Hexham Wind Farm

Chapter 25

Traffic and transport

WIND PROSPECT

25.1 Overview

This chapter describes the existing road and traffic conditions surrounding the project and its transport routes and assesses impacts of the project on the surrounding road network and road users. It describes design measures that would be taken to avoid and minimise these impacts and proposed management controls that would be implemented. This chapter is based on the findings of the ***Traffic and Transport Impact Assessment*** (Appendix G) prepared by Ratio Consultants (Ratio). The assessment comprised of on-site assessment of road and traffic conditions, combined with a review of Department of Transport (DTP) and Moyne Shire Council data sources.

The road network surrounding the project site is consistent with its rural setting, designed to accommodate the transportation needs of the agricultural land uses and the low volume of traffic that typically use these roads. The road network around the project site includes unsealed local roads and arterial roads that are a mix of single and double lane sealed roads. Several other minor local rural roads extend through the project site that typically provide access to the land within and surrounding the project site. Public transport routes do not extend through the project site, but services operate on roads that would be used by project traffic. School buses operate on some roads used to access the project site.

Construction of the project would increase traffic on the surrounding road network used to access the site due to the transport of construction staff, materials, plant and equipment, and wind turbine components. This additional road use would require the implementation of management measures including upgrading some sections of roads to maintain the existing level of service that the road network currently provides the community.

The project would also require the use of oversize and overmass vehicles to transport the large components that make up the wind turbines and supporting infrastructure, and a route has been selected that would minimise impacts on other road users. Port of Portland is the preferred port of entry for all wind turbine generator and other major imported componentry. The Port of Geelong is identified as an alternate option for key component delivery. To transport these large project components to the project site, several intersections along the route would be modified to accommodate the long vehicles and their wider turning circles.

The project has adopted design measures and proposed road upgrades to mitigate impacts on the road network, where possible. These include:

- design of a network of internal access tracks to minimise the use of public roads for internal traffic between different parts of the project site
- use of an on-site quarry to avoid the need to truck-in aggregate/crushed rock
- road upgrades to enable project access while minimising traffic impacts on existing road users.

A range of other management measures have been committed to mitigate impacts on the road network and its users. This would include the preparation and implementation of a detailed Traffic Management Plan in consultation with Moyne Shire Council and DTP, and 'road maintenance and management agreements' with both of these authorities.

Based on the existing traffic volumes and usage and proposed public road upgrades, Ratio concluded that with the implementation of management controls outlined in Section 15.9, the standard and capacity of existing road infrastructure is appropriate to accommodate project traffic and the potential impact of project generated traffic on road function and safety. Similarly, local traffic impacts within the project site during all project phases can be suitability and safely managed. Subject to the resolution of specific traffic management requirements, the identified over-dimensional vehicle route option from the Port of Portland or Port of Geelong to the project site for the transport for wind turbine and other imported major components has been assessed and is suitable for oversize and overmass transport vehicles. Residual impacts were considered negligible or minor.

25.2 EES objectives and key issues

The EES scoping requirements specify the following evaluation objective and key issues, outlined in Table 25.1, relevant to traffic and transport, which have guided this assessment.

Table 25.1 EES evaluation objective and key issues

Evaluation objective	
Traffic and roads: *To avoid and minimise adverse effects on roads and road users during construction, operation and decommissioning of the project.*	
Key Issues	• Managing traffic disruptions for residents, businesses and travellers during the construction of the project. • Potential damage to local and regional road surfaces along transport routes and increased risk to road safety on transport routes.

25.3 Legislation, policy and guidelines

Key legislation, standards and guidelines relevant to the ***Traffic and Transport Impact Assessment*** (Appendix G) are summarised in Table 25.2.

Table 25.2 Relevant legislation, guidelines and standards

Document	Description	Relevance to project
State legislation		
Planning and Environment Act 1987	The *Planning and Environment Act 1987* establishes a framework for planning the use, development and protection of land in Victoria.	Clause 52.32 Wind Energy Facilities of the planning scheme is relevant to the project. The purposes this clause is to facilitate the establishment and expansion of wind energy projects, in appropriate locations, with minimal impact on the amenity of the area. Clause 52.32-4 states that as part of the design response access road options need to be considered.
Road Management Act 2004	The *Road Management Act 2004* provides a statutory framework for the management of road networks and the coordination of road reserves.	The *Road Management Act 2004* requires approval for any construction project that may impact on or change access to a controlled access road (site access points to external roads).
Road Safety Act 1986 Road Safety (Traffic Management) Regulations 2019	The Traffic Management Regulations set out the responsibilities in implementing traffic control devices on roads, including for traffic management at worksites.	Relevant to works within public roads to deliver the site access intersections and/or to upgrade public roads for project use. The transport impact assessment uses this framework as a reference to prescribe traffic management requirements.
Heavy Vehicle National Law Application Act 2013	Provides for the application of the Heavy Vehicle National Law to regulate the use of heavy vehicles above 4.5 tonnes within the State of Victoria and establishes the National Heavy Vehicle Regulator as the statutory authority to administer the Heavy Vehicle National Law.	Provides a nationwide compliance framework and processes for licensing, registration, road and access management, vehicle standards dimension and mass limits, and driver fatigue management.

Document	Description	Relevance to project
Standards / Guidelines		
Planning Guidelines for Development of Wind Energy Facilities (Planning Guidelines) (DTP, 2023s)	These guidelines provide a set of consistent operational performance standards to inform the assessment and operation of a wind energy project; and guidance as to how planning permit application requirements might be met.	Section 4.2.2 Seek Expert Advice of the Planning Guidelines states that an application should be accompanied by a planning assessment including an assessment of the traffic impacts (amongst other impacts) of the proposal prepared by suitably qualified persons. Model planning permit conditions referenced within the Planning Guidelines in relation to traffic management for wind energy facilities include consideration of vehicle access points, pre-construction public road surveys, Traffic Management Plans and traffic upgrade works.
Moyne Shire Council Municipal Road Management Plan (Moyne Shire Council, 2021d)	Prepared under the *Road Management Act 2004* to establish a framework for the classification, management and maintenance of local roads administered by Moyne Shire Council.	Provides guidance on road standard (cross section and pavement elements) against road classifications and expectations of maintenance. The Municipal Road Management Plan was considered to assess project impacts on local roads within the investigation area.
Austroads Guide to Road Design (AGRD) Part 4 (Austroads, 2023)	The AGRD is a primary national reference for the development of safe, economical and efficient road design.	AGRD Part 4 provides guidance on intersection design such as design considerations, design process and choice of design vehicle.
Austroads Guide to Traffic Management (AGTM) Part 3 (Austroads, 2020)	The AGTM is a comprehensive reference for the development of safe, economical and efficient road design.	ADTM Part 3 provides a framework for transport studies and analysis methodologies.
Standards Australia: AS1742.3-2019 Manual of uniform traffic control devices – traffic control for works on roads	AS1742.3-2019 specifies the traffic control measures and devices to be used to warn, instruct and guide road users in the safe negotiation of work sites on roads and within road reserves.	A Traffic Management Plan will be required for works in Hamilton Highway, which will be submitted to Regional Roads Victoria for review.
Austroads Guide to Temporary Traffic Management (Austroads, 2021)	The Austroads Guide to Temporary Traffic Management is a comprehensive reference for the development of Traffic Management Plans and Traffic Guidance Schemes to warn, instruct and guide road users in the safe negotiation of works sites on and within road reserves.	A Traffic Management Plan will be required for works in Local Roads, which will be submitted to Moyne Shire Council for review.

25.4 Investigation area

The traffic and transport assessment investigated transport impacts on the local roads within and surrounding the project site (Figure 25.1).

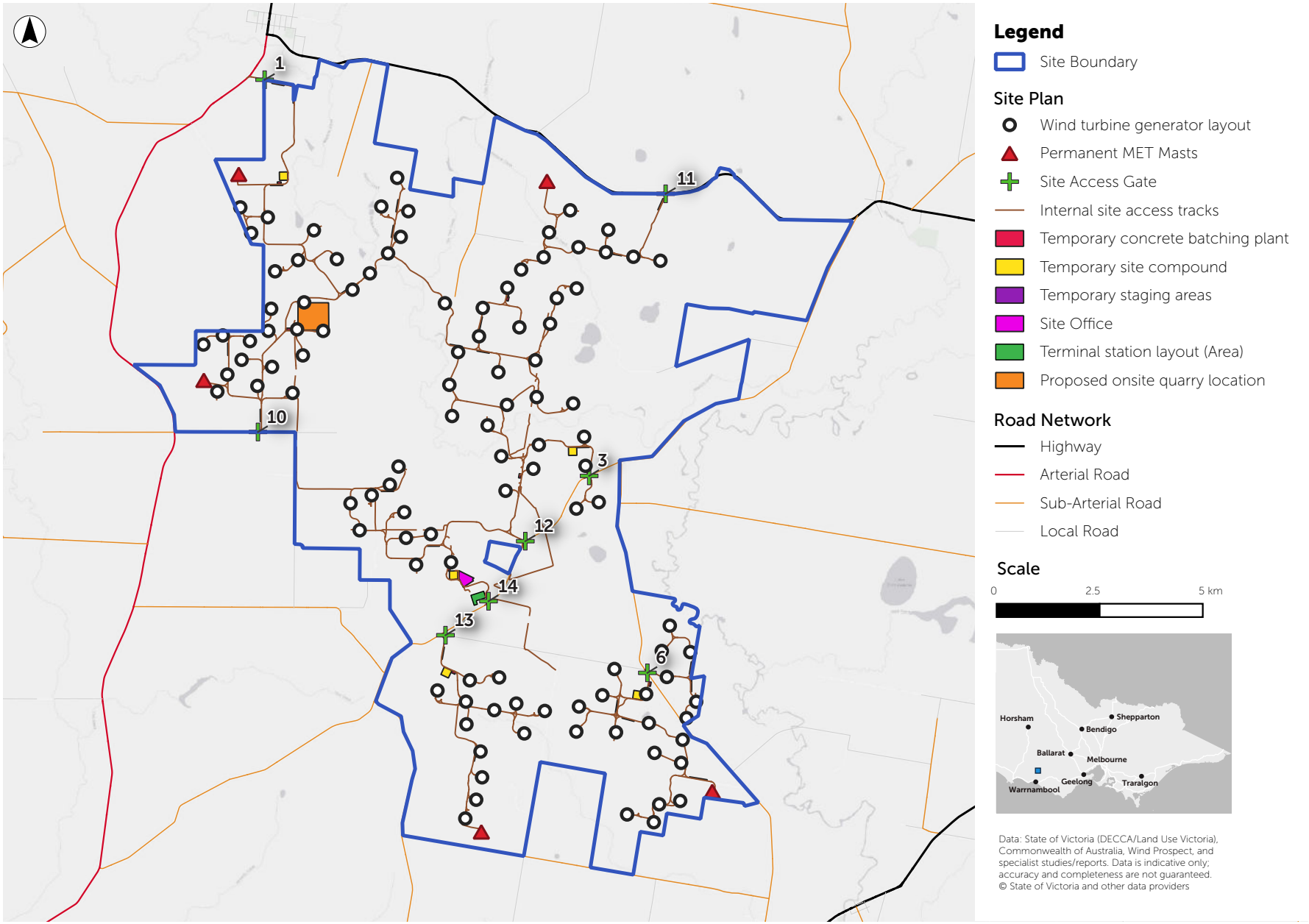


Figure 25.1 Local road network

25.5 Method

The methods used to assess traffic and transport included:

- identification of key traffic sources and/or destinations
- identification of key road networks and potential access route options between the project site and source locations for quarried material and project infrastructure
- data from DTP and Moyne Shire Council on the standards and condition of arterial and local road networks
- desktop review of relevant traffic volumes, road characteristics and accident data
- operational and transport characteristics of known other projects have been sourced
- inspection of the transport routes around the project site and key over-dimensional / oversize and overmass routes (completed March 2023); and
- traffic modelling to predict traffic during all project stages and assessment of potential traffic effects.

25.5.1 Impact Rating

The potential impacts of the project were assessed according to a consequence rating criteria derived to classify the effect level of potential impacts and any residual impacts. These rating criteria are presented in Table 25.3.

Table 25.3 Traffic Effects Consequence Rating Criteria

Level	Qualitative Description
Negligible	Local, small-scale, easily reversible change in road user experience. Road users can easily adapt or cope with change. No detectable change in a local transport operational setting. Negligible adverse impact on traffic conditions or road safety.
Minor	Short-term recoverable change in road user experience. Road users have substantial capacity to adapt and cope with change. Short-term, reversible changes in a local transport operational setting. Detectable change in traffic conditions and minor increase in risk of collisions.
Moderate	Medium-term recoverable change in road user experience. Road users have some capacity to adapt and cope with change. Long-term but limited changes to transport operational setting that are able to be managed. Detectable change in traffic conditions and moderate increase in risk of collisions.
Major	Long-term recoverable change in in road user experience. Road users have limited capacity to adapt and cope with change. Long-term, significant changes resulting in risk to the function of the transport network beyond the project site. Traffic congestion and delays exceed acceptable levels and high risk of collisions.
Severe	Long-term, irreversible change in road user experience. Road users have limited capacity to adapt and cope with change. Irreversible, significant changes resulting in widespread risks to the function of the transport network at a regional scale. Traffic congestion and delays severely restrict accessibility and high increase in risk of collisions or an increase in number of fatalities.

25.6 Existing conditions

The assessment of existing conditions characterises and summarises the existing road network and traffic conditions of the investigation area based on the findings from the desktop assessment and on-site inspections.

25.6.1 Existing road network and use

The road network surrounding the project site contains mix of higher order sealed roads as well as lower order sealed and unsealed rural access roads. Key roads that intersect the project site are described below.

Arterial roads

Hamilton Highway

The Hamilton Highway (B140), managed by DTP, extends along the northern boundary of the project site between Woolsthorpe-Hexham Road in the east and Warrnambool-Caramut Road in the west. It provides a key east-west arterial route across south-western Victoria, linking Geelong to Hamilton via numerous townships including Inverleigh and Mortlake. Along the project site boundary, Hamilton Highway is a seven-metre wide, two-lane sealed carriageway with a 60-metre wide road reserve. From visual inspection, the pavement condition is generally very good, with recent improvement works including pavement upgrades and barrier installations.

The posted speed limit is 100 kilometres per hour, reducing to 70 kilometres per hour at the approach to Caramut and 80 kilometres per hour at the approach to the Hexham township. Hamilton Highway forms part of the gazetted B-double and oversize and overmass road network.

From traffic volume information sourced from DTP, on average around 930 vehicles currently use Hamilton Highway per day, including 180 heavy vehicles per day.

Warrnambool-Caramut Road

Warrnambool-Caramut Road (C174) extends along the western boundary of the project site and consists of a of 3.5-metre wide, two-laned sealed carriageway with a 60-metre wide road reserve. Road shoulders are typically unsealed or grassed, and from a visual inspection, the pavement condition along the project site boundary is good. Warrnambool-Caramut Road is managed by DTP.

The posted speed limit is 100 kilometres per hour, reducing to 70 kilometres per hour at the approach to Caramut and through the Woolsthorpe township to the southwest of the project site. Warrnambool-Caramut Road forms part of the gazetted B-double road network.

From traffic volume information sourced from DTP, on average around 350 vehicles currently use Warrnambool-Caramut Road per day, including 40 heavy vehicles per day.

Local roads

Local roads within the investigation area include higher order sealed rural link roads and collector roads, as well as lower order sealed and unsealed rural access roads that typically provide property access and local connections.

A summary of key local roads within the investigation area is provided in Table 25.4.

Moyne Shire rural road hierarchy

Link: Part of major truck and/or passenger vehicle route through the shire that is not a defined arterial road.

Collector: Provides a connection between traffic generators and destinations, or between arterial roads, link roads and destinations.

Access: Main purpose is to provide access to adjoining properties.

Table 25.4 Construction standard and status of local roads

Road	Section	Classification	Construction standard	Comments
Woolsthorpe-Hexham Road	Hamilton Highway to Hexham-Ballangeich Road (9 kilometres)	Access – Rural	Sealed – single lane	Approximately 4 metres wide with gravel shoulders. Road pavement condition is fair to good. Default speed limit of 100 kilometres per hour.
	Hexham-Ballangeich Road to Warrnambool-Caramut Road (16.8 kilometres)	Collector – Link	Sealed – two lane	Approximately 7 metres wide with grassed verges. Some segments to the south-west of the project site remain as a 4-metre carriageway only, with short sections within the project site providing a narrow two-way carriageway of between 5.5-6 metres. At the intersection with Hexham-Ballangeich Road, priority is provided between Woolsthorpe-Hexham Road south and Hexham-Ballangeich Road. Road pavement condition is very good with some sections recently reconstructed. Default speed limit of 100 kilometres per hour.
Hexham-Ballengeich Road	Woolsthorpe-Hexham Road to Connewarren Lane (1 kilometre)	Collector – Link	Sealed – two lane	Approximately 6 metres wide with gravel shoulders. Reconstructed alongside intersection improvement works at the Hexham-Ballangeich Road / Connewarren Lane intersection. Default speed limit of 100 kilometres per hour for a rural road.
	Connewarren Lane to Gordons Lane (11 kilometres)	Access – Rural	Sealed – single lane	Approximately 4 metres wide with unsealed verges on either side. Default speed limit of 100 kilometres per hour for a rural road.
Connewarren Lane	East of Hexham-Ballangeich Road	Collector – Link	Sealed – two lane	Approximately 7 metres wide with gravel shoulders of 0.5 metres in width. Provides access to the Mortlake Saleyards and Mortlake Power Station. Posted speed limit of 100 kilometres per hour.
Immigrants Lane	West of Hexham-Ballangeich Road	Access - Rural	Unsealed – Single Lane	Grass verges.

Road	Section	Classification	Construction standard	Comments
Hamiltons Lane	East of Warrnambool-Caramut Road	Access - Rural	Unformed	Provides property access only. Significant level change between the Warrnambool-Caramut Road carriageway and surface of Hamiltons Lane surface immediately between the intersection. A guardrail is installed along the western side of Warrnambool-Caramut Road to the north and south of the intersection.

25.6.2 Sensitive road users

Public Transport

No regional bus, coach or school bus routes currently extend through the project site, however a regional bus/coach route runs along the Hamilton Highway that forms the northern border of the project site (Figure 25.2). Current school bus routes relative to the project site are shown in Figure 25.3. These routes include Woolsthorpe-Hexham Road, Grassmere-Hexham Road and Hexham-Ballangeich Road, as well as arterial roads identified for haulage of construction materials and the oversize and overmass route.

As school bus routes are dependent on where students live relative to their schools, these routes may alter between the preparation of this EES and the construction phase of the project. Engagement with local and regional schools would be required prior to construction vehicles mobilising to the project site to understand the operations of school buses at the time.

Pedestrians and Cyclists

There is no bicycle infrastructure along any of the roads within the project site or the sections Hamilton Highway and Warrnambool-Caramut Road relied on by the project (outside of townships). There is also no pedestrian infrastructure along roads within the project site.

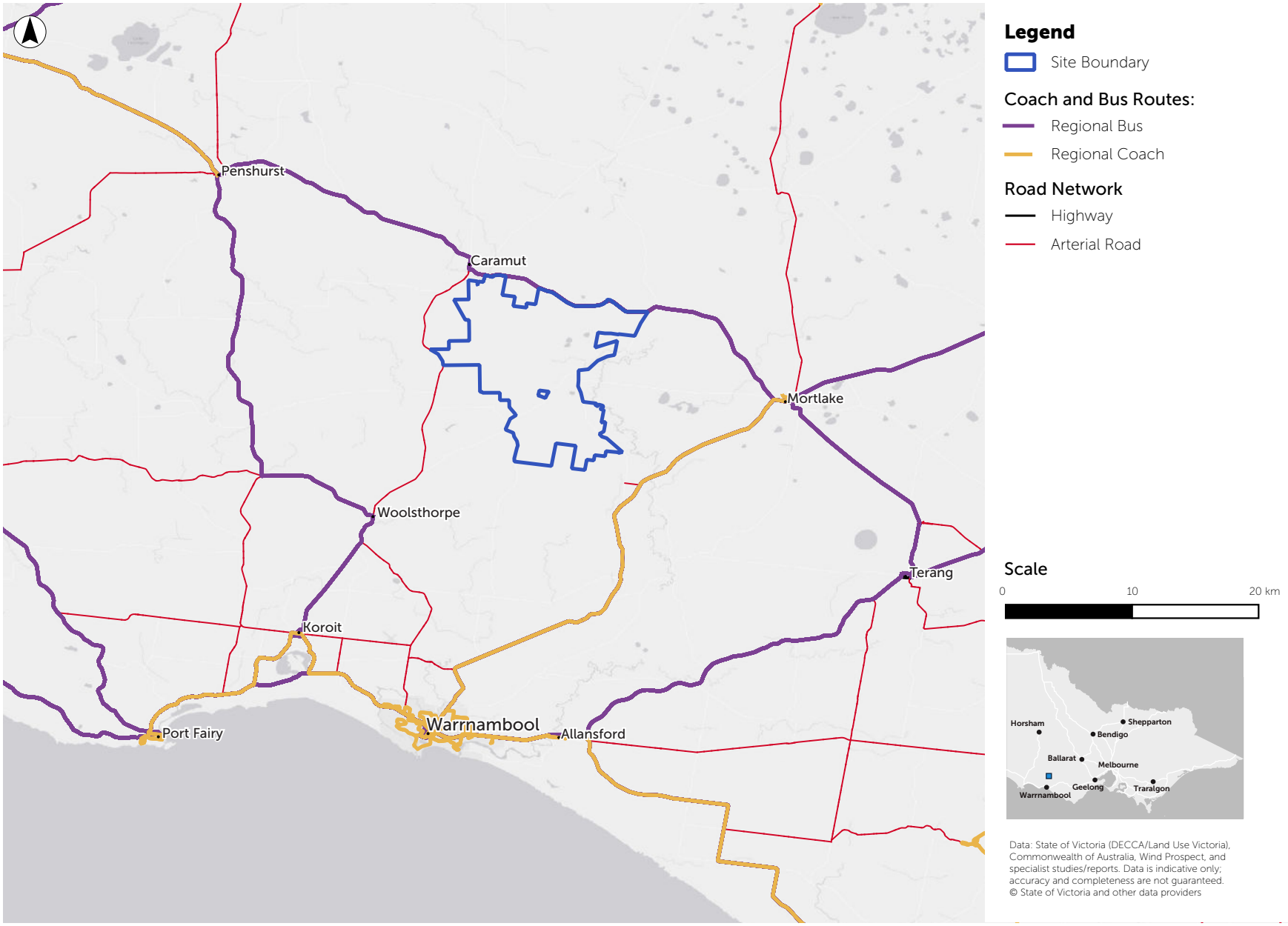


Figure 25.2 Regional Coach and Bus Routes *(Source: Transport Victoria Open Data)*

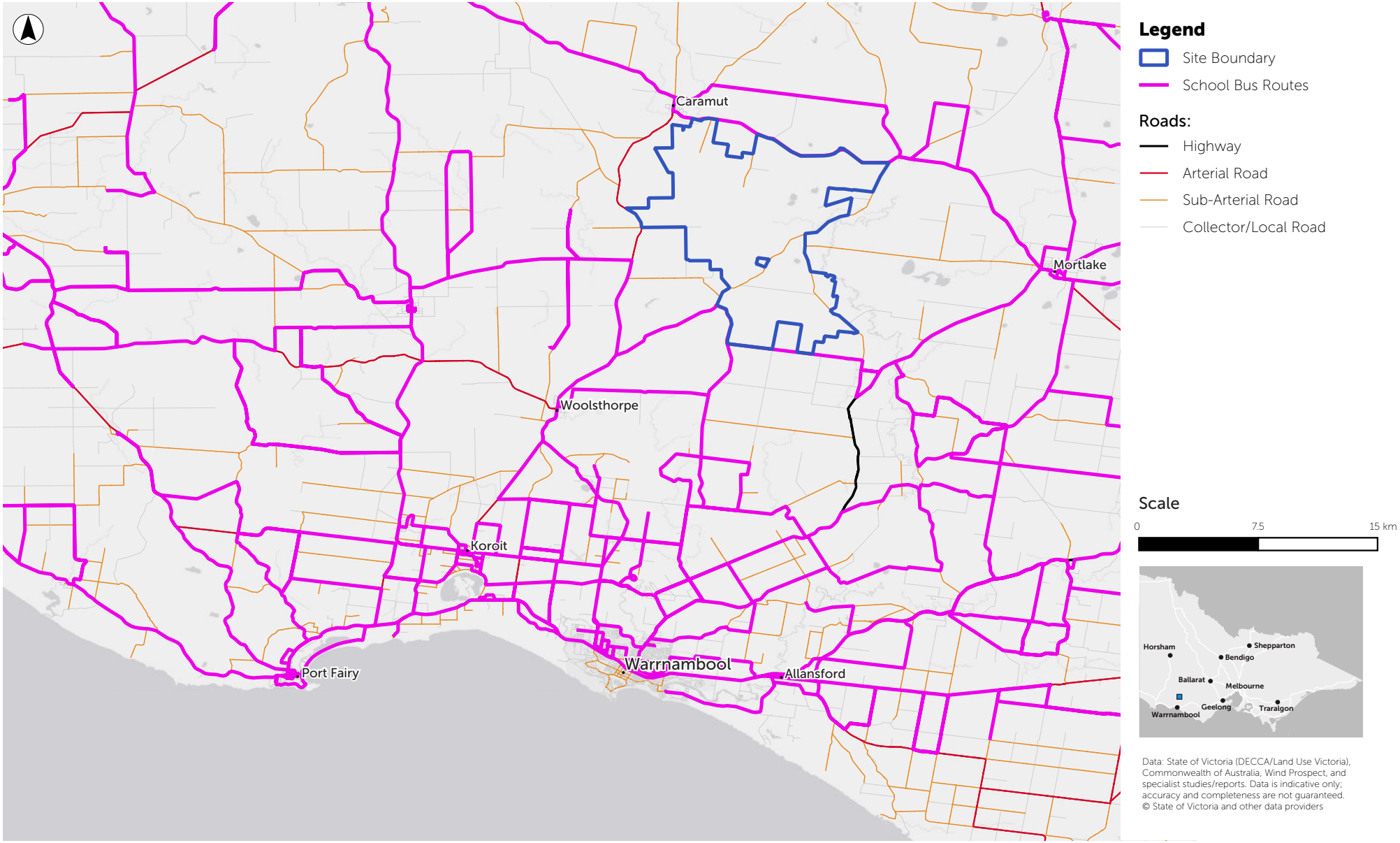


Figure 25.3 **Current School Bus Routes** *(Source: Department of Transport and Planning)*

25.7 Project transport and access elements

25.7.1 Project access

The project site would be accessed via a network of approximately 151 kilometres of new internal access tracks, with upgrades to approximately 16.7 kilometres of existing access tracks also proposed.

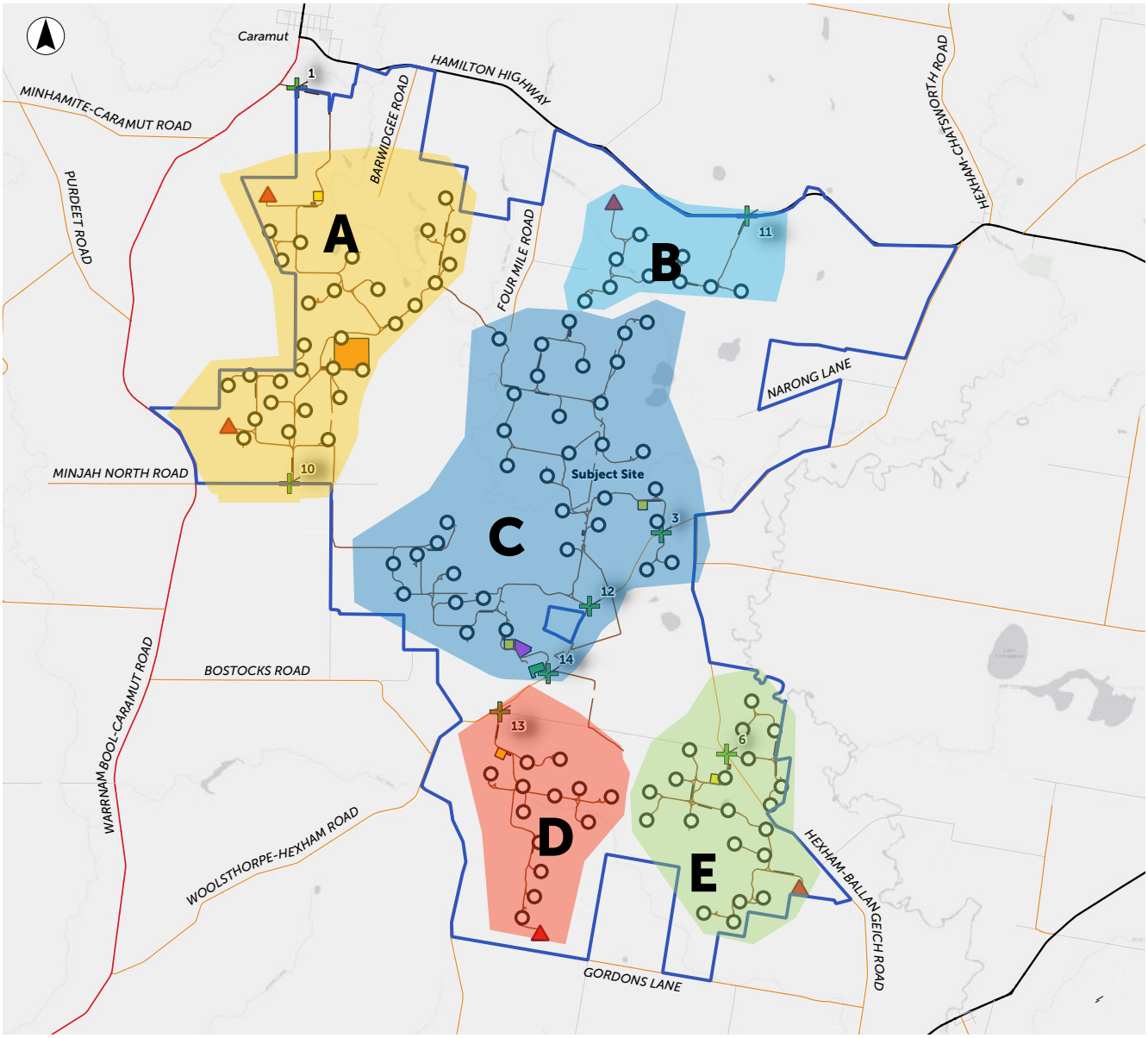
Eleven site access points are proposed from one arterial road and six local roads, being:

- Woolsthorpe-Hexham Road;
- Hexham-Ballangeich Road;
- Keillors Road;
- Hamilton Highway; and
- Warrnambool-Carramut Road.

Gates are proposed in 10 locations from the road network across one arterial and five local MSC roads, being:

- One location on Hamiltons Lane;
- Four locations from Woolsthorpe-Hexham Road;
- Two locations from Hexham-Ballangeich Road; and
- One location on each of Immigrants Lane, Keillors Road and Hamilton Highway.

Gates locations and internal access tracks in context with the existing road network are shown in Figure 25.4.



Legend

Site Boundary

Site Plan

- Wind turbine generator layout
- Permanent MET Masts
- Site Access Gate
- Internal site access tracks
- Temporary concrete batching plant
- Temporary site compound
- Temporary staging areas
- Site Office
- Terminal station layout (Area)
- Proposed onsite quarry location

Road Network

- Highway
- Arterial Road
- Sub-Arterial Road
- Local Road

2.5 5 km

Figure 25.4 Site access points and access road network

25.7.2 Transport elements

Construction

The construction of the project would occur across a 24-month period (approximately) and would include the following key work phases to be undertaken on a rolling basis:

- external works, including road and intersection upgrades, and vegetation management
- delivery of key plant and construction vehicles, construction of initial internal access tracks to be used for the delivery of construction materials, and the establishment of on-site quarrying and water sourcing (if pursued)
- civil construction works, including the construction of remaining internal access tracks, wind turbine hardstand areas and footings, terminal station and internal power infrastructure
- wind turbine delivery, including wind turbine blade delivery, tower section delivery and other associated wind turbine components
- wind turbine generator installation, using mobile cranes and associated infrastructure.

Transport of external construction material

The establishment of an on-site quarry to extract aggregate for use in the construction of internal access tracks and hardstand areas is subject to a separate approvals process. If approved, access track and hardstand material would be transported using access tracks within the project site, in preference to external roads. Woolsthorpe-Hexham Road would be the primary road to be used to transfer material between the construction areas as required.

If on-site materials sourcing is not possible, material for access tracks and hardstand construction would be sourced externally from one or more of the quarries identified in Figure 25.5.

Heavy vehicle network

Proposed material haulage routes are gazetted B-double routes (with the exception of the southern part of Woolsthorpe-Hexham Road between Warrnambool-Caramut Road and Hexham-Ballangeich Road), which are suitable for vehicles likely to be transporting materials to the project site.

Haulage routes for major project components from Port of Portland and Port of Geelong rely on established oversize-overmass routes that have previously been used for other wind farm projects. Two routes have been considered from Port of Portland and a single route from Port of Geelong has been considered, with this route previously established for other wind farm projects in the Mortlake area.

Roads that form part of the identified materials haulage routes are summarised in T.

Table 25.5 Materials Haulage Route Segments

Material Source	Material Type	Road Authority	Road Name	Between	Length (kilometres)
Gillear Quarry	Lime and Sandstone	Warrnambool City Council	Buckleys Road	Gillear Quarry and Burkes Road	1.3
			Burkes Road	Buckleys Road and Tooram Road	0.7
			Tooram Road	Burkes Road and Ziegler Parade	3.2
			Ziegler Parade	Tooram Road and Princes Highway	0.5
		Department of Transport and Planning	Princes Highway	Warrnambool	8.8
			Hopkins Highway	Warrnambool to Mortlake	48.2
		Moyne Shire Council	Connewarren Lane	Mortlake and Site	18
		Total Length:			82.1
Mt Shadwell Quarry	Aggregate	Department of Transport and Planning	Mortlake – Ararat Road	Mt Shadwell Quarry and Hamilton Highway	2.5
			Hamilton Highway	Mortlake	2.2
		Moyne Shire Council	Connewarren Lane	Mortlake and Site	18
		Total Length:			22.3
Mt Napier Boral Quarry	Aggregate	Southern Grampians Shire Council	Mt Napier Road	Mt Napier Quarry and MacArthur – Penhurst Road	9.1
		Department of Transport and Planning	MacArthur – Penhurst Road	Mt Napier Road and MacArthur	20.6
			Hamilton Highway	Penhurst and Caramut	44.9
			Warrnambool-Caramut Road	Caramut to Woolsthorpe-Hexham Rd	22.8
		Moyne Shire Council	Woolsthorpe-Hexham Road	Warrnambool-Caramut Rd to Site	14.9
		Total Length:			95.3
Holcim Warrnambool (Tarrone Quarry)	Aggregate / Cement	Moyne Shire Council	Tarrone Lane	Tarrone Quarry and Penhurst – Warrnambool Road	7.5

Material Source	Material Type	Road Authority	Road Name	Between	Length (kilometres)
		Department of Transport and Planning	Penhurst – Warrnambool Road	Tarrone Lane and Woolsthorpe – Heywood Road	8.5
			Woolsthorpe – Heywood Road	Penhurst – Warrnambool Road and Woolsthorpe	10.5
			Warrnambool-Caramut Road	Woolsthorpe to Woolsthorpe-Hexham Rd	6.2
		Total Length:			47.6
Fenton Quarries	Aggregate	Department of Transport and Planning	Terang-Mortlake Road	Noorat to Mortlake	18.3
			Hamilton Highway	Mortlake	1.5
		Moyne Shire Council	Connewarren Lane	Mortlake and Site	18
			Racecourse Road	Quarry to Sisters-Noorat Road	2.8
			Sisters-Noorat Road	Racecourse Road to Noorat	2.3
		Total Length:			41.6
Salt Creek Quarry	Aggregate	Moyne Shire Council	Hexham-Woorndoo Road	Quarry to Hamilton Highway	5.0
		Department of Transport and Planning	Mortlake – Ararat Road	Mt Shadwell Quarry and Hamilton Highway	21.8
			Hamilton Highway	Mortlake	2.2
		Moyne Shire Council	Connewarren Lane	Mortlake and Site	18
		Total Length:			47

Transport of wind turbine, substation and battery energy storage system components

The Port of Portland has been identified as the preferred port of entry for wind turbine generators and other major imported componentry. Blade and hub/nacelle wind turbine components would be delivered to the project site by oversize and overmass vehicles.

The suitability of roads along the preferred oversize and overmass haulage route was assessed to identify locations where temporary works and/or infrastructure may be required to support large project vehicles. For most intersections, works required are limited to the temporary removal of signage and some roadside furniture as well as the addition of temporary hardstand within verges to allow oversize and overmass vehicles to swing wide of the road carriageway and use the road reserve. Trimming of trees or vegetation removal is also required at some intersections. Vegetation removal is further discussed in Chapter 8 – ***Biodiversity and habitat***.

Intersections along the oversize and overmass vehicle route requiring specific traffic management measures are detailed in Table 25.6.

Table 25.6 Key intersection oversize and overmass traffic management for the preferred route

Intersection	Movement	Traffic Management
Henty Highway / New Street, Portland	Vehicles approaching from the west will require the full width of Henty Highway on approach to intersection during left turn.	Temporary closure of right and left turns from Henty Highway (north) and New Street during transit.
Princes Highway / Henty Highway, Portland	To avoid street lighting and power poles, vehicles will cross median and median islands during right turn from Henty Highway to Princes Highway. There are two options which can facilitate this movement	Temporary removal of signage. Infill within Henty Highway center median swale (impact on drainage to be considered). Temporary closure of Henty Highway southbound and Princes Highway southbound during transit.
Henty Highway / Mt Baimbridge Road, Hamilton	Vehicles turning left from Henty Highway to Mt Bainbridge Road will rely on the full road width plus areas of road verges	Temporary removal of signage. Potential vegetation removal. Infill within road verges on Henty Highway and Mt Bainbridge Road. Temporary closure of the intersection during transit.
Mt Baimbridge Road / Coleraine, Hamilton	Vehicles turning left from Mt Baimbridge Road will rely on the full road width plus areas of road verges and likely track across part the roundabout island	Temporary removal of signage. Infill within road verges on Mt Bainbridge Road. Infill across part of the roundabout center island. Temporary closure of the intersection during transit.
Penhurst-Dunkeld Road / Hamilton Highway, Dunkeld	Vehicles turning from north to east will swing wide within the road reserve to avoid a HV power pole and associated stays on the inside corner of the intersection	Temporary removal of signage. Likely tree removal. Dwelling power supply pole to be relocated. Infill within road verges on Penhurst-Dunkeld Road and Hamilton Highway. Temporary closure of the intersection during transit.
Warrnambool-Caramut Road / Woolsthorpe-Hexham Road, Woolsthorpe	Vehicles turning from north to east will swing wide within the road reserve.	Temporary removal of signage. Potential vegetation removal. Infill within road verges on Warrnambool-Caramut Road and Woolsthorpe-Hexham Road. Temporary closure of the intersection during transit.

Operation

Transport for the project during operation would consist of:

- daily routine wind turbine maintenance to be carried out by two to five people
- weekly/fortnightly regular minor maintenance to be carried out by a small team. This would involve a team of no more than fifteen people attending the site, with up to four vehicles
- occasional maintenance when components of the development need to be replaced, such as replacing a gearbox. This is expected to only occur very occasionally and would be subject to approval processes with the relevant authorities
- visitors to the site, such as office-based staff and courier deliveries.

Transport activity during project operation would be limited to light vehicle traffic and maintenance vehicles. Whilst unlikely, it is also possible a crane may be required for maintenance during operations. External traffic would typically originate from/to the operations compound via Woolsthorpe-Hexham Road, with project traffic movements within the project site relying on the internal road network as much as practicable.

Decommissioning

The eventual decommissioning of the project would involve the removal of all wind turbine structures above ground and to a depth of one metre. The portion of wind turbine foundations deeper than one metre below ground level will remain in place, as well as the access tracks kept in agreement with landowners.

Transport requirements during this stage would consist of:

- the transport of plant to the project site required for the dismantling of wind turbines and other structures
- heavy vehicle movements associated with the removal of materials and componentry from the project site
- oversize and overmass movements associated with the back haulage of wind turbines and substation components from the project site.

25.8 Impact assessment

The effects of the project on roads and road users, within and around the project site, were considered for the following receptors:

- local road users (within and around the project site)
- arterial road users (external to the project site and Woolsthorpe-Heywood Road within the project site)
- public road infrastructure relied on by project traffic.

25.8.1 Impact pathways

The project has the potential to impact traffic through the following pathways:

- increased traffic volume on the existing road network, particularly during project construction
- altered traffic composition increasing the proportion of heavy vehicles and oversize and overmass vehicle traffic
- local road closures and/or deviations during project construction and decommissioning
- damage to the road network.

As a result of these changes caused by the project, the project has the potential to impact transport infrastructure and road users, including:

- disruptions and/or delays to through traffic due to oversize and overmass vehicle movements and/or works on public roads (e.g., creating access, upgrading roads)
- additional project traffic that exceeds the capacity of the road network, resulting in increased congestion and damage to roads, compromising road safety for other users
- temporary changes to public access to land within the project site, causing ongoing inconvenience to road users.

25.8.2 Design mitigation

This section highlights the design mitigation measures that have been adopted to minimise potential impacts of the project construction and operation on traffic and transport.

Internal access tracks

The project has been designed to rely on internal access tracks for movements around the project site during construction to minimise the volumes of project traffic on public roads. All vehicle movements, including water haulage and the haulage of any material quarried on-site, will use the project's internal access tracks and, where necessary sections of local roads within the project site.

A reduction in access points has been achieved through visual assessment of access gates on site, avoiding the need to redesign access tracks and internal road networks during the delivery stage of the project.

Quarry selection

Subject to resolving the establishment of an on-site quarry, unsealed internal access tracks, hardstand areas and the upgrade/upkeep of local external roads used for project construction traffic will be constructed from material sourced on-site.

Prior to the establishment of the proposed on-site quarry, or in the event that on-site materials sourcing is not possible, material for road and hardstand construction will be sourced externally from one or more of the quarries identified in Figure 25.5. Where sourced from the proposed on-site quarry access track and hardstand material will be transported using internal access tracks in preference to external roads. Woolsthorpe-Hexham Road will be the primary road to be used to transfer material between the various areas within the project site as required.

Oversize and overmass and materials haulage route selection

Materials haulage routes will rely on higher order roads and/or routes gazetted as appropriate to cater for the traffic generated by the project's construction. Lower order roads have been avoided.

Where material is sourced externally for road and hardstand construction, the material would be delivered directly to the project site to reduce the number of trips between each access point and to avoid additional handling and heavy vehicle movements.

The use of external roads by internal construction traffic will be limited to the movement of construction materials not able to be stored at each work area and/or quarried aggregate (if permitted) between the central construction compound and wind farm turbine areas not accessible by internal access tracks. At the time of peak construction activity, external project traffic will add a maximum of between 820-1300 vehicle movements per day across the external road network, subject to the level of on-site materials sourcing

During construction, various techniques will be used to mitigate the production of dust, including the spraying of water (potentially with wetting or binding agents added) onto road surfaces, including internal access tracks. Refer to Chapter 16 – ***Air quality and greenhouse gas*** for further discussion on dust impacts and proposed management measures.

Haulage routes for major plant/equipment and wind turbine components are gazetted oversize and overmass routes, within the exception of roads managed by Moyne Shire Council within the project site (see Figure 25.5 and Figure 25.6).

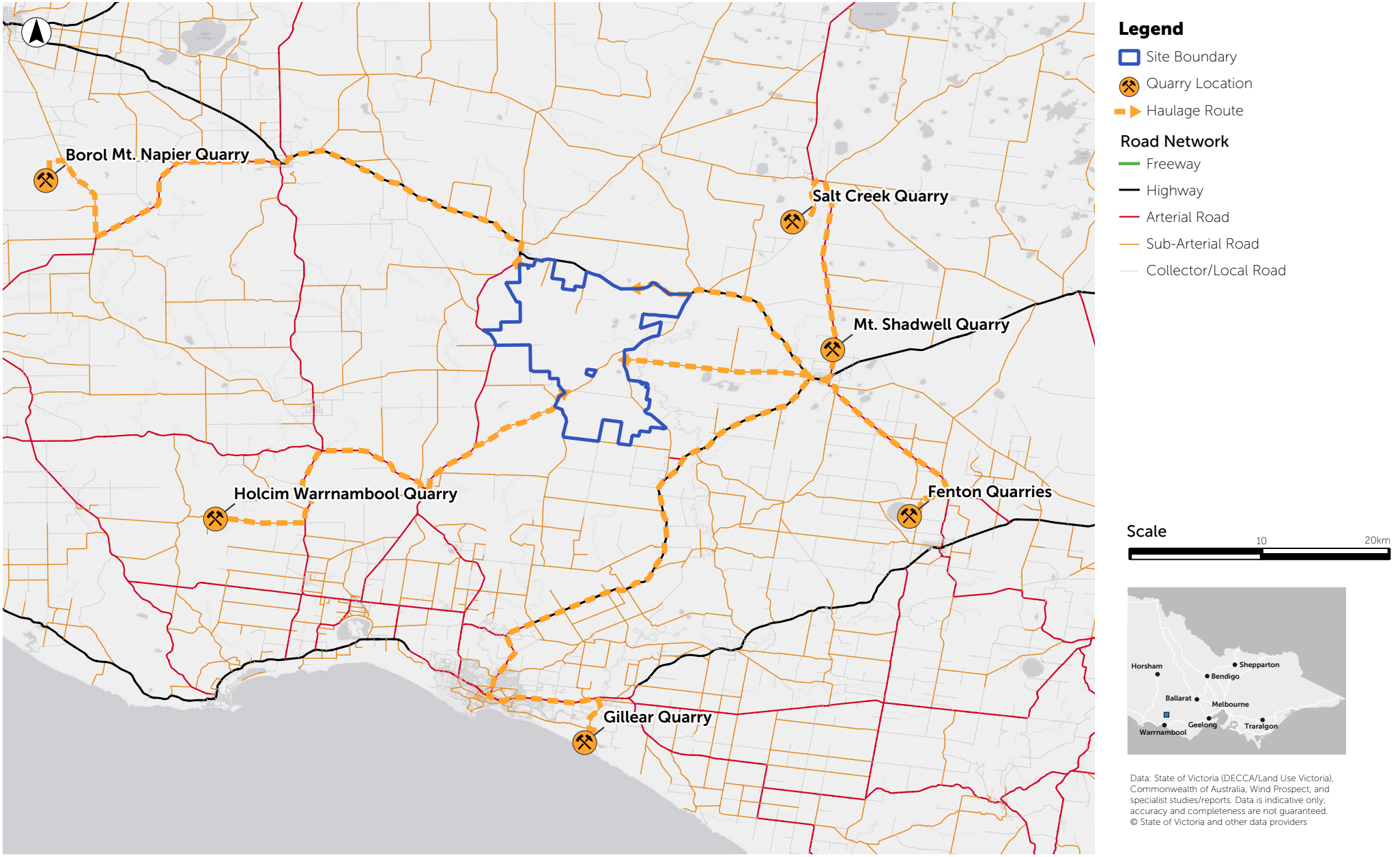
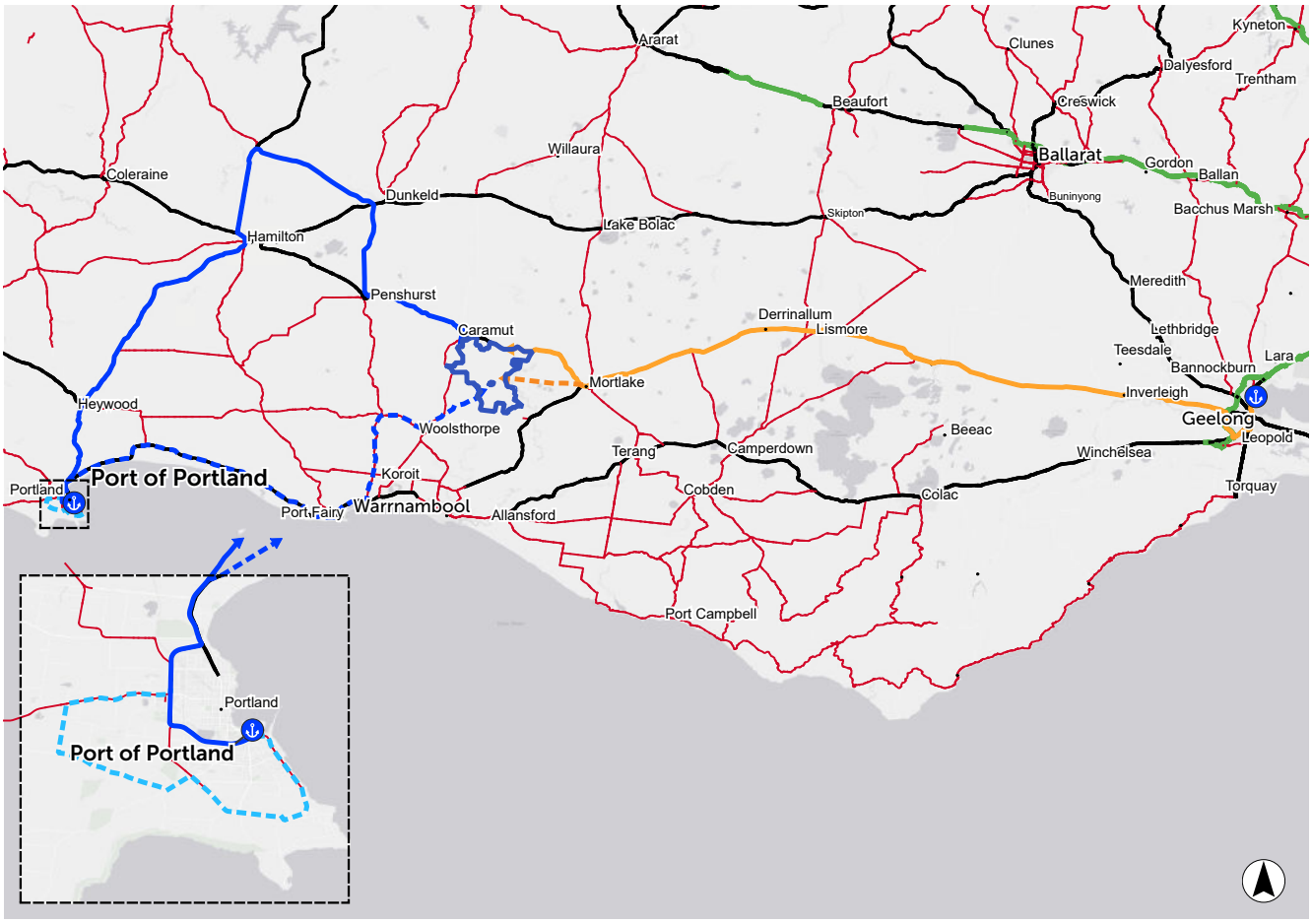


Figure 25.5 Preferred Material Haulage Routes



Legend

- Site Boundary
- Port Location

Road Network

- Freeway
- Highway
- Arterial Roads

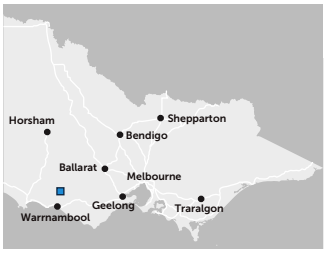
Port of Portland:

- Primary OD Route
- Secondary OD Route
- Alternative Port Access

Port of Geelong:

- Primary OD Route
- Secondary OD Route

0 25 50 km



Data: State of Victoria (DECCA/Land Use Victoria), Commonwealth of Australia, Wind Prospect, and specialist studies/reports. Data is indicative only; accuracy and completeness are not guaranteed. © State of Victoria and other data providers

Figure 25.6 Oversize and Overmass Delivery Routes

25.8.3 Environmental management measures

Where feasible, engineering design measures have been included to avoid potential impacts to roads and road users. To further minimise potential impacts to traffic and the road infrastructure, a range of management controls are proposed to be implemented.

Road and intersection upgrades

Local Roads

The project will generate substantial traffic volumes across local roads within and around the project site during construction and will result in volumes on a number of these roads exceeding target capacities against existing classification and construction standard. Road upgrades will be required to sections of local roads relied on by project traffic. Project traffic would not be permitted to use other sections of these roads.

Local roads that will require upgrade are:

- Hexham-Ballangeich Road
- Keillors Road
- Hamiltons Lane
- Immigrants Lane at its intersection with Woolsthorpe-Hexham Road.

While traffic generated by the project on Woolsthorpe-Hexham Road and Hexham-Ballangeich Road, north of Connewarren Lane are within the targets for these roads based on classification, segments of these roads currently present as single lanes or narrow two-lane roads. To support project generated traffic and mitigate traffic impacts, these road segments will also be upgraded.

All local roads within and surrounding the project site used by project traffic will be maintained by the proponent during construction and decommissioning phases through an agreement with Moyne Shire Council.

Intersections

Project traffic will contribute to additional turning movements through several road network intersections and at project site access points (refer to Figure 25.7). The following locations will require right and/or left turn lane improvements:

Road intersections:

- Warrnambool-Caramut Road / Hamiltons Lane
- Warrnambool-Caramut Road / Keillors Road
- Warrnambool-Caramut Road / Woolsthorpe-Hexham Road.

Project gates:

- Access points from Woolsthorpe-Hexham Road
- Access points from Hamilton Highway.

These works are separate to temporary road works at that may be needed to support oversize and overmass vehicle movements and access during construction.

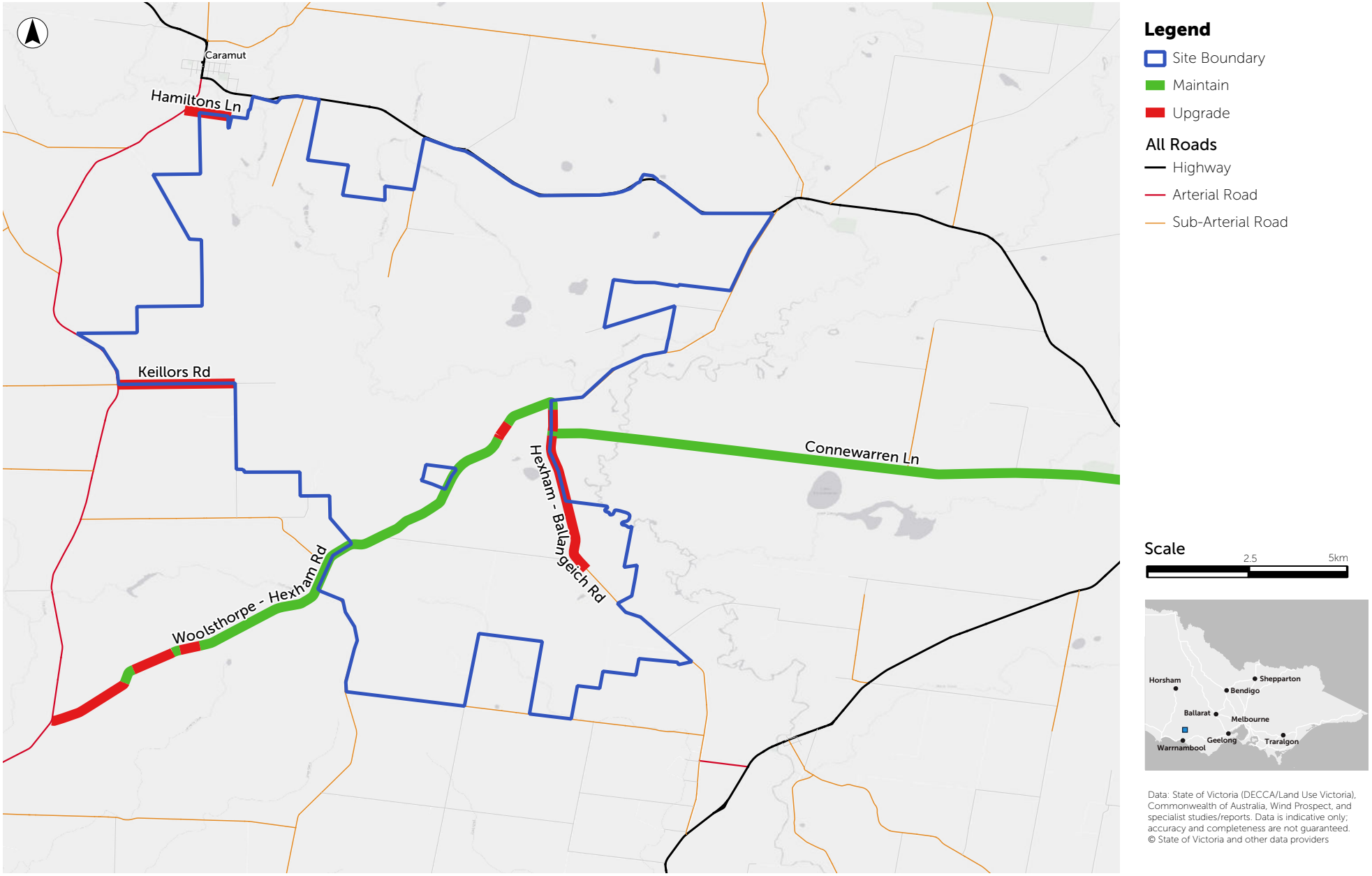


Figure 25.7 Project site roads —Project Upgraded and Maintained

Traffic Management Plan

A detailed Traffic Management Plan would be prepared prior to the commencement of construction to identify, assess and minimise impacts on road operations and road safety for road users where construction occurs outside the project site. The Traffic Management Plan would:

- Identify the configuration and treatment of site access points from Hamilton Highway or local roads that require intersection assessments, such as Hamiltons Lane
- Confirm the oversize and overmass and heavy vehicle haulage routes to be used, as well as expected traffic volumes
- Review and confirm existing local road conditions and use prior to construction
- Expected traffic volumes to be generated on local roads relied on during construction
- For construction, operations, decommissioning stages, provide details of:
  - Any signage/line marking requirements to manage traffic movements and inform external road users;
  - Expected haulage hours, including identification of non-activity periods during school bus times; and
  - The location and management of stock crossing points on haulage routes.

Green Travel Plans

Green Travel Plans are an on-going management tool that seek to promote sustainable transport initiatives with the intent to minimise private vehicle use. In the context of the project, a Green Travel Plan would focus on staff activity with the intent to encourage carpooling and/or rely on project provided transit services. The Green Travel Plan would be prepared by the proponent, in consultation with Moyne Shire Council, and would include:

- sustainable transport initiatives and associated incentives
- travel mode targets and timeframes
- mechanisms to monitor, review and amend the Green Travel Plan, where required.

Road maintenance and management agreements

The project would develop and enter into agreements with Moyne Shire Council and DTP, which would detail the road maintenance and management obligations for local roads within the project site and/or relied on by project traffic. In addition to local roads, Woolsthorpe-Heywood Road has been identified as an arterial road that would undertake a road maintenance and management agreement with DTP for OSOM haulage, if the route is relied upon.

These agreements would outline:

- Existing road conditions prior to the commencement of works
- Maintenance responsibility, triggers and standard for roads within the project site and/or relined on by project traffic
- Regular inspection and independent audit of road conditions
- An appropriate on-site contact for the reporting of road maintenance issues identified outside of regular inspections
- Timeframes and procedures for rectification of identified issues
- Dispute resolution processes.

These agreements would:

- Be limited to construction and decommissioning project phases only and linked to Traffic Management Plans prepared for works during these phases
- Apply to all local roads within the project site and relied on by project traffic during construction and decommissioning
- Apply to local roads external to the project site identified as a project access route
- Apply to sections of arterial roads on the oversize and overmass haulage route where passing relies on unsealed shoulders.

25.8.4 Summary of environmental management measures

Committed management measures are summarised in Table 25.7.

Table 25.7 Transport management measures

Transport impact	Item	Management measures	Number
Potential for the project to alter traffic composition and/or volumes	Pre-construction	**Traffic Management Plan** 1. Prior to the commencement of construction, prepare and implement a Traffic Management Plan as described in Section 15.9.2 of Chapter 25 –***Traffic and transport*** to minimise potential impacts to the transport network and users, in consultation with Moyne Shire Council and the Department of Transport (Regional Roads Victoria and Public Transport Victoria), and to their satisfaction. This will be a sub-plan to the Construction Environmental Management Plan (EMM01). 2. The Traffic Management Plan will address the traffic-related planning conditions and include: a. pre- and post-construction condition surveys and details of the procedure for any road maintenance works during construction and remedial work required following construction. b. communication – the plan for communication with local residents and businesses to ensure that people are kept informed about when works would be carried out and how to contact the construction team in the event of any questions or complaints. This will be documented in the Community and Stakeholder Engagement Plan (EMM02). c. traffic management – for each stage of construction, a detailed traffic management strategy would be provided, which would include the delivery schedule of the oversize and overmass loads.	TT01
	Pre-construction	**Green Travel Plan** 1. Prior to the commencement of construction, establish a Green Travel Plan to encourage sustainable travel and to minimise project traffic generation throughout the construction, operation, and decommissioning.	TT02
	Pre-construction	**Permanent road upgrades** 1. The project will upgrade and widen sections of oversize and overmass routes and local roads within the project site to the applicable Department of Transport/Moyne Shire Council standards, including sections of Keillors Road within the project site for oversize and overmass haulage operations. 2. Road upgrades and widening will be undertaken in accordance with road maintenance and management agreements [EMM02].	TT03

	Construction	**Temporary road infrastructure** 1. Prior to mobilising any oversize and overmass vehicles on the haulage route, temporary infrastructure works must be designed in consultation with, and completed to the satisfaction of, the Department of Transport (Regional Roads Victoria).	TT04
Potential for the project to alter traffic composition and/or volumes Potential for temporary changes to land access	Pre-construction Construction Operation	**Community and Stakeholder Engagement Plan** 1. Prior to the commencement of construction, develop and implement an overarching Community and Stakeholder Engagement Plan to facilitate ongoing consultation between the Proponent and the broader community. 2. The Community and Stakeholder Engagement Plan will: a. provide an approach for ongoing engagement with the broader community about the long-term benefits and opportunities of the project b. outline how the Proponent will maintain a stakeholder database throughout the life of the project to assist identifying and resolving project issues experienced by stakeholders efficiently, to put stakeholder ease of communication and issue resolution at the heart of stakeholder relations c. outline procedures and mechanisms for the regular distribution of accessible information about or relevant to the project d. identify opportunities to provide timely, useful and accurate information regularly about construction activities, schedules and milestones e. include measures to notify affected landowners and neighbours well in advance about any specific construction issues with direct impacts on properties (e.g., traffic management, out-of-hours work) and how they can easily reach the project team with questions f. detail the mechanisms for advising the community in advance of upcoming works (where necessary) and how the proponent will work with community to mitigate the negative impacts of construction whenever possible g. be reviewed and adapted based on community feedback so that the communications and engagement approach is fit for purpose and meets the needs of the community h. address the requirements of relevant EMMs, including specific engagement to be undertaken in relation to potential impacts to groundwater use, the storage of dangerous goods, aviation and electromagnetic interference.	EMM02

Potential for the project to cause damage to the road network	Pre-construction	**Road maintenance and management agreements** 1. Prior to construction, road maintenance and management agreements would be established with Department of Transport and Moyne Shire Council for local roads relied on by the project during construction.	TT05
	Construction Decommissioning	**Road management agreements** 1. Establishment of road management agreements with Moyne Shire Council and Department of Transport to remove external redundant transport project infrastructure and rehabilitate local roads relied on by the project at the end of the project construction phase.	TT06

25.8.5 Residual impacts

Following the development of design measures and implementation of management controls, an assessment of residual effects and impacts was completed describing the changes to the road network and traffic from the construction, operation and eventual decommissioning of the project, and rating the significance of these effects.

Traffic generated during project construction would consist of:

- general traffic (utes, vans and private cars) generated by staff travelling to and from the project site
- oversize and overmass vehicles used for the delivery of large wind turbine components
- other heavy vehicles used for the delivery of the smaller wind turbine components and construction materials (e.g., aggregate and cement).

With the exception of site establishment works and external road upgrades, work phases would overlap and would be undertaken in tandem with wind turbine component delivery and installation to commence soon after the completion of the initial site footing and access works. It is noted that in some cases external road upgrades may occur in tandem with other work phases, depending on construction timeframes.

While the intention is to source aggregate from an on-site quarry, approval would occur after the assessment of the EES. As such, Transport Impact Assessment considered two options for traffic generation associated with aggregate sourcing:

- Scenario 1: use of an on-site quarry to source all aggregate for the construction of internal tracks and hardstand areas
- Scenario 2: all aggregate material would be sourced off-site from existing commercial quarries.

This section provides a summary of the residual traffic and transport impacts associated with the impact pathways identified in Section 15.8.1, with the full assessment presented in the ***Traffic and Transport Impact Assessment*** (Appendix G).

Disruptions to traffic due to oversize and overmass vehicle movements and works on public roads

The estimated external daily vehicle movements during the project construction stage are summarised in Table 25.8. This estimate assumes that an on-site quarry would be established and would provide for approximately all road construction materials.

This estimate also considers project timeframes, expected external material requirements and the typical construction vehicle types. Specifically, the traffic movements include the construction of gate access around the project, but they do not include the site-specific works along the haulage routes. These external traffic movements are isolated and would not contribute to the concentrations of traffic associated with the project and would be subject to separate Traffic Management Plans prior to works being undertaken.

If material can be sourced on-site, this will substantially reduce the impact of project generated traffic to the external road network, with 666 fewer movements per day expected during the peak construction period of weeks 7 to 70. This would be comprised mostly of staff vehicle traffic, however if materials are sourced off-site, heavy vehicle traffic would instead comprise the greatest proportion of vehicle movements.

Outside of the project site, arterial roads are of suitable standard to cater for heavy vehicle traffic accessing the project site during construction and decommissioning. Within the project site, subject to materials sourcing locations, heavy vehicle traffic may warrant widening of sections of Woolsthorpe-Heywood Road within the project site.

Project operational traffic volumes would be safely accommodated within existing roads, and internal tracks will be used to move throughout the project site. During decommissioning, traffic will be significantly less than construction but will include the use of over-dimensional, and oversize and overmass vehicles to remove wind turbines and other major components.

To mitigate impacts, any temporary infrastructure works on the oversize and overmass routes would be undertaken in consultation with DTP [EMM TT03], and a Community and Stakeholder Engagement Plan would be developed [EMM02]. Impacts to public transport services will be measured against established PTV punctuality targets for regional bus services, which identify 0 to five minutes as a reasonable delay. The Traffic Management Plan [EMM TT01] will require engagement with DTP (Public Transport Victoria) and the relevant bus operator(s) to ensure haulage activity does not unreasonably delay bus services. The plan will also include a provision to avoid heavy vehicle movement during school bus times as far as practicable. With the implementation of a Traffic Management Plan [EMM TT01], and road management agreements with Moyne Shire Council and DTP (TT06, TT04) the residual impact is considered minor.

Table 25.8 External Daily Vehicle Movements – Hexham Wind Farm (On-site Materials Sourcing)

Phase	Staff		Over-dimensional Vehicles		Heavy Vehicles		Total	
	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day
Weeks 1-6	62	124	1	2	200	400	263	526
Weeks 7-21	102	204	1	2	203	406	306	612
Weeks 21-70	284	568	8	16	243	485	534	106
Weeks 71-99	182	364	7	14	39	79	228	457
Weeks 100-104	102	204	-	-	14	28	116	232

Should on-site materials sourcing not be possible, estimated external daily traffic volumes are presented in Table 25.9, with the significant difference being an increase in heavy vehicles per day during the peak construction period.

Table 25.9 External Daily Vehicle Movements – Hexham Wind Farm (No on-site Materials Sourcing)

Phase	Staff		Over-dimensional Vehicles		Heavy Vehicles		Total	
	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles / Day	Ave. Vehicle Movements / Day	Ave. Vehicles /Day	Ave. Vehicle Movements / Day
Weeks 1-6	62	124	1	2	200	400	263	526
Weeks 7-21	102	204	1	2	536	1072	639	1,278
Weeks 21-70	284	568	8	16	575	1151	867	1,735
Weeks 71-99	182	364	7	14	39	79	228	457
Weeks 100-104	102	204	-	-	19	38	116	232

Temporary changes to public access to land within the project site, causing ongoing inconvenience to road users.

Roadworks to construct project site access may cause temporary delays for road users. Additionally, temporary intersection works and road maintenance works undertaken to cater for oversize and overmass vehicles may cause temporary delays for road users. Oversize and overmass haulage activity may also cause delays to traffic on arterial roads.

A Traffic Management Plan would be prepared prior to construction to identify, assess and minimise impacts on road operations and road safety for road users [EMM TT01]. This Plan may include:

- demonstration of how construction works will be staged
- demonstration of how lane closures would be managed to minimise disruption to through traffic
- identification local roads / road sections to be closed and the duration of each road closure (where relevant) and identification of detour routes around the project site for through traffic
- demonstration of how local access to impacted properties within the project site will be maintained
- demonstration of how the interaction of public and project traffic will be safely managed
- measures to minimise travel time disruptions and prioritise movements for public transport through the project site (where relevant)
- a communications strategy to inform of the community and local landowners of road closures and changes to local access
- provision for community feedback and response during the Construction Traffic Management Plan implementation
- a reporting and review mechanism with Moyne Shire Council and DTP to monitor impacts and make amendments to the Traffic Management Plan as necessary.

In addition, a Community and Stakeholder Engagement Plan would be prepared to identify and consult affected and interested stakeholders [EMM02]. While road and intersection upgrade works are undertaken there will be short term disruptions to road users, however with the implementation of management measures the impact is negligible.

Additional project traffic that exceeds the capacity of the road network, resulting in increased congestion and damage to roads, compromising road safety for other users

General traffic accessing the project site during construction and decommissioning can be accommodated within the existing arterial road network. It is assumed that that all staff would access the project site by private vehicle with an average occupancy of 1.8 persons per vehicle. Staff movements to and from the project site would be substantially reduced with the implementation of the Green Travel Plan [EMM TT02].

An assessment of the project traffic was undertaken for the peak construction phase (i.e., weeks 21 through 70) for traffic movements on roads within the project site for the on-site materials sourcing scenario and off-site materials scenario. During peak construction, project traffic will add 1,070 to 1,740 vehicle movements per day across the external road network, subject to the level of on-site materials sourcing. Woolsthorpe-Hexham Road will experience the highest increase in traffic, with 600 to 750 vehicle movements per day, followed by Connewarren Lane, which will experience an additional 340 to 680 vehicle movements per day. Both estimates are subject to the level of on-site sourcing.

With the project traffic, the total volumes for these roads will remain within the target daily capacity, however traffic volumes on sections of Hamiltons Lane, Keillors Road, Immigrants Lane, and Hexham-Ballangeich Road will exceed the current target capacity of these roads for both materials sourcing scenarios. Sections of these roads relied on by project traffic will require upgrades.

As heavy vehicle traffic generated during construction and decommissioning may cause damage to road pavements, road maintenance agreements would be established to manage short-term impacts to local roads and key arterial road sections relied on by the project, and condition monitoring would be undertaken for roads relied on by project traffic (TT06, TT07). Any temporary intersection works on the oversize and overmass routes would be undertaken in consultation with DTP (TT03, TT04), and a Community and Stakeholder Engagement Plan would be developed (TT05).

During operation, traffic is estimated to comprise of four vehicle movements per day to the external road network. Weekly/fortnightly minor maintenance will be carried out by a small team, with up to five vehicles. This is expected to increase the daily traffic generation of the site to a maximum of approximately 10 vehicle movements. Most vehicle movements will be internal to the site and will not affect the surrounding road network. Occasional maintenance will occur when components need to be replaced, such as replacing a gearbox. This is expected to occur very occasionally and will be subject to approval processes with the relevant authorities. Other traffic generation will include visitors to the site such as office-based staff and courier deliveries.

The residual impact is considered minor.

25.8.6 Cumulative Impacts

Cumulative impact considers the construction period of major energy projects in proximity to Hexham Wind Farm, and specifically where concurrent projects would rely on equivalent or overlapping material haulage and oversize and overmass routes during the construction period. The project is in proximity to a number of approved and proposed major energy projects that, subject to timing of development, may also contribute traffic to roads relied on by the Hexham Wind Farm. These include:

Proposed

- Willatook (approval stage)
- Darlington
- Tarrone
- Bushy Creek
- Swansons Lane

Pre-Construction

- Mt Fyans
- Woolsthorpe
- Mortlake Energy Hub (battery energy storage system and solar farm)

Operating

- Hawkesdale

Figure 25.8 shows the location of the above projects that are within the Moyne Shire area in relation to the project (marked as Number 13).

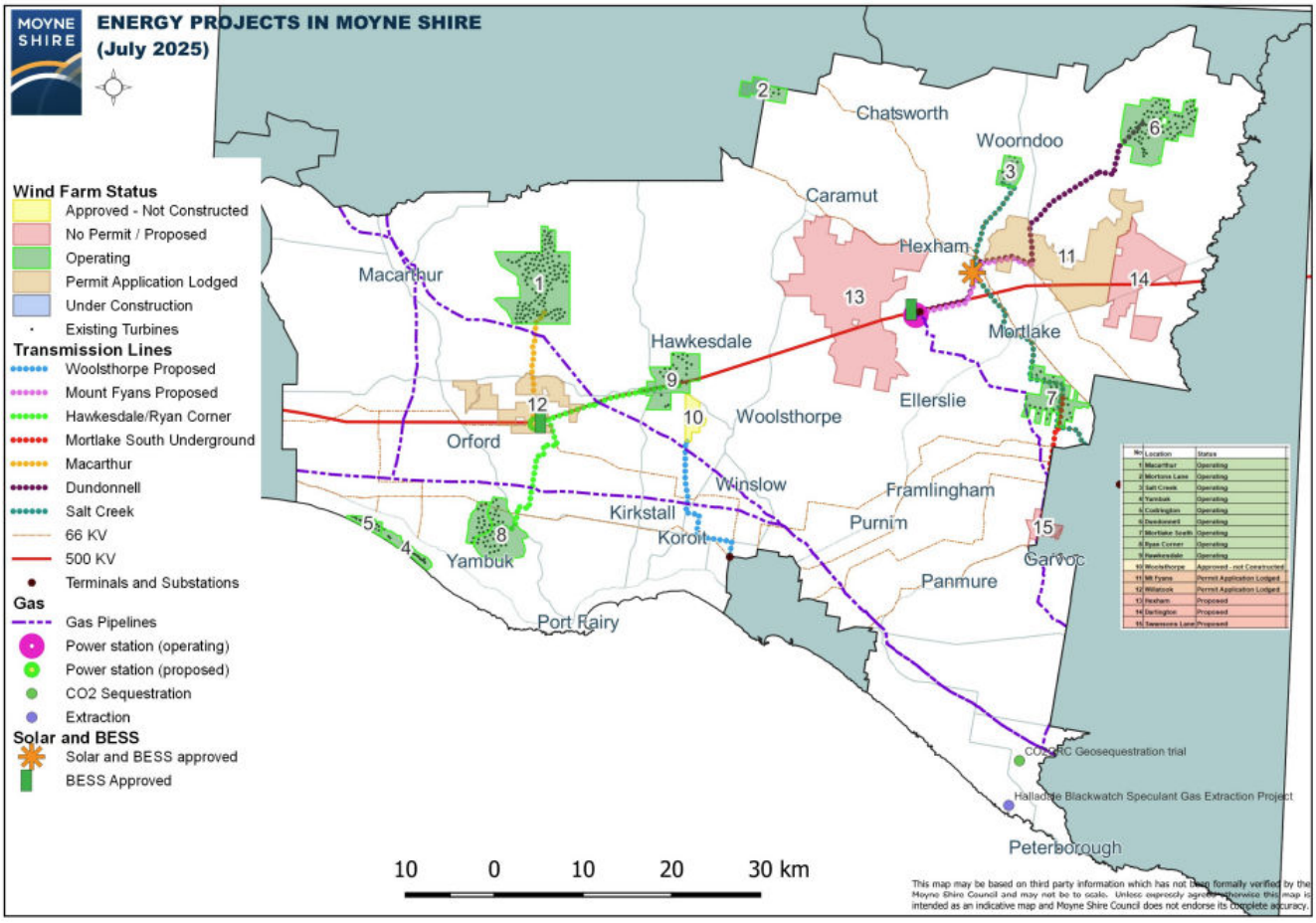


Figure 25.8 **Moyne Shire Wind Farm Projects** *(Source: Moyne Shire Council, 2025b)*

It is expected that construction works for Woolsthorpe Windfarm and Mortlake Energy Hub will commence in 2026, and will be completed by 2028. As this will be prior to the commencement of the Hexham project, it is not expected that project traffic would overlap.

Timeframes for pre-construction and construction for Mt Fyans and Willatook projects would be similar to Hexham, however it is expected that significant materials haulage associated with construction for Mt Fyans and Willatook projects would be completed prior to the commencement of any substantive construction works for the Hexham project.

Should Mt Fyans or Willatook projects overlap with the Hexham project:

- Some potential crossover of light vehicle traffic (staff) may occur, but would be limited to arterial roads.
- Some potential materials haulage traffic may occur, subject to the source locations and whether materials are being sourced on-site.
- Possible crossover of oversize and overmass movements, however these are coordinated through DTP and National Heavy Vehicle Regulator permits.

Any potential cumulative traffic would be less than the predicted peak Hexham-generated traffic. Road monitoring undertaken as part of the Hexham project will capture any change in road condition from all traffic including Mt Fyans and Willatook projects.

25.8.7 Impact assessment summary

A summary of the proposed traffic and transport mitigation measures and potential residual impacts is presented in Table 25.10. Residual impacts were considered negligible or minor.

Table 25.10 Traffic impact assessment summary

Transport impact	Description	Project phase	Mitigation and management measures	Likely effect (magnitude, extent and duration)	Residual rating
Potential for the project to alter traffic composition and/or volumes	Oversize and overmass vehicles and works on public roads (e.g., creating access, upgrading roads) may disrupt and/or delay through traffic	Pre-construction, Construction	• Design and construct an internal project access track network to support project generated traffic • Minimisation of access points • Materials haulage routes to rely on higher order roads • Develop and implement Traffic Management Plans [EMM TT01] • Establish Green Travel Plans [EMM TT02] • Undertake infrastructure improvement works at project site access locations and widening of section of Keillors Road within the project site [EMM TT03] • Undertake temporary intersection and road maintenance works on the oversize and overmass route in consultation with Department of Transport (Regional Roads Victoria) [EMM TT03] • Prepare and implement a Community and Stakeholder Engagement Plan [EMM02] • Road maintenance and management agreements would be established with Moyne Shire Council and Department of Transport (Regional Roads Victoria) [EMM TT05].	The installation and removal of temporary intersection works and road maintenance works to cater for oversize and overmass vehicles may cause temporary delays for road users. Oversize and overmass haulage activity may also cause delays to traffic on arterial roads. Roadworks to construct project site access may cause temporary delays for road users.	Minor

Transport impact	Description	Project phase	Mitigation and management measures	Likely effect (magnitude, extent and duration)	Residual rating
	Additional project traffic may exceed the capacity of the road network, resulting in increased congestion and/or compromising road safety for other users.	Pre-construction, Construction, Operation, Decommissioning	• Design and construct an internal project access track network to support project generated traffic • Minimisation of access points • Materials haulage routes to rely on higher order roads • Develop and implement Traffic Management Plans [EMM TT01] • Establish Green Travel Plans [EMM TT02] • Undertake temporary intersection and road maintenance works on the oversize and overmass route in consultation with Department of Transport (Regional Roads Victoria) (TT03, TT04) • Prepare and implement a Community and Stakeholder Engagement Plan [EMM02] • Road maintenance and management agreements would be established with Moyne Shire Council and Department of Transport (Regional Roads Victoria) (TT06, TT07).	General traffic accessing the project site during construction and decommissioning can be accommodated within the existing arterial road network. Subject to materials sourcing locations, heavy vehicle traffic accessing the project site during construction and decommissioning may warrant widening of sections of Keillors Road within the project site. Outside of the project site, arterial roads are of suitable standard to cater for this traffic. Project operational traffic volumes are low and able to be safely accommodated within existing roads. Internal tracks will be used to move throughout the project site.	Minor
Potential for temporary changes to land access	Project construction and decommissioning may require local road closures and/or deviations that affect public access to land within the project site and cause ongoing inconvenience to road users.	Pre-construction, Construction, Decommissioning	• Design and construct an internal project access track network • Develop and implement Traffic Management Plans [EMM TT01] • Prepare and implement a Community and Stakeholder Engagement Plan [EMM02].	Construction activity may require local road closures at times and the provision of alternate access for landowners.	Negligible

Transport impact	Description	Project phase	Mitigation and management measures	Likely effect (magnitude, extent and duration)	Residual rating
Potential for the project to cause damage to the road network	Heavy vehicle traffic may compromise road safety for other users through increased damage to road pavements.	Pre-construction, Construction, Decommissioning	• Road maintenance and management agreements would be established with Moyne Shire Council and Department of Transport (Regional Roads Victoria) [EMM TT05] • Establish road management agreements to rehabilitate local roads relied on by the project at the end of the project construction phase [EMM TT06] • Establish road management agreements to remove external redundant transport project infrastructure [EMM TT06] • Undertake condition monitoring for all roads relied on by project traffic during construction [EMM TT06].	Heavy vehicle traffic during construction and decommissioning may result in increased damage to road pavements on arterial and local roads.	Minor

25.9 Conclusions

Wind farm developments have the potential to cause traffic and transport impacts through the addition of construction and delivery vehicles to the roads approaching the project site. These additional vehicles can cause damage to the road surface from repeated heavy vehicles use, as well as pose a safety risk to other road users due to increased amount of traffic movements and changed road conditions.

The Transport Impact Assessment was undertaken to determine the potential impacts of the project on key intersections, roads and transport networks, and to recommend measures to avoid, minimise and mitigate potential project impacts.

The project's internal access tracks have been designed to minimise the amount of project-related traffic that needs to use external public roads. Project traffic generated to external roads during construction will comprise staff vehicles, heavy vehicle traffic associated with external bulk materials haulage, and over-dimensional/oversize and overmass vehicles associated with wind turbine and other major component delivery.

At the time of peak construction activity, external project traffic will add between 1,070 to 1,740 vehicle movements per day across the external road network, subject to the level of on-site materials sourcing. The highest increases in traffic volumes will be along Woolsthorpe-Hexham Road, with the project generating around 600 to 750 vehicle movements per day, subject to the level of on-site materials sourcing. Volume increases on other roads will be less.

Upgrades to sections of Hamiltons Lane, Keillors Road, Immigrants Lane, and Hexham-Ballangeich Road relied on by project traffic will be required. The project would also upgrade single-lane or narrow two-lane roads segments of Woolsthorpe-Hexham Road and Hexham-Ballangeich Road, north of Connewarren Lane. These roads and other local roads within and around the project site relied on by project traffic would be maintained during the construction phase through appropriate traffic management plans and road maintenance agreements.

Local traffic impacts within the project site during all project phases can be suitability and safely managed.