3 days at a time. Bi-directional vehicular passage would be maintained over the remaining lane of traffic during the partial closures The exact locations and extent of road closures will be confirmed in the next stages of the project.	AECOM

No	Assumption	Assumption source
23.	The transport assessment excludes an assessment of transport impacts associated with offshore construction because: • Materials to build the offshore wind farm are expected to be primarily transported to the wind farm site by vessels from ports at Bell Bay or Geelong or from overseas ports • The anticipated peak number of offshore construction staff to be located at Barry Beach Marine Terminal/Port Anthony is 255 and these are expected to travel daily by light vehicles along Barry Road between 7am and 9am in the morning and between 5pm and 7pm in the afternoon • The anticipated peak number of offshore construction staff that will be accommodated in the offshore construction vessels is 917 and these are expected to travel by light vehicles or buses along Barry Road once per fortnight (spread across the fortnight and time of day due to varying shift changes) • The typical mid-block two-way road capacity for Barry Road is in the order of 1,800 vehicles per hour and therefore the expected traffic volumes associated with the construction workforce are anticipated to be low relative to road capacity and is not considered to be an issue requiring mitigation.	AECOM

6.10 Linkages to other technical reports

This report has interdependencies with the report in relation to the assessment of impacts associated with:

- Technical Report G: Onshore ecology
- Technical Report J: Soil and waste
- Technical Report Q: Business and tourism
- Technical Report R: Social
- Technical Report S: Agriculture and forestry
- Technical Report T: Land use and planning
- Technical Report W: Onshore noise
- Technical Report Y: Air quality

The specialists undertaking this assessment worked collaboratively to evaluate these potential impacts and design suitable mitigation measures to be adopted by the project.

7.0 Existing environment

The existing environment assessment provides an overview of the existing transport environment within the study area. It establishes the baseline conditions against which the potential impacts of the project are assessed. The review includes an examination of the local road network, traffic conditions, crash history and existing sustainable transport options such as walking, cycling and public transport services.

7.1 Local road network

The proposed onshore transmission infrastructure in the context of the local road network is shown in Figure 6-2. At this stage of project planning, the proposed onshore transmission infrastructure is anticipated to require 6 staging nodes along its length. These staging nodes are primary access points connecting to a section of the transmission alignment where temporary laydown areas and, in some cases, batch plants are located. It is noted that the staging nodes may have one to two access roads to connect with the local road network, however only one primary access road will be used for the purpose of this assessment. Other access roads, providing secondary access along the transmission cable alignment, may also be required in some instances. However, it is understood that the majority of project traffic would utilise primary access roads associated with the staging nodes during construction.

A summary review of the key transport elements of the existing local road network providing connections to the project are outlined in the following tables, for the respective road authorities:

- Table 7-1 and Table 7-2 – DTP managed roads
- Table 7-3 and Table 7-4 – Wellington Shire and Latrobe City Council managed roads

At this time, no proposed internal project-specific roads have been investigated or listed. There are plantation tracks operated by HVP Plantations which are currently in use and may be impacted by the project either through use of vehicles or road closures. However, these are privately owned roads/tracks and their use will be subject to negotiations with HVP Plantations to ensure that effects on plantation operations will be minimised.

A site visit was undertaken by AECOM on Wednesday 15 and Thursday 16 September 2021 to help understand current road network conditions, with Appendix A providing photos and more details on local roads from the site visit observations. A second site visit was undertaken on Thursday 8 and Friday 9 September 2022 following changes to the transmission alignment. A third site visit was undertaken on Wednesday 7 and Thursday 8 February 2024 following further changes to the transmission alignment. A fourth site visit was undertaken on Wednesday 19 February 2025 following further revisions to the transmission alignment. These visits represent snapshots of the local conditions only and may not be representative of traffic at other times. A summary of the key observations from the site visits is provided below:

- The major highway and arterial roads were observed within the study area to be lightly trafficked. The roads were found to be generally in good condition, with sealed roads, good delineation provided and no apparent pavement defects. The posted speed limits are typical for the road classification and are either 80 or 100km/hr.
- The following observations were made of roads proposed to provide access to the project work sites:
  - All site access roads form a priority-controlled intersection with their respective major road connection. Some of these were observed to have restricted sight distance for entry of the major road from site access roads.
  - Several site access roads were observed to be unsealed, gravel local roads
  - Majority of the site access roads did not have posted speed limits, therefore the default rural speed limit of 100km/h applies.
  - Proposed site access roads were observed to have limited traffic volumes.
- Traffic volumes for some of the roads include logging truck movements in the area. Logging truck movements (<10 over a one-hour period) were observed on wider access roads such as Rosedale-

Longford Road, Gormandale-Stradbroke Road, Hyland Highway and South Gippsland Highway. Heavy vehicle movements were also observed along Firmins Lane and Tramway Road.

Table 7-1 DTP managed roads - existing conditions

Transport element	Princes Freeway	Monash Way	Tramway Road	Firmins Lane	Hazelwood Road	Mattingley Hill Road
Speed Limit (kph)	80 - 100	80-100	80 - 100	80 - 100	80 - 100	80 - 100
Classification	M1	C456	C474	C475	C476	C475
Managed by	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)
Carriageway Width (m)	7 – 18	6.5 – 9	8 – 11	7 – 8	7 – 8	6.5 – 8
Shoulders (m)	1.5 – 3	1.5 – 2.5	0.5 – 1	1	0.3 – 1	0.5 – 1
Road surface	Sealed with sealed shoulders Appropriate signage and line markings	Sealed with sealed shoulders Appropriate signage and line markings	Sealed with sealed shoulders Appropriate signage and line markings	Sealed with sealed shoulders Appropriate signage and line markings	Sealed with gravel shoulders Appropriate signage and line markings	Sealed with gravel shoulders Appropriate signage and line markings
Total number of lanes	Two to four	Two	Two (median/slip lane)	Two	Two	Two
Traffic Control	On and off-ramps Give way intersections at local roads.	Give way intersections at local roads. Roundabout at intersections with Firmins Lane	Give way intersections at local roads. Roundabout at intersections with Firmins Lane	Give way intersections at local roads. Roundabout at intersections with Tramway Road and Hazelwood Road	Give way intersections at local roads. Roundabout at intersection with Firmins Lane	Give way intersections at local roads. Major signalised intersections at major roads such as Traralgon Creek Road Roundabout at intersection with Hyland Highway (Barton Lane)
Road user hierarchy*	Preferred Traffic Route from Strzelecki Highway to Princes Drive	Preferred Traffic Route from Princes Highway off-ramp / on-ramp	Preferred Traffic Route from Princes Highway off-ramp / on-ramp Other from Princes Highway on-ramp to Porters Road	n/a	n/a	n/a
On a Strategic Cycling Corridor	No	No	No	No	No	No
Bicycle facilities	No	No	No	No	No	No

Transport element	Princes Freeway	Monash Way	Tramway Road	Firmins Lane	Hazelwood Road	Mattingley Hill Road
Pedestrian facilities	No	No	No	No	No	No
Bus facilities	No	No	No	School bus stops present along the road	No	No
B-Double Route	Yes	Yes	Yes	Yes	Yes	Yes
OD Route	No	No	No	Monash Way to Hazelwood Road	Firmins Road to Mattingley Hill Road	Hazelwood Road to Hyland Highway
OSOM Route	Yes	Princes Freeway to Brodribb Road	Princes Drive to Firmins Lane	Yes	Jeeralang North Road to Mattingley Hill Road	Yes

**VicRoads Road Use Hierarchy is a set of guiding principles that allocates priorities for road use by transport mode, place and time of day. The Road Use Hierarchy is a key component of the SmartRoads approach to prioritising the use of arterial roads in Victoria. Road use type categories include Bicycle, Proposed Bicycle, Bus, Proposed Bus, Freight, Local Primary Access Route, Local Secondary Access Route, Proposed Other, Other, Pedestrian, Principal Pedestrian Network, Preferred Traffic Route, Proposed Preferred Traffic Route, Tram, Proposed Tram.*

Table 7-2 DTP managed roads - existing conditions

Transport element	Hyland Highway	Traralgon Creek Road	Carrajung-Woodside Road	South Gippsland Highway	Woodside Beach Road	Rosedale-Longford Road
Speed Limit (kph)	80 - 100	80 - 100	80 - 100	80 - 100	100	80 - 100
Classification	C482	C483	C453	A440	C453	C485
Managed by	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)	RRV (DTP)
Carriageway Width (m)	6.25 – 8	6.5 – 7	6.3	8	6 – 7.3	5.9
Shoulders (m)	1	0.5 – 1	None	0.5 – 1	1.5 m gravel shoulders near South Gippsland Hwy only	1.4
Road surface	Sealed with sealed shoulders Appropriate signage and line markings Median provided along length of Highway	Sealed with sealed shoulders from Hyland Highway to Traralgon South Gravel shoulder on one side of the road. Shoulders reclaimed by grass Appropriate signage and line markings	Sealed with gravel shoulders. Appropriate signage and line markings	Sealed with sealed shoulders. Appropriate signage and line markings	Sealed with no shoulders except near intersection with South Gippsland Hwy Appropriate signage and line markings	Sealed, good road surface overall though some minor potholes were observed along length of the road Appropriate signage and line markings
Total number of lanes	Two to four Up to six lanes due to turning lanes at certain intersections, notably near Hazelwood substation	Two	Two	Two to four (at major intersections)	Two	Two
Traffic Control	Give way intersections at local roads. Major signalised intersections at major roads such as Traralgon Creek Road Roundabout at intersection with Mattingley Hill Road	Give way intersections at local roads.	Give way intersections at local roads.	Give way intersections at local and other arterial roads. Roundabout at intersection with Princes Highway (Sale) Appropriate signage and line markings	Give way intersections at local roads.	Give way intersections at local roads. Level crossing near Mullocky Lane with passive controls

Transport element	Hyland Highway	Traralgon Creek Road	Carrajung-Woodside Road	South Gippsland Highway	Woodside Beach Road	Rosedale-Longford Road
Road user hierarchy*	n/a	n/a	n/a	n/a	n/a	n/a
On a Strategic Cycling Corridor	No	No	No	No	No	No
Bicycle facilities	No	No	No	No	No	No
Pedestrian facilities	No	Pedestrian path located along eastern side of the road connecting to Loy Yang Park	No	No	No	Yes
Bus facilities	Bus stops located near intersections with Gormandale Stradbroke Road and Carrajung-Woodside Road School bus route and stops (signs provided along road)	School bus route from Hyland Highway to Traralgon Creek Road/Traralgon-Balloong Road	Yes	School bus route from Sale to Woodside (Note: route continues south)	Regional bus stops near Longford Primary School School bus route from South Gippsland Highway (High Street) to Richard Road	Canberra – Melbourne via Bairnsdale route running along this road Schools bus stops (signs provided along road)
B-Double Route	Yes	Yes	Yes	Yes	Yes	No
OD Route	Mattingley Hill Road to Flynns Creek Road	No	No	No	South Gippsland Highway (High Street) to Cherry Tree Road	Yes* (restricted sections – conditionally approved at level crossing near Mullocky Lane)
OSOM Route	Yes	No	No	Yes	No	Yes

**VicRoads Road Use Hierarchy is a set of guiding principles that allocates priorities for road use by transport mode, place and time of day. The Road Use Hierarchy is a key component of the SmartRoads approach to prioritising the use of arterial roads in Victoria. Road use type categories include Bicycle, Proposed Bicycle, Bus, Proposed Bus, Freight, Local Primary Access Route, Local Secondary Access Route, Proposed Other, Other, Pedestrian, Principal Pedestrian Network, Preferred Traffic Route, Proposed Preferred Traffic Route, Tram, Proposed Tram.*

Table 7-3 Council roads – existing conditions

Transport element	Balloong Road	Reeves Beach Road	Four Mile Creek Road	Dewars Road	Maryland Road	Belchers Road	Stringy Bark Lane
Speed Limit (kph)	100	100	100	100	100	100	100
Classification	Local - Access A	Local - Access B	Local - Access B	Local - Access B	Local - Access C	Local – Access B	Local - Access C
Managed by	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council
Carriageway Width (m)	5.7	3.8 – 5.2	4.5	3 – 4	4	4.5 – 5	4 – 4.5
Shoulders (m)	None	None	None	None	None	None	None
Road surface	Sealed No line markings	Sealed Gravel / dirt Potholes/sunk sections of road observed near edges	Gravel / dirt Sealed at intersection with South Gippsland Highway	Gravel / dirt	Gravel	Gravel / dirt	Dirt
Total number of lanes	One	One	Two	One	One	Two	One
Traffic Control	Give way intersections at local roads.	Give way intersections at local roads.	Give way intersections at local roads	Give way intersections at local roads	Give way intersections at local roads	Give way intersections at local roads	Give way intersections at local roads
On a Strategic Cycling Corridor	No	No	No	No	No	No	No
Bicycle facilities	No	No	No	No	No	No	No
Pedestrian facilities	No	No	No	No	No	No	No
Bus facilities	No	No	No	No	No	No	No
B-Double Route	McLaughlins Road to Tetleys Road	No	No	No	No	No	No

Transport element	Balloong Road	Reeves Beach Road	Four Mile Creek Road	Dewars Road	Maryland Road	Belchers Road	Stringy Bark Lane
OD Route	Cherry Tree Road to Old Sale Road	No	No	No	No	No	No
OSOM Route	Woodside Road to McLaughlins Beach Road	No	No	No	No	No	No

Table 7-4 Council roads – existing conditions

Transport element	Lyons Road	Gormandale-Stradbroke Road	Giffard Road	Giffard West Road	Epplestuns Road	Flynns Creek Road
Speed Limit (kph)	100	80 - 100	100	100	100	100
Classification	Local - Access C	Local - Collector	Local – Collector	Local – Access B	Local – Access B	Local - Collector
Managed by	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Wellington Shire Council	Latrobe City Council
Carriageway Width (m)	4	6.5 – 7.5	4.2	4.4	4.7	4 – 6.3
Shoulders (m)	None	None	None	None	None	2 - 3
Road surface	Gravel / dirt Potholes observed on road surface	Sealed, loose gravel road for 11km after Old Rosedale Road (eastbound) with low speed corners Appropriate signage and line markings	Sealed No line markings	Sealed No line markings	Gravel / dirt	Sealed with gravel/sandy shoulders No line markings on the northern sections of the road towards Flynn
Total number of lanes	One	Two	Two	Two	Two	Two
Traffic Control	Give way intersections at local roads	Give way intersections at local roads	Give way intersections at local roads.	Give way intersections at local roads.	Give way intersections at local roads.	Give way intersections at local roads. Level crossing with passive controls 200m south of Princes Highway
On a Strategic Cycling Corridor	No	No	No	No	No	No
Bicycle facilities	No	No	No	No	No	No
Pedestrian facilities	No	No	No	No	No	No
Bus facilities	No	Hyland Highway to Willung Road and from Taylors Lane to South Gippsland Highway	School bus route from Seaspray Road to the Warrigal Creek Streamside Reserve	No	No	Canberra – Melbourne via Bairnsdale School bus stops
B-Double Route	No	No	No	No	No	Yes

Transport element	Lyons Road	Gormandale-Stradbroke Road	Giffard Road	Giffard West Road	Epplestuns Road	Flynns Creek Road
OD Route	No	No	No	No	No	No
OSOM Route	No	No	No	No	No	Yes* (restricted sections – conditionally approved at level crossing near Mullocky Lane)

7.2 Traffic data sources

7.2.1 Latrobe City Council and Wellington Shire Council

Latrobe City Council and Wellington Shire Council provided AECOM with their respective available ATC datasets for roads within the wider project area, these are outlined in Table 7-5.

Table 7-5 Council ATC survey locations

Road authority	Road	Approximate survey location	ATC survey dates	
			Start	End
Latrobe City Council	Flynns Creek Road	200m west of Rathjens Rd	Monday 3 October 2016	Monday 24 October 2016
Wellington Shire Council	Balloong Road	350m east of intersection with Old Sale Road	26 Feb 2018	13 March 2018
Wellington Shire Council	Gormandale-Stradbroke Road	550m west of Mooneys Road Intersection	Tuesday 13 October 2020	Friday 6 November 2020
Wellington Shire Council	Gormandale-Stradbroke Road	600m north-east of Butts Hill Road Intersection	Tuesday 13 October 2020	Friday 6 November 2020

7.2.2 Department of Transport and Planning (DTP)

AECOM obtained the DTP declared road 2020 Annual Average Daily Traffic (AADTs), heavy vehicle and growth rates for the declared roads in the study area from DTP Open Data Hub, as detailed in Table 7-7.

7.2.3 ATC surveys

AECOM commissioned Matrix Traffic and Transport Data to undertake 7-day ATC traffic surveys on roads detailed in Table 7-6. The data collected included speed, classification, and vehicle volumes by direction. At the time that the surveys were carried out a COVID-19 workers permit was required to travel between metropolitan Melbourne and regional Victoria. This would have contributed to lower traffic volumes within the study area being recorded in comparison to unrestricted time periods. Therefore, DTP AADT sourced data as it were found to provide higher volumes and thus adopted for a more robust assessment.

Table 7-6 Matrix ATC surveys

Road	Approximate survey location	Dates surveyed	
		Start	End
Hyland Highway	Near Rosedale Longford Road	Monday 25th October 2021	Sunday 24th October 2021
Gormandale Stradbroke Road	7km east of Willung Road	Tuesday 12th October 2021	Monday 18th October 2021
Carrajung-Woodside Road	1km north of Napier Road		
South Gippsland Highway	Near Four Mile Creek Road		

7.3 Traffic volumes

7.3.1 Road network traffic volumes

During the project construction phase, the peak traffic volume time periods are as follows:

- Morning peak period between 6:00am to 7:00am - construction worker arrivals
- Evening peak period between 6:00pm to 7:00pm - construction worker departures
- Midday peak period hour, nominal time period for general construction vehicle movements.

It is assumed that travel to and from the site will occur during the above peak hours coinciding with shift start and end times. However, it is noted that certain construction activities may result in traffic movements outside periods outlined above, where required.

A summary of the RRV (VicRoads) and council managed roads AADT and derived peak traffic volumes are provided in Table 7-7 and Table 7-8 respectively. The peak period traffic volumes have been derived by applying a peak period percentage for the corresponding time periods as informed from the commissioned ATC surveys outlined in Section 7.2.3.

For the purpose of traffic generation in this assessment, construction activities are assumed to commence in 2028, with 2020 baseline traffic volumes factored by an annual growth rate of 1.5 per cent per to estimate 2028 background traffic volumes. This assumed start date is used solely for traffic forecasting purposes and does not reflect a confirmed construction timeframe.

Traffic flow diagrams for the peak period 2028 traffic volumes are provided in Appendix C.

Table 7-7 Declared DTP managed road traffic volumes

ID	Road name	Section	Annual Average Daily Traffic (AADT) One-Way 2020			AM Peak Period One-way		PM Peak Period One-way		Afternoon Peak Period One-way	
			Total AADT	Heavy vehicle AADT	Heavy Vehicle %	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
5261	Princes Highway	Eastbound prior to Tramway Road	12,000	1,000	9%	459	45	1235	122	518	51
11988		Traralgon Creek Road to Grey Street	12,000	1,600	14%	434	71	1167	190	490	80
11986		B/w Traralgon and Rosedale	6,300	901	14%	228	37	613	100	257	42
12107	Tramway Road	Princes Highway East onramp & Firmins Lane	4,200	545	13%	154	23	413	62	173	26
15173		South of Firmins	2,600	306	12%	96	13	259	35	109	15
12704	Firmins Lane	Tramway Road to Hazelwood Road	2,800	360	13%	102	15	276	41	116	17
5984		Tramway Road to Commercial Road	2,400	184	8%	93	8	250	22	105	9
11549	Hazelwood Road	Mattingley Hill Road & Firmins Lane	4,000	334	8%	155	13	416	36	175	15
11905		North from Mattingley Hill Road	2,100	148	7%	82	6	221	17	93	7
13557		South from Firmins	1,700	109	6%	67	4	181	12	76	5
12708	Mattingley Hill Road	Hazelwood Road to Hyland Highway	2,100	261	12%	78	11	209	29	88	12
8075	Hyland Highway	Bartons Lane & Traralgon Creek Road	2,100	271	13%	77	11	207	31	87	13
7752		Former Minnindale Road to Grand Ridge Road	1,400	165	12%	52	7	139	19	58	8
7553		Grand Ridge Road to Carrajung- Woodside Road	805	93	12%	30	4	80	11	34	5
1509	South Gippsland Highway	Sale-Seaspray Road, Sale to High street, Woodside	808	135	17%	28	6	76	16	32	7
11081	Rosedale-Longford Road	South Gippsland Highway to Lyons Street	624	98	16%	22	4	59	11	25	5
11560	Carrajung-Woodside Road	Hyland Highway to South Gippsland Highway	135	11	8%	5	0	14	1	6	1
8028	Woodside Beach Road	South Gippsland Highway to Cherry Tree Road (Prince Road)	209	27	13%	8	1	21	3	9	1

ID	Road name	Section	Annual Average Daily Traffic (AADT) One-Way 2020			AM Peak Period One-way		PM Peak Period One-way		Afternoon Peak Period One-way	
			Total AADT	Heavy vehicle AADT	Heavy Vehicle %	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
8400		Cherry Tree Road to Woodside Beach Road end	154	37	24%	5	2	13	4	6	2
7177	Traralgon Creek Road	B/w Hyland Highway and Dunbar Road	3,100	293	9%	119	12	319	32	134	13
8076		B/w Mattingley Hill Road and Unnamed	2,700	395	15%	97	17	260	46	11	2

Table 7-8 Local road traffic volumes

Road name	Road authority	Classification	Annual Average Daily Traffic (AADT) One-Way 2020			AM Peak Period One way		PM Peak Period One way		Afternoon Peak Period One way	
			Total AADT	Heavy vehicles	% Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Four Mile Creek Road	Wellington Shire Council	Local - Access B	20	4	20%	1	0	2	0	1	0
Dewars Road		Local - Access B	20	4	20%	1	0	2	0	1	0
Maryland Road		Local - Access C	20	4	20%	1	0	2	0	1	0
Stringy Bark Lane		Local - Access C	20	4	20%	1	0	2	0	1	0
Lyons Road		Local - Access C	20	4	20%	1	0	2	0	1	0
Balloong Road		Local - Access A	145	29	20%	5	1	13	3	5	1
Reeves Beach Road		Local - Access B	20	4	20%	1	0	2	0	1	0

7.3.2 Road network capacity

The *Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis* provides typical mid-block capacity estimates for urban roads with interrupted flow. Table 6.1 of the Guide states that an undivided road has a one-way mid-block capacity of 900 passenger carrier units per hour per traffic lane (pc/h/ln). During peak periods, this capacity increases to 1200 to 1400 pc/h/ln.

Several conditions must be met for these capacities:

- Adequate flaring at major upstream intersections.
- Uninterrupted flow from a wider upstream carriageway of an intersection approach and flowing at capacity.
- Control or absence of crossing or entering traffic via minor intersections by major road priority controls.
- Control or absence of parking.
- Control of absence of right turns by banning turning at difficult intersections.
- High volume flows of traffic from upstream intersections during more than one phase of a signal cycle.
- Good co-ordination of traffic signals along the route.

Given the characteristics of arterial rural roads in the study area, a conservative mid-block capacity of 900 pc/h/ln (vehicles per hour) has been adopted. A capacity of up to 1,200 per lane could be considered feasible based on the above conditions and has been applied for Princes Highway.

Figure 7-1 shows projected 2028 peak hour traffic volumes compared to road capacity metrics. All roads are operating within their theoretical mid-block capacity.

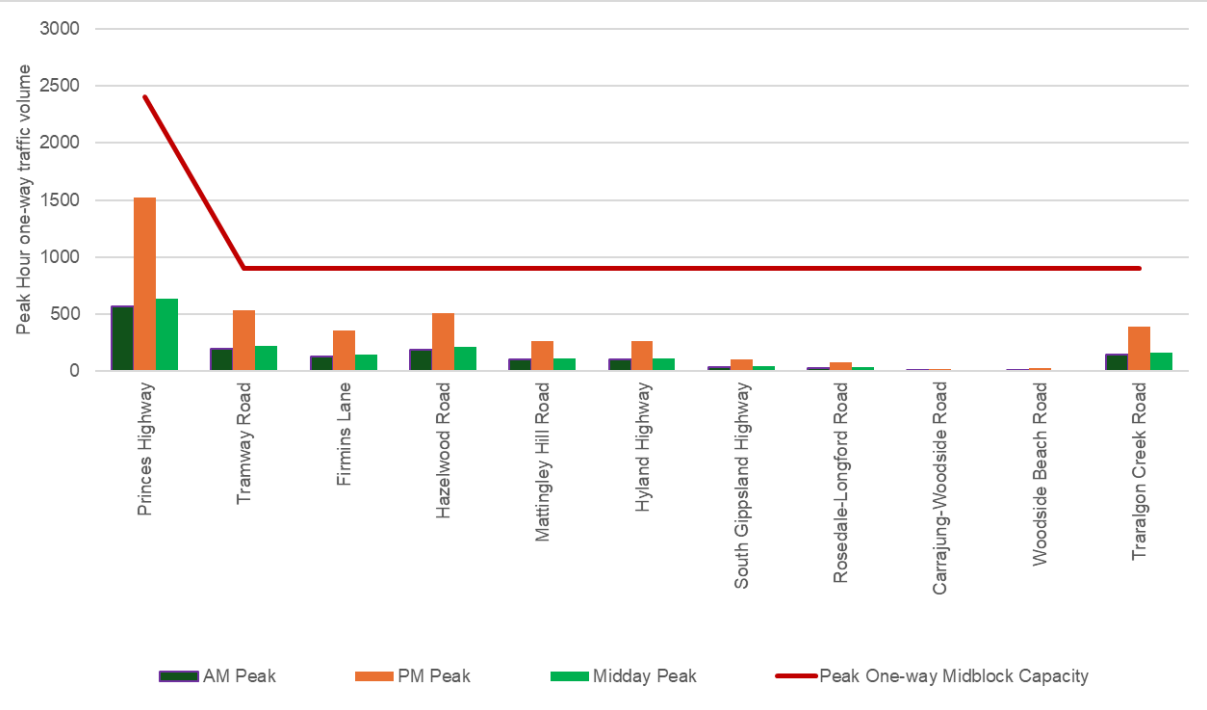


Figure 7-1 Predicted 2028 road network theoretical mid-block peak hour capacity analysis

7.4 Crash history review

The most recent available DTP road crash data, for the last five years (2020 to 2024), was reviewed to assess the crash history of relevant roads within the study area which are classified into two categories based on their function in construction access:

- Direct access roads which are roads that directly connect to proposed construction access roads
- Wider access roads which refer to roads within the broader road network that are anticipated to be used by the project vehicles travelling from surrounding areas to reach these access points.

A detailed breakdown of the recorded crashes is provided in Appendix A, with the relevant location of each crash shown in Figure 7-2.

7.4.1 Direct access roads

Crash analysis has been completed for the roads and intersection locations proposed to be used by the project to provide direct access to the construction corridor. In summary the following was found from the recorded data:

- There has been a total of five crashes recorded, all of which occurred on the South Gippsland Highway between Gormandale-Stradbroke Road and Woodside Beach Road where the posted speed limit is 100km/h.
- In terms of severity, two crashes were classified ‘serious injury’, involving a collision with a fixed object while the other resulted from a vehicle striking an animal. Both crashes happened during the daytime.
- Three crashes recorded were classified as ‘other injury’, two of which were due to vehicles hitting animals and one resulted from a collision with a fixed object.
- None of these crashes occurred at an intersection or involved pedestrians or cyclists.
- Similarly, no crashes were recorded on any of the local roads expected to provide access to construction access roads.

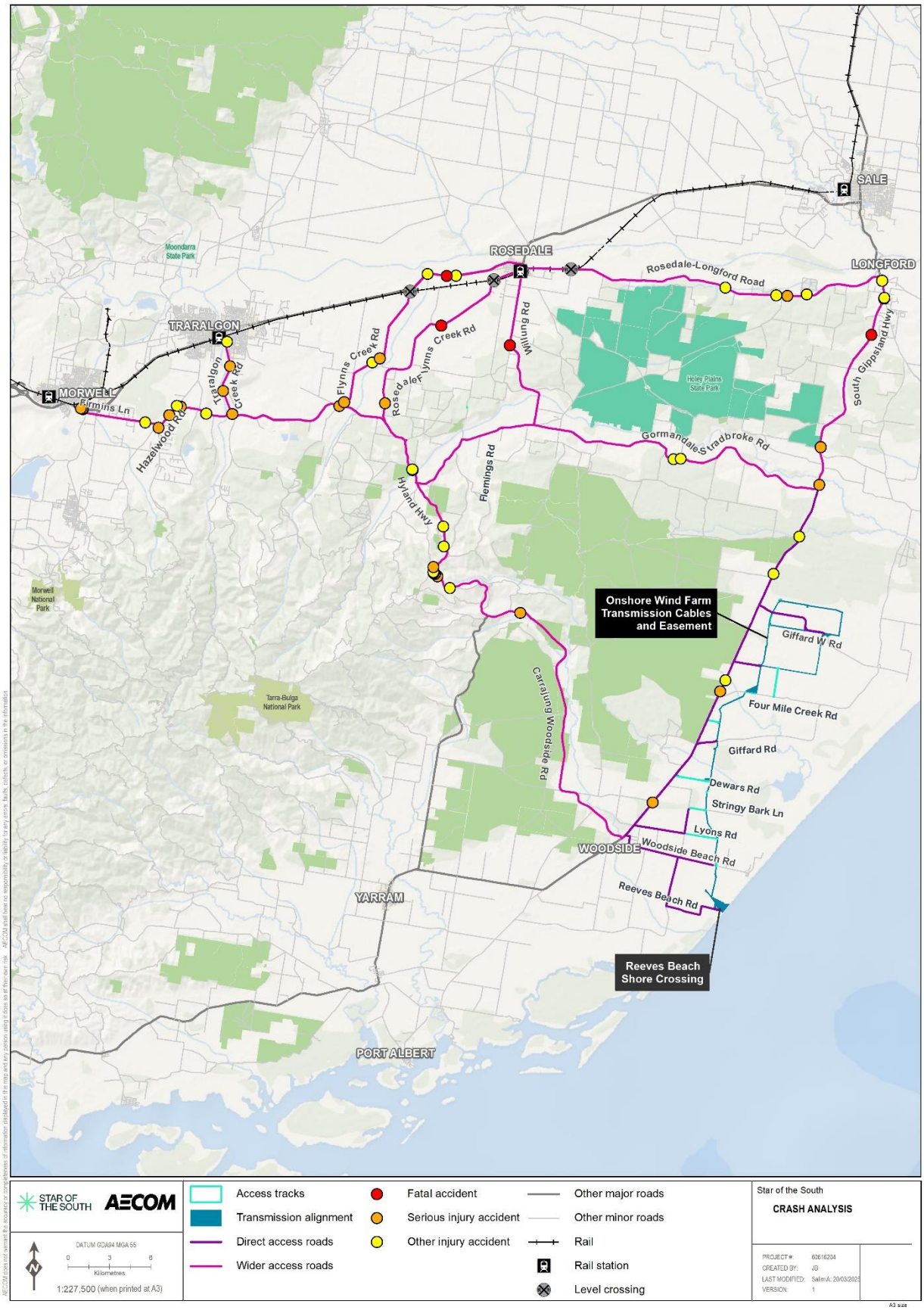


Figure 7-2 Crashes in the last five years recorded within the study area

7.4.2 Wider access roads

An analysis of crashes recorded in the last five years (2020-2024) was also undertaken for roads within the study area that are anticipated to be utilised by the project traffic originating from Melbourne, Traralgon, Longford and Sale before using primary access roads to the staging nodes. In summary the following was found:

- A total of 57 crashes were recorded. In terms of severity the crashes were classified as follows: six 'fatal', 25 'serious injury' and 26 'other injury'.
- The six fatal crashes recorded occurred in areas where the speed limit is between 80km/h and 100km/h. These crashes involved the following circumstances:
    - Two-vehicle collisions:
        - On Hazelwood Road at its intersection with Jeeralang North Road
        - On South Gippsland Highway at its intersection with Boundary Creek Road
    - Vehicle collisions with fixed objects:
        - On Hyland Highway, south of Grand Ridge Road
        - On Rosedale-Flynns Creek Road, east of Stammers Lane
        - On Willung Road, south of Farleys Road
    - Vehicle-pedestrian collision:
        - On pedestrians on Princes Highway, west of Wrights Lane near Flynns.
- A total of 25 'serious injury' crashes were recorded on roads where the speed limit ranges between 80km/h and 100km/h, categorised as follows:
    - Nine were collisions between a vehicle and a fixed object. The majority occurred in the daytime. Only two of these crashes took place at intersections.
    - 10 crashes were collisions involving vehicles. This includes three crashes involving motorcyclists, all occurring at the following intersections:
        - Hazelwood Road and Jeeralang North Road
        - Hyland Highway and Mattingley Hill Road
        - Sanders Road and Hazelwood Road
    - One crash involved a cyclist on Hyland Highway, approximately one kilometre south of Hunters Road, Traralgon.
    - Other 'serious injury' crashes include vehicle rollovers off the carriageway, run-off road incident with no object struck and one animal strike crash.
- Among the recorded incidents, 26 crashes resulted in 'other injury' and included:
    - Eight collisions with vehicles, including one crash involving a motorcycle. All occurred at intersections during the daytime. Five of these crashes were recorded at the intersection of Hyland Highway and Shakespeare Street, south of Traralgon
    - Six collisions with a fixed object were recorded, two of which occurred on Gormandale-Stradbroke Road. Two crashes took place on Princes Highway, east of Flynn
    - One pedestrian was struck on Flynns Creek Road during the daytime
    - Eight off-road rollovers, three of which occurred on Hyland Highway between Oakes Road and Carrajung-Woodside Road and three others were recorded on Rosedale-Longford Road. All happened in daylight except for one at dawn/dusk.

Overall, the crash analysis indicates that a majority of fatal and serious crashes occurred on key arterial roads where a 100km/hr speed limit applies. Notably, a section of Hyland Highway, between Traralgon and Mattingley Hill Road has recorded nine crashes, five of which occurred at the Shakespeare Street / Hyland Highway roundabout.

Similarly, a concentration of crashes was recorded along the Hyland Highway (between the Gormandale Nature Conservation Reserve, north of Oakes Road and Carrajung-Woodside Road) where a total of ten crashes occurred along an approximate ten kilometre long road section. All involved either a collision with a fixed object, an animal strike or a vehicle rollover. This section of Hyland Highway, which is expected to only be used by some of the workforce as an alternate route, was observed to have narrower road width, numerous curves and crests along with dense roadside vegetation and a 100km/hr posted speed limit. Amongst these ten crashes, three resulted in serious injury and one was fatal.

Similarly, Hazelwood Road has several recorded crashes, with one intersection meeting the blackspot criteria. Five crashes including one fatal and three serious injury crashes were recorded at the Hazelwood Road and Jeeralang North Road in the last five years. The intersection presents safety challenges due to its staggered layout in high-speed environment. The curved alignment of Hazelwood Road, combined with dense roadside vegetation may increase the risk of crashes, particularly high-impact collisions.

7.5 Existing sustainable modes of transport

7.5.1 Pedestrians and cyclists

There are generally no dedicated pedestrian or bicycle infrastructure near the proposed staging nodes or roads to the project works areas associated with the onshore transmission infrastructure.

There are several parks and reserves located in proximity of the alignment, where it may be possible that pedestrian and cycling activity may occur on the major roads surrounding the following areas:

- Giffard Nature Conservation Reserve, north of Giffard West Road
- Mullungdung Nature Conservation Reserve, west of South Gippsland Highway and Giffard Road.

Other parks and reserves that may attract pedestrian and cycling activity on roads in proximity of the wider road network are:

- Gormandale Nature Conservation Reserve, north of Hyland Highway and Oakes Road intersection
- Willung South Bushland Reserve, west of Hyland Highway, Willung South
- Holey Plains State Park, north of Gormandale-Stradbroke Road
- Stradbroke Flora and Fauna Reserve, south of Gormandale-Stradbroke Road

The roads anticipated to be used by the project traffic and discussed in this assessment are not designated as part of the Principal Bicycle Network (PBN) or Strategic Cycling Corridors (SCC). A recreational heatmap has been provided in Figure 7-3 from Strava. The heatmap shows that there are recreational cyclists using the road network within the study area and the wider road network, notably:

- Balloong Road
- Woodside Beach Road
- South Gippsland Highway between Woodside Beach Road and Giffard Road
- Giffard Road
- South Gippsland Highway, between Longford and Seaspray-Stradbroke Road West.
- Gormandale-Stradbroke Road
- Flynns-Creek Road
- Traralgon Creek Road

- Hyland Highway between Mattingley Hill Road and Flynns Creek Road

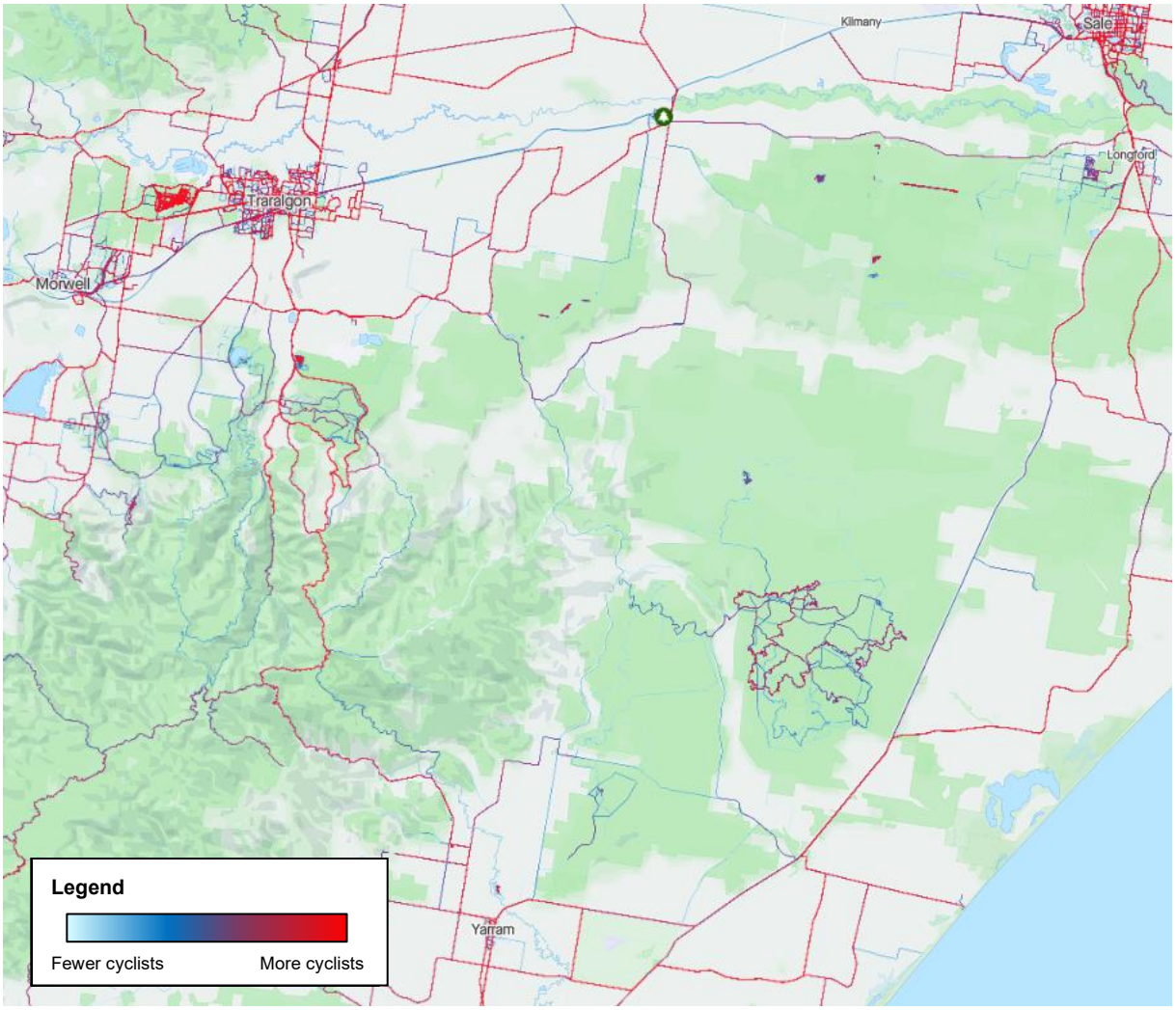


Figure 7-3 Recreational cyclist heatmap of the study area (source: Strava 2025)

7.5.2 Public transport

7.5.2.1 Buses

There are no public bus services that operate within the immediate study area.

According to DTP vMap, several school bus services are operating within the study area on:

- Prince Street / Woodside Beach Road
- Balloong Road
- South Gippsland Highway

The following public bus services operate along the wider transport network:

- The Yarram – Traralgon via Gormandale bus service operates within the wider transport network along Gormandale-Stradbroke Road and Hyland Highway with two bus stops located near the intersections of Gormandale-Stradbroke Road and Hyland Highway and Carrajung-Woodside Road and Hyland Highway. Based on the 2025 PTV timetable, the bus service operates three times a day during weekdays and twice a day during the weekend.
- Bus route 3 – Traralgon – Churchill operates four to five time a day along Hazelwood Road with a bus stop located on Hazelwood Road, south of the Hazelwood Road and Church Road intersection.

- Bus route 7 – Traralgon – Churchill operates once a weekday along Hazelwood Road with a bus stop located on Hazelwood Road, south of the Hazelwood Road and Church Road intersection.

There are also several school bus services operating in the wider road network on:

- Hyland Highway
- Firmins Lane
- Flynns Creek Road
- Rosedale Longford Road
- Gormandale-Stradbroke Road
- Traralgon Creek Road
- Carrajung-Woodside Road.

The school bus services are expected to operate from 7:30 am to 9:00 am and 3:20 pm to 5:00 pm on school days. It is recommended that school routes are confirmed prior to construction commencement by the works contractor, with timetabling rechecked prior to recommencement of each school term to ensure that construction heavy vehicles do not operate on school bus routes at the same time.

V/Line coaches operate between Traralgon, Rosedale and Sale as part of the Melbourne – Bairnsdale service. They currently run approximately five times per day on a typical weekday along Rosedale-Longford Road.

The public and school bus routes in the wider road network area are shown in Figure 7-4.

7.5.2.2 Rail

There are no railway lines or associated stations near the local access roads anticipated to be used to access the work sites for the project.

With regards to the wider transport network, the Melbourne – Bairnsdale via Sale and Traralgon V/Line train and coach services operate north of the project area. Several train stations are also located north of the project area including, Traralgon Railway Station situated the closest to the project area, approximately seven kilometres northwest of the Loy Yang Power Station. The rail corridor crosses several roads within the project area between Traralgon and Rosedale. The frequencies of train services at Traralgon Station are provided in Table 7-9 with the location of level crossings in the project area detailed in Table 7-10.

The rail routes in the wider project area are shown in Figure 7-4.

Table 7-9 Traralgon Station train frequencies

Direction	AM Peak (8:00-9:00am)	Interpeak	PM peak (6:30-7:30pm)	Weekend
To Melbourne	50	60	46	60
To Traralgon	70	60	38	60

Table 7-10 Level crossing locations

Level Crossing	Location	Type of Protection	Sight Distance	Protection Equipment
Rosedale-Longford Road	Near Mullocky Lane, Rosedale	Passive	Clear with no obstructions	Signage and line markings
Flynns-Creek Road	200m south of Princes Highway near Berkeys Road, Flynn	Active	Clear with no obstructions	Roadside warning equipment with boom and lights. Signage and line markings

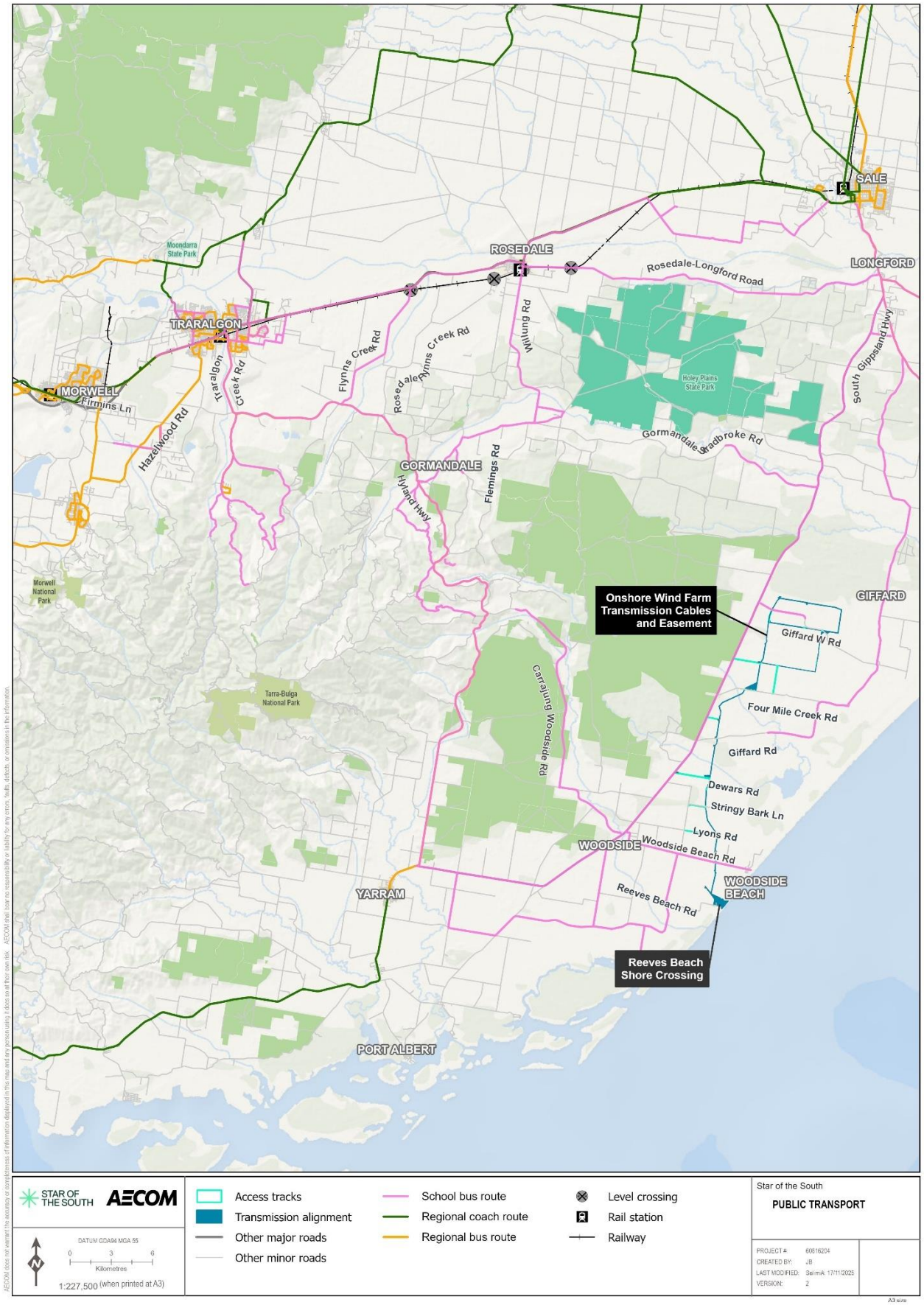


Figure 7-4 Public transport

7.6 Planned local infrastructure upgrades

There are no planned projects identified within the immediate vicinity of the study area.

However, the following projects have recently been completed on roads within the wider project road network:

- Princes Highway East Upgrade – Traralgon to Sale
- Hyland Highway Upgrade
- Flynns Creek Road Upgrade.

8.0 Issues for assessment

The issues for assessment were identified by reviewing the project description for interactions between the key project components and the proposed construction, operations and decommissioning activities and sensitive receptors. These cause and effect pathways were designated as either impacts or risks based on whether the issues relate to situations that are expected or accidental.

The identified issues are presented in Table 8-1 and for each, a maximum design scenario has been defined as the basis for the assessments presented in Section 10.0, Section 11.0 and Section 12.0. The table also includes the residual impact and risk levels arising from the assessment undertaken, following incorporation of mitigation measures.

The complete impact and risk register for this study is presented in Appendix A.

Table 8-1 Transport assessment issues

Impact or Risk ID	Impact or risk pathway	Residual impact rating	Residual risk rating
Construction			
TTP-I001	Additional traffic during construction may result in increased congestion, compromising road operation within the vicinity of the project area.	Minor	-
TTP-I002	Additional traffic during construction may result in reduced safety within the vicinity of the project area.	Minor	-
TTP-I003	Insufficient road network infrastructure to accommodate safe movement of oversized over-mass loads which may result in vehicles driving off carriageway.	Minor	-
TTP-I004	Proposed access locations exacerbate or create new road safety issues. Safety impacts at intersection of access road and public road due to non-complying sight lines, stopping distance and lack of lighting.	Minor	-
TTP-I005	Proposed access locations exacerbate or create new road safety issues. Safety impacts at intersection of public roads due to non-complying sight lines, stopping distance, lack of lighting and space restrictions.	Minor	-
TTP-I006	Road/lane closures or disruptions result in impacts on local access or business operations	Moderate	-
TTP-I007	Plant and spoil trucks deposit construction debris on public roads leading to dust generation and loss of amenity and public health and safety issues.	Minor	-
TTP-I008	Movement of construction vehicles resulting in potential road closures/diversions and delays to public transport and limited access for school buses.	Minor	-
TTP-I009	Additional project generated traffic and construction works impact other vulnerable road or site users resulting in a reduction in public safety and amenity.	Minor	-
TTP-I010	Public roads experience damage or deterioration due to the movement of heavy vehicles, machinery and plant resulting in crashes.	Minor	-
TTP-R001	Given the rural location and construction site locations emergency access will need to be considered / maintained (notable fire risks) to	-	Low

Impact or Risk ID	Impact or risk pathway	Residual impact rating	Residual risk rating
	ensure adequate access and minimal delays for emergency vehicles reaching the worksite.		
Operation			
TTP-I011	Capacity of road network to accommodate workforce and heavy vehicle movements during operation without resulting in increased safety impacts	Negligible	-

9.0 Proposed development

9.1 Construction

9.1.1 Onshore transmission alignment

The proposed alignment extends from the shore crossing at Reeves Beach, Woodside to the proposed VicGrid connection hub in Giffard. The alignment has been developed to avoid and minimise impacts where reasonably practicable. Commencing at the southernmost end, the shore crossing at Reeves Beach, the alignment runs over a distance of approximately 30 kilometres in a northerly direction through Woodside, Darriman to Giffard West.

9.1.2 Construction schedule and timing

Construction of the onshore cable system involves the installation of the cable, fibre and joints within the cable easement to the proposed VicGrid connection hub.

Key construction activities for the project would occur in the following stages:

- Site establishment,
- Construction works,
- Pre-commissioning and commissioning of the constructed infrastructure
- Demobilisation and rehabilitation of areas disturbed by construction activity.

An indicative timeline for construction of the onshore cable system is shown in Figure 9-1 which represents the maximum design scenario and the longest construction duration of up to 26 months.

Figure 9-1 Indicated Construction Schedule – Onshore Transmission (source: SOTS, 2025)

9.1.3 Construction activities and staging

Initial site establishment activities for the cable system would include gaining access, installation of environmental controls, fencing and placement of workforce amenities. Tracks would be constructed to the respective sites and along the corridors suitable to the works being undertaken. The works area would be divided into sections or nodes and a number of construction work fronts established.

Staging nodes are temporary construction compounds, also known as laydown areas. Staging nodes are strategically positioned worksites, evenly distributed along the corridor. These sites are intentionally designed to offer adaptable functionality, capable of accommodating evolving construction requirements as the project progresses. As a base, staging nodes are expected to serve as key areas for workforce mobilisation, central hubs for managing equipment and materials logistics, and designated emergency muster points. These sites hold importance as they are expected to serve as primary access points to the construction corridor, and their locations have been planned to enhance construction efficiency and accessibility. Staging nodes are expected to be paved areas, accessible in all weather conditions.

Temporary batch plants would be strategically sited along the alignment at five of the six staging nodes to provide local batching of thermally stable backfill for cable trenches and structural concrete. Temporary batch plants are expected to be utilised on paved areas, accessible in all weather conditions.

The shore crossing located at Reeves Beach, Woodside is where offshore export cables transitions to the onshore transmission system. The crossing is to be constructed using trenchless crossing techniques to drill bores and install ducts that house the offshore export cables. There will be additional traffic demand for the shore crossing works which are expected to travel to and from staging node 1.

For the purpose of this assessment, the assumption is that construction activities will be undertaken concurrently at three staging nodes at a time and therefore, there will be two distinct work groups (staging nodes 1-3 and staging nodes 4-6). In actuality, the transmission system may be constructed in a different sequence. While it is noted that there are additional access roads along the transmission cable alignment, the assessment focuses mainly on these primary accesses i.e. staging node locations anticipated to be used by the majority of construction traffic.

The assessment assumes concurrent usage of three staging nodes during construction to provide a conservative estimate of potential traffic generation during construction. However, it is acknowledged that this scenario is unlikely to occur across the entire duration of construction. Given that construction is expected to progress in a linear manner along the alignment over an extended period, the actual use of access points is expected to fluctuate, with only a limited number being active at any one time. Even in instances where several staging nodes may be in use simultaneously, such occurrences are expected to be temporary and limited to specific stages of construction. This approach ensures a

robust assessment, while recognising that actual traffic generation is likely to be lower than those presented herein.

This assessment focuses on traffic movements on public roads to and from the onshore transmission alignment easement via the designated access points. It is acknowledged that vehicle crossovers across public roads may also occur at some locations where construction access points are provided on both sides of a road. These movements and associated risks have been considered in the assessment.

The staging nodes and work groups are shown within the context of the project area in Figure 9-2. Details for the staging nodes and related primary access points as well as secondary access points along the transmission cable alignment are summarised in Table 9-1.

While staging nodes are the primary option for access to the points of construction considered at the time of this assessment, these may change if they are found to be unsuitable following further refinement of the project.

This assessment focuses solely on the onshore components of the project as the offshore construction is anticipated to have negligible transport impacts as noted in Section 6.9.2.

Figure 9-2 Transmission construction work groups

Table 9-1 Access roads, condition and features

Node no.	Access ref.	Alignment option	Function	Status	Access road	Major road	Major road authority	Access road pavement type	Construction site features
1	1	Common alignment	Primary access	To be upgraded	New access road via Reeves Beach Road – eastern access	Reeves Beach Road	WSC	Gravel	• Shore Crossing Site and Laydowns • TSB Batch Plant • Cable System Laydown
-	2	Common alignment	Secondary access	New	Off Reeves Beach Road – western access	Reeves Beach Road	WSC	N/A	None
2	3	Common alignment	Primary access	New	New access road via Woodside Beach Road, situated approx. 2.7km east of Belchers Road	Woodside Beach Road	DTP	N/A	• TSB Batch Plant • Cable System Laydown
-	4	Common alignment	Secondary access	New	Off Woodside Beach Road – southern access	Woodside Beach Road	DTP	N/A	None
-	5	Common alignment	Secondary access	New	Off Lyons Road	Lyons Road	WSC	N/A	None
-	6	Common alignment	Secondary access	New	Off Stringy Bark Lane	Stringy Bark Lane	WSC	N/A	None
-	7	Common alignment	Secondary access	New	Off Dewars Road – southern access	Dewars Road	WSC	N/A	None
-	8	Common alignment	Secondary access	New	Off Dewars Road – northern access	Dewars Road	WSC	N/A	None
3	9	Common alignment	Primary access	New	New access road via South Gippsland Highway, situated approx. 900m north of Dewars Road	South Gippsland Highway	DTP	N/A	• TSB Batch Plant • Cable System Laydown
-	10	Common alignment	Secondary access	New	Off Giffard Road	Giffard Road	WSC	N/A	None
-	11	Common alignment	Secondary access	New	Off Giffard Road	Giffard Road	WSC	N/A	None
4	12	Common alignment	Primary access	New	New access road via South Gippsland Highway, situated approx. 1.9km north of Giffard Road	South Gippsland Highway	DTP	N/A	• Cable System Laydown
-	13	Option AB	Secondary access	New	Off Four Mile Creek Road, Approximately 4km from SGH	Four Mile Creek Road	WSC	N/A	None
-	14	Common alignment	Secondary access	New	Off Four Mile Creek Road	Four Mile Creek Road	WSC	N/A	None

Node no.	Access ref.	Alignment option	Function	Status	Access road	Major road	Major road authority	Access road pavement type	Construction site features
-	15	Common alignment	Secondary access	New	Off Four Mile Creek Road	Four Mile Creek Road	WSC	N/A	None
-	16	Common alignment	Secondary access	New	Off Four Mile Creek Road	Four Mile Creek Road	WSC	N/A	None
5	17	Common alignment	Primary access	To be upgraded	Carstairs Road	South Gippsland Highway	DTP	Gravel	• TSB Batch Plant • Cable System Laydown
6	18	Option AB & C	Primary access	New	New access road via Giffard West Road, situated approx. 5km east of South Gippsland Highway – Eastern access	Giffard West Road	WSC	N/A	• TSB Batch Plant • Cable System Laydown
-	19	Option AB & C	Secondary access	New	Approx. 5km east of SGH – Western access	Giffard West Road	WSC	N/A	None
-	20	Option C	Secondary access	New	Approx. 250m south of Giffard West Road	Epplestuns Road	WSC	N/A	None
-	21	Option C	Secondary access	New	Approx. 250m south of Giffard West Road	Epplestuns Road	WSC	N/A	None
6	22	Option D	Primary access	New	New access road via Giffard West Road, situated approx. 1km east of South Gippsland Highway – Northern access	Giffard West Road	WSC	N/A	• TSB Batch Plant • Cable System Laydown
6	23	Option C	Primary access	New	New access road via Giffard West Road, situated approx. 1km east of South Gippsland Highway – Southern access	Giffard West Road	WSC	N/A	• Cable System Laydown

9.1.4 Construction vehicle types

The likely construction vehicle types have been determined by firstly identifying the key materials and equipment needed for construction as outlined in Table 9-2. The construction vehicle types associated with these needs have been grouped to aid with vehicle route assessments taking into account their anticipated size, see Table 9-3.

Table 9-2 Materials and equipment needs and associated vehicle types

Item	Activity	Construction Use	Vehicle Type
1	Cable drum delivery and handling	Cable Installation	Low loader
2	Trench consumables – Conduit, racks, tapes and covers	Civils	Conventional trucking*
3	Water, delivery and handling	Material batching, Workforce, dust suppression	Conventional trucking*
4	Backload/disposal of water – waste / contaminated	Trench dewatering, Shore crossings	Conventional trucking*
5	Backload/disposal of waste/rubbish	All of works	Conventional trucking*
6	Delivery and handling of Bulk Materials - Roading	Site establishment and Civils	Conventional trucking*
7	Delivery and handling of Raw Bulk Materials – TSB/Concrete (Aggregates, cement)	Civils	Conventional trucking* Special Purpose Vehicles (e.g. concrete trucks)
8	Delivery of TSB and Concrete	Civils	Special Purpose Vehicles (e.g. concrete trucks)
9	Delivery of Concrete	Civils	Special Purpose Vehicles (e.g. concrete trucks)
10	Disposal of Bulk Material Waste – Excavate materials	All of works	Conventional trucking*
11	Batch Plant Equipment Mobilisation/Demobilisation	Site establishment and Civils	Conventional trucking* Some oversize loads
12**	Construction Equipment** Mobilisation/Demobilisation	All of works	Conventional trucking Low loaders
13***	Workforce Mobilisation/Demobilisation	All of works	Private vehicles

The following assumptions have been taken from the *Preliminary Site Access and Vehicle Route Assessment (WSP, 2025) which is attached as Appendix B of this report:*
* Where conventional trucking is referenced, the assumption has been made that this relates to vehicles either up to the size and weight load allowable for a B-Double, or truck and dog trailer combinations covered under DTP Performance Based Standards Level 1 (50.5tonne maximum operating mass, length no greater than 20m).
** Additional information relating to construction vehicles is included in Appendix A of the *Preliminary Site Access and Vehicle Route Assessment*
*** Vehicles relating to the mobilisation and demobilisation of the workforce are generally considered to be standard vehicles for which roads are designed to accommodate and as there is no need for special consideration to be given to these movements with respect to the route required to be used. It is also considered that these movements will generally be undertaken at the start and end of the project and as such will primarily comprise standalone movements. As such, these movements are considered to occur outside the typically daily movements that will be generated by the construction of the cable alignment.

Table 9-3 Construction vehicle classification

Vehicle type/use		Assumed DTP classification
Conventional Trucking – B-Double		B-Double
Conventional Trucking – Truck and Dog Trailer		Performance Based Standards (PBS) Level 1
Low Loader (Cable Drum)		Oversize and Overmass (OSOM)
Construction Vehicles	Concreting	Special Purpose Vehicle (SPV)
	Excavation/Drilling/Scrapping/Grading	Special Purpose Vehicle (SPV) Oversize and Overmass (OSOM)
	Crane	4 & 5 Axle All Terrain Mobile Crane
	Hauling	B-Double or PBS Level 1
	Hauling (Low Loader)	Oversize and Overmass (OSOM)

9.2 Operation

9.2.1 Transmission alignment

Once operational, it is understood that the maintenance activities may generate a few staff movements on a daily basis. With regards to these movements, the following estimations of full-time staff requirements have been provided

- Transmission system operations – 1-2 full time employees
- Management and administration – 1-2 full time employees.

Further additional movements may also be generated should any repairs or maintenance be required. However, this would only be on an as needs basis and it is assumed a team of 5 could typically manage this. Subsequently, it is estimated that typical daily operations of the site may generate between two to four full time employees with potentially an additional five employees for repairs if needed. Assuming that they all drive to and from the site separately, it is therefore estimated that the site could generate between 4 to 18 daily one-way vehicle trips.

9.3 Decommissioning

The decommissioning activities described below are indicative as the specific approach is difficult to predict with certainty so far into the future. In practice it is anticipated that the decommissioning approach would be negotiated with regulators in the lead up to the end of the infrastructure life. However, for the purposes of assessment it has been assumed that current industry practices would be adopted.

To minimise disturbance, it is anticipated that most of the below ground transmission equipment would be left in place with cable ends cut, sealed and securely buried as a precautionary measure. The surface interfacing infrastructure like link and fibre pits could be removed if environmental impacts may arise or required as part of landholder agreements. Additionally, signage and markers associated with the infrastructure would be removed.

10.0 Construction assessment

This section discusses the potential impacts and risks associated with the project as a result of construction activities and the associated mitigation measures that aim to reduce impacts and risks to as low a level as possible. Mitigation measures referred to are summarised in Section 14.0.

10.1 Project parameters that form the basis of impact assessment

Table 10-1 specifies the maximum design scenario that has been assessed for construction. These represent the values of project parameters from ranges specified in the project design envelope that represent the greatest potential impact to an identified sensitive receptor or receptor group.

Table 10-1 Maximum design scenario - construction

Risk	Key parameter values	Justification
TTP-I001, TTP-I002, TTP-I003, TTP-I005, TTP-I006, TTP-I007, TTP-I008, TTP-I009, TTP-I010	The works and infrastructure are located within the onshore construction project area, which is defined by the area required for construction of the following: • Onshore Wind Farm transmission system infrastructure: – Up to 8 underground cable circuits with the following upper limit footprints: - Temporary construction corridor width between shore crossing and VicGrid connection hub: 40m width. – Joints and bays at 0.8-1.2km spacing (approx.) intervals with upper limit joint footprints of 5 m x 15 m x 3 m (W/L/D) – Other temporary construction infrastructure including access roads • Shore crossing infrastructure: – Trenchless shore crossing approaches with maximum length of 1400 m and depth of up to 35m – Transition joints and bays with upper limit footprints of 10 m x 30 m x 5 m (W/L/D) Temporary construction compounds with an upper limit footprint of 100 m x 100 m (W/L)	Operation and maintenance vehicles would be required to service the infrastructure within the onshore project area.
TTP-I001, TTP-I002, TTP-I003, TTP-I005, TTP-I008, TTP-I009, TTP-I010	Vehicle movements during construction associated with: • Project workforce, in the order of 500 – 600 full time employees at any given time • Bulk material volumes for an eight circuit cable arrangement: – Up to 470,000 m^3 for Thermally Stable Backfill (TSB) – Up to 685,000 m^3 for Materials to manufacture TSB – Up to 85,000 m^3 for Access roads (cable alignment) – Up to 125,000 m^3 for Pads/Laydown Areas (temporary) – Up to 26,000m^3 for Landfall – Up to 20.5 ML for Workforce amenities/ablution – Up to 13.0 ML for Vehicle washing (weeds and seeds) – Up to 52.0 ML for Revegetation (Water)	The anticipated workforce and material volumes define the maximum construction traffic likely required for the project.

To assess potential impacts associated with the project, the assessment has also considered the assumptions detailed in Section 6.9.

10.2 Impact assessment

10.2.1 Traffic generation and road capacity impact analysis (TTP-I001 and TTP-I002)

The sections below present the impact assessment relating to the road network capacity, distribution and performance. It considers the potential impacts identified due to increased traffic volumes as a result of construction traffic. This increased traffic has the potential to increase the level of impact for temporary congestion, reduced travel speeds and an increased likelihood of conflicts between

construction vehicles and general road users, particularly during peak construction periods at key roads, intersections and access points within the study area.

10.2.1.1 Traffic generation overview

The following section details the workforce, bulk materials and cable delivery traffic generation for the project during construction of the onshore transmission component of the Star of the South project.

Construction traffic will be travelling to and from the laydown areas at the six staging nodes, as defined in Section 9.1.3. The assumption is that construction activities will be undertaken concurrently at three staging nodes at a time and, as a consequence, there will be two distinct work groups across staging nodes 1-3 and staging nodes 4-6.

The construction activities that would generate traffic on a daily basis are:

- Project workforce travelling via light vehicles to and from local towns to work compounds.
- Bulk materials being transported to and from the construction corridor, primarily TSB and surplus spoil.
- Cable materials being delivered to and from the site laydown areas.

Other movements that would occur during construction include:

- Site mobilisation and plant delivery (potential for OSOM vehicles) for construction works.
- Pre-works such as site access upgrades, new site access road construction, and construction corridor vegetation clearance easement.

It is recommended that the traffic generation estimates for the construction phase of the onshore transmission infrastructure are reviewed and amended once a contractor is appointed later in the project design development process to inform the development of a TMP. The predicted volumes represent an estimate of the traffic generated by the onshore construction activities. For the purpose of the assessment, these estimates are considered conservative as some works are unlikely to occur simultaneously following further refinement of the construction program. It is assumed that travel to and from the site will occur during the above peak hours coinciding with shift start and end times, although in actuality it is expected that different workstreams will travel to and from the site outside peak hours depending on the nature of their activities. The traffic volume estimates presented in the following sections are not representative of conditions across the entire construction period. Rather, they reflect a reasonable maximum of what could be expected during short-term, high-activity periods of construction.

The preliminary construction traffic volume generation estimates, distribution and origin locations are provided in the PSAVRA for the onshore transmission alignment construction. A copy of this report is provided in Appendix B. The volumes in the PSAVRA were provided as for a peak month which has then been converted to peak daily volumes by dividing for four weeks a month then for an assumed six day working week.

For the purpose of this assessment, one-way trips are defined as the singular movement of a vehicle to enter or exit the node and two-way trips are the combination of two one-way trips that a vehicle will be undertaking to enter and exit the node.

Workforce traffic generation

Star of the South provided AECOM with the estimates of the full-time construction workforce, which includes management and technical staff. It is expected that the total workforce will be working across one shift from 7am-6pm. The workforce estimates outlined in this assessment are intended to provide a conservative basis for estimating vehicle trip generation and may therefore differ from workforce projections used in Technical Report Q: Business and tourism and Technical Report R: Social assessment.

All workforce vehicles are assumed to be travelling to the site during the AM peak (6am-7am) and leaving the site during the PM peak (6pm-7pm). The breakdown of peak workforce vehicle trips to and from each staging node is shown in Table 10-2.

Table 10-2 Construction workforce traffic generation

Work group	Staging node no.	Total one-way trips during AM peak	Total one-way trips during PM peak
1	1	255	255
	2	196	196
	3	196	196
2	4	196	196
	5	196	196
	6	196	196

Bulk material traffic generation

Traffic generation for bulk materials is presented in Table 10-3 and the projections have been broken down into daily and midday peak hour traffic volume estimates.

For the purposes of assessment, it is assumed that 10 per cent of the total daily bulk material vehicles will arrive to and depart from the site during the midday peak hour. The remaining bulk material vehicles are expected to travel uniformly over the remainder of a 10-hour period between 7am and 5pm (noting that normal construction working hours would be between 7am and 6pm).

Table 10-3 Estimated peak bulk material heavy vehicle traffic generation

Work group	Staging node no.	Total daily two-way trips	Total two-way trips during midday peak hour
1	1	524	53
	2	511	52
	3	511	52
2	4	397	41
	5	511	53
	6	511	52

Currently, the exact quantities of bulk materials required at each of the staging nodes is yet to be fully quantified as this is reliant on further site investigations. The quantities required at each staging node to construct the cable alignment will depend on each individual site and soil conditions and the volumes of bulk materials that need to be transported to and from the staging node.

Cable material traffic generation

Cable material (bundles) deliveries have been estimated on a 12-month time period (noting that construction period will be longer than this) and on a daily basis for construction works. It is assumed that 10 per cent of the total daily cable material vehicles will arrive to and depart from the site during the midday peak hour. The cable material vehicle trips have been estimated for each construction staging node. The predicted peak traffic generation is shown in Table 10-4.

Table 10-4 Estimated cable material heavy vehicle delivery traffic generation

Work group	Staging node no.	Total daily two-way trips	Total two-way trips during midday peak hour
1	1	9	1
	2	9	1

Work group	Staging node no.	Total daily two-way trips	Total two-way trips during midday peak hour
	3	9	1
2	4	9	1
	5	9	1
	6	9	1

Total daily and hourly construction traffic generation

A summary of daily one-way trips and peak hour daily trips estimated during construction peak is shown in Table 10-5.

Table 10-5 Total peak construction traffic generation

Work group	Staging node	Total daily one-way trips				Total peak hour one-way trips		
		LV	HV		Total	LV	HV	
		Workforce	Bulk Materials	Cable materials		Workforce	Bulk Materials	Cable materials
1	1	510	1,048	18	1,576	255	106	2
	2	393	1,022	18	1,433	196	104	2
	3	393	1,022	18	1,433	196	104	2
2	4	393	794	18	1,206	196	82	2
	5	393	1,022	18	1,433	196	106	2
	6	393	1,022	18	1,433	196	104	2

10.2.1.2 Traffic distribution

Workforce traffic distribution

The traffic distribution of workforce from the identified origins was provided in the PSAVRA . Table 10-6 shows the distribution for the respective work groups and associated staging nodes. The final distribution of construction workforce movements would be verified once the contractor has been appointed.

Table 10-6 Worker town origin percentage breakdown

Work group	Staging node	Origin		
		Morwell/Traralgon	Longford/Sale	Yarram/Woodside
1	1	53%	26%	21%
	2	53%	27%	20%
	3	53%	30%	17%
2	4	53%	33%	14%
	5	50%	40%	10%
	6	46%	46%	8%

Bulk material traffic distribution

The project has not yet identified the preferred bulk material locations and there is a variety of potential locations in which bulk material heavy vehicles would originate from as shown on Figure 10-1. Trip origins will be confirmed once the sites for bulk materials are identified.

Traffic distributions were estimated by considering the proximity of bulk materials to each respective staging node. Any spoil from construction would be removed by the trucks that delivered bulk materials and taken back to the bulk material source locations.

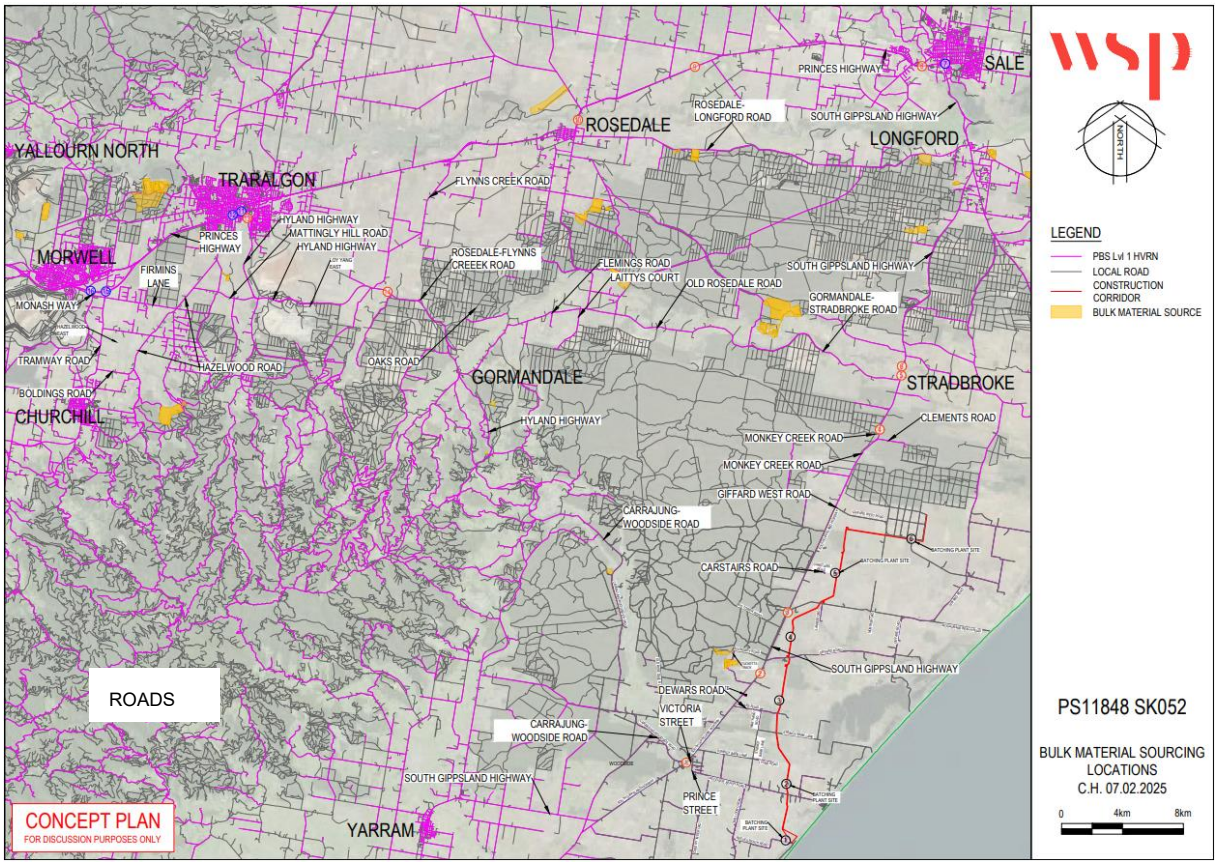


Figure 10-1 Preliminary bulk material sourcing locations (Source: WSP, 2025)

For the purpose of this assessment, the identified bulk materials sources were grouped into four distinct locations: north-east, north-west, south-east and southwest. The traffic distribution of bulk materials from the identified origins is provided in Table 10-7 for the respective work groups and associated staging nodes.

Table 10-7 Bulk material vehicle traffic distribution

Work group	Staging node no.	Origin			
		North-east	North-west	South-east	South-west
1	1	62%	38%	0%	0%
	2	62%	38%	0%	0%
	3	62%	38%	0%	0%
2	4	7%	4%	0%	89%
	5	16%	7%	0%	77%
	6	31%	9%	0%	60%

Cable material delivery traffic distribution

The heavy vehicles delivering cable materials to each staging node are expected to consist of OSOM and B-Double vehicles which would originate from the west of the project area via Princes Highway.

The majority of arterial roads in the study area are B-Double approved apart from Gormandale-Stradbroke Road between Willung Road and Taylors Lane.

Therefore, OSOM vehicles would travel via Princes Freeway to Hyland Highway via Tramway Road, Firmins Lane, Hazelwood Road, Mattingley Hill Road before connecting to Rosedale-Longford Road via Flynns Creek Road and Princes Highway.

Traffic assignment and flow diagrams

To aid traffic impact capacity assessments of the local and wider road network, a series of traffic volume diagrams have been produced and provided in Appendix C which include the following scenarios:

- 2020 base morning (6am to 7am), evening (6pm to 7pm) and midday peak traffic volumes.
- 2028 base morning (6am to 7am), evening (6pm to 7pm) and midday peak traffic volumes.
- For each defined work group, the construction phase volumes have been derived for the following periods:
  - Morning peak construction worker arrivals (6am to 7am)
  - Evening peak construction worker departures (6pm to 7pm)
  - Midday peak construction heavy vehicle movements.
- The 2028 base and above derived work group traffic demands by time period have been combined, these final traffic flow diagrams will assist with intersection and road mid-block.

The 2028 assessment base future year has been adopted for all traffic impact analysis with predicted project related traffic demands.

10.2.1.3 Project traffic impact analysis

Mid-block road capacity analysis

The mid-block capacity assessments for the existing road network are detailed in Section 7.4.2 of this report. Based on the characteristics of the rural arterial roads in the study area, a mid-block capacity of 1,300 vehicles per hour per lane has been conservatively adopted. For highways with long sections of uninterrupted flow and wide carriageways, a mid-block volume of up to 1,800 per traffic lane was used instead.

For each of the study area roads, the maximum peak hour one-way traffic volume during the construction works has been predicted to assess the mid-block traffic volume impacts. A comparison between these volumes and the theoretical mid-block capacities are shown in Figure 10-2.

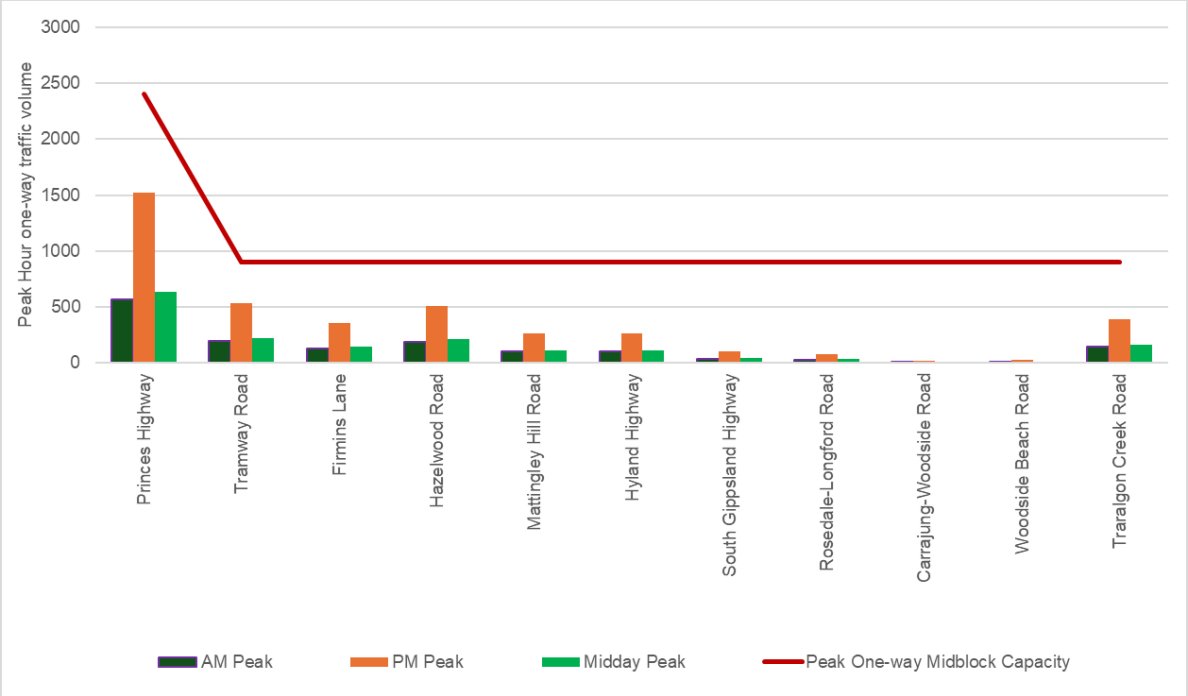


Figure 10-2 Peak hour mid-block capacity comparison

Figure 10-2 demonstrates that with the project's construction traffic that the local road network is predicted to have ample spare mid-block road capacity to facilitate traffic movements to and from the work sites.

10.2.1.4 Road network intersection analysis

Key intersections on the local road network were modelled in SIDRA Intersection 9 during each of the peak periods to determine impacts from the additional traffic volumes generated by the project construction.

The following seven intersections were deemed to have required modelling and analysis:

- South Gippsland Highway/Rosedale-Longford Road priority-controlled intersection.
- South Gippsland Highway/Giffard West Road
- South Gippsland Highway/Carstairs Road
- South Gippsland Highway/New Access Road (Node 4)
- South Gippsland Highway/New Access Road (Node 3)
- South Gippsland Highway/Woodside Beach Road priority-controlled intersection.
- Woodside Beach Road/Balloong Road.

The SIDRA models have been developed with the following parameters:

- All measurements taken from Google earth aerial imagery.
- Access roads assumed to be 60km/hr and major roads are modelled as 100km/hr although TMP measures may result in potential temporary speed reductions in the vicinity of access points.
- Traffic volumes turning movements have been estimated based on balancing link volumes, no turning movement surveys have occurred.
- In terms of model calibration, the Basic Saturation flows was kept as per SIDRA default at 1950 tcu/h as it is considered that the intersections investigated are in an ideal area type.

- Midday peak period surveyed percentage of total existing daily volume is 4.75 per cent. AM peak period surveyed percentage of total existing daily volume is 4.21 per cent. PM peak period surveyed percentage of total existing daily volume is 11.31 per cent.

The following SIDRA outputs are evaluated:

- Degree of saturation (DoS): this is the ratio of demand to capacity. A DoS of 1.0 or more in theory represents saturated conditions, but a lower practical DoS is used. For priority-controlled intersections, a DoS of 0.8 is the desired upper limit; for roundabouts, it is 0.85; and for signals it is 0.9.
- Average delay: this is the average amount of time it takes a vehicle to negotiate an intersection, including the time to negotiate corners and the time stopped in queues or waiting for a green signal. This parameter is the most tangible to drivers.
- Level of service (LoS): this is an alpha-numeric rating of the overall performance of an intersection, ranging from LoS A (very good) to LoS F (very poor). It is directly related to the average delay. The desirable target is generally LoS C or above, but in congested urban environments the realistic target is usually taken to be LoS D. Level of service is not reported for priority-controlled intersections, as major road movements have zero delay, which skews the results.

The intersections were modelled and the SIDRA modelling results for AM, PM and midday peaks are summarised in Table 10-10, Table 10-9 and Table 10-10 respectively. The full SIDRA results can be found in Appendix H.

The results show that all intersections operate to a DoS of less than 0.8 and low average delay.

Table 10-8 Network intersection SIDRA results – Average AM peak hour

No.	Intersection	Design Peak Period (all vehicles)		
		Average AM Peak Hour		
		DoS	Ave Delay (s/veh)	LOS
1	South Gippsland Highway / Rosedale Longford Road	0.618	7.5	NA*
2	South Gippsland Highway / Giffard West Road	0.311	2.0	NA*
3	South Gippsland Highway / Carstairs Road	0.214	2.6	NA*
4	South Gippsland Highway / New Access Road (Node 4)	0.118	3.7	NA*
5	South Gippsland Highway / New Access Road (Node 3)	0.308	2.1	NA*
6	South Gippsland Highway / Woodside Beach Road	0.272	4.8	NA*
7	Woodside Beach Road / Balloong Road	0.188	3.0	NA*

* - LoS is not applicable for priority-controlled intersections as major road movements have zero delay, which skews results.

Table 10-9 Network intersection SIDRA results – Average PM peak hour

No.	Intersection	Design Peak Period (all vehicles)		
		Average PM Peak Hour		
		DoS	Ave Delay (s/veh)	LOS
1	South Gippsland Highway / Rosedale Longford Road	0.201	3.6	NA*
2	South Gippsland Highway / Giffard West Road	0.279	2.3	NA*
3	South Gippsland Highway / Carstairs Road	0.230	2.5	NA*
4	South Gippsland Highway / New Access Road (Node 4)	0.195	3.0	NA*
5	South Gippsland Highway / New Access Road (Node 3)	0.270	2.2	NA*
6	South Gippsland Highway / Woodside Beach Road	0.439	4.7	NA*
7	Woodside Beach Road / Balloong Road	0.224	3.1	NA*

* - LoS is not applicable for priority-controlled intersections as major road movements have zero delay, which skews results.

Table 10-10 Network intersection SIDRA results – Average midday peak hour

No.	Intersection	Design Peak Period (all vehicles)		
		Average Midday Peak Hour		
		DoS	Ave Delay (s/veh)	LOS
1	South Gippsland Highway / Rosedale Longford Road	0.274	4.4	NA*
2	South Gippsland Highway / Giffard West Road	0.081	3.6	NA*
3	South Gippsland Highway / Carstairs Road	0.106	3.3	NA*
4	South Gippsland Highway / New Access Road (Node 4)	0.134	2.4	NA*
5	South Gippsland Highway / New Access Road (Node 3)	0.172	2.5	NA*
6	South Gippsland Highway / Woodside Beach Road	0.168	5.4	NA*
7	Woodside Beach Road/Balloong Road	0.069	3.4	NA*

* - LoS is not applicable for priority-controlled intersections as major road movements have zero delay, which skews results.

10.2.1.5 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to traffic generation impacts on road capacity:

- *Stakeholder Engagement Plan (SEP) (TTP-M001)* to inform the community and other stakeholders of changes in transport conditions such as the increase in traffic expected and likely peak times so traffic can be avoided if desired.
- *Traffic Management Plan (TMP) (TTP-M002)* to include measures for the management of light and heavy vehicle routes and reduction in trips where reasonably practicable. Heavy vehicle routes would be investigated further during the TMP development to reduce the risk of accidents and enhance safety for all road users. Given that the increase in traffic volumes would be temporary, it is expected that temporary measures would be sufficient to reduce delays to negligible levels.
- *Site Access Strategy (TTP-M005)* to develop the routes workers will use to access each site, method of travel (carpooling, buses etc), parking and time of arrivals and departures to reduce the traffic volumes on roads and intersection during peak times.

Mitigation measures are detailed further in Section 14.1.

10.2.1.6 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact level due to the project traffic be minor on the existing capacity as other routes will be chosen or TMP and access measures would be implemented to support traffic performance. The low residual impact of project traffic volumes to the existing road network users is due to the road network's capacity to absorb temporary increases in traffic volumes with minor travel delays and road safety expected to be minor and manageable.

10.2.2 Construction traffic route assessments (TTP-002 and TTP-I003)

The following sections present the impact assessment relating to construction traffic routes, addressing the impacts associated with increased construction traffic volumes and the potential for reduced road safety within the project vicinity, as well as the adequacy of the existing road network to safely accommodate heavy vehicle movements.

At this stage of the project, the source locations for materials and components required for the project are indicative. Accordingly, an assessment has been undertaken based on the assumptions set out in the *Preliminary Site Access and Vehicle Route Assessments, (WSP, 2025)* (refer to Appendix B).

Based on the source locations, a high-level desktop analysis of the transportation routes to the staging nodes was undertaken:

- Wider road network
  - Limited to the wider road network transport route from Melbourne to the project area.
- Local road network
  - Workforce (light vehicle) movements from local towns to the work site staging nodes.
  - 26 metre B-double and OSOM vehicle transport movements to deliver and remove associated materials with regards to bulk and cable materials which are predicted to constitute the main construction traffic movements associated with the construction of the onshore transmission infrastructure.

Further analysis is proposed during the detailed design phase to verify material and component source locations.

10.2.2.1 Wider road network transport routes

Most of the initial traffic associated with the delivery of materials and components is expected to originate west of the project area. Once works sites are established and construction has commenced, the vehicle trips would be more locally concentrated. A review of the NHVR route planner has been conducted which shows the expected transport route for heavy vehicles from the west to the project area. This transport route is shown in Figure 10-3.

It is noted that construction feeder ports are expected to be used for construction. Although locations have not yet been confirmed, it is expected that the Geelong Port or Port of Hastings may be utilised as construction feeder ports. It is noted that the assessment of impacts related to construction feeder ports are considered in a separate assessment and are not included in this report.

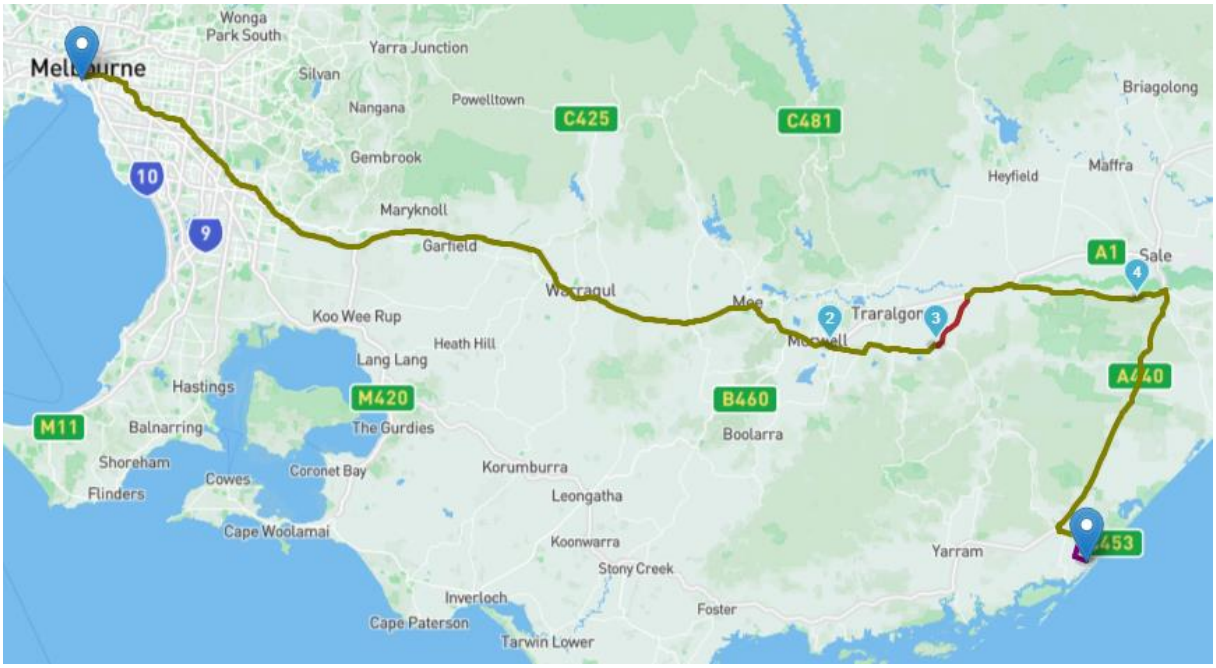


Figure 10-3 Transport primary access route between Melbourne and the project area (Source: NHVR Route Planner)

10.2.2.2 Local road network

Workforce – light vehicles

As discussed in Section 10.1, the final distribution of workforce trips would be verified once a contractor has been appointed. However, they are anticipated to originate from or via the local towns of Morwell, Traralgon, Sale, Longford, Woodside and Yarram as shown in Figure 10-4.

Workers will likely travel directly to staging nodes and park at the respective works compound via their instructed transport route. These routes are the most direct, have the lowest impact and have considered safety.

Workers may travel in single-occupancy vehicles to and from the site. If bus transfers are deemed to be required, due to safety of works and/or lack of parking, bus transfers might be adopted from the above towns. It is expected that the transport routes identified would also be adequate for bus movements.

Bulk and cable material transport routes – Adopted 26m B-Double vehicles

As discussed in Section 10.2.2, 26 metre B-Double vehicles have been conservatively adopted as the check vehicle:

1. From Princes Highway (from the west of the study area) to each staging node location for delivery of cable materials
2. To and from bulk materials locations to each staging node.

The DTP approved B-Double and OSOM road networks are provided in Appendix F which have helped to inform the transport route review for the cable drum and bulk material delivery. Although the roads identified are approved under legislation or policy guidelines, it is recommended that contractors will undertake their own transport route assessments to ensure that they are safe and acceptable for the movement of vehicles to and from the work sites.

Cable delivery and bulk material movements

The delivery of cables would depend on the size and weight of the drums to be transported to the staging nodes. The transportation movements would likely involve B-Double sized OSOM vehicles. Accordingly, to ensure a robust assessment a design vehicle of a 26 metre B-Double size has been assumed to be utilised for cable deliveries.

The initial B-Double routes for cable delivery to each staging node are shown on Figure 10-5 and summarised in Table 10-11. Where roads are not identified as part of the DTP approved B-Double road network, approvals to travel are required.

In addition, most bulk material is expected to be transported by a truck and dog trailer, with combinations being no more than 19 metres in length. It is noted that the use of Performance-based standards (PBS) scheme vehicles may offer logistical and efficiency benefits by enabling the transport of larger or heavier loads, thereby reducing the total number of heavy vehicle trips required. However, the feasibility of using PBS vehicles would require further assessment of route suitability, road authority approval prior to potential implementation.

The level of B-Double and OSOM approval for roads that may be used throughout the network are shown in Table 10-11. There are some roads which are not fully approved. These roads have either been excluded from the primary route or may need to be upgraded to gain approval from the relevant authority. The proposed B-Double routes for transport of bulk materials to staging nodes are shown in Figure 10-5.

Table 10-11 Cable and bulk materials – Heavy vehicle approved roads

Road	26m B-Double approved road	OSOM approved road
Declared Roads		
Hazelwood Road	Yes	Yes between Firmins Lane and Mattingley Hill Road
Mattingley Hill Road	Yes	Yes
Hyland Highway	Yes	Yes but conditional approval between Rosedale-Flynns Creek Road and Carrajung-Woodside Road
South Gippsland Highway	Yes	Yes
Woodside Beach Road	Yes	Yes
Traralgon Creek Road	Yes	Yes
Princes Highway	Yes	Yes
Tramway Road	Yes	Yes
Firmins Lane	Yes	Yes
Carrajung-Woodside Road	Yes	Yes
South-Gippsland Highway	Yes	Yes
Woodside Beach Road	Yes	Yes between High Street and Cherry Tree Road
Rosedale-Longford Road	Yes	Yes
Wellington Shire Council		
Balloong Road	No	Yes
Reeves Beach Road	No	No
Carstairs Road	No	No
Gormandale-Stradbroke Road	Yes* but not between Willung Road and Taylors Lane	No
Latrobe City Council		
Flynns Creek Road	Yes	Yes

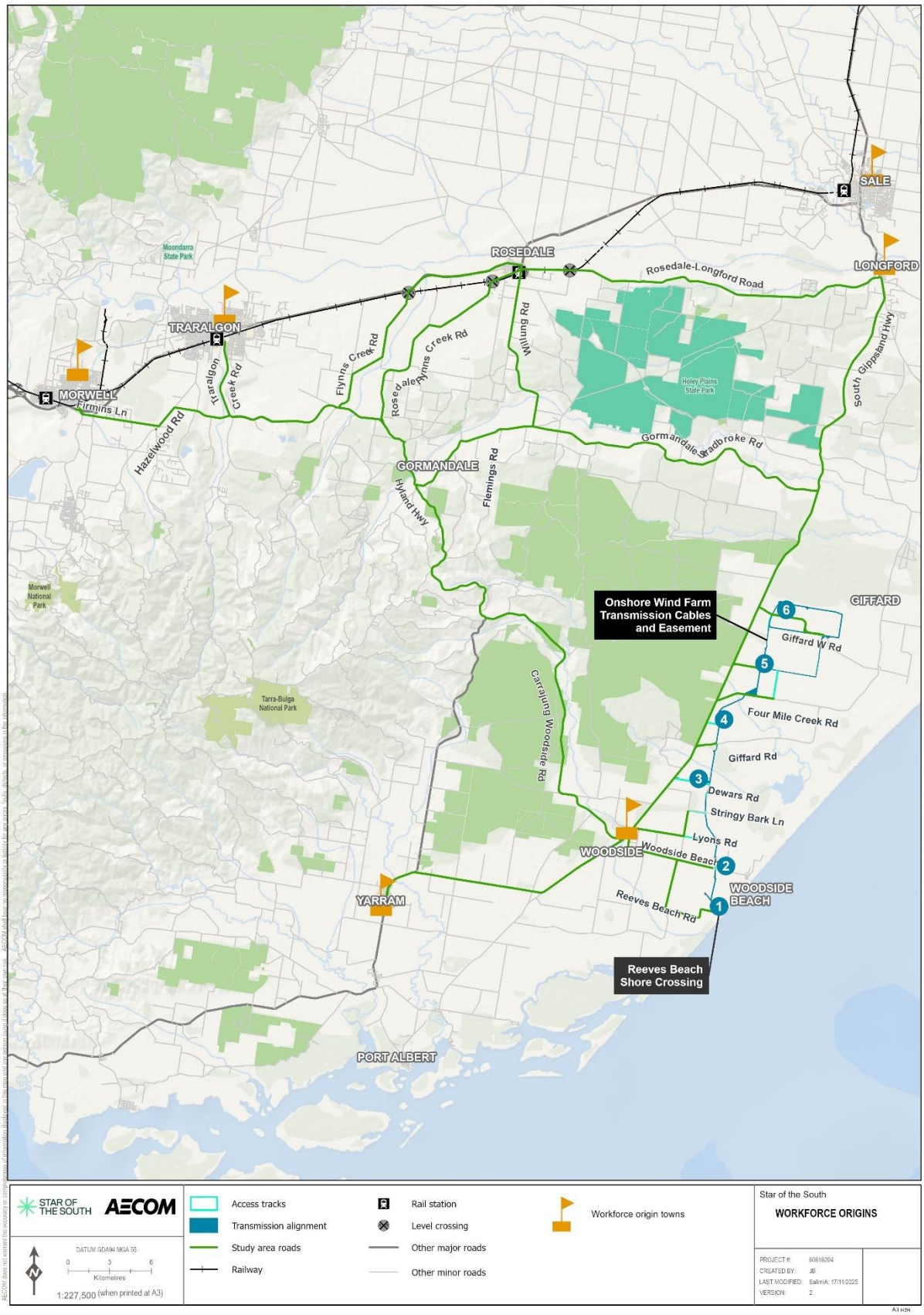


Figure 10-4 Workforce origins and distribution

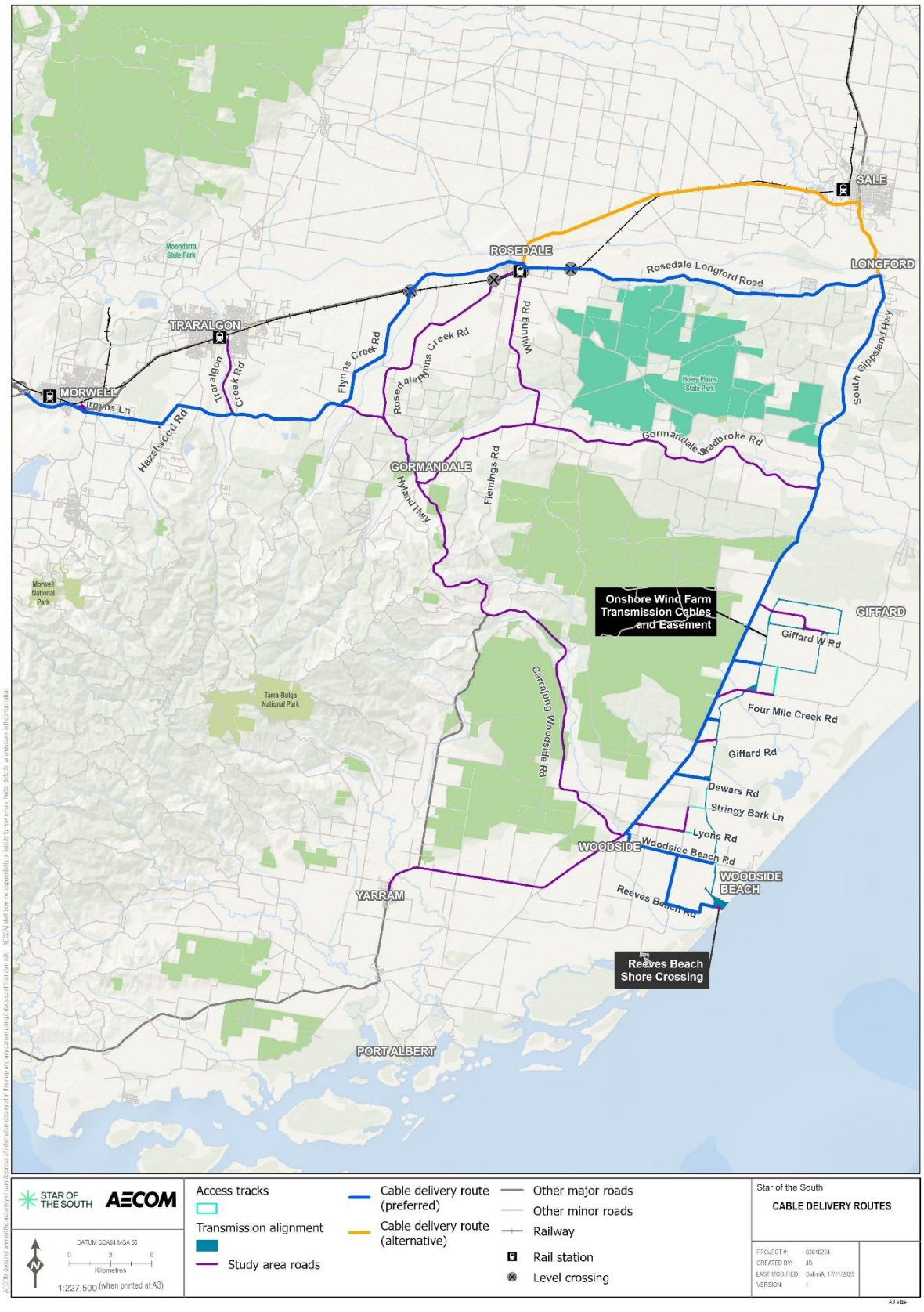


Figure 10-5 Cable delivery routes

10.2.2.3 Approvals and control measures

Where practical, heavy vehicle movements, including OSOM vehicles should be limited to existing approved heavy vehicle routes. However, access to the construction easement is expected to require the use of local roads, some of which are not currently approved for such vehicle classes and lack the required structural capacity. Examples include Reeves Beach Road (Staging node 1) and Giffard West Road (Staging node 6). Therefore, approvals and control measures need to be considered with regards to construction transportation routes to these proposed staging nodes, in order to upgrade the roads to sufficient standard for the use of heavy vehicles. This includes engaging with relevant road managers, notably WSC and seeking permit approval for construction heavy vehicle access through the NHVR, subject to road managers' consent and develop measures to manage risks and protect infrastructure. It is noted that permit requirements vary based on heavy vehicle classes, and the jurisdiction in which vehicles are travelling.

It is noted that the use of some local unsealed roads, particularly for the transport of bulk materials may be unavoidable. This includes Gormandale-Stradbroke Road (eastern section) which may be used due to its proximity to some of the potential bulk material sources.

In many cases these roads are unsuitable to accommodate recurring heavy vehicle movements due to the constraints of their current conditions. These are also discussed in sections 10.2.3 and 10.2.8 below and include unsealed surface, narrow widths, limited pavement strength, and lack of appropriate turning facilities.

10.2.2.4 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to construction traffic routes:

- *Stakeholder Engagement Plan (TTP-M001)* for agreement and finalisation of final B-Double and OSOM transportation options with relevant road authorities. This would consider route suitability to accommodate heavy vehicles and road user safety to minimise the risk of accidents and ensure the safety of all road users. This would include obtaining necessary relevant permits from NHVR and Department of Transport and Planning for travel.
- *Route assessment for the heavy vehicles (TTP-M004)* planned to be used during construction. This should include route assessments to identify constraints such as limited pavement capacity, road geometry, overhead structures (i.e. bridges, overpasses, etc.), signage clearance, and other physical or operational limitations.
- *Traffic Management Plan (TMP) (TTP-M002)* to identify constraints and implement mitigation measures such as temporary traffic controls, structural risk management and local road safety enhancements which are to be developed and managed in agreement with road authorities (discussed further in Sections 10.2.3 and 10.2.8).

Mitigation measures are detailed further in Section 14.1.

10.2.2.5 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact level on transport infrastructure and operations due to project construction traffic routes is expected to be minor. Effects on the road network are expected to be localised, temporary and reversible.

Residual impacts include:

- Potential expected wear, particularly on non-approved roads requiring post-construction rehabilitation (discussed further in Section 10.2.8).
- Increased delays to public road users in the vicinity of staging nodes due to potential temporary lowered speed limits.

It is recommended that construction transport routes are further investigated and confirmed during the development of a TMP. Any use of non-approved roads should be subject to detailed assessment and engagement with relevant road authorities to determine suitability, required improvements, and applicable approvals or permits. These will be considered in more detail with by the respective

transportation contractors in consultation with relevant approval processes (NHVR) and stakeholder co-ordination as part of developed transportation TMPs.

The approvals required are outlined in Appendix G.

10.2.3 Site access and road section upgrades (TTP-I004 and TTP-I005)

The following sections outline the impact assessment for the access roads and intersections anticipated to be used during construction. The assessment considers impacts associated with the potential for new or modified access locations and road upgrades to exacerbate existing road safety issues or create new ones, including crash risks at public road and construction access intersections

10.2.3.1 Primary access points

Austroads turning treatment warrants

Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management details the warrants for turning treatments on major roads at unsignalised intersections, as shown in Figure **10-6**. The warrants are a set of guidelines which compares the number of turning vehicles into an intersecting road with the total number of vehicles on the major through road and provides a recommendation for treatments. The treatments, as shown in Figure **10-6**, include basic left or right turn treatments (BAL / BAR), short channelised left or right turns (CHL(S)/CHR(S), shortened auxiliary left turns (AUL(S)), and full auxiliary or channelised turn treatments (AUL / CHL /CHR). Examples of turn treatments are also shown in Appendix J.

Figure 10-6 shows three graphs that guide the selection of turn treatments on roads with the following design speed:

- A - >100 km/h, is appropriate for high-speed rural roads.
- B – Between 70 and 100 km/h is appropriate for higher-speed urban roads, including those on the urban fringe and lower speed rural roads.
- C - < 70 km/h is appropriate for urban roads.

In selecting the required turning treatment, the following should be considered:

- The above focuses on safety performance and evaluation of improvement to operation performance may require a higher level of treatment or intersection control beyond those recommended.
- Where practicable a channelised turn treatment should be used in preference to a non-channelised turning treatment.
- Adding auxiliary turning lanes will reduce the risk of rear end crashes, although the risk of other high severity crash types may increase (such as right-angle crashes).
- If the warrants indicate that a BAR turn treatment is acceptable for the relevant traffic volumes, but limited visibility to the right-turning vehicle is available, then consideration should be given to the adoption of a CHR(S) or CHR turn treatment instead.
- If a major road on a short steep downgrade has numerous heavy vehicles travelling down the grade, it may not be appropriate to adopt a BAL turn treatment, a CHL would be a preferred treatment.

In applying the warrants, it should be noted that:

- Curve 1 represents:
  - on two-lane two-way roads: the boundary between a BAR and a CHR(S) turn treatment and between a BAL and an AUL(S) turn treatment
  - on four or six-lane two-way roads: the boundary between a BAL and an AUL(S) turn treatment. Note that on these roads, the minimum right-turn treatment is a CHR(S).
- Curve 2 represents the boundary between a CHR(S) and a CHR turn treatment and between an AUL(S) and an AUL or CHL turn treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the

intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

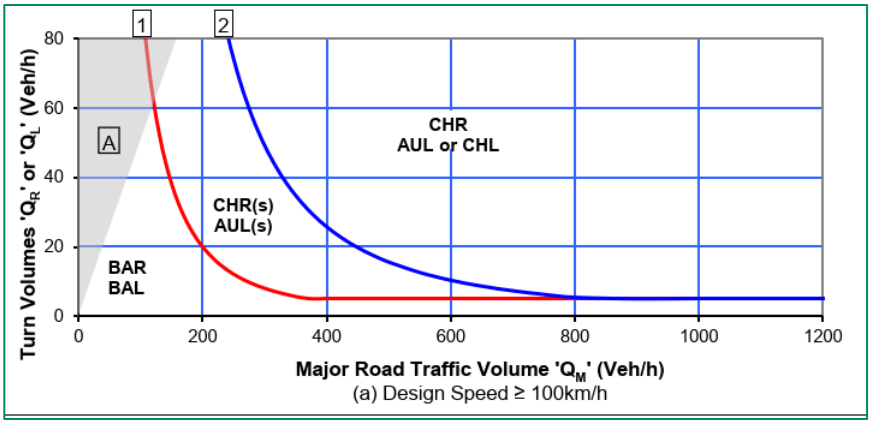
- The warrants apply to turning movements from the major road only (the road with priority). Turn treatments for the minor road should be determined through an operational performance evaluation.

Staging nodes across the construction corridor are expected to provide primary access to the transmission alignment during the construction phase. As access to the nodes are expected to intersect with a public road, an intersection upgrade is expected to be required to ensure safe movement of vehicles in and out of the access roads during construction. While it is noted that some of the proposed staging nodes would be utilising existing access routes, these would require upgrade to safely accommodate construction vehicles. Several of these staging nodes would be accessed via primary access roads that would form a priority-controlled intersection with South Gippsland Highway. It is noted that there are other access roads along the proposed transmission alignment; however, at the time of the assessment it is understood that the majority of construction generated traffic would be utilising staging nodes as primary access points. As movements to these secondary access roads is anticipated to be minimal, it is expected that basic left or right turn treatments (BAL / BAR) would be provided.

The site access turning treatments are recommended for each of proposed staging nodes and are summarised in Table 10-12, using the morning peak hour (6-7am) traffic volumes turning off major roads into the site access roads / tracks when all workers are traveling to their respective construction compound during the designated work stage. It is noted that these upgrades would be investigated further as part of the TMP (TTP-M002) and that intersection upgrade layout would be subject to functional and detailed designs, turning radii verification and approval from relevant road authorities. A Road Safety Audit (RSA – TTP-M003) may recommend additional control measures such as early warning signage, side road activation speed (SRAS) and other safety measurements.

While there may be a need for intersection treatments such as auxiliary turn lanes or channelised lanes at some locations, based on projected traffic volumes and road classifications, these treatments are subject to further confirmation and the extent of any associated impacts will depend on further design development and consultation with relevant road authorities. Any additional impacts beyond those defined within the project area, if required, will be identified and managed through the TMP (TTP-M002) and authority approvals process during the detailed design development of the project.

As outlined previously in this TIA, conservative estimates with regards to worker arrivals have been adopted, in that each worker would travel to site in a separate vehicle. If the transport arrangements or required worker numbers change then the form of intersection treatments should be revisited. This is expected to occur during the development of project TMP in consultation and agreement with key stakeholders.



Source: Austroads Guide to Traffic Management Part 6 – Figure 3.25

Figure 10-6 **Warrants for turn treatments on major roads at unsignalised intersections**

Table 10-12 Staging node access intersection turning treatments

Access Road	Major Road	AM Peak Volumes				PM Peak Volumes				Treatment Required	
		Intersection volumes				Intersection volumes					
		Left In		Right In		Left In		Right In			
		Qm	Ql	Qm	Qr	Qm	Ql	Qm	Qr	Left in	Right in
Balloong Road	Woodside Beach Road	10	0	216	255	222	0	249	0	BAL	CHR(s)
Woodside Beach Road	SGH	38	358	467	93	135	0	238	0	BAL	CHR
New access via SGH, approx. 900m north of Dewars Road	SGH	396	163	597	33	102	0	563	0	AUL(s)	CHR
New access via SGH, approx. 1.9km north of Giffard Road	SGH	38	169	281	27	138	0	241	0	BAL	CHR(s)
Carstairs Road	SGH	207	177	438	20	118	0	390	0	AUL(s)	CHR
Giffard West Road	SGH	384	180	602	16	102	0	551	0	AUL/CHL	CHR

Qm – major road traffic volume (veh/h) as calculated from formulas shown in Figure 3.26 of Austroads Guide to Traffic Management Part 6, Ql – left turning volume from major road (veh/h), Qr – right turning volume from major road (veh/h)

Primary access sight distance checks

Sight distances at each of the primary access points were assessed according to the Safe Intersection Sight Distance (SISD) requirements outlined in the *2021 Austroads Guide to Road Design Part 4a (AGRD4a) Signalised and Unsignalised Intersections* and *the VicRoads Supplements to Austroads Guide to Road Design Part 4a: Signalised and Unsignalised Intersections*.

AGRD4a defines SISD as the minimum sight distance which must be provided on the major road at any intersection which provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation, and to decelerate to a stop before reaching the collision point. Therefore, the sight distance assessment is applicable to project vehicles turning from a minor road onto a major road as well as project vehicles travelling through at road crossings where the alignment runs on both sides of a major road.

Preliminary checks for the sight distance requirements have been undertaken as follows for primary access points as summarised in Table 10-13 and for all access points is provided in Appendix I:

- High level sight distance checks were undertaken through site visit observations and approximated using satellite imagery.
- Limited to the 2D horizontal alignment requirements, with no 3D vertical checks undertaken at this stage.
- Upon review of the above standards, the guidance applicable for typical heavy vehicle use with a driver reaction time of 2.5 seconds has been adopted, as follows:
    - For the posted speed limit, this being 100 km/hr, which translates to a SISD of 289m.
    - For a reduced speed limit of 80 km/hr (assumed to be adopted in most traffic managed access arrangements during the project, or lower if required based on safety requirements), which translates to a SISD of 209m.
    - For a reduced speed limit of 60 km/hr which translates to a SISD of 141m.
    - For a reduced speed limit of 50 km/hr which translates to a SISD of 110m.

All eight primary access points were assessed for sight distances as summarised in Table 10-13.

It was found that seven of the eight primary access intersections were non-conforming intersections, shown in Figure 10-7. The non-conforming intersections between the proposed primary access roads and public roads were found to have restricted sight distances due to the following:

- Horizontal alignment of public road in vicinity of access road restricts sight distances for turning/crossing traffic in one or both directions.
- Vertical alignment of public road in vicinity of access road restricts sight distances for turning/crossing traffic in one or both directions.
- Presence of roadside vegetation restricting sight distances for turning/crossing traffic in one or both directions.

Examples of sight distance restrictions are shown in Figure 10-8, Figure 10-9 and Figure 10-10.

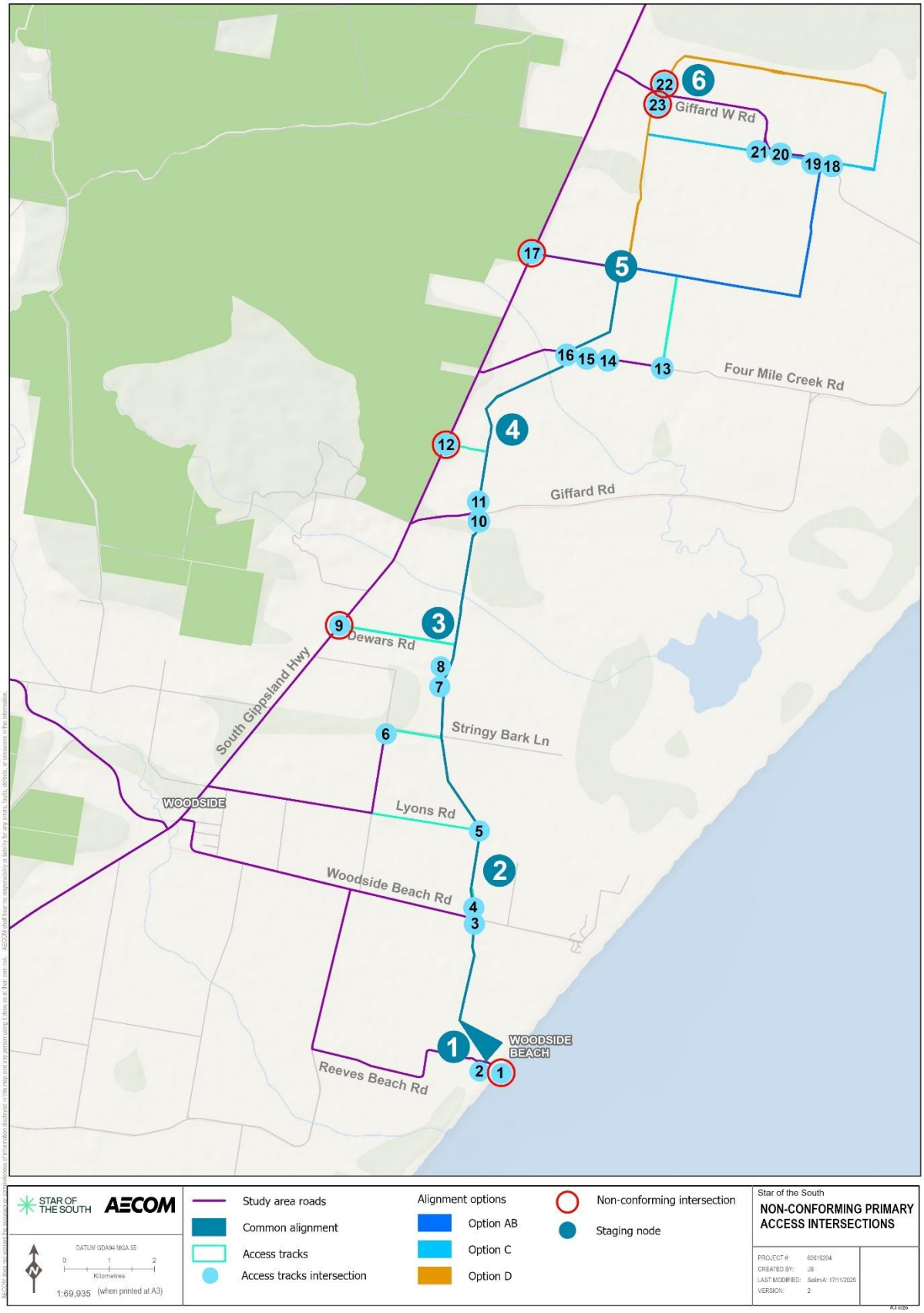


Figure 10-7 Locations of non-conforming intersections

Figure 10-8 Curve restricting sight distance at Giffard West Road (east) looking north-west (Source: AECOM, 2025)

Figure 10-9 Crest restricting sight distance at Four Mile Creek Road looking north onto South Gippsland Highway (Source: AECOM, 2025)

Figure 10-10 Roadside vegetation restricting sight distance at Giffard West Road (north) looking east (Source: AECOM, 2025)

Where non-conforming intersections were found, the following mitigation measures were considered:

- **Access road relocation:** Relocating the proposed access road to an alternative location within the project construction area where sight distances would be conforming. However, this is often impractical due to the existing road geometry, presence of native vegetation, or use of existing gates. When access road relocation is not feasible, temporary mitigation measures are recommended.
- **Vertical realignment:** Flattening vertical crests to improve sight distances.
- **Horizontal realignment:** Straightening horizontal curves in the road to improve sight distances.
- **Localised vegetation removal:** Removing roadside vegetation that encroaches on access road intersections to improve sight distances. An assessment of the native vegetation's value is necessary, as road reserves often contain ecologically and culturally significant items such as rare plants and significant trees.
- **Temporary traffic management measures:** Implementing appropriate traffic management measures, such as temporary speed limit reductions and warning signage, as defined in Australian Standard AS 1742, to ensure the safety of traffic near non-conforming intersections.

The viability of these mitigation measures, given that most non-conforming intersections are on rural roads with generally low traffic volumes, is assessed as follows:

- The project aims to use existing roads and tracks where reasonably practicable to avoid the need for new roads and approvals. Therefore, access road relocation may not be practicable.
- Road realignment works are not considered a practical solution for the minor nature of the impacts, especially given the short duration of the anticipated construction period (26 months) and there being practical alternatives to mitigating sight distance issues.
- The presence of sensitive native vegetation may restrict opportunities for vegetation clearing.

Consequently, the following risk mitigation traffic management measures are recommended:

- Where sight distances are restricted due to crests and/or curves, a reduced speed limit of 80 km/h should be applied for personnel and construction vehicles near non-conforming intersections.

Where vegetation removal alone will improve sight distances, speed reductions will not be required. Adequate traffic management signage will also be required.

- For a temporary speed limit of 80km/h, the temporary speed zone should be a minimum of 300 metres. Speed limit ahead and End speed limit signage must also be provided at a distance double the speed in advance of the speed restriction sign. For a posted speed limit of 100km/h, this signifies a minimum distance of 200 metres on either side of the temporary speed limit zone.
- Provision of supplementary advance warning signage such as “Trucks entering” (T2-25) to advise road users entering the temporary speed limit zone. Multi-message signs should be considered to ensure efficient warning to road users.
- Localised vegetation removal at relevant intersections, where reasonably practicable, after appropriate environmental (flora, fauna and cultural) impact assessments have been completed.

An example of temporary signage measures is shown in Figure 10-11. Such measures would need to be agreed with the relevant road authorities during the development of the construction phase Traffic Management Plan (TMP). Although these measures may not completely address the sight distance non-conformances highlighted, they can improve safety at the proposed site access points and reduce identified risks.

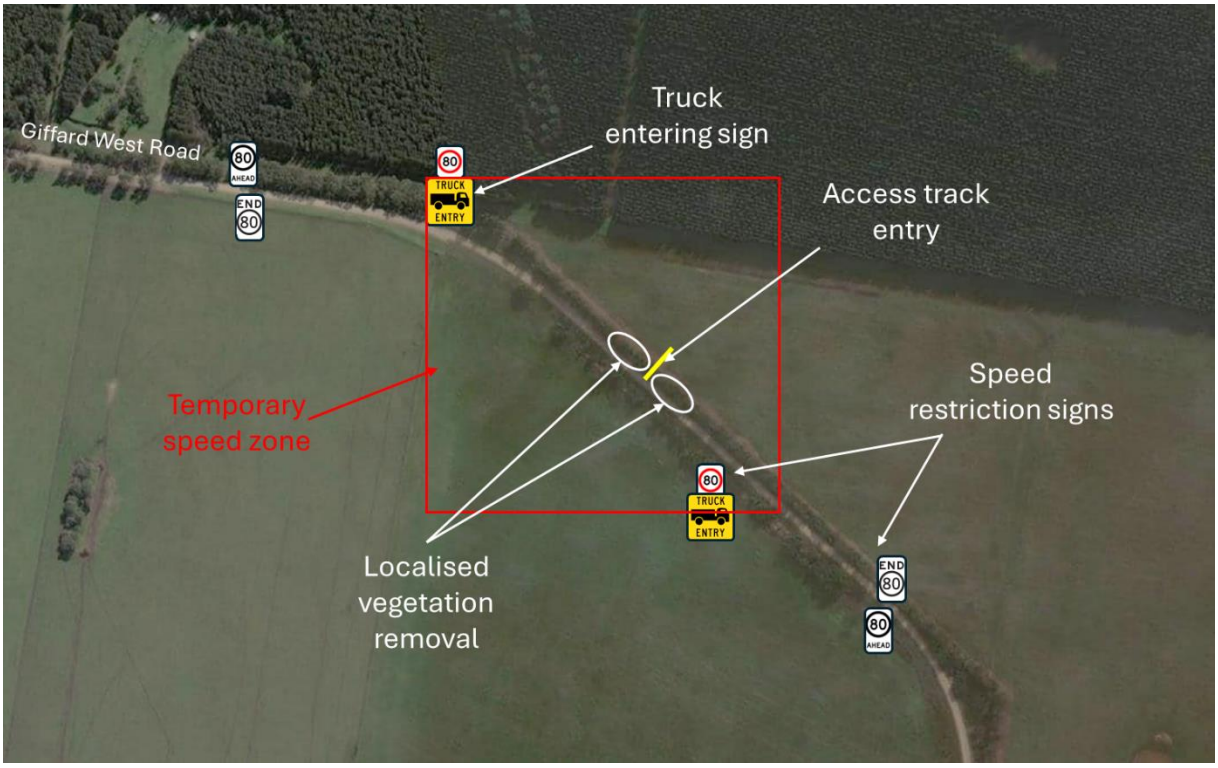


Figure 10-11 Proposed traffic measures at a non-conforming intersection (example)

It is recommended that access point locations be investigated further as part of the project TMP when there is more certainty on the site access strategy, including vehicle site access requirements (TTP-M002) for which concept designs would then start to be developed, further assessment works include:

- Confirmation of access road locations, noting the intent is to use existing site access roads and tracks where reasonably practicable to avoid the need for new roads and approvals for access.
- Review possibility of localised vegetation removal, where reasonably practicable, to improve sight distances at the site access points.
- Traffic management measures such as advanced warning signage and a reduced posted speed limit to be agreed with the relevant road authority. Although these may not address the sight

distance non-conformances highlighted, they can improve safety at the proposed site access points.

- Site access review checks should be expanded to include vertical SISD requirements, approach site distance (ASD) and minimum gap sight distance (MGSD) checks during subsequent design phases and any non-conformances highlighted so that mitigation measures can be derived to ensure the safe movement of vehicles. The additional sight distance checks are summarised below:
    - Approach sight distance (ASD) – the minimum level of sight distance which must be available on a minor road for cars to be aware of the presence of an intersection, and for vehicles approaching the intersection at the 85th percentile of the operating speed to stop safely.
    - Minimum gap sight distance (MGSD) – the minimum sight distance corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections.

Sight distances at intersections on roads providing direct access to the construction easement should also be investigated as part of a Road Safety Audit (RSA – TTP-M003) at the subsequent design stages of the project. The RSA would investigate all access points onto both minor and major roads to ensure all intersections can provide safe vehicle movements to the satisfaction of the responsible road authorities including appropriate sight distances are provided.

Consultation with DTP and councils is required to discuss and agree the recommended mitigation approach. Once agreed, more detailed signage location drawings will be developed as part of the construction phase TMP when there is more certainty on the site access strategy, including vehicle site access requirements. It is also noted that speed reductions have been identified as one of several potential mitigation measures. Speed reductions have been recommended for non-arterial roads where sight distances are significantly restricted. While temporary speed limit reductions can serve as en effective risk mitigation measure, particularly during high construction activity, their implementation alogn arterial roads is generally subject to strict approval processes.

Given the strategic function of arterial roads such as South Gippsland Highway in maintaining traffic flows, it is anticipated that alternative mitigation measures would be more adequate as primary means of managing interactions with general traffic. The feasibility and duration of any temporary speed limit changes would be subject to approval by relevant road authorities and may not be supported for extended periods during construction. As noted above, final treatment will be subject to road authorities' approval.

Table 10-13 Summary of access point with identified sight distance restrictions

Staging node	Access ref.	Access road	Existing posted speed limit (km/h)*	Required SISD based on existing speed limit (m)	Existing sight distance (m)		Sight distance restriction	Potential mitigation measures
					Left of intersection **	Right of intersection^		
1	1	New access road via Reeves Beach Road – eastern access	100	289	80	180	Horizontal curve and vegetation restricts sight distance for drivers looking right at intersection. Vertical crest and vegetation restricts sight distance for drivers looking left at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage. Due to the presence of curve and crest on either side, the above mitigation measures may not be satisfactory. Temporary speed limit reduction by at least one step (80km/h) is recommended.
2	3	New access road situated approximately 2.7km east of Belchers Road via Woodside Beach Road	100	289	289+	289+	-	-
3	9	New access road situated approximately 900m north of Dewars Road via South Gippsland Highway	100	289	50	289+	Heavy roadside vegetation restricts sight distance for drivers looking left at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage.
4	12	New access road situated approximately 1.9km north of Giffard Road via South Gippsland Highway	100	289	240	190	Minor vegetation restricts sight distance for drivers looking both directions at intersection. Minor crest restricts sight distance for drivers looking right at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage. Due to the presence of crest, the above mitigation measures may not be satisfactory. Temporary speed limit reduction by at least one step (80km/h) is recommended.
5	17	Carstairs Road via South Gippsland Highway	100	289	289+	260	Minor vegetation restricts sight distance for drivers looking right at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage.

Staging node	Access ref.	Access road	Existing posted speed limit (km/h)*	Required SISD based on existing speed limit (m)	Existing sight distance (m)		Sight distance restriction	Potential mitigation measures
					Left of intersection **	Right of intersection^		
6	18	New access road situated approximately 5km east of South Gippsland Highway via Giffard West Road (eastern access)	100	289	200	150	Vegetation restricts sight distance for drivers looking left at intersection. Horizontal curve and vegetation restricts sight distance for drivers looking right at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage. Due to the presence of a curve, the above mitigation measures may not be satisfactory. Temporary speed limit reduction by at least one step (80km/h) is recommended.
6	22	New access road situated approximately 1km east of South Gippsland Highway via Giffard West Road (northern access)	100	289	100	100	Horizontal curve and vegetation restricts sight distance for drivers looking in both directions at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage. Due to the presence of curves, the above mitigation measures may not be satisfactory. Temporary speed limit reduction by at least one step (80km/h) is recommended.
6	23	New access road situated approximately 1km east of South Gippsland Highway via Giffard West Road (southern access)	100	289	140	289+	Horizontal curve and vegetation restricts sight distance for drivers looking left at intersection.	Localised vegetation removal if possible. Temporary truck entering warning signage. Due to the presence of a curve, the above mitigation measures may not be satisfactory. Temporary speed limit reduction by at least one step (80km/h) is recommended.

* Existing posted speed limit indicates the posted speed limit on major road in kilometres/hour.

** 'Left of intersection' sight distances indicates the unimpeded distance when driver is looking to the left when exiting access road.

^ 'Right of intersection' sight distances indicates the unimpeded distance when driver is looking to the right when exiting.

Primary access point intersection swept path review

Design and check vehicles

The *VicRoads Heavy Vehicle Network Access Considerations Road Design Note 04-01, July 2019* sets out guidelines to be considered on all new road and road upgrade projects during the design phase along corridors to be utilised by heavy vehicles. The guidelines outline the minimum requirements which should be adopted to ensure the current and future performance of the network for large and heavy vehicles.

The guide states that design and check vehicle swept path analyses must be submitted with design packages to validate the vehicle requirements have been adequately addressed.

As outlined in Section 9.1.4, heavy vehicles will be required for bulk material movements and cable material deliveries. The purpose of the swept path assessment is to determine possible conflicts and constraints for heavy vehicles accessing the proposed site, including likely extents of native vegetation and significant tree removal, impacts to road furniture, utilities and privately-owned property.

Currently proposed access points along the construction corridor are expected to require to be newly constructed or would be upgraded (see Section 9.1.3).

As a starting point for assessment, the design vehicle for the project is a 26-metre B-Double vehicle and requires safe two-way travel between staging nodes, and via access intersections (i.e., permit safe two-way movements).

OSOM size vehicles will also be required for deliveries throughout the project to the work site locations, see Section 9.1.4. It is expected that as site access designs progress, the associated vehicle swept paths and improvements to permit access for these vehicles would be developed in consultation with the nominated transport contractor. Improvements to facilitate access for these vehicle types at primary site access points are likely to involve temporary pavement widening to safely accommodate their respective traffic movements.

Temporary pavement refers to a pavement widening constructed to a lower standard than the adjacent carriageway pavement (typically unsealed crushed rock) and used for OSOM vehicles to complete turning movements. It is not expected that the access points to the transmission cable alignment will be maintained. The temporary pavement is typically protected by removeable bollards or flexible barriers during times when these project vehicles do not require access.

Site access intersection swept path analysis

The swept path assessments for the design vehicle (26 metre B-Double) with a 500mm body clearance was undertaken using AutoTURN 11.0 software and is provided in Appendix E. For this assessment B-Double vehicles are to travel to each construction access point, this is a conservative approach and the location and vehicle size required at each access point will be further refined once a contractor is onboarded and swept paths can be updated.

A summary of the swept path intersection assessments for the site access roads, key findings and preliminary mitigation measures are provided in Table 10-14. A map of the site access intersections can be found in Figure 9-2.

Table 10-14 Construction site access point design vehicle swept path assessment findings

Node no.	Access ref.	Access road	Access intersection assessment		
			Movements	Issues	Potential mitigation measures and impacts
1	1	New access road via Reeves Beach Road – eastern access	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	2	Off Reeves Beach Road – western access	B-Double left-in / right-out	Roadside vegetation/trees near/where access driveway is located	Remove vegetation within swept path.
2	3	New access road situated approximately 2.7km east of Belchers Road via Woodside Beach Road	B-Double left-in / right-out	No major issues identified	None required
-	4	Off Woodside Beach Road – southern access	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder	Temporary pavement widening to be constructed
-	5	Off Lyons Road	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder	Temporary pavement widening to be constructed
-	6	Off Stringy Bark Lane	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	7	Off Dewars Road – southern access	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.

Node no.	Access ref.	Access road	Access intersection assessment		
			Movements	Issues	Potential mitigation measures and impacts
-	8	Off Dewars Road – northern access	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
3	9	New access road situated approximately 900m north of Dewars Road via South Gippsland Highway	B-Double all movements	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	10	Off Giffard Road	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	11	Off Giffard Road	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
4	12	New access road situated approximately 1.9km north of Giffard Road via South Gippsland Highway	B-Double all movements	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	13	Off Four Mile Creek Road, Approximately 4km from SGH	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder	Temporary pavement widening to be constructed

Node no.	Access ref.	Access road	Access intersection assessment		
			Movements	Issues	Potential mitigation measures and impacts
-	14	Off Four Mile Creek Road	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	15	Off Four Mile Creek Road	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	16	Off Four Mile Creek Road	B-Double left-in / right-out	Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
5	17	Carstairs Road	B-Double all movements	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
6	18	New access road situated approximately 5km east of South Gippsland Highway via Giffard West Road (eastern access)	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
-	19	Approx. 5km east of SGH – western access	B-Double right-in / left-out	Roadside vegetation/trees near/where access driveway is located	Remove vegetation within swept path.
-	20	Approx. 250m south of Giffard West Road	B-Double left-in / right-out	Roadside vegetation/trees near/where access driveway is located	Remove vegetation within swept path.
-	21	Approx. 250m south of Giffard West Road	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder	Temporary pavement widening to be constructed Remove vegetation within swept path.

Node no.	Access ref.	Access road	Access intersection assessment		
			Movements	Issues	Potential mitigation measures and impacts
				Roadside vegetation/trees near/where access driveway is located	
6	22	New access road situated approximately 1m east of South Gippsland Highway via Giffard West Road (northern access)	B-Double left-in / right-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.
6	23	New access road situated approximately 1km east of South Gippsland Highway (southern access)	B-Double right-in / left-out	Turning movement require vehicle to encroach into opposite traffic lane and/or shoulder Roadside vegetation/trees near/where access driveway is located	Temporary pavement widening to be constructed Remove vegetation within swept path.

In summary, the following was found from the design vehicle swept path analysis at the proposed site access points to the project:

- B-Double vehicles will be required to cross into oncoming traffic lanes to make the required turning movement
- Several of the proposed access points are located in the vicinity of roadside vegetation, (mostly shrubs and small trees). Further impact assessments (flora, fauna and cultural heritage) should be undertaken to identify and confirm any areas of indigenous roadside vegetation that may require removal or pruning.
- Some of the roads providing access to the construction access points cannot currently accommodate safe bi-directional movements and turning movements due to insufficient road width. This includes Reeves Beach Road as well as secondary access roads such as Stringy Bark Lane and Lyons Road.

Vehicle use of the access points during construction would result in an increase in slowing and turning vehicles along the public road network at these locations. This change in traffic conditions may result in an increased risk of vehicle collisions.

As such, construction access point requirements should be investigated and confirmed to ensure that each of the access point intersections provide safe access and egress for construction vehicles as part of a site access strategy (TTP-M005). The site access strategy should consider the following:

- T-intersection design for all access points intersecting with the public road network, with intersection angles between 70-90 degrees, in accordance with Austroads guidance.
- Potential road section upgrades for roads providing access to the construction access points, notably for roads such as Giffard West Road and Reeves Beach Road where the road width is generally insufficient to accommodate safely heavy vehicle bidirectional movements and there are no road shoulders to cater for the projected heavy vehicle turning movements.

The site access strategy (TTP-M005) should also consider OSOM movements.

During construction, traffic management measures are proposed in the vicinity of the proposed site access points, particularly during the construction peak, in the event that more than one single heavy vehicle requires access at a time due to the limited road width at some of the locations. Traffic mitigation measures anticipated to be required include advanced warning signage or line marking and would be developed and managed as part of the TMP (TTP-M002).

While it is expected that a majority of construction traffic movements are expected to occur to and from the construction staging nodes, it is acknowledged that a number of secondary access points may also be utilised during construction. Although the extent and frequency of use at these locations is expected to remain limited compared to staging nodes, the potential for occasional or task-specific movements, including by potential heavy vehicles, may occur. As such secondary access point arrangements should be reviewed and confirmed as part of the TMP, once final construction traffic generations are developed, likely following the appointment of the construction contractor.

Appropriate mitigation measures will be developed during TMP development, in consultation with key stakeholders and to the satisfaction of the responsible road management authority.

10.2.3.2 Wider site access intersections

In addition to the roads providing direct access to the construction staging nodes along the construction corridor, project traffic is expected to use other roads as movements would be originating from various locations including Melbourne and townships such as Morwell, Traralgon, Longford, Sale, Yarram and Woodside.

Construction traffic routes for heavy vehicles were identified using the NHVR route planner to determine roads which are part of the various heavy vehicle approved networks and are discussed further in Section 10.2.2. However, some roads anticipated to be used by project traffic are not designed to accommodate heavy vehicles. A review of key intersections along the identified heavy vehicle approved routes was undertaken to identify potential issues with regards to turning movements and sight distances and to identify locations which might not be sufficiently conforming to safety standards. This assessment mainly focuses on intersections where constraints exist such as connections between arterial and local roads and arterial intersections with non-standard geometry with consideration of the following:

- Number of additional Project related movements
- High existing traffic volumes.
- Any issues identified during the existing condition assessment.

Intersections where no such constraints existed were not subject to further assessment (these being listed in Table 10-14 as intersections that are not included in the assessment).

It is noted that a majority of intersections along identified heavy vehicle routes are located along arterial roads that are already approved for B-double and/or OSOM access. The list of intersections within the study area which are likely to be used by heavy vehicles are outlined in Table 10-15.

Table 10-15 Wider road network intersections anticipated to be used by construction heavy vehicles

Intersection		Type	Included in further assessment
Tramway Road	Firmins Lane	Roundabout	No
Firmins Lane	Hazelwood Road	Roundabout	No
Hazelwood Road	Mattingley Hill Road	T-intersection	No
Mattingley Hill Road	Hyland Highway	Roundabout	No
Hyland Highway	Flynns Creek Road	T-intersection	No
Flynns Creek Road	Princes Highway	T-intersection	Yes
Princes Highway	Princes Highway, Rosedale	Roundabout	Yes
Princes Highway	Rosedale Longford Road	T-intersection	Yes
Rosedale Longford Road	South Gippsland Highway	T-intersection	Yes

Intersection		Type	Included in further assessment
Carrajung-Woodside Road	South Gippsland Highway	T-intersection	No
Hyland Highway	Gormandale-Stradbroke Road	T-intersection	No
Gormandale-Stradbroke Road	South Gippsland Highway	T-intersection	No
South Gippsland Highway	Giffard West Road	T-intersection	Yes
Woodside Beach Road	South Gippsland Highway	T-intersection	Yes
Woodside Beach Road	Balloong Road	T-intersection	Yes
Balloong Road	Reeves Beach Road	T-intersection	Yes

Wider network intersection swept path analysis

This assessment determines if the existing intersection pavement is sufficient for the vehicle turning radius at key intersections with local roads. The swept path assessments for 26 metre B-Double vehicles with a 500mm body clearance were undertaken using AutoTURN 11.0 software.

A summary of constraints identified as a result of the swept path assessments is provided in Table 10-16. The aerial images and vehicle swept paths are provided in Appendix E.

It was found that some turning movements may require the vehicles to cross into oncoming traffic lanes and/or adjacent median strips or traffic islands.

It is noted that OSOM vehicles are expected to be required during construction and are anticipated to be utilising the same routes as B-Doubles. Heavy vehicle transport route assessments (TTP-M004) should be carried out to assess route options and consider safety, alignment, cross section, pavement design of these roads to confirm final route options and provide all the necessary mitigation measures to ensure that construction heavy vehicle movements can be safely accommodated on the road network including at intersections.

During construction, temporary traffic management measures such as temporary pavement widening, controllers, line markings and signage can also be implemented as part of a TMP (TTP-M002).

Table 10-16 Wider intersections swept paths analysis – issues and mitigations

Intersection	Access intersection assessment		
	Movements	Issues	Potential mitigation measures and impacts
Hyland Highway / Flynns Creek Road	Left turn (western leg)	Vehicle may encroach into adjacent lane	Traffic management such as advanced warning signs to be required
Princes Highway / Princes Highway	Right turn (western leg)	Vehicle body may encroach onto adjacent kerb/median	Existing traffic island is driveable. No additional mitigation measure(s) required
Princes Highway / Rosedale Longford Road	Left turn (northern leg)	No major issues identified	None required
Rosedale Longford Road / South Gippsland Highway	Right turn (western leg)	No major issues identified	None required
South Gippsland Highway / Giffard West Road	Right turn (western leg) / Left turn (eastern leg)	Gravel corner insufficient for the radius of the vehicle turning movement Vehicle may encroach into adjacent lane	Localised shoulder widening and shoulder sealing

Intersection	Access intersection assessment		
	Movements	Issues	Potential mitigation measures and impacts
Woodside Beach Road / South Gippsland Highway	Left turn (northern leg)	Vehicle body may encroach onto adjacent kerb/median	Existing traffic island is driveable. No additional mitigation measure(s) required
	Right turn (southern leg)	Vehicle body may encroach onto adjacent kerb/median	Existing traffic island is driveable. No additional mitigation measure(s) required
Woodside Beach Road / Balloong Road	Right turn (western leg)	Vehicle may encroach onto shoulder	Localised shoulder widening and shoulder sealing
Ballong Road/ Reeves Beach Road	Left turn (northern leg)	Gravel corner insufficient for the radius of the vehicle turning movement Culvert pipes present on both side of Reeves Beach Road at intersection	Localised shoulder widening and shoulder sealing

Wider network intersection sight distance checks

Safe Intersection Sight Distances (SISD) were assessed within the study area for key intersections as outlined in *the 2021 Austroads Guide to Road Design Part 4a (AGRD4a): Unsignalised Intersections* and *the Austroads* and *the VicRoads Supplements to Austroads Guide to Road Design Part 4a: Signalised and Unsignalised Intersections.*

The SISD checks have been undertaken as follows:

- Limited to the 2D horizontal alignment requirements, with no vertical checks undertaken at this stage.
- SISD checks undertaken utilising aerial imagery in CAD.
- Following SISD checks undertaken according to heavy vehicle requirements as detailed below:
  - For the posted speed limit, this being 100 km/hr, which translates to a SISD of 289 metres based on a reaction time of 2.5 seconds.
  - For a reduced speed limit of 80 km/hr (assumed to be adopted in most traffic managed access arrangements during the project, or lower if required based on safety requirements), which translates to a SISD of 209 metres based on a reaction time of 2.5 seconds.
  - For a reduced speed limit of 60 km/hr which translates to a SISD of 141 metres based on a reaction time of 2.5 seconds.
  - For a reduced speed limit of 50 km/hr which translates to a SISD of 110 metres based on a reaction time of 2.5 seconds.

Results of the preliminary checks for the above sight distance requirements at selected key intersections are summarised in Table 10-17 and provided in Appendix I, with the following found:

- Three wider intersections do not meet the Austroads SISD design requirements based on their existing posted speed limit.
  - Woodside Beach Road / South Gippsland Highway
  - Hyland Highway / Flynns Creek Road
  - Rosedale Longford Rd / South Gippsland Highway

These constraints are primarily due to the horizontal alignment of the intersecting roads. The intersections in questions are located on rural arterial roads, which are designated B-double approved roads. Measures such as speed limit reductions would impact traffic efficiency and consistency may not be supported for extended periods during construction. As such, it is recommended that temporary traffic management measures such as temporary signage be implemented to alert road users of potential truck activity in the vicinity of intersections. Additional measures that can be considered include scheduling restrictions to avoid construction traffic movements during road network peak periods. These should be considered further during development of the TMP (TTP-M002) and in consultation with relevant road authorities.

It is recommended that these intersections be investigated further as part of the subsequent project TMP when there is more certainty on the site access strategy, including vehicle site access requirements (TTP-M002), further assessment works include:

- Review possibility of localised vegetation removal, if possible, to improve SISD at intersections
- Traffic management measures such as advanced warning signage to be agreed with the relevant road authority. Although these may not address the SISD non-conformances highlighted, they can improve safety at the non-conforming intersections.
- Site access review checks should be expanded to include vertical SISD requirements, approach site distance (ASD) and minimum gap sight distance (MGSD) checks during subsequent design phases and any non-conformances highlighted so that mitigation measures can be derived to ensure the safe movement of vehicles. The additional sight distance checks are summarised below:
  - Approach sight distance (ASD) – the minimum level of sight distance which must be available on a minor road for cars to be aware of the presence of an intersection, and for vehicles approaching the intersection at the 85th percentile of the operating speed to stop safely.
  - Minimum gap sight distance (MGSD) – the minimum sight distance corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections.

Sight distances along roads anticipated to be used should be considered further as part of a Road Safety Audit (RSA – TTP-M003) at the subsequent design stages of the project. The RSA would investigate all access points onto both minor and major roads to ensure all intersections can provide safe vehicle movements to the satisfaction of the responsible road authorities including appropriate sight distances are provided.

Table 10-17 Summary of non-compliant SISD at wider access intersections

Road	Major Road	Posted speed limit on major road (km/h)	Existing SISD (m)		SISD restrictions	Proposed mitigation measures
			Left turn	Right turn		
Flynns Creek Road	Hyland Highway	80	127	209+	Horizontal curve of HH restricts sight distances for left turning traffic.	Temporary advance warning signage during peak use
Rosedale Longford Road	South Gippsland Highway	100	137	148	Horizontal curve of SGH restricts sight distances for both left and right turning traffic.	Temporary advance warning signage during peak use
Woodside Beach Road	South Gippsland Highway	80	209+	179	Horizontal curve of SGH may restrict sight distance for right turning traffic.	Temporary advance warning signage during peak use
Reeves Beach Road	Balloong Road	100	289+	130	Horizontal curve of Balloong Road restricts sight distance for drivers looking right at intersection.	Temporary advance warning signage duringpeak use

10.2.3.3 Site access road section upgrades

Construction staging node access

During construction, project traffic is expected to access the construction corridor primarily via the nominated primary access points for each staging node. The proposed primary access roads to each construction staging node are summarised in Table 10-18. Those which are to be constructed are highlighted below.

Table 10-18 Staging node primary access road intersections and potential upgrades

Node no.	Access ref.	Site access road via:		Access road authority	Existing road access type	Existing road width	Road verge/shoulder present
		Major road	Access road				
1	1	Balloong Road	Reeves Beach Road	WSC	Gravel	3.8 – 5.2m	Yes
2	3	Woodside Beach Road	New access road via Woodside Beach Road, situated approx. 2.7km east of Belchers Road	WSC	To be constructed	N/A	No
3	9	South Gippsland Highway	New access road via SGH, situated approx. 900m north of Dewars Road	DTP	To be constructed	N/A	No
4	12	South Gippsland Highway	New access road via SGH situated approx. 1.9km north of Giffard Road	DTP	To be constructed	N/A	No
5	17	South Gippsland Highway	Carstairs Road	WSC	To be upgraded	N/A	No
6	18	Giffard West Road	New access road via Giffard West Road, situated approx. 5km east of SGH – Eastern access	WSC	To be constructed	N/A	No
6	22	Giffard West Road	New access road via Giffard West Road, situated approx. 1km east of SGH – Northern access	WSC	To be constructed	N/A	No
6	23	Giffard West Road	New access road via Giffard West Road, situated approx. 5km east of SGH – Southern access	WSC	To be constructed	N/A	No

Road cross-section configuration

For access road upgrades or newly proposed access roads, the configuration and cross-section provisions will need to be agreed with key stakeholders and reviewed in line with final traffic access volumes, road safety and other impacts (e.g. land holders, asset impacts, etc).

A review of the *ARRB Unsealed Roads Best Practice Guide* with regards to road cross-sections notes the following:

- Unsealed roads in the majority of cases are either one-lane two-way roads or two-lane two-way roads. The elements of a road cross-section are shown in Figure 10-12, with the respective suggested typical minimum unsealed road cross section widths outlined in Table 10-19.
- For roads with low traffic volumes (<150 vpd) Austroads suggest that a single-lane two-way operation is adequate as there is a low possibility of vehicles meeting and the new passing manoeuvrers can be undertaken at reduced speeds using the shoulders. Providing there is sufficient sight distance these manoeuvres can be performed without hazard and the overall loss in efficiency brought about by reduced speeds when vehicles cross will be minimal. It is not cost - effective to widen carriageway in such circumstances and a basic width of 5.5m will normally suffice.
- For two large vehicles passing with a legal width of 2.5m, a 5.5m carriageway will allow a 0.5m clearance between vehicles.
- For roads carrying a higher percentage of heavy vehicles (>20%) road widening requirements may be required. Particularly around tight curves to match the truck configurations.

Other aspects to the access roads (both existing and proposed) that will need to be considered in subsequent design stages of the project include, crossfall, batter slopes, drainage, erosion and sediment control, surface damage and culverts.

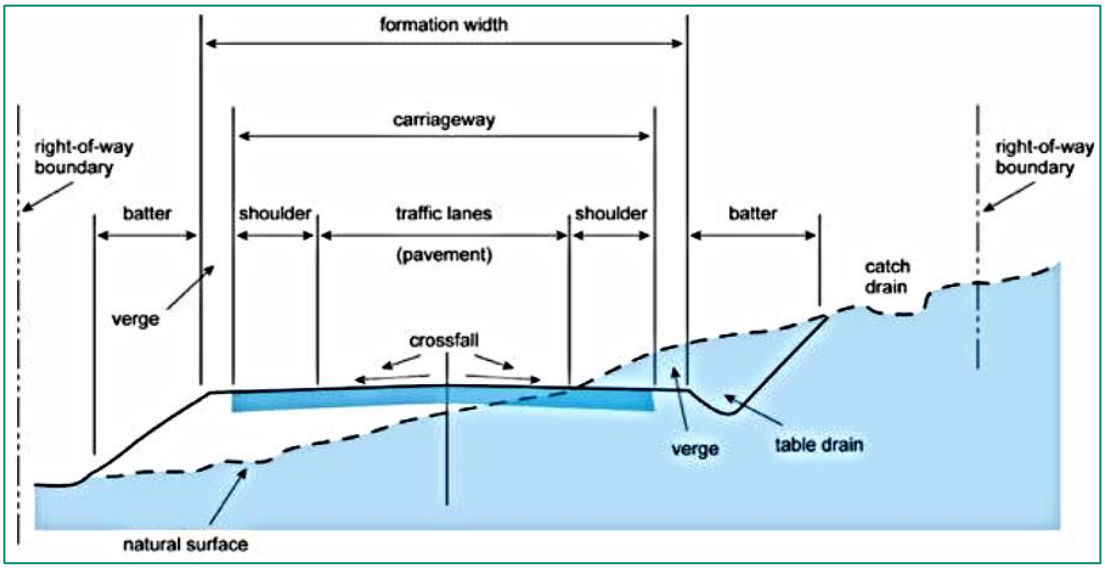


Figure 10-12 Elements of a road cross-section (source: Austroads 2016c – Figure C25 of ARRB Unsealed Roads Best Practice Guide Edition 2)

Table 10-19 Suggested typical minimum unsealed road cross-section widths (source: Austroads 2016c – Table C17 of ARRB Unsealed Roads Best Practice Guide Edition 2)

Description	Two-lane two-way road (m)	Single-lane two-way road (m)
Traffic lane (each)	3.0	3.5
Shoulder (each)	0.5	1.0
Total width of carriageway	7	5.5
Table drain	1.0	1.0

Site access road section upgrades

A number of key local access roads proposed be used for construction may require upgrades to facilitate the safe movement of vehicles to and from the site as outlined in Table 10-20 and shown in Figure 10-13.

Table 10-20 Identified road section upgrades

Staging node	Access point ref.	Access road	Road condition	Potential upgrade requirements
1	1 & 2	Reeves Beach Road	Unsealed, gravel	• Vegetation removal, mostly shrubs and small trees • Localised shoulder widening and shoulder sealing in the vicinity of the intersection with the access roads to provide a wider turning lane • Road surface upgrade
N/A	5	Lyons Road	Unsealed, gravel	• Vegetation removal, mostly shrubs and small trees • Localised road widening to allow for bidirectional heavy vehicle movements • Localised shoulder widening and shoulder sealing in the vicinity of the intersection with the access roads to provide a wider turning lane • Road surface upgrade
N/A	6	Stringy Bark Lane	Unsealed, gravel	• Vegetation removal, mostly shrubs and small trees • Localised road widening to allow for bidirectional heavy vehicle movements • Localised shoulder widening in the vicinity of the intersection with the access roads to provide a wider turning lane • Road surface upgrade
N/A	7 & 8	Dewars Road	Unsealed, gravel	• Vegetation removal, mostly shrubs and small trees • Localised road widening to allow for bidirectional heavy vehicle movements • Localised shoulder widening in the vicinity of the intersection with the access roads to provide a wider turning lane • Road surface upgrade
N/A	10 & 11	Giffard Road	Sealed	• Localised road widening to allow for bidirectional heavy vehicle movements should this road be used for secondary access
N/A	13, 14, 15 & 16	Four Mile Creek Road	Unsealed, gravel	• Upgrades to facilitate vehicle movements to/from secondary access points, should these be used in addition to the primary access via South Gippsland Highway • Road to be sealed • Localised road widening to allow for bidirectional heavy vehicle movements

Staging node	Access point ref.	Access road	Road condition	Potential upgrade requirements
				• Localised shoulder widening in the vicinity of the intersection with the access roads to provide a wider turning lane • Road surface upgrade
N/A	20 & 21	Epplestuns Road	Unsealed, gravel	• Localised road widening to allow for bidirectional heavy vehicle movements should this road be used for secondary access • Road surface upgrade
6	22 & 23	Giffard West Road	Sealed	• Localised road widening to allow for bidirectional heavy vehicle movements • Localised shoulder widening in the vicinity of the intersection with the access roads to provide a wider turning lane

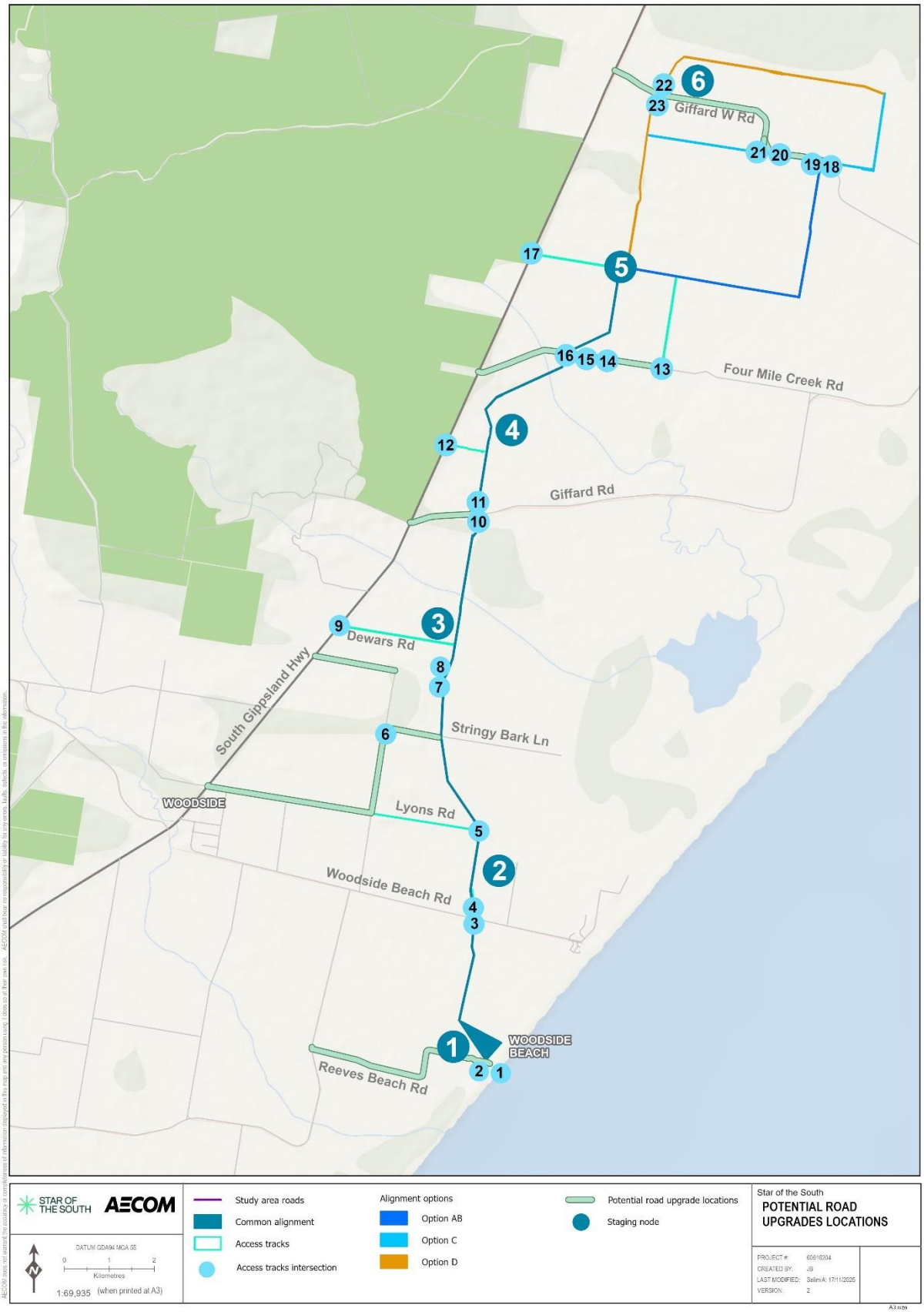


Figure 10-13 Potential road upgrade locations

Road section upgrades summary

The proposed road section upgrades and refinement of the road carriageway requirements would be developed further in the detailed design phase of the project taking into account contractor and stakeholder input, including once specific vehicles sizes and dimensions are confirmed.

Many of the local access roads expected to be used during construction are managed by Wellington Shire Council and upgrades and hand-back agreements would be required and be considered during subsequent design phases.

Whilst rural single lane access roads are expected to have very low traffic demands, there are two main considerations with regards to safety risk and reliability of the local road network:

1. The number of vehicles travelling along a road of an inadequate width increases the likelihood of a fatal or serious injury crash. This is further emphasised with the large number of heavy vehicles required for construction.
2. The increased number of heavy vehicles poses a potential durability and reliability issue to the performance of the existing pavement, which is unlikely to have been designed for the proposed construction vehicles. This risk is further increased during and following a wet weather period.

There are many options that may be employed to mitigate the above factors, including:

- Widening of the road along key routes
- Providing passing bays at key locations
- Traffic management measures
- Reduced speed limits
- Upgrade of road pavements
- Regular inspections and maintenance operations
- Installation of advanced warning signs
- Driver's code of conduct.

In addition to the advice from the relevant road authority, the adoption of an independent Road Safety Audit (TTP-M003) – pre-qualified by the Department of Transport and Planning - could assist with determining the appropriate treatments. No direct impacts to public transport operations are expected though it is noted that some bus routes may be present in the area.

It is proposed that the mitigation measures adopted be determined on a case-by-case basis considering local constraints as well as the duration and nature of construction activities. This would be considered during the development of the TMP (TTP-M002) as part of the site access strategy (TTP-M004) which would be developed to investigate and manage each of the access point intersections to provide safe access and egress for construction in agreement with road authorities. During upgrade works, it is expected that appropriate mitigation measures to the satisfaction of road authorities will be implemented to minimise impacts on other road users including school bus operation. No impacts to rail operations are expected to occur.

Operation controls such as temporary speed reductions, potential OSOM delivery time restrictions and additional signage may be required in addition to the physical measures outlined above. It is expected that these measures would be developed by the commissioned transport contractor during TMP development (TTP-M002), reviewed by the NHVR in consultation with key stakeholders.

10.2.3.4 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the management of site access points and road section upgrades:

- Ongoing stakeholder consultation (TTP-M001) to obtain relevant road authorities' input on transport management particularly during the development of the TMP (TTP-M002) and to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions including road and lane closures associated with works.

- Temporary traffic management measures to be managed as part of a TMP (TTP-M002) to implement measures that may be required to provide safe access and egress to and from the proposed construction access points. Recommended measures include:
  - Confirmation of access road locations, noting the intent is to use existing site access roads and tracks where reasonably practicable to avoid the need for new roads and approvals for access.
  - Sight distance checks to confirm restrictions at both direct access and wider access intersections and expand to include approach sight distance (ASD) and minimum gap sight distance (MGSD) checks.
  - Localised vegetation removal where reasonably practicable at relevant intersections after appropriate environmental (flora, fauna and cultural) impact assessments have been completed to improve sight distances and to allow safe bidirectional movements on some local roads which may be subject to road upgrades and to ensure appropriate heavy vehicle turning movements at direct access intersections.
  - Other additional traffic management measures such as advance warning signage, line markings, driver's code of conduct, provision of passing bays etc. in the vicinity of the proposed site access points, particularly during the construction peak, in the event that more than a single heavy vehicle requires access due to the limited road width at some of the locations. These would be subject to engagement and approval by road authorities.

  Following completion of works, consideration should be made to remove new access points built for the transmission alignment construction.
- Road safety audits (RSAs) (TTP-M003) at:
  - All access points onto both minor and major roads to ensure all intersections and entry points can provide safe vehicle movements to the satisfaction of the responsible road authorities.
  - Access roads and roads to be used and their intersections with the public road network to confirm upgrade requirements.
- Heavy vehicle transport route assessments (TTP-M004) to assess and confirm final routes and provide the necessary mitigation measures to ensure that construction heavy vehicle movements can be safely accommodated on the road network including at intersections. The assessments should consider route options, safety, alignment, cross section and pavement design.
- Site access strategy (TTP-M005) which would be developed to investigate and manage each of the access points to provide safe access and egress for construction vehicles with consideration of the following:
  - T-intersection design for all access points intersecting with the public road network, with intersection angles between 70-90 degrees, in accordance with Austroads guidance.
  - Potential road section upgrades for roads providing access to the construction access points, notably for roads such as Giffard West Road where the road width at some points is insufficient to accommodate safely heavy vehicle bidirectional movements and there are no road shoulders to cater for the heavy vehicle turning movements.
  - Consideration of B-Double and OSOM delivery time to determine if time restrictions could be implemented to reduce potential vehicular conflicts during project peak periods at direct access intersections.

10.2.3.5 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact of construction vehicle access on transport infrastructure and operations is expected to be minor. Any safety effects at construction access points or intersections are expected to be localised, short-term and readily reversible once construction works are completed. Anticipated residual impacts includes increases in travel time resulting from localised safety upgrades required to support construction works in the vicinity of the proposed construction access.

10.2.4 Road and traffic lane closures (TTP-I006)

This section considers impacts associated with temporary road and lane closures that may restrict local access and affect nearby business operations during construction.

The onshore transmission infrastructure would need to cross several roads during construction. These roads are managed by DTP and Wellington Shire Council. The locations and proposed treatment of these crossings are shown on Figure 10-14 and detailed in Table 10-21.

The following construction methods are proposed for the purpose of this assessment and subject to further stakeholder discussions:

- DTP managed roads:
    - Where required, traffic lights or signals may be used to allow work on alternate halves of the road while maintaining the flow of traffic. After excavating the first half, steel plates would be placed across the trench for traffic to pass while the second half of the road is excavated. A section of pipe will then be threaded through the trench under the steel plates. The trench would then be backfilled and the road re-surfaced.
    - Woodside Beach Road is planned to be the only arterial road crossed by the transmission alignment.
- Council managed roads:
    - Minor roads may be open trenched, involving the excavation of the trench across the road. The method is likely to be applied to small single-track roads which would typically require a temporary road closure during the crossing works.

Overall, the road and lane closures are anticipated to result in minor impacts, with the main traffic impact expected to be increased travel time for motorists. Bi-directional vehicular passage would be maintained over the remaining lane of traffic during the partial closures of arterial roads. The main result from the partial closures is expected to include increased travel time during peak period for a maximum duration of 6 days with each lane closed for 3 days at a time.

As local roads are expected to require a full closure, it is expected that traffic management measures such as traffic diversion routes would be required for general traffic. It is noted that some local roads only provide local access to abutting properties and don’t allow passage of through traffic. During all closures, local access to properties would be maintained. The subsequent impacts from the full closures are anticipated to be minor to moderate travel time delays due to detour routes. All the closures would be managed as part of the TMP including temporary measures such as signage, traffic controllers, and traffic and deviation routes.

The final road and traffic lane closure methodologies would be verified following further stakeholder discussions and design stages and outlined in the project TMP, with the following also considered:

- Trenchless crossing methodology may be considered in high constraint applications e.g. if it is not possible to cross the road using open cut. Techniques may be used to minimise any traffic disruptions and negate the need for full or partial road closures as outlined above.
- Specific traffic detours and associated traffic management requirements would be investigated and outlined. Traffic management measures include provision of temporary speed reduction, advance warning signage and temporary traffic signals.
- Where local access roads are affected, access to nearby properties and to permit emergency vehicle access will need to be considered and catered for.
- All affected landowner and local communities will need to be engaged to ensure that appropriate notice is provided prior to closures.
- Following closures, roads including pavement are to be restored to existing or better condition.

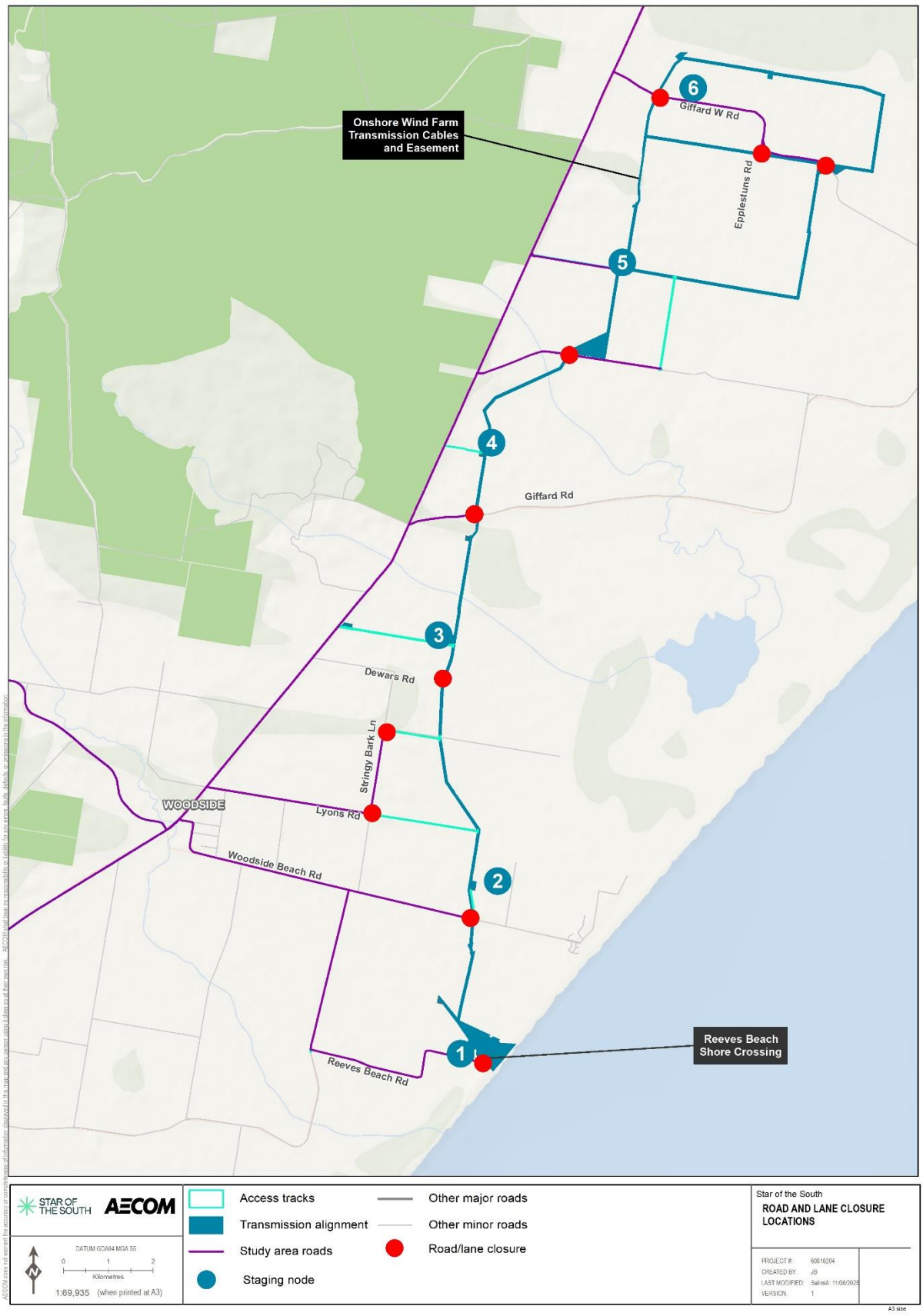


Figure 10-14 Road and lane closure locations

10.2.4.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the road and traffic lane closures:

- *Stakeholder Engagement Plan (TTP-M001)* is to include road and lane closures notification to impacted residents and emergency services where vehicular passage may not be available or be limited. The SEP should include a details analysis of specific landowners significantly affected by temporary road closures, with targeted engagement sessions conducted.
- *Traffic Management Plan (TMP) (TTP-M002)* will be developed in consultation with key stakeholders to minimise disruptions during temporary road closures. Where reasonably practicable, the TMP is to ensure continued access for local motorists, school buses, pedestrians and cyclists, following road design standards and in collaboration with landholders and relevant parties. School bus routes, particularly on South Gippsland Highway, are an important consideration. Closures are to be scheduled during weekends or school holidays where reasonably practicable to reduce impacts. Additionally, seasonal factors such as bushfire season and major local events will be assessed to minimise inconvenience, especially on Woodside Beach Road. The TMP should aim to facilitate necessary roadworks while maintaining safe and efficient connectivity in the area.

10.2.4.2 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact of road and traffic lane closures is expected to be minor as potential disruptions to local access and business operations are expected to be short-term, localised and reversible. Anticipated residual impacts are as follows:

- Localised and short-term congestion and delays to vehicles caused by road closures for up to 3 days and partial closures for up to 6 days with each lane closed for 3 days at a time.
- Reduced likelihood of residents being unaware of road closures and thus reducing vehicles travelling during the closure periods.

Table 10-21 Road and lane closures

Road	Alignment option	Road classification	2028 daily background traffic volumes two-way	Closure type	Closure duration	High level traffic impacts	Potential traffic diversion routes
DTP (RRV)							
Woodside Beach Road	Common alignment	Arterial – C Class	340	Partial closure (one lane at a time)	6 days total (3 days Stage 1 + 3 days stage 2)	Access to be maintained. Single lane of bi-directional traffic on 'stop-go'	N/A
Wellington Shire Council							
Lyons Road	Common alignment	Local - Access C	44	Full closure	3 days	Alignment crosses at private property section of Lyons Road. Minimal traffic impact expected.	No alternative diversion route available
Stringy Bark Lane	Common alignment	Local - Access C	44	Full closure	3 days	Local access to properties to be maintained and managed by TMP Alternate access to Jack Smith Lake Reserve available via Giffard Road	No alternative diversion route available
Dewars Road	Common alignment	Local - Access B	44	Full closure	3 days	Alignment crosses in a section of 'no through road' where only access to 1 landholder's property. Minimal traffic impact expected.	No alternative diversion route available
Giffard Road	Common alignment	Local – Collector	44	Partial closure (one lane at a time)	6 days total (3 days Stage 1 + 3 days stage 2)	Access to be maintained. Single lane of bi-directional traffic on 'stop-go'	N/A
Four Mile Creek Road	Common alignment	Local - Access B	44	Full closure	3 days	Local access to properties to be maintained and managed by TMP. Delays to residents during full closures (additional 20 km travelled).	Via Giffard Road and Four Mile Creek Road
Giffard West Road	Option D (approx. 1km east of South	Local - Access B	44	Partial closure (one lane at a time)	6 days total (3 days Stage 1 + 3 days stage 2)	Access to be maintained. Single lane of bi-directional traffic on 'stop-go'	N/A

Road	Alignment option	Road classification	2028 daily background traffic volumes two-way	Closure type	Closure duration	High level traffic impacts	Potential traffic diversion routes
	Gippsland Highway)						
Epplestuns Road	Option C	Local - Access B	44	Full closure	3 days	Alignment crosses in a section of 'no through road' where only access to 2 landholders' property. Minimal traffic impact expected.	N/A
Giffard West Road	Option AB & Option C (approx. 5km east of South Gippsland Highway)	Local - Access B	44	Partial closure (one lane at a time)	6 days total (3 days Stage 1 + 3 days stage 2)	Access to be maintained. Single lane of bi-directional traffic on 'stop-go'	N/A

10.2.5 Impacts on public transport (TTP-I008)

This section outlines the impact assessment for public transport due to the potential for construction movements and road closures to cause temporary disruptions, delays or access limitations for public bus and school bus services.

School buses operating within the study area including along South Gippsland Highway and Woodside Beach Road may be impacted by the short-term road closures discussed in Section 10.2.3. Proposed detour routes would be provided and managed as part of the TMP if required and would ensure that they are suitable to accommodate school buses.

Any construction heavy vehicle movements associated with the project would either not occur during periods when public buses or school buses are operating, or suitable measures would be implemented to reduce potential impacts if conflicts are unable be suitably managed.

Ongoing consultation with relevant stakeholders would be undertaken to manage potential impacts on buses during construction.

10.2.5.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the potential impacts on public transport:

- *Traffic Management Plan (TTP-M002)* will include traffic management measures to manage road closures and safe bidirectional vehicular passage. A review of existing bus services will be undertaken to confirm bus services that may be affected prior to construction commencement.
- *Stakeholder Engagement Plan (TTP-M001)* will include consultation with local councils and bus operators during the development of the TMP to ensure any affected public and/or school routes have appropriate diversions in place that still service necessary stakeholders and deliver acceptable travel time changes.

10.2.5.2 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact to public transport is expected to be minor as potential impacts to public transport are expected to be short-term, localised and reversible.

Anticipated residual impacts include delays as traffic management will manage road closures to ensure access remains and the local bus services will be informed of the works and usage of roads in the area.

10.2.6 Amenity impacts arising from use of the road network (TTP-I007)

This section assesses the impacts associated with the movement of construction vehicles along public roads which has the potential to affect local amenity and road user safety.

Vehicle movements during construction works may generate dust deposition on roads and other surfaces. Dust and debris accumulating on surfaces may be considered a nuisance and could impact the quality of the road network or create safety hazards.

Measures to manage dust and sedimentation impacts should be included in the TMP, and sub-contractor TMP’s. These may include keeping vehicles to defined haul roads, minimising vehicle movements on exposed surfaces, using wheel washing facilities and enforcing vehicle speed limits.

Additional mitigation measures that may be relevant to traffic are outlined in Technical report Y: Air quality such as *AQM-M001 General dust management*, *AQM-M002 Vehicle and mobile equipment operation requirements*, *AQM-M003 Stabilise temporary access tracks* and *AQM-M004 Covering vehicle loads*.

Potential changes to air quality due to construction activities are further examined in Technical report Y: Air quality.

During construction, increased traffic may cause noise and vibration impacts for nearby sensitive receptors such as residences. To reduce disruption, work on the onshore transmission infrastructure will mainly take place during standard hours: 7am to 6pm on weekdays and 7am to 1pm on Saturdays. Construction would only occur outside normal working hours where unavoidable or for safety reasons. The batch plant operations and trenchless crossings may be outside of these hours.

Schools are particularly sensitive to these impacts. Woodside Primary School, in particular, will experience higher vehicle traffic traversing past it. To lessen the effects, timing of travel for construction vehicles may be altered so that construction heavy vehicles will be limited to travelling to times outside of school drop-off and peak periods.

Measures to manage potential noise and vibration impacts include restricting vehicle movements to and from the site during normal working hours where practicable to avoid disturbance outside of standard construction hours, and no construction vehicles should be left idle with the engine running.

Potential noise and vibration effects associated with construction activities are further examined in Technical report P: Noise.

10.2.6.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the potential amenity impacts arising from use of the road network:

- The *Traffic Management Plan (TTP-M002)* will include the development of dust and debris management strategies and will include dust suppression methods such as covering vehicle loads and street sweeping if required necessary. The TMP will include details pertaining to construction vehicle travel times and ensure major works reduce impacts where reasonably practicable in sensitive areas such as the Woodside Primary School.

10.2.6.2 Residual impacts

With the implementation of the mitigation measures outlined above, the residual impact on the road network and key receptors is expected to be minor as dust and debris will be prevented as much as possible and removed when required.

10.2.7 Impacts on pedestrians and cyclists (TTP-I009)

This section assesses the impacts to pedestrians and cyclists from increased traffic and construction activities that may reduce safety in the vicinity of the works.

As the project is located within the rural road network, there are no dedicated pedestrian or bicycle facilities located in the vicinity of the project area.

Nevertheless, the increase in vehicle volumes and use of heavy vehicles poses an increased safety risk to pedestrians and cyclists, including school children who utilise the school bus stops in the project area. The construction works and mitigation must consider the safety of cyclists and pedestrians when travelling and operating on roads in the study area.

10.2.7.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the potential impacts on pedestrians and cyclists:

- *Stakeholder Engagement Plan (TTP-M001)* to inform the local community and road users of the changes in transport conditions including details of proposed road and traffic lane closures.
- *Traffic Management Plan (TTP-M002)* to include appropriate traffic management measures to ensure safe pedestrian (including school children in vicinity of school bus stops) and cyclist passage during construction, in accordance with relevant road design standards and in consultation with relevant road authorities.

10.2.7.2 Residual impacts

With the implementation of the mitigation measures outlined above, there are not anticipated to be residual safety and connectivity impacts to pedestrians and cyclists.

10.2.8 Road condition and maintenance (TTP-I010)

This section considers the impacts that the movement of heavy vehicles, machinery and equipment during construction may cause deterioration or damage to public roads, potentially leading to safety hazards or vehicle crashes.

As noted in Section 10.2.1, heavy vehicle movements are anticipated to occur on a number of local and declared roads during the construction phase in addition to daily light vehicle traffic associated with

workforce transportation. These roads may experience deterioration in the quality of their surfaces due to the movements of heavy vehicles during construction period. While many of the arterial roads identified for construction access are approved for heavy vehicle use, the cumulative impact of concentrated construction traffic over a sustained period may accelerate pavement deterioration and reduce asset life.

Similarly, several local roads are expected to provide direct access to the construction easement are unsealed, narrow, or otherwise unsuitable for regular heavy vehicle movements. Even with planned upgrades, ongoing maintenance will be required to manage the condition of these roads throughout the construction period with the responsibility of each stakeholder throughout the process clearly identified. Pre-construction road conditions should be in a suitable state to allow safe access to support construction activities along relevant declared and local roads. As part of the TMP, dilapidation surveys should be undertaken to provide a comprehensive baseline of road surface conditions and establish any triggers for immediate and future impacts for the upgrade or remediation of road assets.

10.2.8.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards to the pavement degradation from sustained construction traffic:

- Agreements with road asset owners, including DTP and Wellington Shire Council, on the following to inform the TMP (*TTP-M002)*:
    - Extent and form of dilapidation surveys to be undertaken prior to works commencing, either by way of photographic or more detailed survey vehicle techniques. This would provide a comprehensive and accurate baseline of pavement conditions, shoulder integrity, drainage infrastructure and any pre-existing defects at the commencement of construction.
    - Define a road maintenance methodology, which would typically involve a drive-over inspection at a minimum frequency of one inspection per month. The checking procedures would need to be agreed with, along with the intervention criteria, treatments and response timeframes based on the pavement distress type identified (e.g. potholes, surface treatment, cleaning etc.).
    - In case where significant structural or safely related deficiencies are identified, particularly along high-volume and/or heavy vehicle routes, targeted pre-construction upgrades may be required to ensure roads are fit for purpose (refer to Section 10.2.3). The scope and timing of any such upgrades should be determined in consultation with relevant road authorities
    - Post construction review and identification and hand-back protocols would need to be agreed and documented.
- If impacts occur during the construction period, rectification should be implemented to reinstate road to an equivalent standard to existing condition or better in agreement with relevant road authority.

It is proposed with regards to road condition and maintenance that the mitigation measures outlined in *TTP-M001 – Stakeholder consultation*, *TTP-M002 – Traffic Management Plan* and *TTP-M004 – Heavy vehicle transport route assessments* be undertaken.

10.2.8.2 Residual impacts

With the implementation of the mitigation measures outlined above, it is expected that the residual impacts to road condition would be minor as they would be temporary and reversible. The residual impacts would be that any road damage would be identified and rectified early through stakeholder communication over the construction period and there will be no remaining damage to the road network after construction.

10.2.9 Summary of residual impacts

Residual impacts are those that remain once mitigation measures have been implemented. Table 10-22 describes the potential residual impacts during the construction phase of the project, once mitigation measures have been considered and applied.

Table 10-22 Summary of residual impacts during construction

Section	Impact assessment	Residual impacts
Section 10.2.1	Traffic generation and road capacity impact analysis	With the implementation of the mitigation measures outlined above the project traffic will have a low impact on the existing capacity as other routes will be chosen or TMP and Access measures would be implemented to support traffic performance. The residual impact of project traffic volumes to the existing road network users is expected to be minor in relation to travel delays and road safety.
Section 10.2.2	Preliminary construction traffic route assessments	Implementation of mitigation measures during construction would reduce residual impacts on transport infrastructure and operations. Anticipated residual impacts would be: ● Potential expected wear, particularly on non-approved roads requiring post-construction rehabilitation ● Increased delays to public road users due to lowered speed limits and manoeuvring of heavy vehicles
Section 10.2.3	Preliminary site access and road section upgrades	The residual impact of construction vehicles access on transport infrastructure and operations is expected to be low, with minor increases in travel time resulting from localised safety upgrades required to support construction works in the vicinity of the proposed construction access.
Section 10.2.4	Potential road and traffic lane closures	Localised and short-term congestion and delays to vehicles caused by road closures for up to 3 days and partial closures for up to 6 days with each lane closed for 3 days at a time. Reduced likelihood of residents being unaware of road closures and thus reducing vehicles travelling during the closure periods.
Section 10.2.5	Impacts to public transport	With the implementation of the mitigation measures, the residual impact to public transport is expected to be minor delays as traffic management will manage road closures to ensure access remains and the local bus services will be informed of the works and usage of roads in the area.
Section 10.2.6	Amenity impacts on the local road network	With the implementation of the mitigation measures, the residual impact on the road network is expected to be low as dust and debris will be prevented and removed when required.
Section 10.2.7	Impacts to pedestrians and cyclists	With the implementation of the mitigation measures, there are not anticipated to be residual safety and connectivity impacts to pedestrians and cyclists.
Section 10.2.8	Road condition and maintenance	Any road damage would be identified and rectified early through stakeholder communication over the construction period and no remaining damage to the road network after construction.

10.3 Risk Assessment

Residual impacts are those that remain once mitigation measures have been implemented. This section describes potential residual impacts during the operation phase of the project, once mitigation measures have been considered and applied.

10.3.1 Emergency vehicle access (TTP-R001)

The following sections evaluates the risk that emergency response may be affected if adequate access provisions are not provided and/or maintained, particularly in locations with notable fire risks.

Availability of emergency services is a key issue for regional communities in Gippsland. The region has previously been subject to a range of natural disasters such as bushfires, severe storms and floods and has ongoing need for rapid responses in relation to medical emergencies.

The project works have been designed to minimise the disruption of the transport network, for example by minimising road and traffic lane closures required. This will ensure that current access arrangements for emergency vehicles are maintained.

Nevertheless, emergency vehicle access protocols will be developed in consultation with emergency services stakeholders, with unrestricted access to be always maintained, especially given the location of the project work sites, and potential on site hazards. The arrangements to maintain emergency vehicle access would be outlined in the TMP and an Emergency Management Plan would be developed for the project encompassing emergency response and evacuation procedures for project work sites.

10.3.1.1 Proposed mitigation measures

The following mitigation measures are proposed to be implemented with regards emergency vehicle access:

- Stakeholder Engagement Plan (TTP-M001) to include active engagement with local emergency service operators to inform changes in transport conditions, in particular any road or traffic lane closures.
- Traffic Management Plan (TTP-M002) to include appropriate traffic management measures, in accordance with relevant road design standards, including proposed measures to maintain emergency services access. These requirements that may be developed in consultation with relevant emergency service stakeholders should be included as part of any broader emergency management plan that may be developed for the project.
- Road Safety Audit (TTP-M003) to include consideration of emergency vehicle access and if road surface upgrades are required.

10.3.2 Residual risks

Implementation of these measures during construction would reduce residual risk to a minor level on transport infrastructure and operations. The residual impacts would be that the road network is able to safely provide access and minimal delays for service emergency vehicles during construction of the project.

10.3.3 Summary of residual risks

Residual risks are those that remain once mitigation measures have been implemented. Table 10-23 describes the potential residual impacts during the construction phase of the project, once mitigation measures have been considered and applied.

Table 10-23 Summary of residual risks during construction

Section	Risk assessment	Residual risks
Section 10.3.1	Emergency vehicle access	Implementation of these measures during construction would reduce residual risks on transport infrastructure and operations, the residual risks would be that the road network is able to safely provide access and minimal delays for emergency vehicles during construction of the project.

11.0 Operation assessment

This section discusses the potential impacts of the project during the operation phase and the associated mitigation measures that aim to reduce impacts to as low as possible. Mitigation measures referred to are defined in Section 14.0.

11.1 Project parameters that form the basis of impact assessment

Table 11-1 specifies the maximum design scenario that has been assessed for operation.

Table 11-1 Maximum design scenario - operation

Risk	Key parameter values	Justification
TTP-I011	The works and infrastructure are located within the onshore operation project area, which is defined by the area required for the following: • Onshore transmission infrastructure: – Up to 8 underground cable circuits with the following upper limit easement footprints: - Operation easement width between shore crossing and VicGrid connection hub: 40m width	Operation and maintenance vehicles would be required to service the infrastructure within the onshore project area.

To assess potential impacts associated with the project, the operational assessment has also considered the following assumptions:

- Following construction, all cable trenches will be covered with topsoil and seeded with appropriate groundcover. Similarly, all joint bays will be covered with topsoil and seeded, leaving just the link pit lids above ground.

11.2 Impact assessment

11.2.1 Traffic generation and road capacity for the transmission alignment (TTP-I011)

The following section considers the impacts for operational traffic generation, focusing on the impact to road network congestion, affecting capacity and safety.

It is not anticipated that the underground cable systems would require regular access to normally operate the system. The infrastructure would be consistently monitored remotely via control and condition monitoring systems. Easements would be periodically inspected and tested.

An operations and maintenance base would be expected to be established, either within an onshore substation or at a separate site in the region.

A small workforce is envisaged for the ongoing operation of the onshore transmission infrastructure. This typically would involve small teams utilising light service vehicles to inspect the infrastructure for routine maintenance.

Periodic inspection of the cable easement would be undertaken to monitor and control vegetation and compliance with easement controls.

For the purpose of the assessment, it has been conservatively assumed some staff movements will be generated on a daily basis. With regards to these movements, the following estimations of full-time staff requirements have been provided in the *Preliminary Site Access and Vehicle Route Assessment (WSP, 2025)*:

- Transmission system operations– 1-2 full-time employees
- Management and administration – 1-2 full-time employees

Additional traffic movements may be generated associated with repairs or maintenance; however, this would only be on an as needs basis and a team of five could typically manage this.

Further additional movements may also be generated should any repairs or maintenance be required, however this would only be on an as needs basis and it is assumed a team of 5 could typically manage this. Subsequently, it is estimated that typical daily operations of the site may generate in the order of between 2 – 4 full time employees with allowance for a further 5 employees for repairs if needed. Assuming that they all drive to and from the site separately, it is therefore estimated that the site could generate in the order of 2 - 9 daily two-way trips.

This assessment focuses solely on the onshore components of the project and does not assess offshore-related activities as these fall outside of the EES scope as offshore construction related activities are expected to have immaterial transport impacts as explained in Section 6.9.2.

11.3 Summary of residual impacts

Residual impacts are those that remain once mitigation measures have been implemented. This section describes potential residual impacts during the operation phase of the project, once mitigation measures have been considered and applied.

As outlined in Section 11.2.1, the operational traffic volume is negligible. As a result, the potential for residual impacts to road safety or network performance is considered negligible with changes to the road network expected to be undetectable.

12.0 Decommissioning assessment

The decommissioning activities outlined in Section 9.3 are indicative as the specific approach is difficult to predict with certainty so far into the future.

The decommissioning phase of the project is anticipated to be less of an impact to transport networks and infrastructure than the construction of the project as it is anticipated that most of the below ground transmission infrastructure would be left in place. Accordingly, the transport activities associated with decommissioning are expected to be low. Decommissioning of the project (after approximately 30 years of operation) would need to adhere to regulatory requirements and approvals at that time.

13.0 Cumulative impact assessment

This section provides an assessment of cumulative impacts with other proposed developments in the region. The method to consider cumulative impacts has been described in Section 6.8 and Chapter 6 - Assessment Framework within both the EIS and EES.

13.1 Projects within zone of influence

For the purpose of evaluating cumulative impacts, this assessment has identified other projects that are located within the zone of influence of this study. The zone of influence for this study has been defined as projects with the potential to generate traffic within the study area. The long list of projects that fall within the zone of influence for this study are presented in Table 13-1 and are shown in Figure 13-1. Each of the projects in Table 13-2 have been evaluated against the cumulative assessment criteria to determine whether there is the potential for cumulative impacts with the project and sufficient information available to undertake a meaningful assessment.

In assessing the potential cumulative impacts for the Star of the South project it is important to consider that some developments, predominately those ‘proposed’ (referred) or identified in development plans, may not actually be taken forward, or fully built out. There is therefore a need to build in some certainty (or uncertainty) with respect to the potential impacts that may arise from such proposals, which is done by allocating projects into ‘tiers’. This approach allows appropriate weight to be given to each tier when considering the potential cumulative impacts.

Ten potential projects within the zone of influence of the project were screened in as they were assessed as Tier 1 or Tier 2 (medium certainty) projects and passed the criteria for scale parameter, spatial overlap and temporal overlap. The potential for the project to result in cumulative impacts when

combined with these projects has been considered in the following sections with respect to severity, extent and duration.

The remaining fourteen projects were assessed as Tier 3 (low certainty) projects and therefore are screened out of the cumulative impact assessment due to insufficient information or did not fulfil one of the criteria for scale parameter, spatial overlap and temporal overlap. Table 13-2 describes the projects screened in to be taken forward for the cumulative impact assessment.

Table 13-1 Cumulative impacts – projects in zone of influence

Project or action	Data confidence	Scale parameter	Receptor impact	Temporal overlap	Conclusion
(within the zone of influence)	Certainty tier	Is the project or action of sufficient scale to warrant inclusion?	Will the project / action adversely affect the same receptors as the project? And have a spatial overlap	Will the project / action result in adverse impacts to the same receptors as the project at the same time or on a timescale that could result in a cumulative impact?	Is the long list project / action shortlisted for assessment of cumulative impacts?
Aurora Green (Iberdrola)	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Blue Mackerel North (Parkwind)	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Cape Winds Offshore Windfarm	Tier 3 – Seeking approval. Proposed construction start in 2024, operation expected in 2026.				Screened OUT – due to insufficient data available
CarbonNet	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Delburn Onshore Wind Farm	Tier 1 – Approved. Construction was planned to commence in 2024	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 50km west of project area. Close proximity to wider project road network. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN
EDF Renewables	Tier 3 – Proposed. Details unknown.				Screened OUT – due to insufficient data available
Esso Decommissioning of Bass Strait Assets	Tier 1 – Currently underway	Yes – impacts considered to be of similar scale to Star of the South	No – approx. 100km west of project area. Minimal overlap of traffic routes expected		Screened OUT – due to insufficient data available
Gelliondale Wind Farm	Tier 2 – Seeking approval. Planning application	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 30km south-west of project area, similarity in potential routes	No – timing unknown at the time of assessment	Screened OUT – due to insufficient data available

Project or action	Data confidence	Scale parameter	Receptor impact	Temporal overlap	Conclusion
	submitted to Victorian Govt.				
Gippsland Offshore Wind Farm 1 (Ørsted)	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Gippsland Offshore Wind Farm 2 (Ørsted)	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Gippsland Offshore Wind Transmission 2GW Project (VicGrid)	Tier 2 – Seeking approval. In EES process.	Yes – impacts considered to be of similar scale to Star of the South	Yes – directly adjacent to project area. Similarity in potential routes	Yes – construction and operational impacts in the same time period	Screened IN
Gippsland Skies Offshore Wind	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Golden Beach-2 Gas Project	Tier 1 – Approved. Drilling completed in July 2024, 40 year design life	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 25km north of project area. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN
Great Eastern Offshore Wind Farm (Corio)	Tier 2 – Seeking approval.	Yes – impacts considered to be of similar scale to Star of the South	Yes – directly adjacent to project area. Similarity in potential routes	Yes – construction and operational impacts in the same time period	Screened IN
Hazelwood Rehabilitation Project	Tier 2 – Seeking approval. EES process to have been concluded in 2024	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 50km west of project area. Close proximity to wider project road network. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN
High Sea Wind Project (Ocean Winds)	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Kut-Wut Bratualung	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Loy Yang Battery Energy Storage System	Tier 1 – Approved. Targeting FID in 2026.	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 40km west of project area. Situated on wider project road network. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN

Project or action	Data confidence	Scale parameter	Receptor impact	Temporal overlap	Conclusion
Marinus Link	Tier 1 – Seeking approval. Construction proposed start early 2025 and completed 2030. Proposed end December 2071.	Yes – impacts considered to be of similar scale to Star of the South	Yes – connection expected close proximity to Morwell. Situated on wider project road network. Similarity in potential routes	Yes – construction and operational impacts in the same time period	Screened IN
Navigator North	Tier 3 – Proposed. Received feasibility licence				Screened OUT – due to insufficient data available
Robbins Island & Jim's Plain Wind	Tier 2 – Seeking approval. Construction was expected in 2023, delayed due to approvals issues.	Yes – impacts considered to be of similar scale to Star of the South	No – different receptors as located approx. 200km south-west of project area		Screened OUT – due to insufficient data available
Seaspray Solar Farm	Tier 2 – Seeking approval. Construction expected to commence mid-2025.	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 6km east of project area. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN
South East Australia Carbon Capture and Storage Project (SEA CCS Project)	Tier 2 – Seeking approval. Commencement targeting 2025.	Yes – impacts considered to be of similar scale to Star of the South	Yes – approx. 25km north of project area. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN
Tasmanian Gas Pipeline	Tier 1 – Operational.	Yes – impacts considered to be of similar scale to Star of the South	Yes – connection in Longford. Approx. 25km north of project area. Similarity in potential routes	Yes – operational impacts in the same time period	Screened IN

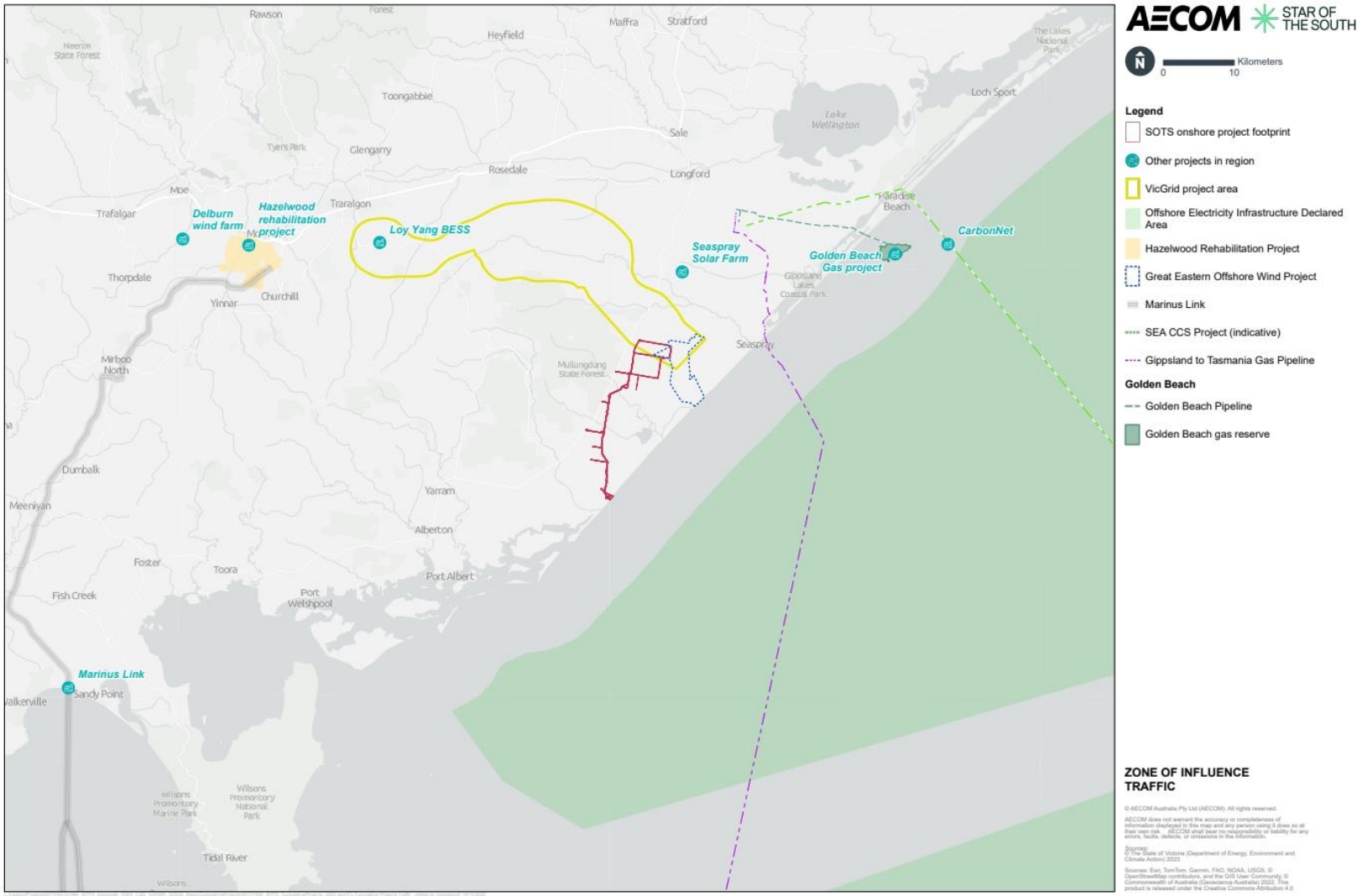


Figure 13-1 Cumulative impact zone of influence and projects further assessed

Table 13-2 Projects assessed for cumulative impacts

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
Delburn Onshore Wind Farm	Approved	The Delburn Onshore Wind Farm is a planned onshore wind farm with 33 turbines. It will span between across the Strezlecki ranges, to the south of Latrobe Valley. The wind farm is located approximately 20km south-west of Morwell, overlooking the former Hazelwood Mine site.	Spatial relevance: the construction of the SOTS onshore transmission system will have workforce and material travelling from the wider transport network considered such as Morwell. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that operation of the wind farm will overlap with the construction of SOTS. Potential cumulative risk pathway: operation of Delburn Onshore Wind Farm could impact traffic efficiency and road infrastructure in the vicinity of the wider network near Morwell.	Tier 1 (High)	For the purposes of this assessment, it is expected that routes for operation traffic of the Delburn Onshore Wind Farm will overlap with SOTS construction traffic near Morwell. However, it is assumed that the typical operation traffic volume for a wind farm will not be significant enough to have adverse impact to traffic efficiency and road infrastructure.
Gippsland Offshore Wind Transmission 2GW Project (VicGrid)	Referred	The proposed Gippsland Offshore Wind Transmission 2GW Project is a new overhead transmission line from the Latrobe Valley to a new onshore connection hub in Giffard. The proposed VicGrid connection hub would comprise a high-voltage substation plant and equipment, including transformers, synchronous condensers and switchgear. Construction is planned to commence in 2028 subject to	Spatial relevance: the SOTS onshore transmission system is proposed to connect in with the VicGrid connection hub in Giffard, therefore the projects will be directly adjacent. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that construction periods could overlap. Operational periods will overlap. Potential cumulative risk pathway: construction and operation of the VicGrid connection hub could impact traffic efficiency and road infrastructure in the vicinity of the SOTS onshore transmission system near Giffard.	Tier 2 (Medium)	There is uncertainty around whether construction of the VicGrid connection hub would occur at the same time as construction of the SOTS onshore transmission system (in the vicinity of the connection hub). Therefore, it is conservatively assumed that there could be an overlap. For the purposes of this assessment it is assumed that the construction traffic will be managed in a way that would not greatly impact traffic and road infrastructure. It is assumed that operational traffic volume is not expected

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
		planning and environmental approvals.			to be significant enough to have traffic impacts.
Golden Beach-2 Gas Project	Approved	The Golden Beach-2 Gas Project is developed to provide gas supply and storage infrastructure to Australia's east coast energy market. The 21km gas pipeline is to run between Golden Beach foreshore and Longford Gas Plant.	Spatial relevance: the project is connecting at Longford Gas Plant, approximately 20km north of the SOTS project area. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the timeframes, it is possible that operation of the the gas project will overlap with the construction and operations of SOTS. Potential cumulative risk pathway: operation of Golden Beach-2 Gas Project could impact traffic efficiency and road infrastructure in the vicinity of the wider network near Longford.	Tier 1 (High)	For the purposes of this assessment, it is expected that routes for operation traffic of the Golden Beach-2 Gas Project will overlap with SOTS construction traffic especially near Longford. However, it is assumed that the typical operation traffic volume will not be significant enough to have adverse impact to traffic efficiency and road infrastructure.
Great Eastern Offshore Wind Farm (Corio)	Referred	The Great Eastern Offshore Wind Farm is a proposed project approximately 24km off the central Gippsland coast, aiming to generate up to 2.5 GW of electricity for Australia's energy grid. Construction is planned to commence in 2028 subject to planning and environmental approvals.	Spatial relevance: Similar to SOTS, the Great Eastern Offshore Wind Farm is proposed to connect in with the VicGrid connection hub in Giffard, therefore the projects will be directly adjacent. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that construction periods could overlap. Operational periods will overlap. Potential cumulative risk pathway: construction and operation of the onshore component of the Great Eastern Offshore Wind Farm could impact traffic efficiency and road infrastructure in the vicinity the SOTS onshore transmission system near Giffard.	Tier 2 (Medium)	There is uncertainty around whether construction of the onshore component of the Great Eastern Offshore Wind Farm would occur at the same time as construction of the SOTS onshore transmission system (in the vicinity of the VicGrid connection hub). Therefore, it is conservatively assumed that there could be an overlap. For the purposes of this assessment it is assumed that the construction traffic will be managed in a way that would not greatly impact traffic and

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
					road infrastructure. It is assumed that operational traffic volume is not expected to be significant enough to have traffic impacts.
Hazelwood Rehabilitation Project	Referred	The rehabilitation of the former Hazelwood Mine to a safe, stable and sustainable landform capable of supporting productive land uses.	Spatial relevance: the construction of the SOTS onshore transmission system will have workforce and material travelling from the wider transport network considered such as Morwell. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that rehabilitation works will overlap with the construction and operations of SOTS. Potential cumulative risk pathway: construction and operation of the Hazelwood Rehabilitation Project could impact traffic efficiency and road infrastructure in the vicinity of the wider network near Morwell.	Tier 2 (Medium)	For the purposes of this assessment, it is expected that routes for the Hazelwood Rehabilitation Project will overlap with SOTS construction traffic especially near Morwell and Hazelwood which are part of the wider network considered for SOTS. However, it is assumed that the project traffic volume will not be significant enough to have adverse impact to traffic efficiency and road infrastructure as it will only affect the wider network.
Loy Yang Battery Energy Storage System (BESS)	Approved	The Loy Yang BESS is a 200MW, two-hour grid-scale battery to be situated at Loy Yang power station. The existing power station is set to be closed in 2035.	Spatial relevance: the Loy Yang BESS is to be located on the SOTS primary access route for vehicles travelling between Morwell and the project area. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that construction periods could overlap. Operational periods will overlap. Potential cumulative risk pathway: construction and operation of the Loy Yang BESS could impact traffic	Tier 1 (High)	For the purposes of this assessment, it is expected that routes for the Loy Yang BESS will overlap with SOTS construction traffic for vehicles travelling between Morwell and the SOTS project area. However the impact will be minimal due to the number of vehicles expected to travel for Morwell and the roads expected to have sufficient

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
			efficiency and road infrastructure on the wider network as traffic routes are likely to be shared.		capacity to facilitate traffic for both projects.
Marinus Link	Referred	Marinus Link is a proposed 1500 megawatt capacity undersea and underground electricity connection to further link Tasmania and Victoria as part of Australia's future electricity network.	Spatial relevance: the Marinus Link transmission route is expected to run through to Hazelwood, therefore the projects will likely share routes. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the project timeframes, it is possible that construction periods could overlap. Operational periods will overlap. Potential cumulative risk pathway: construction and operation of the Marinus Link could impact traffic efficiency and road infrastructure in the vicinity the SOTS onshore transmission system near Hazelwood.	Tier 1 (High)	Given that Marinus Link construction is expected to be completed in 2030 and operations to follow until 2071. It is assumed that construction periods could overlap with operational periods likely to overlap. The proposed route for Marinus Link is expected to run through to Hazelwood, therefore close proximity to the SOTS wider project road network. Potential for construction traffic route to have marginal overlap with primary access route for Star of the South. However the impact will be minimal due to the number of vehicles expected to travel through Hazelwood and the roads expected to have sufficient capacity to facilitate traffic for both projects during operational periods.
Seaspray Solar Farm	Referred	Seaspray Solar Farm is a 4.95MW DC Solar Power Farm under development in Stradbroke, Victoria	Spatial relevance: the Seaspray Solar Farm is to be located north of the SOTS transmission alignment. Therefore it is likely that traffic and transport impacts would apply to both projects.	Tier 2 (Medium)	Assumption made that the traffic routes will overlap with the primary route for Star of the South, expected to be minimal operational traffic

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
			Temporal relevance: based on the project timeframes, it is expected that operational period will overlap with the construction and operation of SOTS. Potential cumulative risk pathway: operation of the Seaspray Solar Farm could impact traffic efficiency and road infrastructure on the wider network as traffic routes are likely to be shared.		volumes. The Seaspray Solar Farm is expected to be operational late 2025. Due to the proximity with the wider network for Star of the South, there will likely be operational traffic during the construction and operation of the Star of the South. However, the operational traffic for the solar farm is only expected to be 5 employees daily.
South East Australia Carbon Capture and Storage Project (SEA CCS Project)	Referred	The SEA CCS Project is a facility to compress, dehydrate, transport and store carbon dioxide (CO2) in the depleted Bream oil and gas reservoir. Planned new pipeline on land between Longford and Dutson Downs.	Spatial relevance: the project is connecting in Longford, approximately 20km north of the SOTS project area. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the timeframes, it is possible that operation of the SEA CCS Project will overlap with the construction and operations of SOTS. Potential cumulative risk pathway: operation of SEA CCS Project could impact traffic efficiency and road infrastructure in the vicinity of the wider network near Longford.	Tier 2 (Medium)	For the purposes of this assessment, it is expected that routes for operation traffic of the SEA CCS Project will overlap with SOTS construction traffic especially near Longford. However, it is assumed that the typical operation traffic volume will not be significant enough to have adverse impact to traffic efficiency and road infrastructure.
Tasmanian Gas Pipeline	Operational	A transmission pipeline operating and transporting gas from southern Victoria to northern Tasmania. The pipeline is 740 km in length, including approximately 300km of sub-sea pipeline	Spatial relevance: the project is connecting in Longford, approximately 20km north of the SOTS project area. It is likely that traffic and transport impacts would apply to both projects. Temporal relevance: based on the timeframes, the operation of the Tasmanian Gas Pipeline will	Tier 1 (High)	For the purposes of this assessment, it is expected that routes for operation traffic of the Tasmanian Gas Pipeline Project will overlap with SOTS construction traffic especially near Longford.

Project or action	Stage	Project description	Relevance to this assessment	Certainty	Assessment assumptions
			overlap with the construction and operations of SOTS. Potential cumulative risk pathway: operation of Tasmanian Gas Pipeline could impact traffic efficiency and road infrastructure in the vicinity of the wider network near Longford.		However, it is assumed that the typical operation traffic volume will not be significant enough to have adverse impact to traffic efficiency and road infrastructure.

13.1.1 Cumulative transport and traffic impacts

The cumulative impacts for the ten projects that have been assessed vary due to their proximity and timing in relation to Star of the South. There are several projects which have components in the immediate vicinity of the project, such as the following:

- Golden Beach-2 Gas Project, in Longford
- Gippsland Offshore Wind Transmission 2GW Project, in Giffard and connecting at VicGrid connection hub
- Great Eastern Offshore Wind Farm (Corio), in Giffard and connecting at VicGrid connection hub
- Seaspray Solar Farm, in Stradbroke
- SEA CCS Project, in Longford
- Tasmanian Gas Pipeline, in Longford.

These projects are likely to have similar routes to the Star of the South construction and operations traffic. Particularly during their construction phases, it is likely that a large amount of traffic will be generated and thus appropriate mitigation measures will need to be put in place. Whereas projects in their operational phase are likely to have a small number of employee traffic generated and the cumulative impact for the Star of the South may be minimal.

The remaining projects are closer in proximity to the wider access road network, notably:

- Delburn Onshore Wind Farm, located south-west of Morwell
- Hazelwood Rehabilitation Project, located south of Morwell
- Loy Yang Battery Energy Storage System (BESS), located in Loy Yang, on SOTS primary route – along Hyland Highway
- Marinus Link, connecting to Hazelwood, south of Morwell.

These projects will have a small amount of overlap in routes with the primary access route for the Star of the South construction and operations traffic, particularly employees and material travelling from the north-west region of Morwell and Traralgon and potentially from Melbourne. These impacts are expected to be minimal as only a proportion of the Star of the South traffic will be originating from this region and travelling on those routes.

Each of the projects discussed above would be anticipated to require traffic management plans and other mitigation measures to manage their potential impacts on the local road network. Whilst numbers of vehicles in the region may increase if each of these projects were to be constructed at the same time, this is anticipated to be manageable with appropriate mitigation measures which would be developed to the satisfaction of relevant road authorities.

14.0 Summary of mitigation, monitoring, and contingency measures

14.1 Mitigation measures

The mitigation measures that are proposed to avoid, mitigate or manage transport impacts associated with the project are summarised in Table 14-1. It is noted that an assessment and approval process that is required to be undertaken and subject to targeted stakeholder engagement support.

Table 14-1 Mitigation measures relevant to transport

Measure ID	Mitigation measure	Phase
TTP-M001	**Stakeholder Engagement Plan** Implement a Stakeholder Engagement Plan to guide consultation with stakeholders during project construction, including in relation to transport matters. This includes engagement with relevant road authorities. The plan will include mechanisms to obtain stakeholder input on transport management and protocols to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions associated with works. While the Traffic Management Plan will detail the operational and safety aspects of traffic management and control, the plan will serve a broader function, ensuring transparent and ongoing communication throughout the project lifecycle.	Construction
TTP-M002	**Traffic Management Plan (TMP)** Develop and implement a Traffic Management Plan (TMP) to support onshore construction traffic. The TMP will be established prior to construction commencement and will serve as both a mitigation and monitoring tool. It will contain measures to maintain road safety and to minimise disruption to vehicle movements on roads in the vicinity of the project, parking, on-road public transport and emergency vehicle access. The TMP will be developed in consultation with the relevant road management authorities and consider: • Planning approval conditions relating to traffic management • Relevant policy, regulatory and protocol requirements specific to construction traffic management • Review and verification of existing conditions at the time the TMP is developed • Approved project scope including finalised details on construction extents, staging, vehicle types, origins and destinations for construction materials and spoil) and peaks of construction activity • Cumulative impacts of other major projects in the local area which may change traffic conditions • Verification of the final site access strategy, including staging nodes and secondary access points and crossovers to work sites (see *TTP-M004 - Heavy vehicle transport route assessments*). Upgrades at proposed access points will be subject to approval of relevant road authorities • Other mitigation measures outlined in the transport impact assessment, including primary site access and secondary access requirements and heavy vehicle transport routes. The TMP mitigation measures will include:	Construction

Measure ID	Mitigation measure	Phase
	• Management of temporary road and traffic lane closures to maintain existing connectivity for local access, minimise the number and duration of closures and planning closures to occur outside of peak traffic periods. This includes the provision of adequate notice to local residents and communities and advisory signage such as variable message signs. A review of existing bus services should also be undertaken to confirm public and/or school bus services that may be affected prior to construction commencement and ensure minimal disruptions to school bus operation. • Development of suitable measures to ensure emergency service access (notably fire) is not inhibited by project construction activities. This will be done through engagement with emergency services to ensure access is maintained, especially during any public road and traffic lane closures. These requirements should be included as part of any broader emergency management plan that may be developed for the project. • Management of car parking associated with construction works to ensure that car parking is contained within the project boundary. If required car share or shuttle bus provisions will be considered. • Routes to be used for construction vehicles travelling to and from the construction sites, recognising sensitive receptors, local access requirements and road users' safety to be agreed upon with relevant road authorities. • Pre-construction on-site checks to assess route options for safety and clearance to potential obstructions, such as wires, structures and trees for Oversize Overmass vehicles. • Requirement for pre-construction dilapidation surveys to be undertaken. This will include documentation of the condition of pavements and other road infrastructure such as bridges and culverts for roads which are to be utilised by construction traffic. Consultation with road asset owners will be undertaken to agree on the extent of pre-condition (dilapidation survey) survey extents and survey requirements (specialist vehicle condition or photographic), road maintenance criteria, treatments and response timeframes, post construction surveys, asset hand-back agreements and remediation should the project have an adverse impact on road condition. • Engagement with public and private bus operators (particularly operators of school buses) to provide information on transport changes anticipated as a consequence of construction including road and lane closures. • Temporary speed limits as appropriate to maintain intersection safety in the vicinity of primary site access and secondary access points with non-conforming sight distances on local roads, such as a reduced speed limit of 60 - 80km/h, particularly for limited durations during higher-risk construction periods. Temporary speed limit changes are subject to approval from relevant road authorities i.e. councils for local roads and the Department of Transport and Planning for arterial roads. • Provision of signage in accordance with Australian Standard AS 1742 indicating: – Locations of temporary speed limits – Movement of trucks from site access points to and from major road connections. – Access points where trucks are not permitted to enter. • Management of the risk of adverse impacts to road condition, operational efficiency and safety for road users associated with heavy vehicle movements on construction traffic routes. Where constraints are identified, mitigation measures such as temporary traffic controls, structural risk management and local road safety enhancements should	

Measure ID	Mitigation measure	Phase
	be developed and managed as part of the project TMP in agreement with road authorities • Provision of safe access to laydown areas and site compounds • Asset maintenance measures in agreement with relevant road authorities along nominated heavy vehicle routes • Consideration of a driver's code of conduct for heavy vehicle drivers in consultation with the nominated transport contractor. The code of conduct is to include information relating to worker behaviour and adherence to the TMP and other matters (i.e. using approved routes, compliance with speed limits, parking in designated areas etc.). A list of measures to be outlined in the code of conduct include: – Inductions to inform workers of safety expectations travelling to and from the site and activities on site – Toolbox talks held at the start of the day/shift to discuss potential hazards – Regular inspections to ensure safe work practices – Vehicle registration numbers to be provided to the project for following up of any driver complaints • Protocols to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions in accordance with *TTP-M001 - Stakeholder Engagement Plan* • Verify operating and working hours for construction. These will be consulted with key stakeholders. Construction will be in accordance with the approvals for unavoidable works as per EPA Victoria Publication 1834.2 • Implementation of control measures to minimise safety risk related to traffic and transport in case of inclement weather • Minimisation of dirt and debris on roads by measures such as street sweeping, covering vehicle loads and vehicle cleaning. Other measures include wheel washes and sealing of access bell mouths • Minimisation of noise and vibration impacts to sensitive receptors such as residences and schools by altering timing of travel to ensure reduced major works impacts where reasonably practicable (for example Woodside Primary School) • Minimisation of the need to transport waste from the site by reuse of materials where reasonably practicable. The TMP would set out a framework for subsequent development of work site specific TMPs by selected construction contractors where required. These specific TMPs would include further detail on the proposed management of transport issues on individual sites.	
TTP-M003	**Road safety audits (RSAs)** Road safety audits (RSAs) will be undertaken during the detailed design phase and prior to construction commencement to confirm the adequacy of roads for the proposed construction activities. These would indicatively occur at: • Access points i.e. staging nodes and secondary access points onto both minor and major roads • Access roads and roads to be used and their intersections with the public road network • Along Hyland Highway (Traralgon Creek Road) and Hazelwood Road due to the crash history.	Construction

Measure ID	Mitigation measure	Phase
	RSAs will include consideration of emergency vehicle access and if road surface upgrades are required. RSAs will be completed by a pre-qualified RSA auditor from the Department of Transport and Planning and be independent to the project.	
TTP-M004	**Heavy vehicle transport route assessments** An assessment of the proposed B-Double and Oversize Overmass transport routes between origins and destinations for oversize, loads, bulk materials and spoil will be undertaken once these have been confirmed. This will be undertaken prior to construction commencement and will include investigation of clearance to potential obstructions, such as wires, structures (bridges and culverts) and trees. The assessment will be completed by a transport specialist and conducted in consultation with relevant road authorities and other stakeholders and will identify any additional mitigation measures required.	Construction
TTP-M005	**Site access strategy** A site access strategy will be developed in consultation with relevant road authorities and other stakeholders such as landowners, prior to construction commencement. The strategy will focus on locations and arrangements for site access points (primary and secondary) that will be investigated further to ensure safe entry and egress for construction vehicles (including heavy vehicles). This will include consideration of potential road section upgrade and appropriate design of access points intersecting with the public road network as required. It will take into consideration the existing local plantation traffic access and movements and other local amenities or facilities (including parks and reserves) in the vicinity of the access points. During detailed design the posted speed limit of roads intersecting with site access points will be reviewed and verified, where appropriate sight distances at site access points cannot be achieved. Any temporary speed limit change that may be considered is noted to be subject to approval from relevant road authorities i.e. councils for local roads and the Department of Transport and Planning responsible for arterial roads.	Construction

15.0 Summary of implications under relevant legislation

This study has assessed the impacts of construction and operation of the project on transport assets and values to be protected.

The significance of the impacts has been assessed in accordance with the evaluation framework, based on applicable legislation, policy and standards and the evaluation objectives and environmental significance guidelines arising from the government terms of reference established to guide the assessments.

The following sections summarise these identified impacts under the relevant Commonwealth and Victorian legislation.

15.1 Commonwealth

In relation to the evaluation objectives set out in the Star of the South EIS Guidelines, the project would not have significant impacts on traffic and transport for the following reasons:

- The EIS guidelines do not include a specific requirement to consider traffic or transport impacts due to the project (except for in relation to the transport of dangerous goods or waste which are addressed in Technical report J: Soil and waste and Technical report I: Surface water, and in relation to vehicle traffic lighting impacts on wildlife which are addressed in Technical report G: Onshore ecology). Transport impacts generated by the project are unlikely to impact a matter of national environmental significance.
- No other specific commonwealth legislation or policy with regards to transport is relevant to the project.

15.2 Victorian

In relation to the evaluation objectives set out in the Star of the South EIS Guidelines,, the project would not have significant impacts on traffic and transport for the following reasons:

- The project is not expected to disrupt existing or proposed traffic and transport assets on a long-term basis; where impacts may occur on a temporary basis or related to amenity, it is considered that mitigation measures would negate or minimise this impact.
- The project is consistent with State and local policies and planning scheme provisions (refer to Section 4.1).

16.0 Conclusion

The purpose of this report is to assess the potential transport impacts associated with the Star of the South Offshore Wind Farm to inform the preparation of the EIS/EES required for the project. A summary of the key assets, values or uses potentially affected by the project, and an associated assessment of transport impacts and recommended mitigation measures, are summarised below.

Existing environment

An existing transport conditions assessment was undertaken, which was informed by desktop reviews, site visit, crash/traffic data analysis and review of relevant policies and legislation. The key existing condition findings include:

- The major highway and arterial roads were observed within the study area to be lightly trafficked. The roads were found to be generally in good condition, with sealed roads, good delineation provided and no apparent pavement defects. The following observations have been made of roads initially proposed to provide access to the project work sites considered:
  - All site access roads form a priority intersection with their respective major road connection. Some of these were observed to have restricted sight distance upon entering the major road.
  - Several site access roads were observed to be unsealed, gravel local roads

  - Proposed site access roads were observed to have limited traffic volumes.
- Traffic volume data was collected from DTP, Wellington Shire Council and Latrobe City Council. Peak hours were identified as AM 6-7am, PM 6-7pm and midday. The 2020 volumes were uplifted to 2028 and the 2028 morning, evening and midday road peak hour one-way traffic volumes against the outlined one-way road capacity metrics. All roads are operating within their respective theoretical mid-block capacity.
- There are a few dwellings located within the vicinity of the project area and it is noted that pedestrian and cycling activity may occur on the major roads as there are several parks and reserves located within the study area.
- There are no public bus services and several school bus services that operate within the immediate study area. In the wider network, several bus services operate including:
  - The Yarram – Traralgon via Gormandale bus service operates along Gormandale-Stradbroke Road and Hyland Highway three times a day during weekdays and twice a day during the weekend.
  - Bus routes 3 Traralgon – Churchill operates four to five time a day along Hazelwood Road
  - Bus route 7 Traralgon – Churchill operates once a weekday along Hazelwood Road
- There are no railway lines or associated stations near the road network anticipated to be utilised to access the project area.
- Victoria crash data was analysed for the last five years of available crash data, between 2020 to 2024. In the immediate project area, there were a total of five crashes recorded along South Gippsland Highway. In the wider network, there is a concentration of crashes recorded along the Hyland Highway, between the Gormandale Nature Conservation Reserve, north of Oakes Road and Gormandale-Stradbroke Road.

Construction impact assessment

During construction, potential impacts on the transport network include:

- Diminished safety related to project construction traffic, including heavy vehicle use of the public road network
- Disruption of the public road network including public transport due to proposed road and lane closures
- Deterioration of road conditions due to use of the public road network by project heavy vehicles.

These would be managed through the implementation of standard traffic management measures typically applied for projects of this scale and nature and incorporated into a TMP. The key findings of the construction phase impact assessment were as follows:

- Capacity: the analysis included anticipated traffic generated by the project construction across morning peak, afternoon peak and midday peak and flow diagrams were established. SIDRA Intersection was used to model key staging node intersections and wider intersections across the study area which will be impacted in each of the peak periods. The intersections volumes assessed are within acceptable capacity metrics.

  The impact to the road network due to the project traffic is expected to be low as the road network's capacity is expected to be able to absorb temporary increases in traffic volumes with minor travel delays. The implementation of the mitigation measures, such as TMP and alternate routes and access measures, are expected to support traffic performance.
- Heavy vehicle route assessment: preliminary routes for B-Doubles and OSOM vehicles routes have been established based on the restrictions of the study area roads. Traffic management would be required and should be investigated as part of a TMP. Heavy vehicle transport route assessments are recommended to determine the final vehicle routes for each vehicle type.

- Site access and road upgrades: review was undertaken of the access points (staging nodes and secondary access points) and roads to be used by the project during construction. There were staging nodes and road sections identified which will require upgrades or alterations. A site access strategy is to be developed to ensure that each of the access point intersections provide safe use for all road users. This includes considerations for newly constructed access roads, potential road section upgrades and provision of appropriately designed site access points intersecting with the local road network.
- Road and lane closures: all road and lane closures are anticipated to be managed as part of a TMP. This includes traffic detours and traffic management measures such as traffic controllers and signage. Delays to motorists and public transport services are expected to occur. Local property access is expected to be maintained during the closures.

Overall, impacts to the transport network during construction can be managed through measures described in a TMP for the project.

Operation impact assessment

Transport impacts identified in the operation phase of the project are considered negligible for the road network and intersection capacity due to the relatively low traffic volumes and minor traffic anticipated to be generated during this phase.

Decommissioning impact assessment

Potential impacts associated with decommissioning works for the project are expected to be the same or similar to those associated with the construction phase. However, the overall level of impact would be lower due to the nature of decommissioning activities as it is anticipated that most of the below ground transmission infrastructure would be left in place. These impacts should also be managed with the implementation of the same mitigation measures as those proposed for construction impacts.

Mitigation and contingency measures

This assessment has identified impacts and risks and proportional mitigation measures to address the potential risks and impacts identified.

Potential impacts on transport due to the project will be avoided, minimised or managed to required standards through the recommended mitigation measures provided in Table 14-1.

17.0 References

The following reports and / or parties have been referenced or consulted in the preparation of this report:

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