APPENDIX I

Traffic & Transport Impact Assessment

Author: Stantec Australia Pty Ltd

Client: Burrendong Wind Farm Pty Ltd

Burrendong Wind Farm

Traffic and Transport Impact Assessment

Prepared for: Burrendong Wind Farm Pty Ltd

Ref: 300304951 | Date: 28 September 2023

Revision

Revision	Date	Comment	Prepared By	Approved By
A	1 November 2021	Working Draft	Chris White	Hayden Calvey
B	8 March 2022	Final	Chris White	Hayden Calvey
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Bayzid Khan

For and on behalf of

Stantec Australia Pty Ltd

L9, 203 Pacific Highway, St Leonards NSW 2065

Acknowledgment of Country

In the spirit of reconciliation, Stantec acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

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Executive Summary

Stantec has been engaged by Burrendong Wind Farm Pty Ltd to undertake a Traffic and Transport Impact Assessment as part of an Environmental Impact Statement (EIS) in support of the proposed State Significant Development (SSD) at Burrendong Wind Farm (the Project). The Project Site is to be located approximately 30km south-east of Wellington, just east of Lake Burrendong.

The Project will involve the construction, operation, maintenance and decommissioning of 70 Wind Turbine Generators (WTGs) and associated ancillary infrastructure, as well as over 79km of access tracks and roads, approximately 60km of underground electrical cabling, overhead powerlines and up to 2 collector substations.

The wind turbine components will be sourced from overseas and shipped to the Port of Newcastle, where they will be stored until they are ready to be transported via the road network to the Project Site. Due to the over-sized nature of the wind turbine components, they will be transported using over-size over-mass (OSOM) vehicles. The blade lengths are anticipated to be 82 metres in length, and the heaviest wind turbine tower section is anticipated to be approximately 95 tonnes.

From the Port of Newcastle, the OSOM vehicles will travel north-west via the Golden Highway towards Dubbo. From Dunedoo, the OSOM vehicles transporting the wind turbine blades will take a different route (via Golden Highway and Saxa Road) to the OSOM vehicles transporting the remaining wind turbine components (via Castlereagh Highway), due to the latter route not being able to accommodate the vehicles transporting the 82 metre blades. The routes will recombine north of the Project Site, with all OSOM transport vehicles then using Twelve Mile Road, Yarrabin Road and Burrendong Dam Road to reach the Project Site.

A detailed route study (from the Port of Newcastle to the Project Site) has been undertaken to outline all the potential road and intersection upgrades that will be required to accommodate an OSOM transport vehicle carrying an 82-metre blade. The route study identified numerous shortfalls at a number of locations which will need to be addressed post-EIS approval during the detailed design stage, assuming the SSD is approved.

Traffic Impacts

The initial 24-30 month construction phase will have the most significant impact on traffic generation, with minimal traffic movements expected over the operational life of the Project, and to a lesser extent, the decommissioning phase after 25-30 years of operation.

On average, the construction period is anticipated to generate 153 one-way vehicle trips per day, fluctuating month-to-month between 136 vehicles/day and 182 vehicles/day. Construction months 9 and 10 are expected to generate the highest traffic flow, consisting of 125 light vehicles/day and 57 heavy vehicles/day.

The delivery of wind turbine components using OSOM vehicles will only occur during months 15 to 21, at an average rate of 4 vehicles/night. OSOM deliveries are likely to occur overnight and be grouped together to minimise the impact to drivers on the road network.

The origins of light vehicle traffic generated by employees and heavy vehicle deliveries are assumed to be distributed as follows:

- Mudgee – 60%
- Wellington – 20%
- Dubbo – 20%.

Traffic originating from Mudgee will access the Project Site via Hill End Road, Yarrabin Road and Burrendong Dam Road (Route 1). Traffic originating from Wellington and Dubbo will access the Project Site via Mitchell Highway, Goolma Road, Twelve Mile Road, Yarrabin Road and Burrendong Dam Road (Route 2). The preferred route for traffic accessing the western side of the Project Site is via Burrendong Way, Fashions Mount Road and Tara Road (Route 3A).

Construction months 9 and 10 are expected to generate 136 peak hour vehicle movements, split between the three routes. During the busiest construction months, each impacted road is predicted to retain a Level of Service of LOS C or higher, indicating that these roads have capacity to cater for the highest traffic flows generated by the Project.

The major developments which may impact the Project are Uungula Wind Farm and Maryvale Solar Farm, which are due to commence construction in 2023. In the unlikely scenario that the peak construction months from Burrendong Wind Farm, Uungula Wind Farm and Maryvale Solar Farm all occur simultaneously, Goolma Road may be slightly impacted. Burrendong Wind Farm is expected to add 49 vehicles/hour to Goolma Road's existing peak hour traffic volume of 256 vehicles/hour (inclusive of Uungula Wind Farm traffic).

At the intersection of Goolma Road / Twelve Mile Road, the cumulative right turn volumes from Goolma Road into Twelve Mile Road indicate that only a Basic Right Turn (BAR) intersection treatment is warranted. At the intersection of Hill End Road / Yarrabin Road, the cumulative right turn volumes from Hill End Road into Yarrabin Road indicate that a short Channelised Right Turn (CHR[s]) intersection treatment is warranted. It is suggested that this be taken into consideration during the detailed design stage.

Other Transport Considerations

- School bus routes and times have been listed and identified in the report. School bus companies should be consulted regarding the Project, with all OSOM and heavy vehicle deliveries scheduled outside of these times to increase safety for school children and to eliminate any potential delays for school buses.
- Heavy vehicle travel conditions for OSOM vehicles and B-double trucks have been listed and identified in the report. All deliveries from these vehicles should comply with the identified conditions.
- Railway level crossings which may be impacted have been listed and identified in the report. All crossings are located on OSOM vehicle transport routes, with none of the crossings to be impacted by an increase in light or heavy vehicle traffic generation. Due to the highly controlled nature of the OSOM vehicle transportation process, they are considered a low safety risk in traversing over the crossings.
- Locations of Crown Land have been identified in the report. Crown Land NSW should be consulted to ascertain if any licences, acquisitions or easements are required for these identified locations.

Traffic Management Plan

A high-level traffic management strategy has been developed for the Project's critical areas / activities, in terms of minimising traffic safety impacts, minimising disruption to local road users, driver code of conduct, stakeholder management plan, internal site management, construction hours, parking and signage.

A detailed Traffic Management Plan should be prepared post-EIS approval to specifically address the impact of the development on traffic throughout the life of the Project, including the construction, maintenance, operation and decommissioning stages.

1. Introduction

1.1 Background

Burrendong Wind Farm Pty Ltd (the Proponent) are seeking approval to construct, maintain and operate a 70 Wind Turbine Generator (WTG) Wind Farm and associated infrastructure collectively known as Burrendong Wind Farm (the Project). The Project Site is located approximately 30km south-east of Wellington, just east of Lake Burrendong, and within the Dubbo Regional Council and Mid-Western Regional Council Local Government Areas (LGAs).

The proposed development exceeds the $30 million capital investment value for electricity generating works under Schedule 1 Clause 20(a) of the State Environmental Planning Policy (Plannings Systems) 2021 and hence has been declared as a state significant development. This Traffic & Transport Impact Assessment (TTIA) is being prepared in support of the Environmental Impact Statement (EIS) to be submitted by Eco Logical Australia (ELA) in 2023.

This TTIA provides an assessment of the potential transport impacts during the construction, operation and decommissioning phases of the Project. In addition to the proposed WTGs, this TTIA also considers the associated operation and maintenance buildings, civil works and electrical infrastructure required to connect the Project to the existing transmission network.

This TTIA provides an assessment of the existing road network and its condition, identification of current and potential safety issues that may arise during construction and operation, and descriptions of potential mitigation strategies to address any issues.

1.2 Scope of Report

Stantec's scope of work to prepare this TTIA includes:

- Address all of the Secretary's Environmental Assessment Requirements (SEARs)
- Review relevant background documents and information, including previously completed traffic impact assessments undertaken in the surrounding area
- Review of planning requirements, supporting policy documentation and initial reports for the Project
- Consult with local Councils and / or TfNSW on any relevant local policies, road / asset management information, local circumstances (including school bus routes) and local knowledge relevant to local haulage routes and roads used to access the Project Site
- Review existing traffic count data and/or undertake traffic counts in areas where data is not available
- Review the potential transportation routes for safe movement of over-sized loads to the Project Site. This assessment will consider the construction, operation and decommissioning phases of the Project
- Conduct a road safety assessment to investigate and identify potential safety deficiencies with the road alignment along the designated construction access routes for the Project
- Assess the likely Project only and cumulative traffic impacts during the construction, operational and decommissioning phases of the Project (including intersection performance, capacity, safety and site access)
- Identify necessary mitigation and management measures to minimise the impact of the Project.

1.3 Environmental Assessment Requirements

The Project is deemed a SSD by Clause 20(a) of Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021. Consent is required under Clause 2.7 of Chapter 2 of the SEPP to carry out the Project.

To guide the preparation of the EIS, the Department of Planning and Environment (DPE) releases the SEARs. Within the SEARs, key traffic and transport issues related to the Project are identified and listed. **Table 1.1** reproduces this list and identifies where each item is addressed in the report, while **Table 1.2** lists the TTIA requirements as requested by TfNSW.

Table 1.1 – List of SEARS to be addressed

Item	Section
An assessment of the construction, operational and decommissioning traffic impacts of the development on the local, regional and State road network.	• Section **3** • Section **4** • Section **5**
Provide details of the peak and average traffic volumes (including light, heavy and over-mass / over-dimensional vehicles) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel).	• Section **5.1** • Section **5.2** • Section **5.3**
An assessment of the potential traffic impacts of the project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones.	• Section **3.2** • Section **4.1** • Section **5.5**
An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the project (including over-mass / over-dimensional traffic haulage routes from port to site) during construction, operation and decommissioning.	• Section **4** • Section **5.5**
An assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown land (including the existing Travelling Stock Route network), particularly in relation to the capacity and conditions of the roads and use of rail level crossings (and rail safety assessment if required), and impacts to rail underbridges and overbridges.	• Section **3.4** • Section **3.7** • Section **4** • Section **5.6**
A cumulative impact assessment of traffic from nearby developments.	• Section **5.4**
Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and / or rail authority.	• Section **4.3** • **Appendix A**

Source: SEARS

Table 1.2 – List of TfNSW Requirements

Item	Section
In addition to the requested TIA, due to the significant scope of the transport logistics for OSOM transit, a concept-level route analysis is required to be provided with the SSD application based on high-level 3D swept path analysis to generally indicate locations where civil works are likely to be required. The route analysis is to include at a minimum the following: • **Identify the OSOM route to be utilised and any indicative pinch points within the network vertically, horizontally and laterally and the potential civil works required to accommodate the OSOM vehicles.** • **The logistics assessment is to highlight each at-risk road structures that the haulage route crosses including bridges, traffic signals, signage, major culverts, and minor culverts that may not meet the desirable cover to cater for proposed axle loads.** • **The design vehicle templates used with the swept path analysis software are also requested in order for TfNSW to review the performance within the software (e.g. Autodesk Vehicle Tracking or Transoft AutoTURN).** • **Provide the following measurements parameters of the OSOM components / materials to be moved:** – **Identify all the types of OSOM vehicles proposed to be used for the project.** – **Overall combination length, width, height and mass** – **Maximum component length (e.g. blade length, blade overhang length, etc.)** – **Maximum component widths (e.g. turbine tower, battery component, pipes, etc.)** – **Maximum load heights (clearance to overhead obstructions such as structures, utilities and vegetation),** – **Wheelbase dimensions,** – **Maximum trailer articulation angle(s),** – **Minimum overhang heights above the road surface,** – **Axle loads and axle group loads in terms of both tonnes and Equivalent Standard Axles (refer to Austroads Guide to Pavement Technology).**	• Section **4.3** • **Appendix A**
Detailed plans identifying the proposed location of any: • **Project-related infrastructure within and outside of the project boundary.** • **Transmission line infrastructure, or any other project-related structures, within a road reserve. Include demarcation of local and classified road reserves.** • **Permanent or temporary connection/access to classified roads.**	• Section **2.2** • Section **5.2.2**

Item	Section
• **The Scoping Report identifies that ancillary infrastructure and temporary facilities are to be provided on-site including (but not limited to) concrete batching facilities. The TIA should identify the source for input materials and quantify the traffic generation associated with the haulage of the source materials.**	
Cumulative impacts: • **Identify and assess the implications of any road and rail projects that will potentially be occurring simultaneously with the scheduling of the OSOM movements along the proposed OSOM routes.** • **An assessment should be undertaken as a part of the EIS and TIA to identify the projects that will have overlapping construction periods and assess the cumulative traffic impacts with emphasis on the following:** • **The cumulative impacts from traffic generated from the construction workforces in terms of the origin-destination routes, access, AM/PM peaks where there is overlap with other projects.** • **The cumulative impacts of heavy vehicle movements in terms of AM/PM peaks and routes where there is an overlap with other projects.** • **Cumulative impacts and consideration in relation to the timing of movements of OSOMs where other projects will be utilising the same routes as proposed for this development.**	• Section **5.4**
Heavy vehicle and OSOM routes: • **Identify the return routes for OSOMs.** • **National Heavy Vehicle Regulator (NHVR) approved routes identified on the Restricted Access Maps (RAV MAP) are to be utilised for the heavy vehicle routes for the proposed development.** • **The TIA is required to include details on the number of OSOM movements, the intended time for OSOM movements to occur and identify the location of rest areas required along the OSOM routes.**	• Section **3.3** • Section **4.1** • Section **5.1** • Section **6.5**
Project schedule: • **Hours and days of work, number of shifts and start and end times.** • **Phases and staging of the project, including construction, operation and decommissioning.**	• Section **6.4** • Section **5.1**
Traffic volumes including: • **Existing background traffic.** • **Project-related traffic for each phase or stage of the project.** • **Projected cumulative traffic at commencement of operation, and a 10-year horizon post-commencement.**	• Section **3.5** • Section **5.1** • Section **5.4**
Traffic characteristics including: • **Number and ratio of heavy vehicles to light vehicles,** • **Peak times for existing traffic,** • **Peak times for project-related traffic including commuter periods,** • **Proposed hours for transportation and haulage,** • **Interactions between existing and projected-related traffic.**	• Section **3.5** • Section **5.1**
The origins, destinations and routes for: • **Commuter (employee and contractor) light vehicles and pool vehicles.** • **Heavy (haulage) traffic.** • **OSOM vehicles.**	• Section **4.1** • Section **5.2**
Road safety assessment of key haulage route/s.	• Section **4.3** • **Appendix A**
Identify the necessary road network infrastructure upgrades that are required to cater for and mitigate the impact of project related traffic on both the local and classified road network for the development (for instance, road widening and/or intersection treatments). In this regard, preliminary concept drawings should be submitted with the SSD application for any identified road infrastructure upgrades. It should be noted that any identified road infrastructure upgrades will need to be to the satisfaction of TfNSW and Council.	• Section **4.3** • **Appendix A**
Proposed road facilities, access and intersection treatments are to be identified and be in accordance with Austroads Guide to Road Design including provision of Safe Intersection Sight Distance (SISD).	• Section **5.5**
Consideration of local climate conditions that may affect road safety during the life of the project (e.g. fog, wet and dry weather, icy road conditions).	• Section **3.6**
The layout of the internal road network, parking facilities and infrastructure.	• Section **2.2**
Impact on rail corridors and level crossings detailing any proposed interface treatments. Note, the rail authority for rail corridors in the vicinity of the site and likely OSOM route is UGLRL.	• Section **3.4** • Section **5.6**

Item	Section
Impact on public transport (public and school bus routes) and consideration for alternative transport modes such as carpooling and shuttle buses during construction	• Section **3.2** • Section **5.1**
Identification and assessment of potential environmental impacts of the project, such as blasting, lighting, visual, noise, dust and drainage on the function and integrity of all affected public roads.	• Refer to EIS
Controls for transport and use of any dangerous goods in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development, the Australian Dangerous Goods Code and AS4452 Storage and Handling of Toxic Substances.	• Refer to EIS
A draft Traffic Management Plan (TMP) that could be implemented following approval of the EIS, in consultation with relevant Councils and TfNSW. The TMP would need to identify strategies to manage the impacts of project related traffic, including any community consultation measures for peak haulage periods.	• Section **6**
Propose a Driver Code of Conduct for haulage operations which could include, but not be limited to: • **Safety initiatives for haulage through residential areas and/or school zones.** • **An induction process for vehicle operators and regular toolbox meetings.** • **A public complaint resolution and disciplinary procedure.**	• Section **6**

Source: TfNSW

1.4 References

In preparation of this report, the following documents were reviewed:

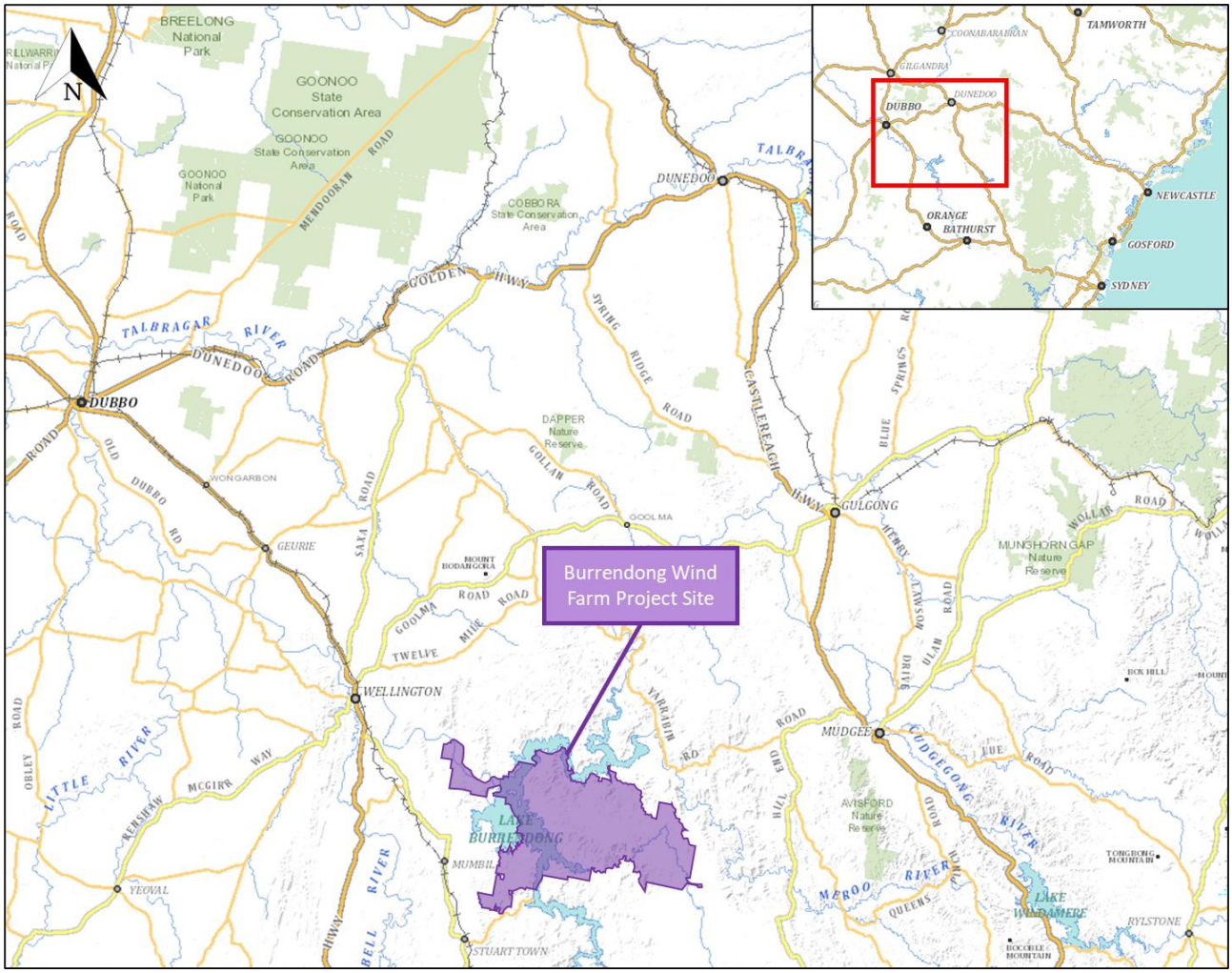
- Austroads 2020, *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods*, Austroads, Sydney
- Austroads 2020, *Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments*, Austroads, Sydney
- Cardno 2020, *Traffic & Transport Impact Assessment – Bowmans Creek Windfarm Environment Impact Statement*, Cardno, Sydney
- CWP 2020, *Environmental Impact Statement – Uungula Wind Farm*, CWP Renewables Pty Ltd, Newcastle
- Eco Logical Australia 2020, *Burrendong Wind Farm Scoping Study. Prepared for Epuron Projects Pty Ltd*
- i3 consulting 2020, *Burrendong Wind Farm – External Route Assessment*
- Moovit 2021, *School Buses – Schedules, Route and Stops*, <https://moovitapp.com/index/en-gb/public_transportation-lines-Sydney-442-1684140>, accessed 25 October 2021
- Ogden's Coaches 2021, *Timetables*, <https://www.ogdenscoaches.com.au/timetables/>, accessed 25 October 2021
- Rex J Andrews 2019, *Lake Burrendong Wind Farm Ex Port of Newcastle*
- RTA 2002, *Guide to Traffic Generating Developments*, Transport for NSW, Sydney
- Samsa Consulting 2020, *Uungula Wind Farm Project – Transport Assessment*, Samsa Consulting, Sydney; and
- Transport for NSW 2013, *Guide to Traffic Generating Developments – updated traffic surveys*, Technical Direction TDT 2013/04a, Transport for NSW, Sydney.

2. Development Proposal

2.1 Site Location

The Project Site is located in Yarrabin, NSW, which is approximately 230km north-west of Sydney. The site is located on the local government border between Dubbo Regional Council and Mid-Western Regional Council, and between the towns of Wellington and Mudgee in Western NSW. The Project Site is currently primarily used for agriculture, including farming and grazing operations, and also lies within the Lake Burrendong catchment. Its location is shown below in **Figure 2.1**.

Figure 2.1 – Site Location



Base image source: SIX Maps

2.2 Project Description

The Project will involve the construction, operation, maintenance and decommissioning of 70 WTGs and associated ancillary infrastructure.

The scope of the project includes:

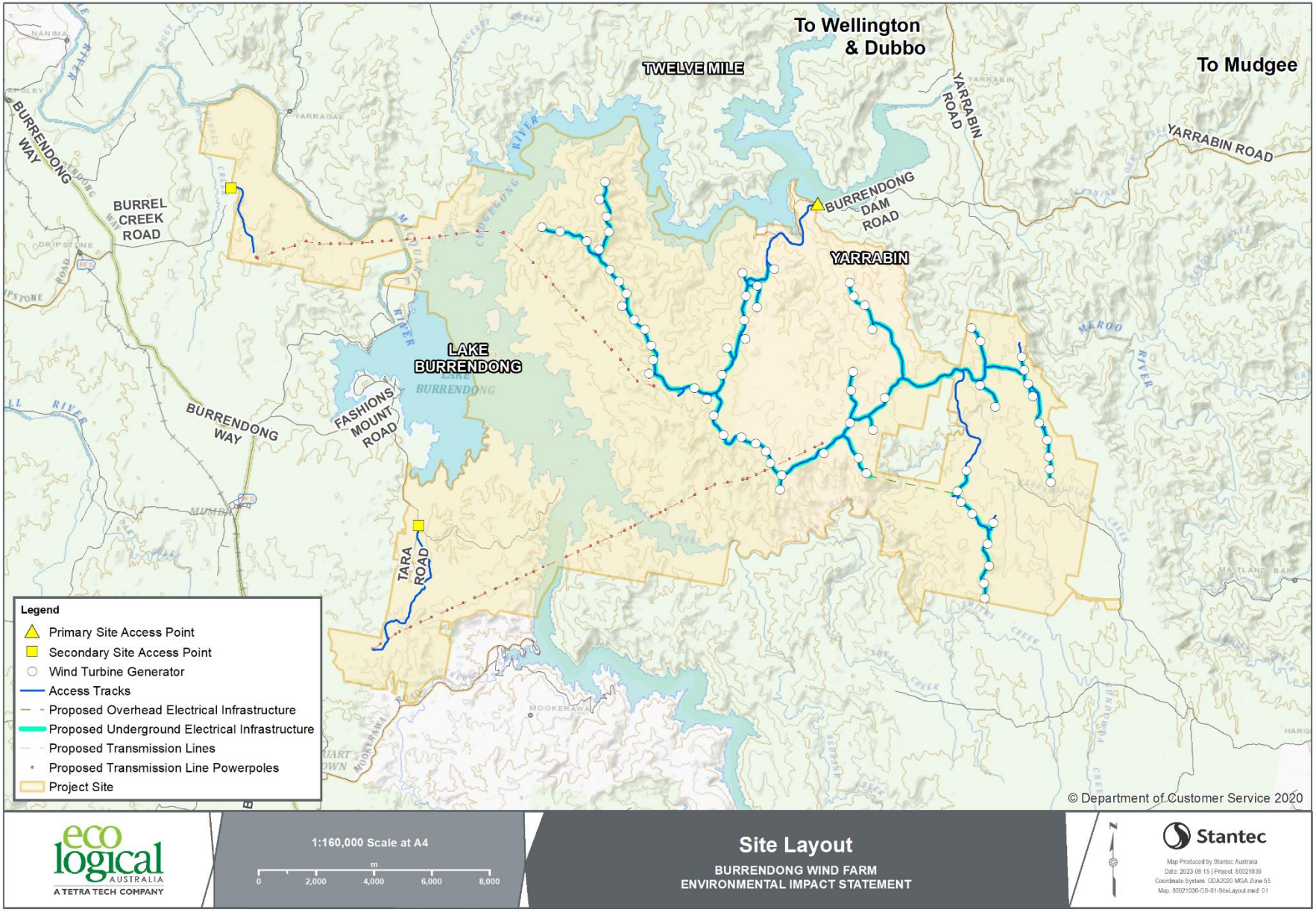
- 70 WTGs, each consisting of:
  - A three-bladed rotor and nacelle mounted onto a tubular steel tower and concrete foundation
  - A crane hardstand and laydown area for assembly of the wind turbine generator
  - A wind turbine generator transformer located either in the nacelle or adjacent to the wind turbine generator.
- Roads and tracks:
  - Upgrades to the existing public road network to provide access to the Project Site and enable safe delivery of the oversize/overmass components from the Port of Newcastle

- New access tracks within the Project Site providing access to the WTG locations and other infrastructure.

- Electrical infrastructure:
  - Medium voltage (usually 33kV) electrical connections between the WTGs and the collector substations, which will include a combination of underground cabling and overhead powerlines
  - Up to two collector substations
  - A high voltage (330kV) power line to connect the collector substations to the connection switchyard
  - A connection switchyard to connect the Project powerline to the existing TransGrid 330 kV transmission network.
- Ancillary infrastructure:
  - A permanent Operations and Maintenance facility
  - A temporary construction compound and site office
  - Temporary storage facilities and laydown areas
  - Temporary construction facilities (including concrete batching plant, material stockpiles and rock crushing plant)
  - Two temporary wind monitoring masts (110m tall) and the installation of up to four permanent wind monitoring masts (hub height)
  - Minor works including fencing, gates, drainage structures, erosion & sediment control measures, rehabilitation works, boundary adjustments and land subdivision.

The Project Site layout is shown in **Figure 2.2**. This TTIA generally applies to the Proposed Site Boundary unless otherwise stipulated in this TTIA and the EIS Project Description.

Figure 2.2 – Project Site Layout



2.3 Transport Routes

All WTG components for the Project will be shipped and stored at the Port of Newcastle until they are ready to be transported to the Project Site. Two transport route options were initially assessed by Rex J Andrews in a Route Study (**Appendix A**), with Routes 2A and 2B from the study being selected as the preferred routes.

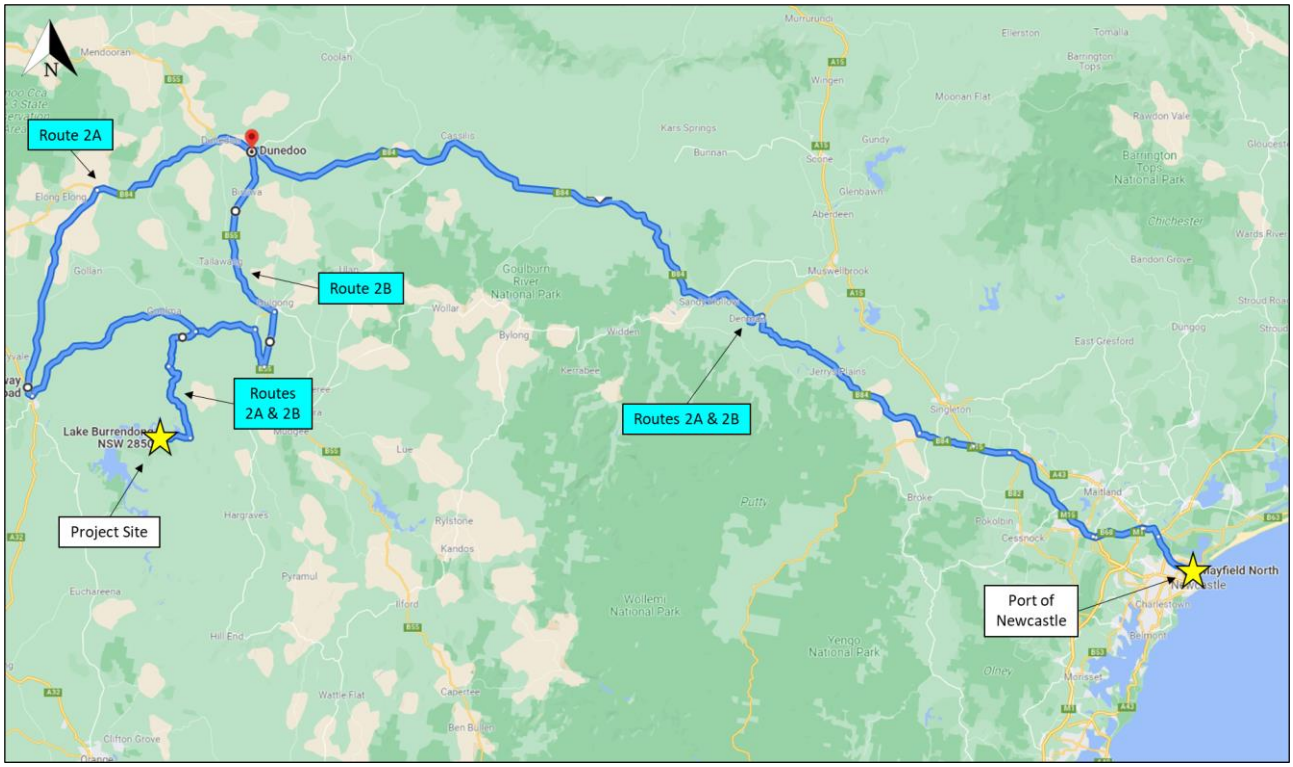
Routes 2A and 2B both follow the same path from the Port of Newcastle to the intersection of Golden Highway / Castlereagh Highway, Dunedoo. From this intersection, the over-size over-mass (OSOM) vehicles transporting the wind turbine components will have two route options due to the length of the WTG blades (82.0m).

- Route 2A (Blades): 469.0km – the blades will be transported via Saxa Road and OSOM vehicles will approach the intersection of Goolma Road / Twelve Mile Road intersection from a westerly direction.
- Route 2B (All other components): 388.0km – all other components will be transported via Castlereagh Highway and approach the intersection of Goolma Road / Twelve Mile Road intersection from an easterly direction.

Routes 2A and 2B recombine at the intersection of Goolma Road / Twelve Mile Road, Two Mile Flat, with all OSOM transport vehicles then using Twelve Mile Road, Yarrabin Road and Burrendong Dam Road to reach the Project Site.

This is shown below in **Figure 2.3**.

Figure 2.3 – OSOM Transport Routes 2A and 2B



Base image source: Google Maps

In addition to the OSOM vehicles, traffic impacts from the Project will be generated by:

- Light and heavy vehicles used to deliver construction materials and personnel during the 2-year construction phase.
- Light vehicles used by onsite personnel and visitors during the 30-year operation phase.

3. Existing Conditions

3.1 Road Network

All roads in NSW are categorised by TfNSW based on their role in the road network and for road management responsibilities:

- State roads link urban and rural centres for the movement of people and freight across the state
- Regional roads are secondary roads that provide connectivity between towns or places of interest within a region
- Local roads are low-capacity roads that provide local access to residences and businesses within a town or locality.

State roads are managed and financed by TfNSW. Regional and local roads are managed and financed by councils, however TfNSW may provide financial assistance to councils for the management of regional roads due to their network significance.

Roads can also be classified functionally by the traffic volume they are expected to convey and their typical characteristics:

- Arterial roads are major roads that connect one region to another
- Sub-arterial roads are secondary roads the connect different areas within a region
- Collector roads are minor roads that link local areas to sub-arterial and arterial roads
- Local roads are minor roads that provide access to houses and carry low traffic volumes.

Table 3.1 provides the expected daily and peak hour traffic volume limits, vehicle operating speeds, heavy vehicle load restrictions and types of pedestrian crossings found on each functional classification of road.

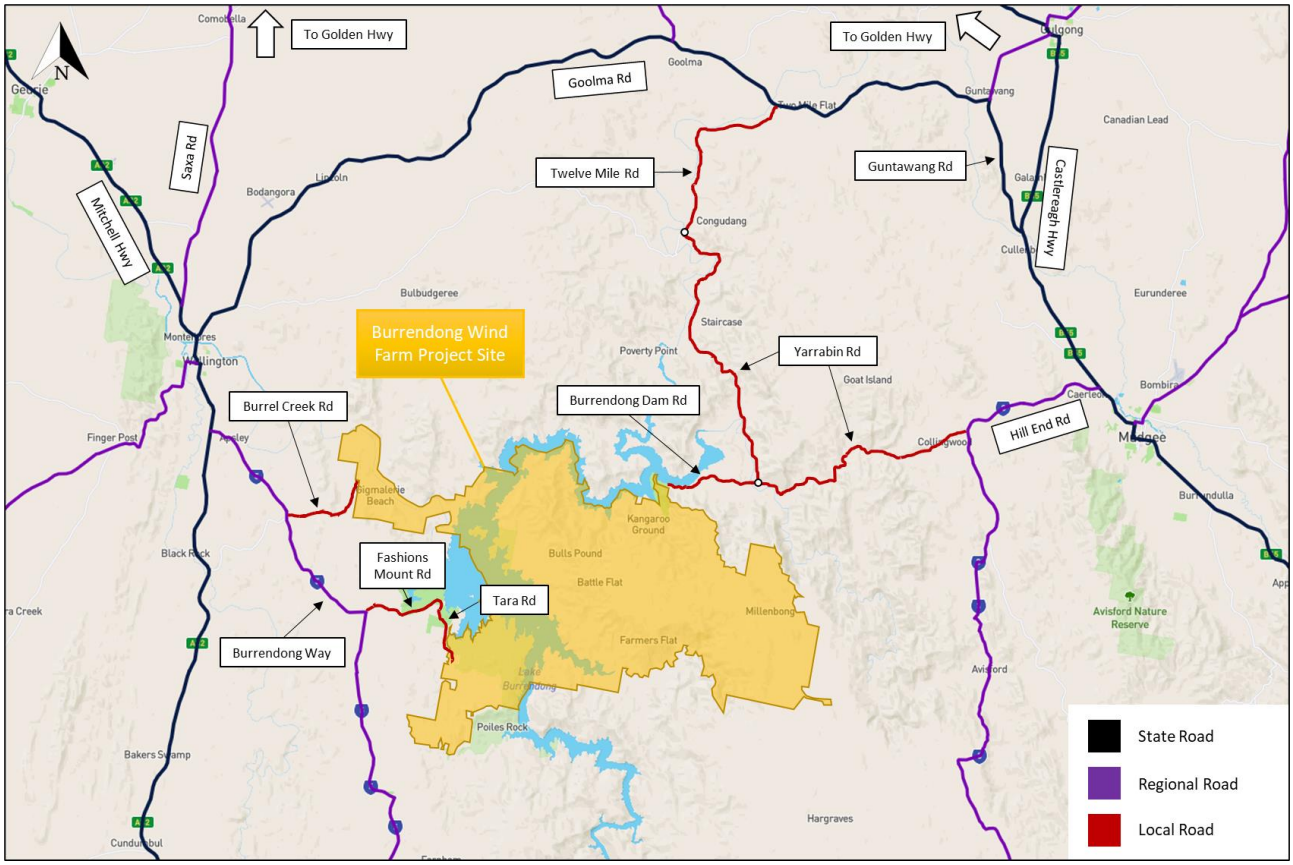
Table 3.1 – Road Hierarchy Descriptions for Rural Areas

Road characteristic	Arterial	Sub-arterial	Collector	Local
Daily traffic volume	No limit	Up to 20,000 vpd	Up to 10,000 vpd	Up to 4,000 vpd
Peak hour traffic volume* ***assumed based on 10% of daily traffic volume**	> 2,000 vph	Up to 2,000 vph	Up to 1,000 vph	Up to 400 vph
Vehicle operating speed	60-110km/h	60-80 km/h	40-60 km/h	40 km/h
Heavy vehicle load restrictions	None	Preferably none	Yes	Yes
Types of pedestrian crossings	Grade-separated or signals	Signals or refuge	Marked crossing or refuge	Marked crossing or refuge

Adapted from source: Road Design Guide (RTA, 1991)

Figure 3.1 shows the locations of the roads that are likely to be impacted by the Project. The following sections will outline the existing conditions of each individual road impacted by the Project.

Figure 3.1 – Map of Existing Road Network



Base image source: TfNSW Road Network Classifications Map

3.1.1 Mitchell Highway

The Mitchell Highway is an east-west rural highway (HW7) in western NSW that connects Bathurst to Nyngan. It is classified as a State Road with a posted speed limit of 80km/h just outside the township of Wellington. The Mitchell Highway will be used by OSOM vehicles for 2.5km as a link between Saxa Road and Goolma Road in Wellington, and between Dubbo and Wellington for any light or heavy vehicles originating from Dubbo.

3.1.2 Castlereagh Highway

The Castlereagh Highway is a north-south rural highway (HW18) in western NSW that connects Lithgow to the Queensland border. It is classified as a State Road with a posted speed limit of 100km/h between Gulgong and Caerleon. The road has one travel lane in each direction and the carriageway is approximately 9.0m-9.5m wide, inclusive of a shoulder on each side.

A 42km section of Castlereagh Highway has been identified as part of OSOM Haulage Route 2B linking the Golden Highway, Dunedoo, to Goolma Road, Gulgong. A short 2-4km section of Castlereagh Highway just north of Mudgee will also be used by any light or heavy vehicles originating from Mudgee.

3.1.3 Golden Highway

The Golden Highway is an east-west rural highway (HW27) which links Dubbo to the Hunter region, and eventually the Port of Newcastle via New England Highway and Hunter Expressway. It is classified as a State Road with a posted speed limit of 100km/h. The highway predominantly has one lane of travel in each direction, with segments where overtaking lanes exist. The Golden Highway will be the main highway used to transport OSOM freight from the Port of Newcastle to within close proximity of the site.

3.1.4 Goolma Road

Goolma Road is a State Road (MR633) between Wellington and Mudgee in western NSW. The road has a single lane of travel in each direction and has a posted speed limit of 100km/h. The road has varying widths, often between 6.0m-7.0m, and most sections have a small shoulder and edge linemarking.

A 42km section of Goolma Road between Mitchell Highway and Twelve Mile Road (the western end) will be used by OSOM vehicles on Haulage Route 2A, as well as light and heavy vehicles originating from Wellington and Dubbo. A 21km section of Goolma Road between Castlereagh Highway and Twelve Mile Road (the eastern end) will be used by OSOM vehicles on Haulage Route 2B.

3.1.5 Hill End Road

Hill End Road is a classified regional road (MR216) which connects the Castlereagh Highway to the town of Hill End. The road has a single lane of travel in each direction and has a posted speed limit of 100km/h. The road carriageway is approximately 6.0m-7.0m in width and there are no shoulders or edge linemarking.

A 9.5km section of Hill End Road linking Castlereagh Highway, Caerleon, to Yarrabin Road, Collingwood, will be used by light and heavy vehicles originating from Mudgee.

3.1.6 Saxa Road (formerly Cobbora Road)

Saxa Road is a classified regional road (MR353) linking the Golden Highway at Elong Elong to the Mitchell Highway at Wellington, and this road allows haulage vehicles to bypass the town of Dubbo. For roads not in an urban area, the default speed limit is 100km/h. The carriageway is narrow at approximately 6.0m in width with no hard shoulder on the road edges, which may create difficulty for vehicles travelling in the opposite direction to pass OSOM vehicles. Saxa Road will be used by OSOM vehicles on Haulage Route 2A.

3.1.7 Burrendong Way

Burrendong Way is a classified regional road (MR573) linking the Mitchell Highway at Appley to the Mitchell Highway at Orange. The road has a single lane of travel in each direction and has a posted speed limit of 100km/h. The road carriageway is approximately 6.0m-7.5 in width and there are no shoulders or edge linemarking.

Either a 7.5km section or 16.5km section of Burrendong Way will be used by light and heavy vehicles associated with works on the western side of Burrendong Lake, originating from Wellington.

3.1.8 Twelve Mile Road

Twelve Mile Road is a local road off Goolma Road, only providing local access to rural properties. The road is predominantly unsealed and features multiple cattle grids and a variable road width. For unsealed roads, the default speed limit is assumed to be 80km/h.

A 12.5km section of Twelve Mile Road has been identified as part of both OSOM Haulage Routes 2A and 2B linking Goolma Road, Two Mile Flat, to Yarrabin Road, Twelve Mile. Light and heavy vehicles originating from Wellington and Dubbo will also use Twelve Mile Road.

3.1.9 Yarrabin Road

Yarrabin Road is a local road only providing local access to rural properties. The road has a mixture of sealed and unsealed sections and there is a variable road width. For sealed rural roads, the default speed limit is 100km/h. For unsealed rural roads, the default speed limit is assumed to be 80km/h.

A 20km section of Yarrabin Road (running north-south) has been identified as part of both OSOM Haulage Routes 2A and 2B linking Twelve Mile Road, Twelve Mile, to Burrendong Dam Road, Yarrabin. Light and heavy vehicles originating from Wellington and Dubbo will also use this section of Yarrabin Road.

A 16.5km section of Yarrabin Road (running east-west) linking Hill End Road, Collingwood, to Burrendong Dam Road, Yarrabin, will be used by light and heavy vehicles originating from Mudgee.

3.1.10 Burrendong Dam Road

Burrendong Dam Road is a local road only providing local access to rural properties. The road is predominantly unsealed and there is a variable road width. For unsealed roads, the default speed limit is assumed to be 80km/h. Burrendong Dam Road will be used by all OSOM vehicles, light vehicles and heavy vehicles accessing the site.

3.1.11 Fashions Mount Road

Fashions Mount Road is a local road providing access to a botanic garden, caravan park and local rural properties. The road is sealed and has a road carriageway width of approximately 5.0m-6.0m. For sealed rural roads, the default speed limit is 100km/h.

Fashions Mount Road may be used by light and heavy vehicles associated with works on the western side of Burrendong Lake, originating from Wellington.

3.1.12 Tara Road

Tara Road is a local road providing access to a sport and recreation centre, and local rural properties. The road has a mixture of sealed and unsealed sections and has a road carriageway width of approximately 5.0m-6.0m. For sealed rural roads, the default speed limit is 100km/h. For unsealed rural roads, the default speed limit is assumed to be 80km/h.

Tara Road may be used by light and heavy vehicles associated with works on the western side of Burrendong Lake, originating from Wellington.

3.1.13 Burrel Creek Road

Burrel Creek Road is a local road only providing local access to rural properties. The road is predominantly unsealed and has a road carriageway width of approximately 4.0m-5.0m (therefore can only safely carry traffic in one direction). For unsealed roads, the default speed limit is assumed to be 80km/h. Burrel Creek Road is signposted as a No Through Road.

Burrel Creek Road may be used by light and heavy vehicles associated with works on the western side of Burrendong Lake, originating from Wellington.

Table 3.2 – Road Classifications and Conditions

Road	Classification	Speed Limit (km/h)	Road Width (m)	Sealed/ Unsealed
Mitchell Highway	State	80	Variable	Sealed
Castlereagh Highway	State	100	9.0 – 9.5	Sealed
Golden Highway	State	100	Variable	Sealed
Goolma Road	State	100	6.0 – 7.0	Sealed
Hill End Road	Regional	100	6.0 – 7.0	Sealed
Saxa Road	Regional	100	6.0	Sealed
Burrendong Way	Regional	100	6.0 – 7.5	Sealed
Twelve Mile Road	Local	80	Variable	Unsealed
Yarrabin Road	Local	100 / 80	Variable	Sealed/ unsealed
Burrendong Dam Road	Local	80	Variable	Unsealed
Fashions Mount Road	Local	100	5.0 – 6.0	Sealed
Tara Road	Local	100 / 80	5.0 – 6.0	Sealed/ unsealed
Burrel Creek Road	Local	80	4.0 – 5.0	Unsealed

3.2 School Bus Routes

Regional school travel in rural NSW is important to ensure that children are able to receive an education irrespective of where they live. Bus companies run charter services in regional areas so that students are picked up at / near their rural properties and transported to their school on school mornings and dropped off again in the afternoons. In the morning, buses will generally arrive at the schools between 8.30am – 9am, and in the afternoon, buses will generally pick up from the schools between 3pm – 3.30pm.

The towns of Dubbo, Wellington, Goolma and Mudgee all run regional school bus services that travel on roads likely to be impacted by the Project. These school bus routes and their bus times are detailed in **Table 3.3**, and shown on **Figure 3.2**.

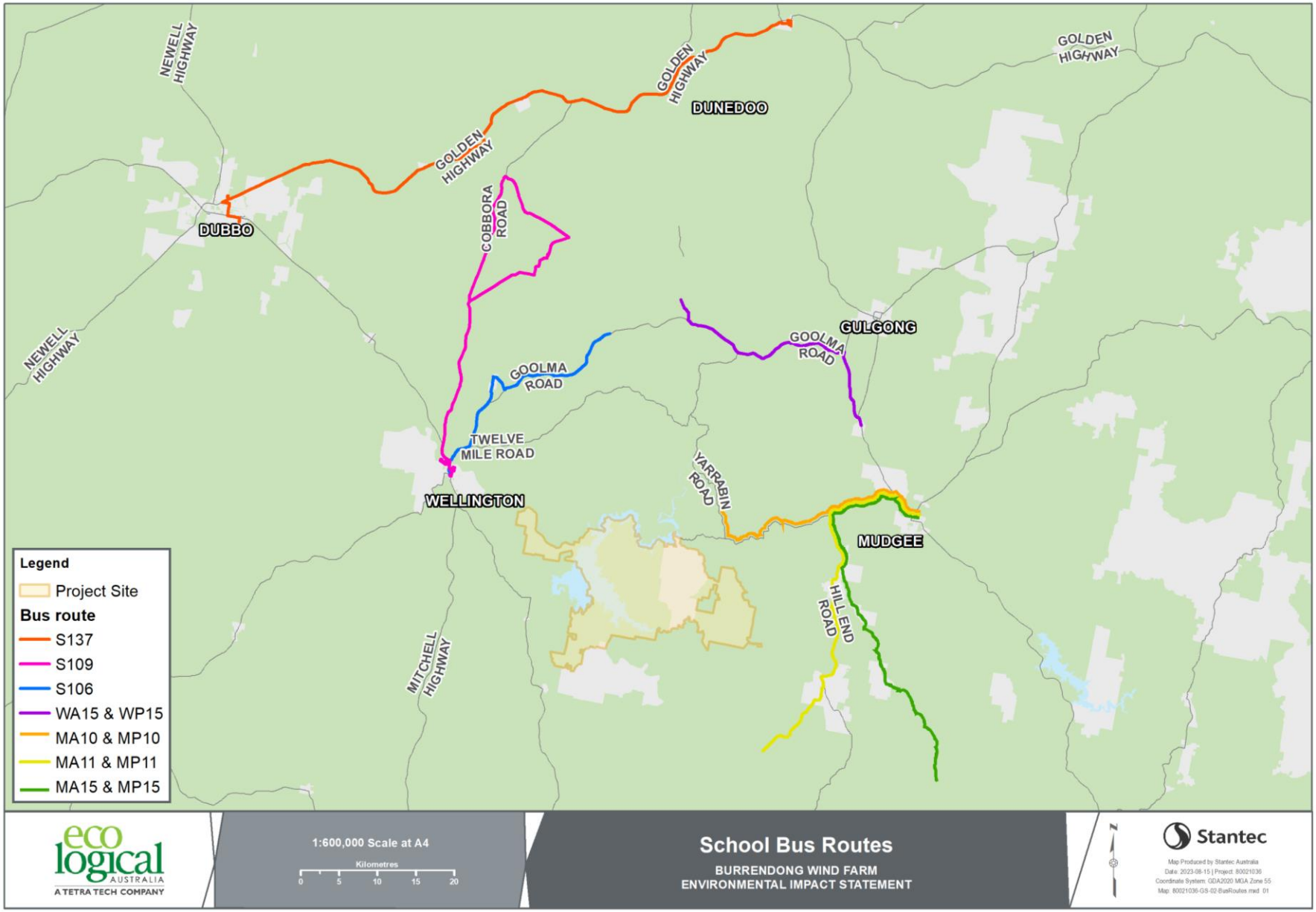
Table 3.3 – School Bus Routes

Bus Route	Road/s Affected	Origin and Destination	Morning Bus Time	Afternoon Bus Time
S137	Golden Highway	Dunedoo to Dubbo schools	07:25 – 08:49	15:30 – 17:05
S109	Saxa Road	Saxa Road to Wellington schools	07:10 – 08:45	15:10 – 16:35
S106	Goolma Road	Mt Bodangora to Wellington schools	08:05 – 08:46	15:07 – 16:05

Bus Route	Road/s Affected	Origin and Destination	Morning Bus Time	Afternoon Bus Time
WA15 & WP15	Goolma Road	Cullenbone to Goolma schools	07:25 – 09:00	15:10 – 16:40
MA10 & MP10	Yarrabin Road & Hill End Road	Yarrabin to Mudgee schools	08:03 – 08:53	15:30 – 16:20
MA11 & MP11	Hill End Road	Hargraves to Mudgee schools	07:33 – 08:46	15:28 – 16:50
MA15 & MP15	Hill End Road	Windeyer to Mudgee schools	07:25 – 08:50	15:30 – 16:48

Source: Moovit (2021) and Ogden's Coaches (2021)

Figure 3.2 – School Bus Routes Map



3.3 Heavy Vehicle Travel Conditions

Reference is made to TfNSW Restricted Access Vehicles (RAV) roads as well as Higher Mass Limits (HML) routes, both of which permit specific vehicle types for travel. Generally speaking, the RAV routes are for vehicles or vehicle combinations which exceed the overall dimensions of vehicles defined in the Heavy Vehicle National Law (HVNL) which is defined based on the width, height, length and internal dimensions. HML routes permit operators to utilise road freight transport vehicles achieving significant increase in productivity.

The heavy vehicle or vehicle combinations that operate on approved RAV and HML routes generally include the following:

- B-Doubles
- 4.6m High Vehicles
- Road Trains.

An OSOM vehicle is defined as a Class 1 vehicle under the HVNL and is considered to be OSOM if it exceeds any general access mass or dimension limits.

Table 3.4 identifies both the OSOM vehicle and B-double travel conditions on roads which will be used during the Project.

Figure 3.3 shows the OSOM vehicle routes identified in the Rex J Andrews Route Study (2019) and the locations of any heavy vehicle travel conditions. These have been identified from TfNSW's OSOM Load Carrying Vehicles Network Map and TfNSW's RAV Map.

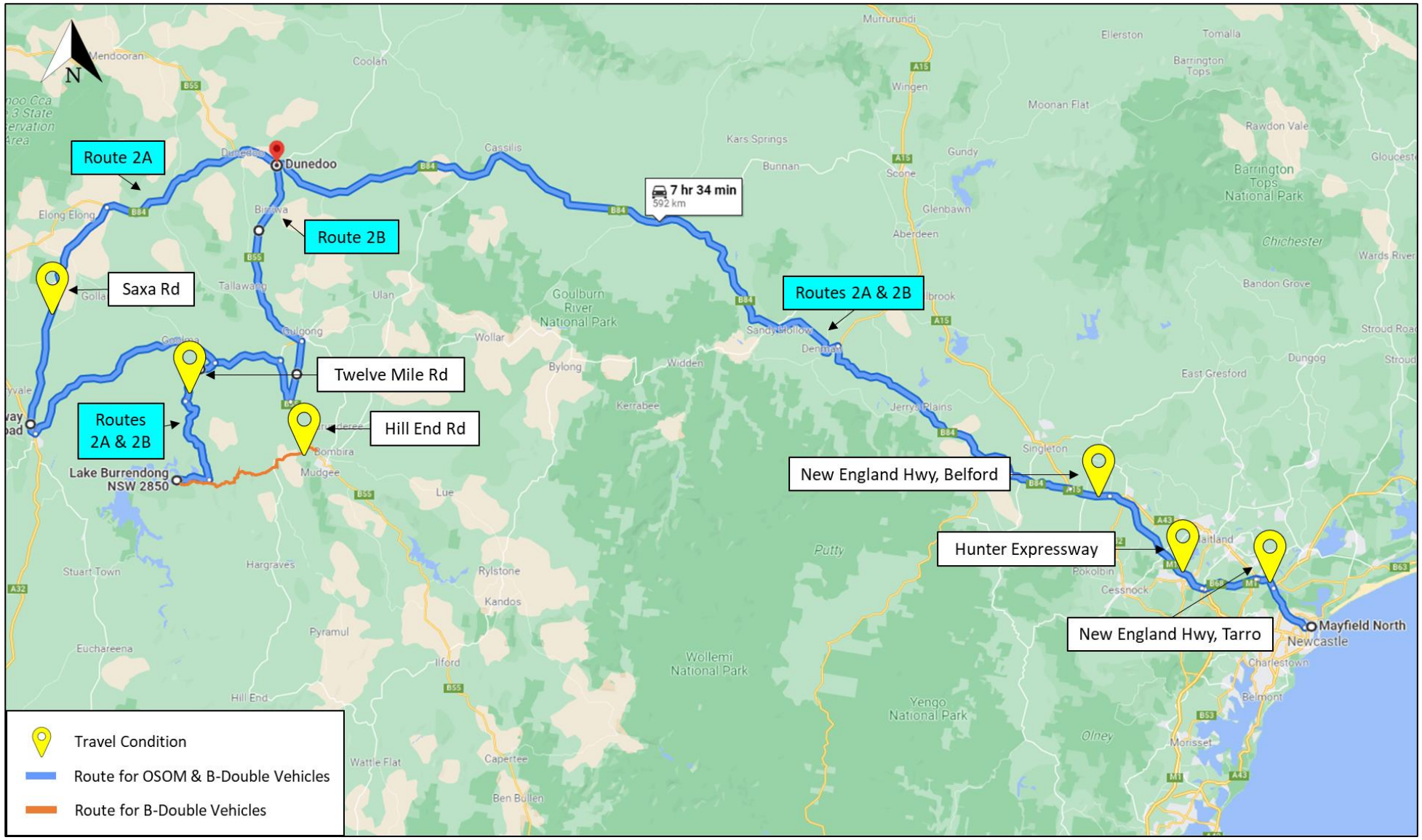
If the Project sought an exception to any of the travel restrictions, it is suggested that the applicant liaise with the TfNSW OSOM Road Access Unit and/or NHVR to apply for an exception permit.

Table 3.4 – OSOM and B-Double Travel Conditions

Road	Route	Travel Conditions
New England Highway, Tarro	Routes 2A & 2B	• B-double vehicles approved, no travel conditions. • OSOM vehicles approved under the following travel conditions: – Between Hexham and Weakleys Drive, vehicles or combinations exceeding 3.5 metres wide or 25.0 metres long are not permitted to travel between 8:30am and sunset on weekends or a state-wide public holiday.
Hunter Expressway, Buchanan	Routes 2A & 2B	• B-double vehicles approved, no travel conditions. • OSOM vehicles approved under the following travel conditions: – Vehicles or combinations exceeding 3.2 metres wide are not permitted to travel from Monday to Friday from 5:00am to 9:00am and from Monday to Friday from 4:00pm to 6:00pm (except on state-wide public holidays).
New England Highway, Belford	Routes 2A & 2B	• B-double vehicles approved, no travel conditions. • OSOM vehicles approved under the following travel conditions: – Between Weakleys Drive and Singleton side of the traffic lights at Magpie Street (Bunning's corner) (north of Singleton), vehicles or combinations exceeding 3.2 metres wide are not permitted to travel from Monday to Friday from 5:00am to 9:00am and from Monday to Friday from 3:00pm to 6:00pm (except on state-wide public holidays).
Saxa Road	Route 2A	• OSOM vehicles approved, no travel conditions. • B-double vehicles approved under the following travel conditions: – No travel permitted 7.30am – 9.00am and 3.30pm – 5.00pm on school days.
Twelve Mile Road	Routes 2A & 2B	• OSOM vehicles approved, no travel conditions. • B-double vehicles approved under the following travel conditions: – A maximum speed limit of 60km/h applies.
Hill End Road	B-Double Route Only	• B-double vehicles approved under the following travel conditions: – 80km/h B-Double speed limit. Outside school bus operation times. • Not approved route for OSOM vehicles.

Source: TfNSW OSOM Load Carrying Vehicles Network Map and RAV Map

Figure 3.3 – Locations of Heavy Vehicle Travel Conditions



3.4 Railway Level Crossings

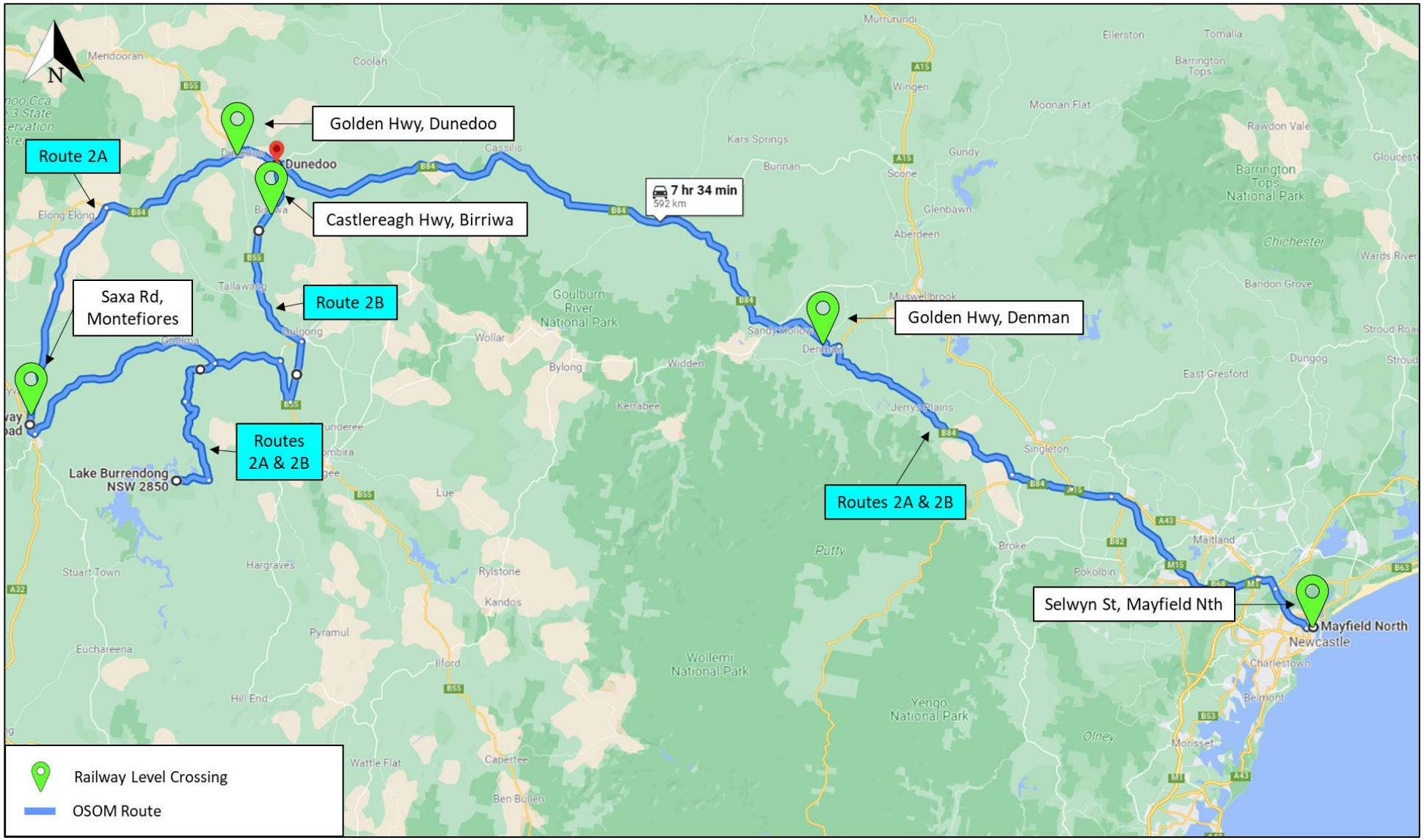
The locations of railway level crossings along the OSOM transport route are listed below in **Table 3.5**, with their locations shown in **Figure 3.4**.

Table 3.5 – Railway Level Crossing Access Conditions

Location	Route	LXM ID	Controls	Access Conditions
Selwyn Street, Mayfield North	Routes 2A & 2B	1659	Active – boom gates & flashing lights	None (privately owned).
Golden Highway (Merriwa Road), Denman	Routes 2A & 2B	1285	Active – boom gates & flashing lights	• Vehicle must approach and traverse the designated level crossings at a speed not less than 35km/h. If the vehicle cannot comply with this condition, the operator must contact Rail Infrastructure Manager. • The Ulan rail line section is owned by Australian Rail Track Corporation (ARTC).
Golden Highway, Dunedoo	Route 2A	1428	Active – flashing lights	• Vehicle must approach and traverse the designated level crossings at a speed not less than 35km/h. If the vehicle cannot comply with this condition, the operator must contact Rail Infrastructure Manager. • The rail line section from Wallerawang to Gwabegar is owned by ARTC.
Saxa Road, Montefiores	Route 2A	699	Active – boom gates & flashing lights	• None (owned by JHR). • Recommended to contact the Rail Infrastructure Manager.
Castlereagh Highway, Birriwa	Route 2B	1425	Active – flashing lights	• Vehicle must approach and traverse the designated level crossings at a speed not less than 35km/h. If the vehicle cannot comply with this condition, the operator must contact Rail Infrastructure Manager. • The rail line section from Wallerawang to Gwabegar is owned by ARTC.

Source: TfNSW Level Crossing Finder

Figure 3.4 – Locations of Railway Level Crossings



3.5 Traffic Volumes

The roads likely to be impacted by the Project are identified in **Section 3.1**. Traffic count data for these roads has been obtained from multiple sources including Mid-Western Regional Council, MetroCount data supplied by TfNSW and previously submitted SSD traffic assessments within close proximity to the Project Site.

Where conflicting traffic volume data was obtained, the most accurate dataset was selected based on source, reliability and survey year. Where no traffic volume data could be obtained (i.e. for Burrendong Way, Fashions Mount Road, Tara Road and Burrel Creek Road), it was assumed that these roads would carry similar traffic volumes to a comparable road.

The data sources range from between 2011 to 2022 and as such, all traffic volumes have been factored up by an assumed growth rate of 1% per annum to 2023.

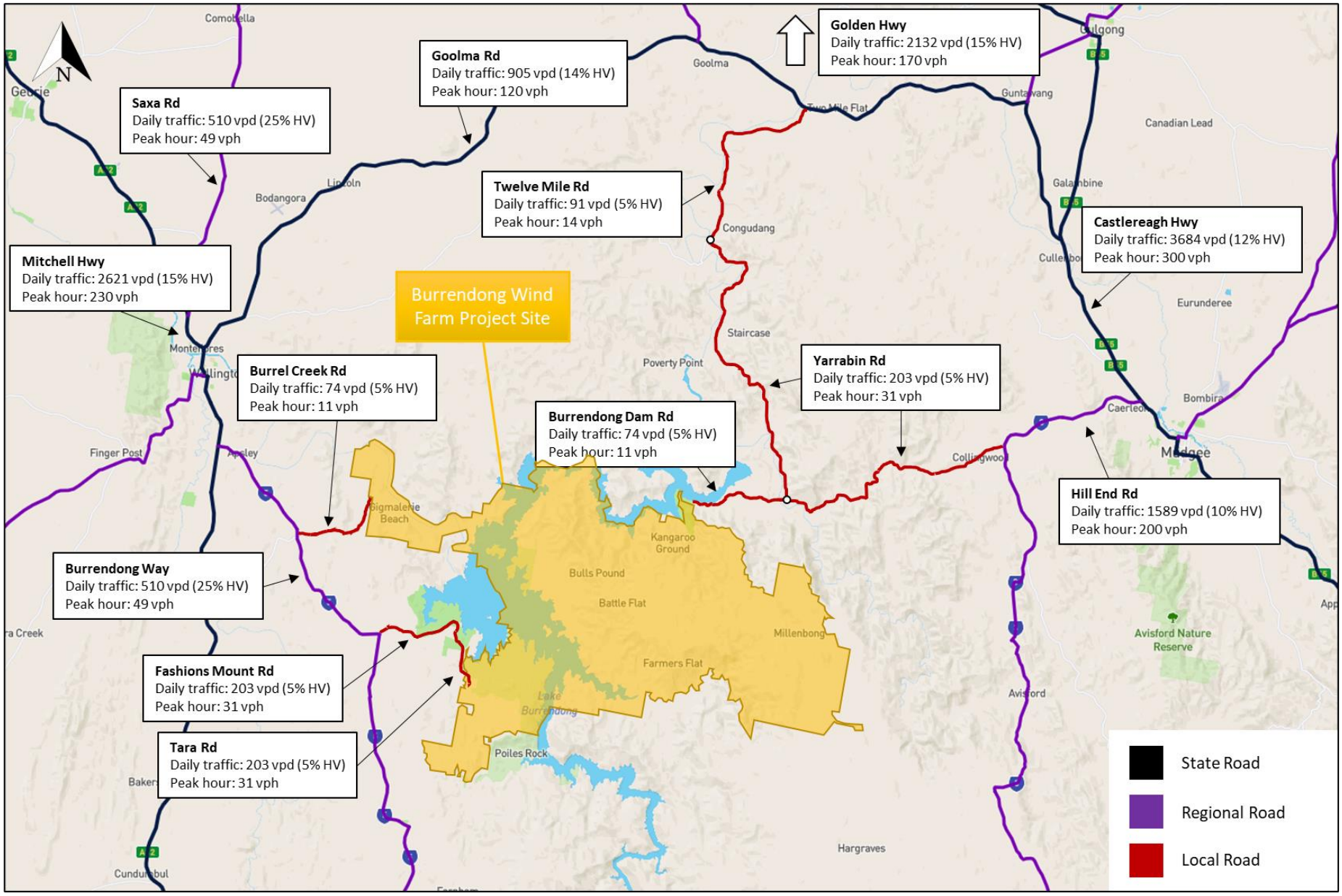
The 2023 average daily traffic volumes, peak hour volumes, heavy vehicle percentages and data sources are all shown below in **Table 3.6**. The median AM Peak Hour time from the data collected was 8.00am – 9.00am, and the median PM Peak Hour time was 3.00pm – 4.00pm.

Table 3.6 – Anticipated 2023 Daily Traffic Volumes and Peak Hour Volumes

Road	Average Daily Traffic Volume (vpd)	Peak Hour Volume (vph)	Traffic Volume Source	2023 Average Daily Traffic Volume (vpd)	Heavy Vehicle Percentage
Mitchell Highway	2520	230	Uungula Wind Farm (Samsa, 2019)	2621	15%
Castlereagh Highway	3289	300	MetroCount Data (TfNSW, 2011)	3684	12%
Golden Highway	2050	170	Uungula Wind Farm (Samsa, 2019)	2132	15%
Goolma Road	870	120	Uungula Wind Farm (Samsa, 2019)	905	14%
Hill End Road	1444	200	Crudine Ridge Wind Farm (Samsa, 2013)	1589	10%
Saxa Road	485	49	Wellington North Solar Farm (GHD, 2018)	510	25%
Burrendong Way	*1444**	*200**	**Assumed to be similar to Hill End Road*	*1589**	*10%**
Twelve Mile Road	90	14[1]	Mid-Western Regional Council (2022)	91	5%[2]
Yarrabin Road	201	31[1]	Mid-Western Regional Council (2022)	203	5%[2]
Burrendong Dam Road	73	11[1]	Mid-Western Regional Council (2022)	74	5%[2]
Fashions Mount Road	*201**	*31**	**Assumed to be similar to Yarrabin Road*	*203**	*5%**
Tara Road	*201**	*31**	**Assumed to be similar to Yarrabin Road*	*203**	*5%**
Burrel Creek Road	*73**	*11**	**Assumed to be similar to Burrendong Dam Road*	*74**	*5%**

[1] Peak hour volume assumed to be 15% of the daily traffic volume
[2] Assumed values

Figure 3.5 – Map of Traffic Volumes



3.6 Crash History

TfNSW provides details of all recorded crashes in NSW within the latest 5-year reporting period (2017 – 2021) on the NSW Centre for Road Safety website.

The history of crashes on the regional and local roads which may be used by vehicles accessing the site are summarised below in **Table 3.7**.

Table 3.7 – Crash History (2017 – 2021) on Regional and Local Roads

	Non-casualty	Minor Injury	Moderate Injury	Serious Injury	Fatal	Total
Saxa Road	2	2	6	2	0	**12**
Burrendong Way	3	1	2	4	0	**10**
Fashions Mount Road	0	0	0	1	0	**1**
Tara Road	0	0	0	1	0	**1**
Yarrabin Road	0	0	1	0	0	**1**
Hill End Road	1	0	2	1	0	**4**
Twelve Mile Road	0	0	0	0	0	**0**
Burrel Creek Road	0	0	0	0	0	**0**
Burrendong Dam Road	0	0	0	0	0	**0**

Source: NSW Centre for Road Safety

The full details of these crashes are included in **Table 3.8**, with their locations depicted in **Figure 3.7**.

Of the 12 recorded crashes on Saxa Road, eight were off-road types of accidents (five on a straight section of road and three on a curve). The four remaining crashes were overtaking, rear end and on-path types of crashes.

On Saxa Road, four crashes occurred at the Saxa Road/ Muronbung Road intersection, two occurred on a horizontal curve near the Saxa Road/ Mine Road intersection (**Figure 3.6**), and the remaining crashes occurred at separate locations. The off-road types of accidents occurring at these locations in particular indicate that drivers on Saxa Road may be misjudging the bends in these locations and not slowing down to appropriate speeds to navigate the curves.

Figure 3.6 – Intersection of Saxa Road and Mine Road, Maryvale

Base image source: Google Streetview (2023)

There are no apparent trends relating to the recorded crashes on Burrendong Way or Hill End Road, and there have been no recorded accidents within the latest 5-year reporting period (2017 – 2021) on Twelve Mile Road, Burrel Creek Road or Burrendong Dam Road.

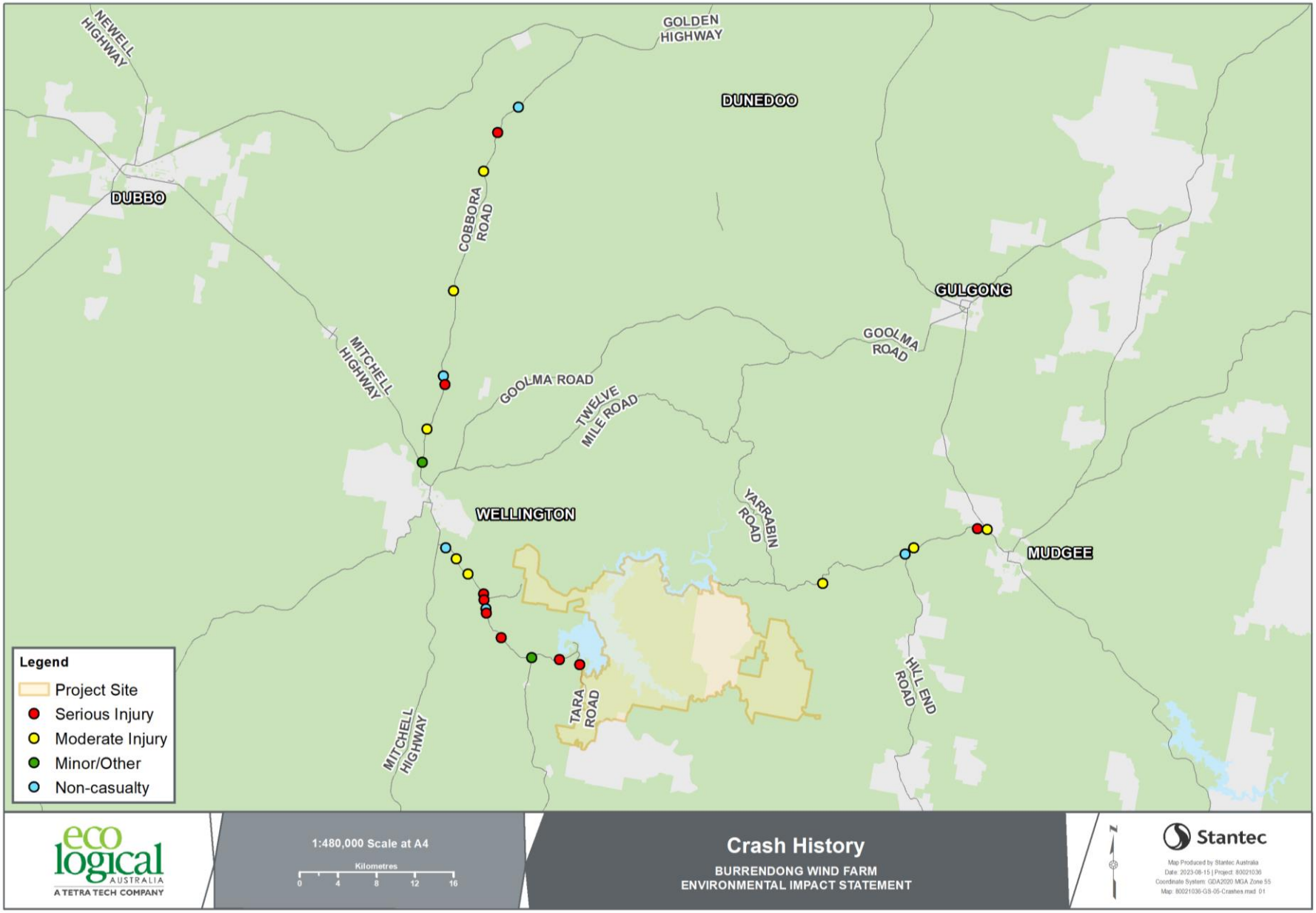
Table 3.8 – Crash History (2017 – 2021)

Reporting Year	Crash ID	Degree of Crash	RUM Code	RUM description	Type of location	Natural lighting	Longitude	Latitude	No. killed	No. injured
Saxa Road										
2017	1124977	Non-casualty	74	Out of control on road	2-way undivided	Daylight	148.954417	-32.436415	-	-
	1141369	Moderate Injury	86	Off left on left bend	T-junction	Daylight	148.956192	-32.444605	-	1
	1149979	Moderate Injury	53	Overtake turning	T-junction	Daylight	149.009572	-32.207368	-	1
2018	1163206	Moderate Injury	55	Pulling out rear end	2-way undivided	Daylight	148.937165	-32.486642	-	1
	1172886	Minor/Other	32	Right rear	2-way undivided	Daylight	148.932941	-32.517789	-	1
2019	1200111	Serious Injury	81	Off left on right bend into object	T-junction	Daylight	148.956192	-32.444605	-	1
2020	1249971	Serious Injury	75	Off end of road at T-intersection	T-junction	Daylight	149.009568	-32.207366	-	1
2021	1274239	Moderate Injury	71	Left off carriageway into object	2-way undivided	Daylight	148.994527	-32.245043	-	1
	1275621	Non-casualty	67	Struck animal	2-way undivided	Daylight	149.032001	-32.182737	-	-
	1275810	Minor/Other	75	Off end of road at T-intersection	T-junction	Darkness	149.009568	-32.207366	-	1
	1279873	Moderate Injury	83	Off right on right bend into object	2-way undivided	Darkness	148.963711	-32.356180	-	1
	1280206	Moderate Injury	75	Off end of road at T-intersection	T-junction	Dawn	149.009568	-32.207366	-	2
Burrendong Way										
2017	1130383	Serious Injury	86	Off left on left bend	2-way undivided	Darkness	149.024054	-32.680957	-	1
	1141552	Moderate Injury	86	Off left on left bend	2-way undivided	Darkness	148.986757	-32.622259	-	1
	1163744	Moderate Injury	81	Off left on right bend into object	2-way undivided	Darkness	148.973030	-32.608720	-	4
2018	1179726	Non-casualty	87	Off left on left bend into object	2-way undivided	Dusk	148.961092	-32.597911	-	-
	1159804	Non-casualty	83	Off right on right bend into object	T-junction	Daylight	149.003742	-32.645493	-	-
	1167833	Serious Injury	88	Out of control on carriageway	T-junction	Daylight	149.003742	-32.645493	-	1
2020	1239596	Serious Injury	87	Off left on left bend into object	2-way undivided	Daylight	149.006776	-32.658446	-	3
	1256063	Minor/Other	20	Head on	T-junction	Daylight	149.058027	-32.699011	-	1
2021	1273334	Serious Injury	81	Off left on right bend into object	2-way undivided	Daylight	149.003284	-32.639877	-	1
	1272339	Non-casualty	85	Off right on left bend into object	2-way undivided	Darkness	149.006366	-32.654110	-	-
Fashions Mount Road										

Reporting Year	Crash ID	Degree of Crash	RUM Code	RUM description	Type of location	Natural lighting	Longitude	Latitude	No. killed	No. injured
2019	1204517	Serious Injury	85	Off right on left bend into object	2-way undivided	Daylight	149.088406	-32.699763	-	2
Tara Road										
2018	1176028	Serious Injury	81	Off left on right bend into object	2-way undivided	Daylight	149.109698	-32.702007	-	1
Yarrabin Road										
2021	1276363	Moderate Injury	67	Struck animal	2-way undivided	Daylight	149.378512	-32.623662	-	1
Hill End Road										
2018	1180356	Non-casualty	40	U turn	T-junction	Daylight	149.469415	-32.594451	-	-
2019	1218720	Moderate Injury	10	Cross traffic	T-junction	Daylight	149.559452	-32.569609	-	1
2020	1249819	Moderate Injury	71	Left off carriageway into object	2-way undivided	Darkness	149.479407	-32.588322	-	1
	1250287	Serious Injury	83	Off right on right bend into object	2-way undivided	Daylight	149.549286	-32.569533	-	1

Source: NSW Centre for Road Safety

Figure 3.7 – Map of Crash History



3.7 Crown Land

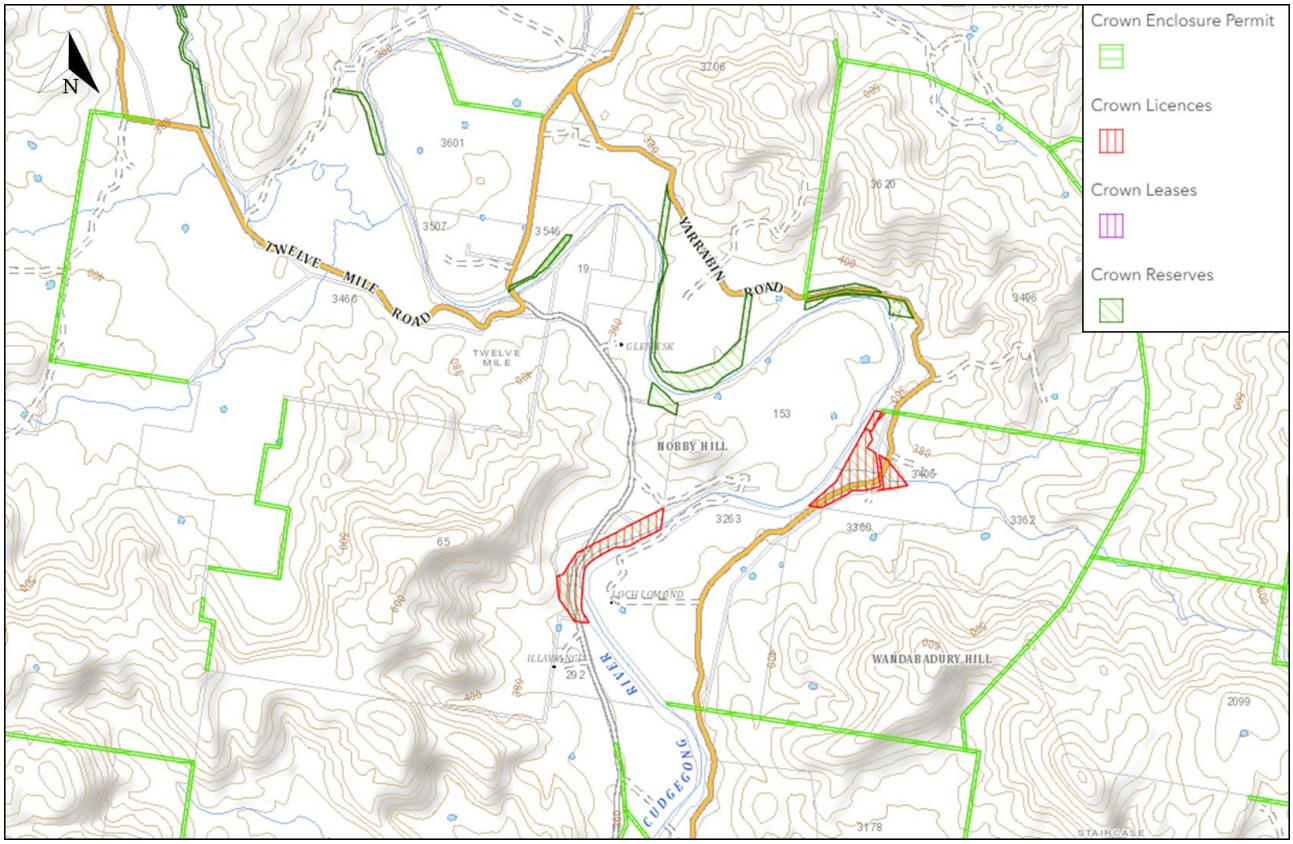
Crown roads were established during the settlement of NSW and are part of the state's public road network. Generally, Crown public roads provide access to freehold and leasehold land where little or no subdivision has occurred since the original Crown subdivision of NSW in the early nineteenth century.

As per the advice from Crown Land NSW in the SEARS requirements, crown land that will be impacted by the development will initially require consent to occupy by way of a Crown land licence, but power-lines will require an easement. Consent of the NSW Aboriginal Land Council is required before any licence/acquisition/easement can be considered. For Crown land already under Tenure or with Land Managers, all discussions for works/occupation will need to be with the Land Manager.

Locations of significance along the OSOM route on Yarrabin Road and Burrendong Dam Road are highlighted in **Figure 3.8** and **Figure 3.9**. The images show any existing crown enclosure permits, crown licenses, crown leases and crown reserves.

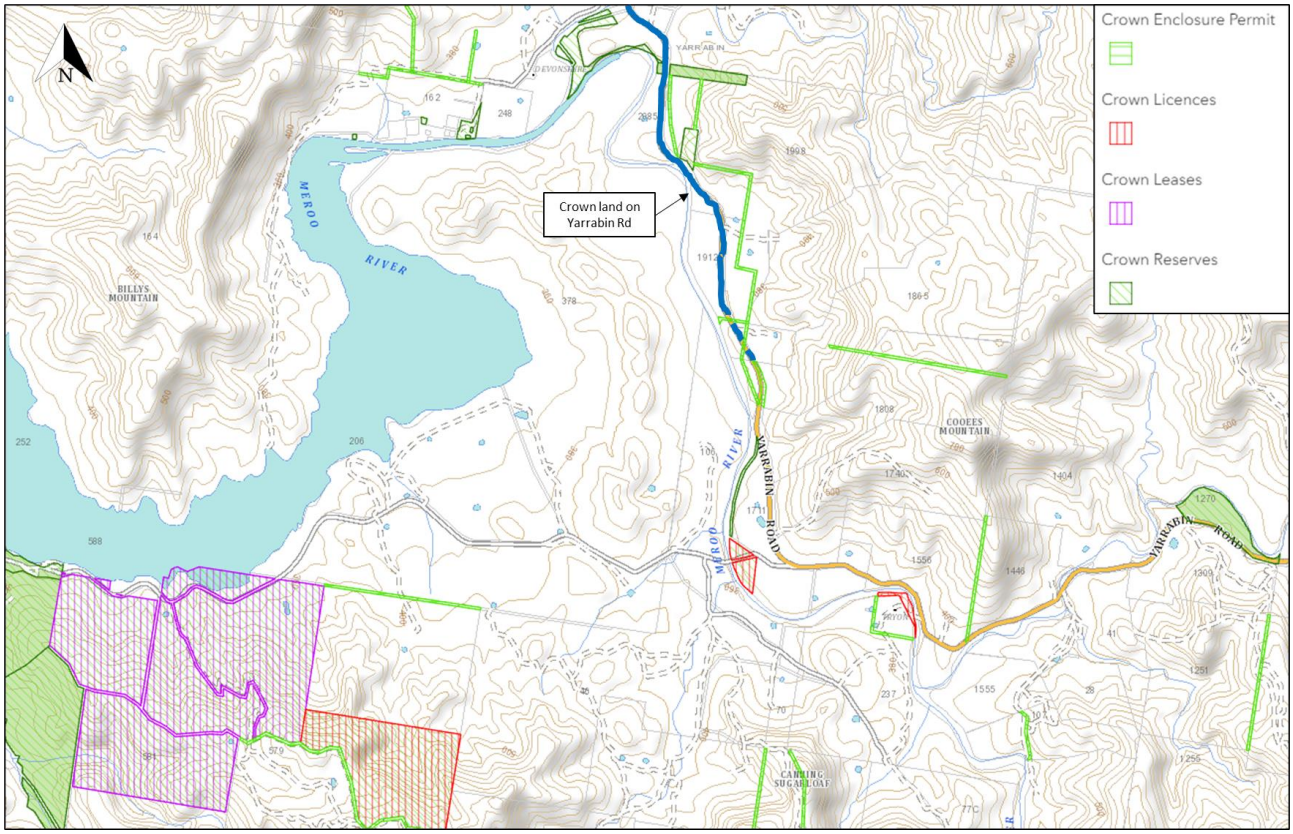
There is a section of crown land of particular significance without any permits or licenses on Yarrabin Road, north of Burrendong Dam Road, shown in **Figure 3.9**.

Figure 3.8 – Crown Land – Yarrabin Road, just south of Twelve Mile Road



Source: NSW Planning Portal Spatial Viewer

Figure 3.9 – Crown Land – Yarrabin Road, just north of Burrendong Dam Road



Source: NSW Planning Portal Spatial Viewer

4. Over-Size Over-Mass Transport Route Assessment

4.1 Overview

As discussed in **Section 2.3**, all wind turbine components for the Project will be shipped and stored at the Port of Newcastle until they ready to be transported to the Project Site.

Routes 2A and 2B both follow the same path from the Port of Newcastle to the intersection of Golden Highway / Castlereagh Highway, Dunedoo, at which point OSOM vehicles transporting the WTG blades will take a different route (Route 2A) to OSOM vehicles transporting the remaining WTG components (Route 2B). This is due to Route 2B not being able to accommodate the vehicles transporting the 82m blades.

Routes 2A and 2B then recombine at the intersection of Goolma Road / Twelve Mile Road, Two Mile Flat, situated north of the Project Site. Both routes use Twelve Mile Road, Yarrabin Road and Burrendong Dam Road to reach the site from the nearest State Road (Goolma Road – MR633).

The OSOM transport routes are shown in **Figure 4.1**.

It is assumed that OSOM vehicles will use the same routes on their return journey that were used to access the Project Site.

4.2 Non-Approved OSOM Roads

In NSW, the National Heavy Vehicle Regulator (NHVR) has three separate gazette notices under which OSOM load carrying vehicles can operate. These are:

- Part A – NSW Class 1 Load Carrying Vehicles Notice (up to 3.5m wide, 4.6m high, 25.0m long, 5.5m rear overhang and total mass of 49.5t)
- Part B – NSW Schedule of the Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice (up to 5.0m wide, 5.0m high, 30.0m long and 7.5m rear overhang)
- Part C – NSW Schedule of the Multi-State Class 1 Load Carrying Vehicles Mass Exemption Notice (up to 115.0t for rows of 8 tyres low loaders and up to 77.5t for rows of 4 tyres low loader combinations).

TfNSW publishes the approved roads for OSOM vehicles on the OSOM Load Carrying Vehicles Network Map which is publicly available online.

To gain approval to use non-approved OSOM roads for the Project, the impacted local Council should first be contacted and consulted, and then a Class 1 permit application should be submitted through the NHVR Portal.

Table 4.1 outlines the non-approved OSOM roads that are proposed to be used by OSOM vehicles for the Project, why they need to be used, and the impacted local Council.

Table 4.1 – List of Non-Approved OSOM Roads

Town	Impacted Local Government Area	Issue	Route	Detour Roads	Action/s Required
Denman	Muswellbrook Shire	Denman Bridge over Hunter River has a maximum height clearance of 5.6m and width clearance of 6.5m. Vehicles over these dimensions cannot travel across the bridge.	Routes 2A and 2B	• Bengalla Rd • Wybong Rd	Council to be consulted & permit application to NHVR.
Twelve Mile & Yarrabin	Mid-Western Regional	Site access from the State Road Network.	Routes 2A and 2B	• Twelve Mile Rd • Yarrabin Rd • Burrendong Dam Rd	Council to be consulted & permit application to NHVR.

Figure 4.1 – OSOM Transport Routes near Project Site

4.3 Vehicle Specifications

Indicative dimensions and weights of the wind turbine components used in the swept path analysis from the Port of Newcastle to the Project Site are outlined below in **Table 4.2**. The table differentiates between the actual dimensions of the components and the dimensions of the possible transportation vehicles for each component.

Table 4.2 – OSOM Transport Vehicle Specifications

Component	Component Dimensions				Possible Transport Configuration	Transport Dimensions			
	L (m)	W (m)	H (m)	Weight (t)		L (m)	W (m)	H (m)	Weight (t)
Nacelle bodies	15	3.9	3.5	86.2	Prime mover with 8x8 platform trailer	32.0	4.5	5.5	144.5
Drivetrains	6.3	3.6	3.1	90.2	Prime mover with 8x8 platform trailer	32.0	4.5	5.5	144.5
Hubs	4.0	3.5	3.8	51.5	**Prime mover with 2x8 4x8 Low Loader**	26.0	5.1	**5.9**	54.5
Blades	82.0	4.0	4.0	35	**Prime mover with 2x4 dolly and 4x4 Extending trailer**	**92.0**	4.5	5.5	77.5
Door section tower	9.5	5.0	4.6	69.5	**Prime mover with 2x8-4x8 Bookend**	35.0	**5.2**	5.3	93.5
Mid Tower D	17.3	4.6	4.3	91	Prime mover with 8x8 low platform	35.0	4.6	5.4	144.5
Mid Tower C	22.4	4.3	4.3	95	Prime mover with 10x8 Platform	39.0	4.3	5.2	164.5
Mid Tower B	29.9	4.3	4.3	93.5	**Prime mover with extending 10x8 Platform**	45.0	4.3	5.2	**174.5**
Mid Tower A	29.9	4.3	4.3	59.2	Prime mover with 2x8 Dolly 3x8 Jinker	45.0	4.3	5.2	94.5
Top Towers	29.7	4.3	3.5	45	Prime mover with 2x8 Dolly 2x8 Jinker	45.0	4.3	5.3	84.5

Source: Rex J Andrews, 2019

Table 4.2 highlights which transport vehicles are anticipated to have the maximum dimensions in terms of length, width, height and maximum load.

OSOM vehicles transporting the blades on Route 2A are predicted to require a travel lane width of at least 4.5m and a clearance height of at least 5.5m. OSOM vehicles transporting all other components on Route 2B are predicted to require a travel lane width of at least 5.2m and a clearance height of at least 5.9m.

4.4 Swept Path Route Study

Rex J Andrews has conducted a detailed swept path Route Study from the Port of Newcastle to the Project Site using an indicative transport vehicle carrying an 82m blade. The profile of the indicative 82m blade transport vehicle used in the assessment is shown in **Figure 4.3**.

Table 4.3 summarises the main findings of the Route Study and lists potential works required along the OSOM routes. The locations of the works are shown in **Figure 4.2**.

Some of these works have been proposed in previous EIS submissions. As detailed in Appendix M of CWP's Uungula Wind Farm EIS submission in May 2020, the OSOM vehicles transporting the 82m blades are proposed to follow an almost identical route from the Port of Newcastle to the Uungula Wind Farm site. The works required for the Project which have been previously considered for Uungula Wind Farm OSOM vehicles are noted in **Table 4.3**.

Existing wind farms within close proximity to Project Site (notably Crudine Ridge Wind Farm and Bodangora Wind Farm) use blades less than 82m in length and as such, the proposed works for the Project were not required during the transport of the WTG components for these other wind farms.

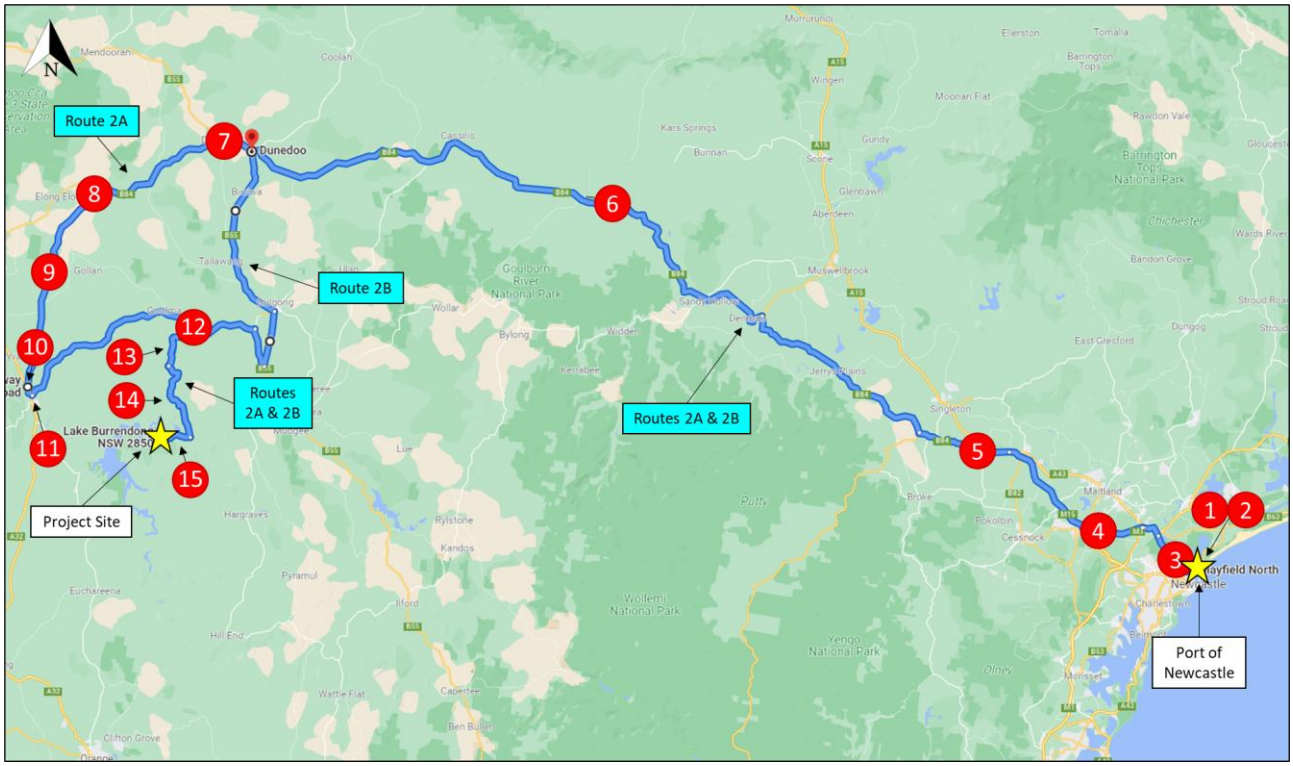
Table 4.3 – Summary of Works Required on OSOM Routes

#	Location	Potential Issues/ Works Required	Route/s	Proposed in a previous EIS?
1	Port of Newcastle	Access to local roads from the port will require some upgrades including the installation of hardstand and relocating fences.	Routes 2A & 2B	Yes – Uungula Wind Farm

#	Location	Potential Issues/ Works Required	Route/s	Proposed in a previous EIS?
2	George Street / Industrial Drive, Mayfield	Installation of hardstand and relocation of a traffic signal.	Routes 2A & 2B	Yes – Uungula Wind Farm
3	Industrial Drive / Maitland Road	Centre median island to be lowered.	Routes 2A & 2B	Yes – Uungula Wind Farm
4	John Renshaw Drive / Hunter Expressway	Police required to stop eastbound traffic on Hunter Expressway to allow OSOM vehicle to make turn at the roundabout.	Routes 2A & 2B	Yes – Uungula Wind Farm
5	New England Highway / Golden Highway	Moderate amount of works required to allow for the turn.	Routes 2A & 2B	Yes – Uungula Wind Farm
6	Golden Highway	Several corners require modifications to allow for the turning OSOM vehicle. Police required to stop eastbound traffic on Golden Highway to allow OSOM vehicle to travel onto the incorrect side of the road for approximately 400m.	Routes 2A & 2B	Yes – Uungula Wind Farm
7	Golden Highway / Wargundy Street, Dunedoo	No Parking Zone required.	Route 2A	Yes – Uungula Wind Farm
8	Golden Highway / Saxa Road	Installation of hardstand, relocation of a drainage pipe, relocation of side markers.	Route 2A	Yes – Uungula Wind Farm
9	Saxa Road	Two floodways and two crests – further survey work required to confirm suitability.	Route 2A	Yes – Uungula Wind Farm
10	Saxa Road / Mitchell Highway	Installation of hardstand, removal of some signage.	Route 2A	Yes – Uungula Wind Farm
11	Mitchell Highway / Goolma Road, Wellington	Installation of hardstand, relocation / removal of several signs, relocation of two light posts.	Route 2A	Yes – Uungula Wind Farm
12	Goolma Road / Twelve Mile Road	Installation of hardstand, relocation of some signage, removal of a tree.	Routes 2A & 2B	No
13	Twelve Mile Road	Road pavement needs to be upgraded and widened to 5.5m, road realignment required in some sections, installation of hardstand, acquisitions of land from property owners, replacement of Piambong Bridge, large amounts of vegetation removal, vertical curve modifications, relocation of a power pole.	Routes 2A & 2B	No
14	Yarrabin Road	Road pavement needs to be upgraded and widened to 5.5m, road realignment required in some sections, installation of hardstand, acquisitions of land from property owners, large amounts of vegetation removal, vertical curve modifications, floodway modifications.	Routes 2A & 2B	No
15	Burrendong Dam Road	Road pavement needs to be upgraded and widened to 5.5-6.5m, road realignment required in some sections, installation of hardstand, possible acquisitions of land from property owners, large amounts of vegetation removal, vertical curve modifications, modification of Meroo River Bridge.	Routes 2A & 2B	No

Source: Rex J Andrews, 2019

Figure 4.2 – Locations of Works Required on OSOM Routes

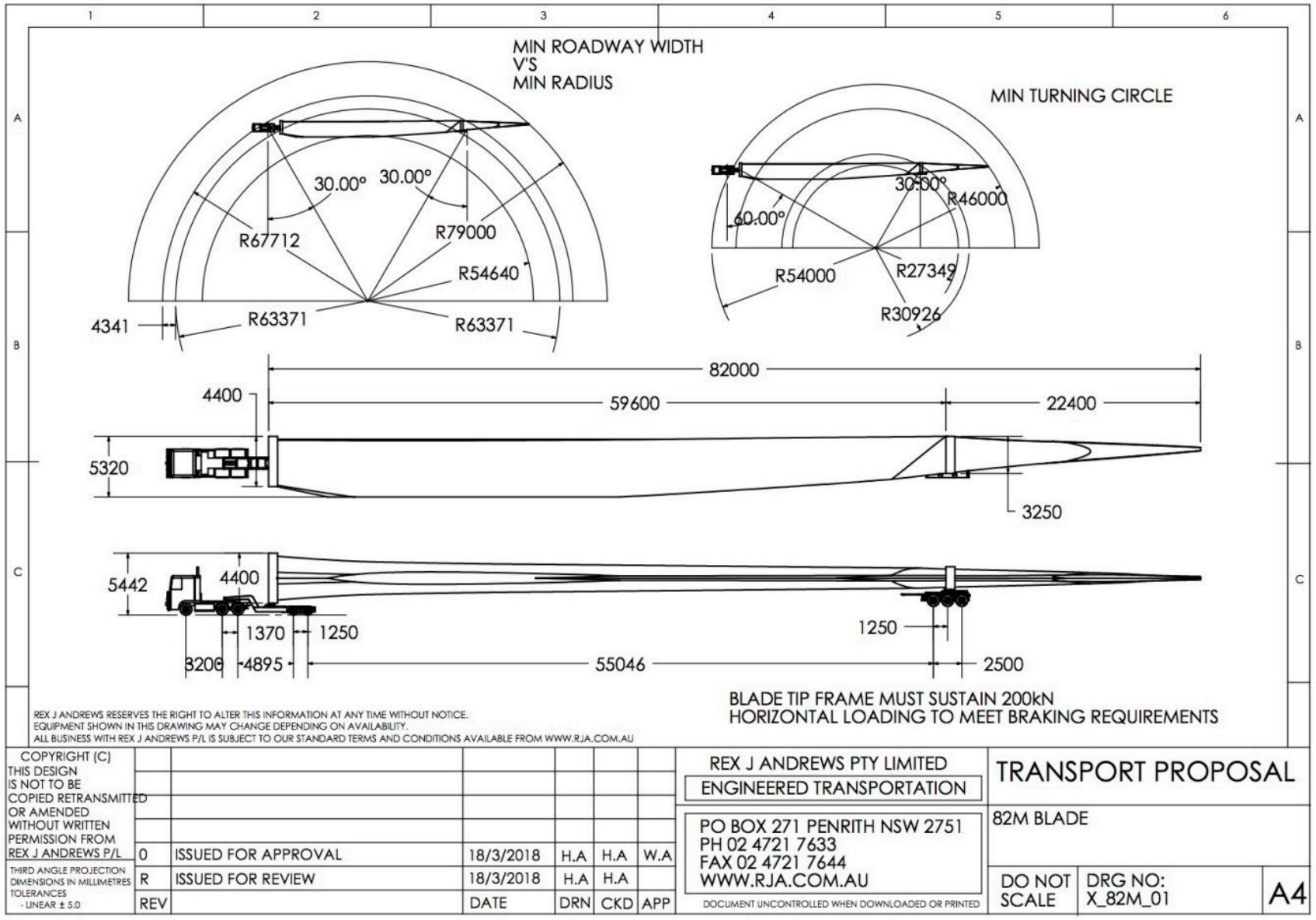


Base image source: Google Maps

The potential issues noted above will need to be addressed as part of the post-EIS Traffic Management Plan (TMP) and in the detailed design stage. Of particular significance is the road pavement width and quality along Twelve Mile Road, Yarrabin Road and Burrendong Dam Road. Mid-Western Regional Council have suggested that these roads be sealed and widened to 7.2m (6.2m for travel lanes and 0.5m shoulders on each side) to align with rural road width guidelines contained in *Austroads Guide to Road Design Part 3* (2021).

The full Rex J Andrews Route Study is attached to this report as **Appendix A**. This Route Study is preliminary and uses indicative blade lengths and transport vehicle dimensions. A full route study, vertical curve study, vegetation assessment, floodway assessment, bridge assessment and overhead utilities scoping assessment would be required once the actual dimensions, weights and transport frames have been determined.

Figure 4.3 – Indicative Transport Vehicle for 82m Blade



Source: Rex J Andrews, 2019

5. Traffic Impact Assessment

5.1 Traffic Generation

Traffic generation for the Project can be broken down into three phases of the Project lifecycle – construction, operation and decommissioning. The initial construction phase will have the most significant impact on traffic generation, with minimal traffic movements expected over the operational life of the Project.

5.1.1 Construction Phase

The construction of a Project comprising of 70 WTGs is expected to take 24 months, up to a maximum of 30 months. On average, this phase is estimated to generate approximately 151 one-way vehicle trips per day during construction months 1-14 and 22-24, and approximately 155 one-way vehicle trips per day during construction months 15-21. Across the entire 24 month construction program the average is 153 one-way vehicle trips per day (16% lower than the maximum traffic generation rate during months 9-10).

Across the construction phase, these traffic generation rates will vary between a minimum of 136 vehicles/day at the start of construction, up to a maximum of 182 vehicles/day during months 9-10.

An indicative analysis of the construction traffic generation is shown in **Figure 5.1**, with **Figure 5.2** outlining the traffic generation on a daily and monthly basis. **Figure 5.3** shows the indicative two-year construction schedule used for the purpose of this analysis.

Light Vehicles

For the majority of the construction phase, it is anticipated that the average workforce on-site will be approximately 250 employees. During peak construction periods, this may increase up to a maximum of 375 employees. From previous experience in wind farm projects, the average carpooling rate is approximately 2 employees per light vehicle over 6 days a week, with a small number of mini-buses used as well. On average, this would result in 125 vehicles going to and from the Project Site each day.

As shown in **Table 5.1**, light vehicles are estimated to make up approximately 81-83% of the total traffic generated during construction. The modal split between vehicle classes will fluctuate between various construction months.

Table 5.1 – Average Modal Split of One-Way Traffic Generation

	Months 1-14 & 22-24		Months 15-21	
	Average One-Way Trips	Percentage of Traffic Generation	Average One-Way Trips	Percentage of Traffic Generation
Light vehicles	125 veh/day	83%	125 veh/day	81%
Heavy vehicles	26 veh/day	17%	26 veh/day	17%
Over-size over-mass vehicles	0 veh/day	0%	4 veh/day	2%
Total	**151 veh/day**	**100%**	**155 veh/day**	**100%**

Figure 5.1 – Indicative Construction Traffic Generation for Trips Approaching the Site

Operation	Purpose	Tonnes / load	Total tonnage	Delivery Vehicle	Trips: as per all construction materials sourced externally
General					
Construction Operations	Water delivery	15	na	Truck Tanker	6,240
	Fuel delivery	15	na	Truck Tanker	208
	Skip delivery	3	na	SM Flat Bed	156
	Portaloo Deliveries	12	na	L Low Loader	260
Wind Farm Construction					
Site Set-Up	Miscelaneous Establishment Deliveries	5	na	L Low Loader	40
	Earthworks equipment delivery	30	na	H Low Loader	30
Road & Hard standings	Imported material for site roads capping (200mm)	30	87,690	Truck and Dog	3,215
	Imported material for crane hardstands (300mm)	30	27,195	Truck and Dog	997
	Imported material for construction site compound (350mm)	30	3,497	Truck and Dog	128
	Imported material for batching plant (350mm)	30	6,475	Truck and Dog	237
	Lime / Cement Stabilisation	60	3,746	Cement Delivery	62
	Subgrade improvement material / fill	30		Truck and Dog	-
Foundation Construction	Heavy equipment delivery	30	na	H Low Loader	10
	Misc works	5	na	SM Flat Bed	10
	Aggregate delivery to batching plant	30	75,600	Truck and Dog	2,520
	Concrete binder for batching	60	12,754	Cement Delivery	213
	Water delivery to batching plant	15	5,443	Truck Tanker	363
	Reinforcing steel delivery	30	3,710	HT Flat bed	124
	Foundation bolts or steel insert delivery	12	na	L Low Loader	70
	Concrete delivery to site (m3)	17	TBC	Redimix Concrete Truck	-
Turbine Components	Tool container delivery	15	na	L Low Loader	15
	WTG container delivery	25	na	SM Flat bed	88
	Tower container delivery	25	na	SM Flat bed	88
	Delivery of 2 top sections	50	na	Low loader - Towers	70
	Delivery of 2 middle top sections	50	na	Low loader - Towers	70
	Delivery of 2 middle bottom sections	50	na	Low loader - Towers	70
	Delivery of 2 bottom sections	50	na	Low loader - Towers	70
	Blades delivery - single blade transport	10	na	Low loader - Blade	210
	Nacelle and Transformer	80	na	Low loader - Nacelle	70
	Drive Train	80	na	Low loader - Drive Train	70
	Hubs + Spinner	15	na	L Low Loader	70
	Power module	24	na	H Low Loader	70
	Return Containers	25	na	HT Flat bed	350
	Escort Vehicles	na	na	4WD and commercial	1,540
Cable Installation	Cable delivery	15	na	L Low Loader	70
	Excavator delivery	30	na	H Low loader	8
	Cable laying equipment	15	na	L Low loader	2
	Cable Bedding Sand	30	8,940	Truck and Dog	298
Cranage	Terrain crane (130t)	130	na	H Low Loader	3
	Terrain crane (220t)	220	na	H Low Loader	4
	Terrain crane (500t)	500	na	H Low Loader	13
	Main Crane	30	na	H Low Loader	24
Overhead Transmission Line	Pole delivery	2	na	Semi trailer	138
	Associated work OHTL vehicles	5	na	Semi trailer	25
	Associated work OHTL vehicles	60	na	Medium rigid	25
	Associated work OHTL vehicles	3	na	Medium rigid	25
Internal Sub Station Construction					
Sub Station Civils	Lime / Cement Stabilisation	17	83	Redimix Concrete Truck	2
		30	2,775	Truck and Dog	62
	Imported Stone for substation compound	30	7,516	Truck and Dog	62
Sub Station Electrical	Transformer delivery - substation	130	130	Low loader - Trans	2
	Switchgear etc.	15	na	L Low Loader	4
	Misc electrical equipment	5	na	SM Flat Bed	1
	Switchgear cable and pylon delivery	24	450	H Low Loader	2
	Operations building	15	12	L Low Loader	3
Operational Infastructure					
Operational Structures			na	Six axle articulated	16
			na	L Low Loader	8
			na	4WD and commercial	44
Decommission of Temprary Structures			na	Six Axle Articulated	16
			na	L Low Loader	8
			n/a	4WD and commercial	44
Light vehicle traffic	Workers and Visitors			Vans, cars	78,000
	Misc small tools etc.			Light goods van	200
OSOM traffic	Total estimated OD Traffic (one-way)				770
Heavy vehicle traffic	Total estimated HV Traffic (one-way)				16,197
	Total estimated traffic for project (one way delivery)				95,167

Notes: (1) OSOM vehicle calculations based on 70 wind turbines.
(2) One-way trips over the two-year construction period are shown. Total trips over the construction period will be double.

Figure 5.2 – Indicative Daily and Monthly Construction Traffic Generation

Access Route	Vehicle Type		Access per month (Trips)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
All	Truck Tanker	Heavy Vehicle - MRV / HRV	269	269	269	269	269	269	269	321	321	321	321	321	321	321	269	269	269	269	269	269	269	269	269	269	6811
	SM Flat Bed	Heavy Vehicle - MRV	7	7	7	7	7	7	7	8	8	8	8	8	8	8	32	32	32	32	32	32	32	7	7	7	341
	HT Flat Bed	Heavy Vehicle - HRV	0	0	0	0	0	0	0	18	18	18	18	18	18	18	50	50	50	50	50	50	50	0	0	0	474
	L Low Loader	Heavy Vehicle - HRV	11	11	11	11	11	11	11	21	21	21	21	31	31	31	23	23	23	23	15	15	15	12	12	11	425
	H Low Loader	Heavy Vehicle - 19m Semi Trailer	10	10	10	0	0	0	6	8	8	8	8	9	9	3	11	11	11	11	10	10	10	0	0	0	162
	Truck and Dog	Heavy Vehicle - 19m Truck & Dog	0	0	0	654	654	654	654	1032	1032	1032	378	420	420	420	43	43	43	43	0	0	0	0	0	0	7520
	Low Loader Towers	OSOM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	0	0	0	280
	Low Loader Blade	OSOM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	30	30	30	30	30	30	0	0	0	210
	Low Loader Nacelle	OSOM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	10	10	10	0	0	0	70
	Low Loader Drive Train	OSOM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	10	10	10	0	0	0	70
	Cement Delivery	Heavy Vehicle - HRV	0	0	0	9	9	9	9	39	39	39	30	30	30	30	0	0	0	0	0	0	0	0	0	0	275
	Redimix Concrete Truck	Heavy Vehicle - HRV					2																				2
	4WD and Commercial	Light Vehicle - B99	3250	3259	3259	3259	3259	3259	3259	3259	3259	3259	3259	3259	3259	3259	3479	3479	3479	3479	3488	3488	3488	3268	3268	3250	79784
	Semi Trailer	Heavy Vehicle - 19m Semi Trailer	0	0	0	0	0	0	0	0	23	23	23	23	23	23	23	0	0	0	0	0	0	0	0	0	163
	Medium Rigid	Heavy Vehicle - MRV	0	0	0	0	0	0	0	0	7	7	7	7	7	7	7	0	0	0	0	0	0	0	0	0	50
	Six axle articulated	Heavy Vehicle - 19m Semi Trailer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	9	9	5	32
	Daily Total (Assuming 26 operating days per month)		136	137	137	162	162	162	162	181	182	182	157	159	159	158	155	154	154	154	152	152	152	137	137	136	
	Monthly Total		3546	3555	3555	4208	4210	4208	4214	4705	4735	4735	4072	4126	4126	4120	4027	3996	3996	3996	3956	3956	3956	3564	3564	3541	96669

Notes: (1) One-way trips over the two-year construction period are shown. Total trips over the construction period will be double.

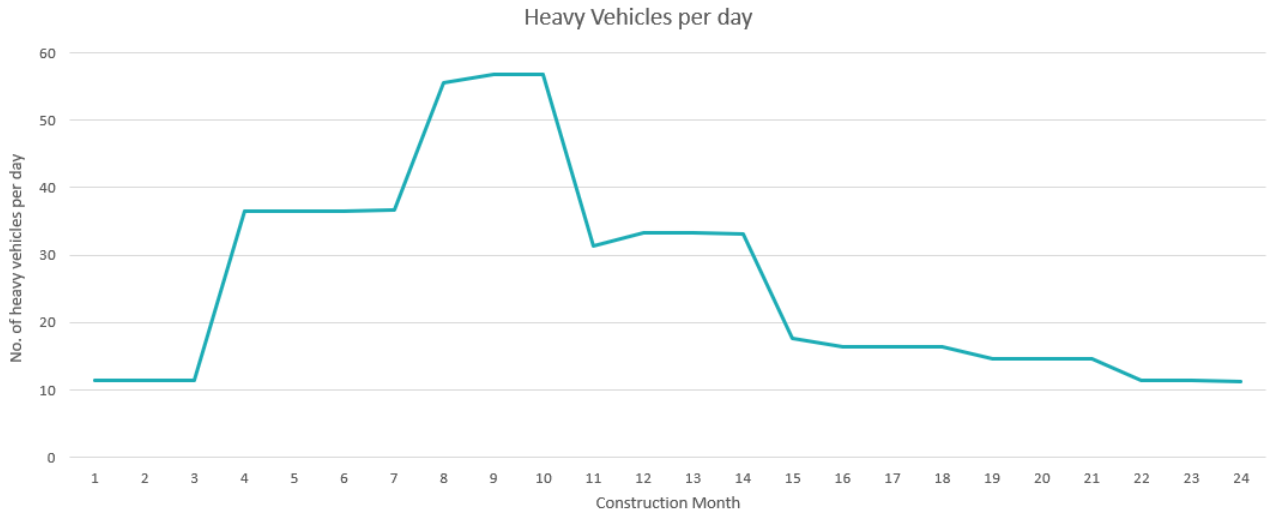
Figure 5.3 – Indicative Two-Year Construction Schedule

Access Route	Category	Purpose	Construction Month																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
All	Construction Operations	General	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24
	Preliminary Transport	Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24
		Employee		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		22
	Wiind Farm Construction	Site Set Up	✓	✓	✓																						3
		Establish Site Access	✓	✓	✓	✓	✓																				5
		Roads and Hard Standings				✓	✓	✓	✓	✓	✓	✓															7
		Foundation Construction								✓	✓	✓	✓	✓	✓	✓											7
		Cables and Reticulation												✓	✓	✓	✓	✓	✓	✓							7
		Turbine Components															✓	✓	✓	✓	✓	✓	✓				7
		Cranage															✓	✓	✓	✓	✓	✓	✓				7
	Sub-Station Construction	Sub Station Civils							✓	✓	✓	✓	✓	✓	✓												7
		Sub Station Electrical								✓	✓	✓	✓	✓	✓	✓											7
		Transmission Lines									✓	✓	✓	✓	✓	✓	✓										7
	Operational Infastructure	General																			✓	✓	✓	✓	✓		5
		Decommision of Temprary Structures																						✓	✓	✓	3

Heavy Vehicles

Heavy vehicle deliveries will also fluctuate over the 24-month construction period. Months 9-10 are expected to generate the most heavy vehicle deliveries for the construction of the Project foundations and electrical substations. It is anticipated that there will be 182 daily one-way traffic movements during this period, 57 of which will be heavy vehicles (31%).

Figure 5.4 – Daily Heavy Vehicle Traffic Generation



Over-size Over-mass (OSOM) Vehicles

The delivery of the WTG components on OSOM vehicles will only occur during months 15-21. In order to minimise the impact on the road network, OSOM deliveries are likely to be grouped together on particular nights to avoid peak hours and local traffic during the day (subject to Council and TfNSW approval). Similar WTG transportation journeys in the past have occurred between 10pm – 5am. On average, there will be 4 OSOM vehicle journeys on 6 nights per week over a 7-month period.

5.1.2 Operational Phase

The operational phase of a Project is generally between 25-30 years. Routine maintenance is likely to be carried out by 10-15 employees during project operations, typically utilising local professionals or professionals relocating to the region to fill these roles.

Assuming each employee drives themselves to and from the Project Site, the daily traffic generation would equate to 20-30 trips. Inbound trips are likely to coincide with the network AM peak period, whilst outbound trips are likely to coincide with the network PM peak period.

5.1.3 Decommissioning Phase

The decommissioning phase after 25-30 years of operation would conceptually generate a similar or lesser number of trips than the construction phase. This phase would have a significantly reduced workforce and less traffic generation of heavy vehicles. For example, heavy vehicles required for concrete pours during the construction phase will not be required in the decommissioning phase.

Traffic management controls will need to be considered at the decommissioning stage to mitigate any traffic and transport impacts. This may include the timing of inbound and outbound heavy vehicle and OSOM trips to avoid network peak periods.

5.2 Distribution and Assignment

5.2.1 Traffic Routes

Both light and heavy vehicles will be able reach the primary site access point via two routes. Vehicles taking Route 1 will turn off from Castlereagh Highway (State Road No. 18) and reach the site via Hill End Road, Yarrabin Road and Burrendong Dam Road. Vehicles taking Route 2 will turn off from Goolma Road (State Road No. 633) and reach the Project Site via Twelve Mile Road, Yarrabin Road and Burrendong Dam Road.

There will also be a small number of light and heavy vehicles needing to access one of two possible locations on the western side of Lake Burrendong to construct a switchyard and gantry structures to support powerlines. If the southern switchyard location is selected (preferred option), vehicles taking Route 3A will reach the site via Burrendong Way, Fashions Mount Road and Tara Road. If the northern switchyard location is selected (alternate option), vehicles taking Route 3B will reach the site via Burrendong Way and Burrel Creek Road.

These routes are shown in **Figure 5.5**.

5.2.2 Sourcing of Materials

It is assumed that 50% of raw materials needed for the construction of roads, hardstands and foundations (such as sand and gravel) will be sourced from the Project Site, predominantly coming from the WTG foundation excavation. The other 50% of raw materials will be imported from a number of suitable quarries in the local area.

Potable water will be sourced from the municipal water supply and transported to the site using road registered water trucks. Water that does not need to be of potable quality will be sourced from water storages in the region and transported to the Project Site using road registered water trucks.

Overall, the majority of materials will be sourced locally wherever possible.

5.2.3 Origins and Destinations

Based on location, population and availability of resources, general light vehicle traffic generated by employees and heavy vehicle deliveries travelling to the primary site access point are assumed to originate from the following locations:

- Mudgee – 60% (Approximately 40-minute drive via Route 1)
- Wellington – 20% (Approximately 90-minute drive via Route 2)
- Dubbo – 20% (Approximately 110-minute drive via Route 2).

Vehicles travelling to the secondary access point/s are assumed to originate from the following locations:

- Wellington – 50%
- Dubbo – 50%.

Figure 5.5 – Light and Heavy Vehicles Trip Distribution

5.2.4 Traffic Assignment

During construction, employees in light vehicles are assumed to arrive at an 80% / 20% in / out distribution in the AM peak hour, and a 20% / 80% in / out distribution in the PM peak hour.

Heavy vehicles deliveries are assumed to be evenly distributed throughout an 11-hour working day due to material arrivals scheduled over the course of a day.

As shown in **Figure 5.2**, the period with the highest traffic generation will be months 9 and 10, with 182 trips entering the Project Site and 182 trips leaving the Project Site in a single day (total of 364 trips).

Table 5.2 outlines the peak hour traffic generation for light and heavy vehicles during months 9 and 10.

Table 5.2 – Peak Hour Traffic Generation (Months 9-10)

Vehicle Type	Total Trips / day	Peak Hour Factor	Total Peak Hour Movements	AM Peak (In / Out)	PM Peak (In / Out)
Light vehicles	250	50% (1)	125	100 / 25	25 / 100
Heavy vehicles	114	9.1% (2)	11	6 / 5	5 / 6
Total	**364**		**136**	**106 / 30**	**30 / 106**

Notes: (1) Worst case scenario, assuming all one-way trips occur during the peak hour
(2) Assuming heavy vehicle movements are spread evenly over an 11-hour work day

The peak hour generation is estimated to be up to 136 vehicle trips during Months 9-10. Given the average daily generation is approximately 16% lower than the peak, the average peak hour vehicle trips are estimated to be 114 vehicle trips.

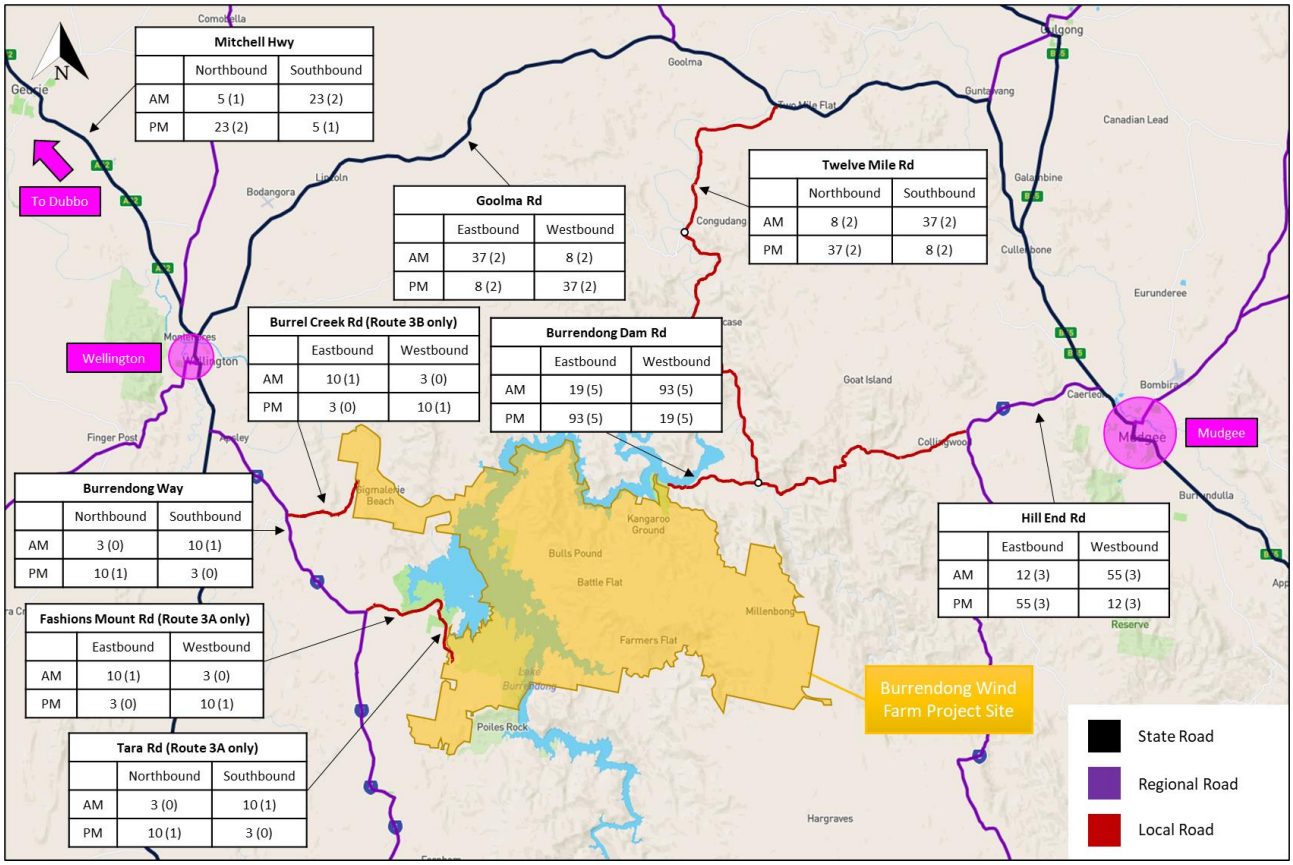
It is assumed that the AM and PM peak hour traffic generation rates will be assigned to the impacted roads based on the origin / destination split outlined in **Section 5.2.3**. These calculations are detailed below in **Table 5.3** with the resulting trip assignment for the peak construction months shown in **Figure 5.6**. It has also been assumed that during Months 9-10, 10% of the traffic generation will access the western side of the development (via either Route 3A or Route 3B), with the remaining 90% accessing the primary access point on the eastern side.

Table 5.3 – Peak Hour Traffic Generation on Impacted Roads (Months 9-10)

Road	Origin / Destination	Origin %	AM Peak (In / Out) (1)	PM Peak (In / Out) (1)	Total Peak Hour Traffic Generation
Burrendong Way	Dubbo, Wellington	10%	10 (1) / 3 (0)	3 (0) / 10 (1)	14 veh/h
Mitchell Highway	Dubbo	23%	23 (2) / 5 (1)	5 (1) / 23 (2)	31 veh/h
Goolma Road	Dubbo, Wellington	36%	37 (2) / 8 (2)	8 (2) / 37 (2)	49 veh/h
Twelve Mile Road	Dubbo, Wellington	36%	37 (2) / 8 (2)	8 (2) / 37 (2)	49 veh/h
Hill End Road	Mudgee	54%	55 (3) / 12 (3)	12 (3) / 55 (3)	73 veh/h
Burrendong Dam Road	Dubbo, Wellington, Mudgee	90%	93 (5) / 19 (5)	19 (5) / 93 (5)	122 veh/h
If Route 3A is selected over Route 3B:					
Fashions Mount Road	Dubbo, Wellington	10%	10 (1) / 3 (0)	3 (0) / 10 (1)	14 veh/h
Tara Road	Dubbo, Wellington	10%	10 (1) / 3 (0)	3 (0) / 10 (1)	14 veh/h
If Route 3B is selected over Route 3A:					
Burrel Creek Road	Dubbo, Wellington	10%	10 (1) / 3 (0)	3 (0) / 10 (1)	14 veh/h

Notes: (1) Values shown in format 'LV (HV)'

Figure 5.6 – Trip Assignment in Months 9 and 10



Base image source: TfNSW Road Network Classifications Map

5.3 Road Capacity

The thresholds which define two-way rural road capacities are outlined in Section 4.2.4 of the Guide for Traffic Generating Developments (RMS, 2002) and Section 8 of the Highway Capacity Manual – Special Report 209 (TRB, 1985). Factors which influence the assessment of a rural road capacity include heavy vehicle percentage, terrain, percentage of no passing zones, lane width, shoulder width, design speed and directional distribution.

The general formula used in the HCM to calculate total service flow rate for each Level of Service, is as follows:

$$SF = 2800 \times (v/c) \times f_d \times f_w \times f_{HV}$$

where

$$f_{HV} = \frac{1}{1 + P_T(E_T - 1)}$$

The values of v/c, f_d, f_w and E_T are sourced from Tables in Section 8 of the HCM.

The input values for each of the most impacted roads are shown below in **Table 5.4**. All values in 'metres' and 'kilometres per hour' have been converted from 'feet' and 'miles per hour' respectively.

Table 5.4 – Existing Road Conditions and Characteristics

	Goolma Rd	Hill End Rd	Burrendong Way	Twelve Mile Rd, Yarrabin Rd, Burrendong Dam Rd, Fashions Mount Rd, Tara Rd and Burrel Creek Rd
Heavy vehicle percentage, P_T (%) (1)	14	10	10	5
Terrain (2)	Rolling	Rolling	Rolling	Mountainous
Percentage of no passing zones (%) (2)	40	40	40	60
Lane width (m) (3)	3.35	3.35	3.35	3.05

	Goolma Rd	Hill End Rd	Burrendong Way	Twelve Mile Rd, Yarrabin Rd, Burrendong Dam Rd, Fashions Mount Rd, Tara Rd and Burrel Creek Rd
Shoulder width (m) (3)	1.2	0	0	0
Design speed (km/h) (3)	100	100	100	80
Directional distribution (2)	60/40	60/40	60/40	50/50

Notes: (1) As per **Table 3.6** of this report
(2) Assumed values
(3) Approximate values based on desktop assessment

Based on these road conditions and characteristics, each road has individual thresholds to define its road capacity. Each Level of Service threshold is shown in **Table 5.5**.

Table 5.5 – Peak Hour Service Flow Rates on Two-Way Rural Roads (veh/h)

	LOS A	LOS B	LOS C	LOS D	LOS E
Goolma Rd	111	273	502	746	1429
Hill End Rd	93	233	428	636	1419
Burrendong Way	93	233	428	636	1419
Twelve Mile Rd	50	146	258	420	1111
Yarrabin Rd	50	146	258	420	1111
Burrendong Dam Rd	50	146	258	420	1111
Fashions Mount Rd	50	146	258	420	1111
Tara Rd	50	146	258	420	1111
Burrel Creek Rd	50	146	258	420	1111

Based on the expected Project traffic generation during its busiest months (months 9-10), the anticipated peak hour flows are described in **Table 5.6**. A comparison between each road's existing level of service and level of service during the busiest construction months is also shown below. Some roads will experience changes to their existing service rates during the peak construction months, but these changes will be temporary and only last for a couple of months during the peak.

Table 5.6 – Existing and Future Levels of Service During Construction Months 9-10

Location	Existing			Peak Hour Traffic Generation (veh/h)	Future		
	Actual Flow Rate (veh/h)	Service Flow Rate (veh/h) (1)	Existing LOS		Actual Flow Rate (veh/h)	Service Flow Rate (veh/h) (1)	Future LOS
Goolma Rd	120	145	B	+49	169	204	B
Hill End Rd	200	230	B	+73	273	314	C
Burrendong Way	200	230	B	+14	214	246	C
Twelve Mile Rd	14	17	A	+49	63	76	B
Yarrabin Rd	31	38	A	+73	104	126	B
Burrendong Dam Rd	11	14	A	+122	133	161	C
Fashions Mount Rd (route 3A only)	31	38	A	+14	45	55	B
Tara Rd (route 3A only)	31	38	A	+14	45	55	B
Burrel Creek Rd (route 3B only)	11	14	A	+14	25	31	A

Notes: (1) $Service\ flow\ rate\ (for\ peak\ 15\ \text{min}\ period), v = \frac{Actual\ flow\ rate\ (full\ hourly\ volume), V}{Peak\ hour\ factor, PHF}$

5.4 Cumulative Traffic Impacts

There are a number of major renewable energy projects in close proximity to the Project Site which may result in cumulative traffic impacts.

5.4.1 Construction Stage

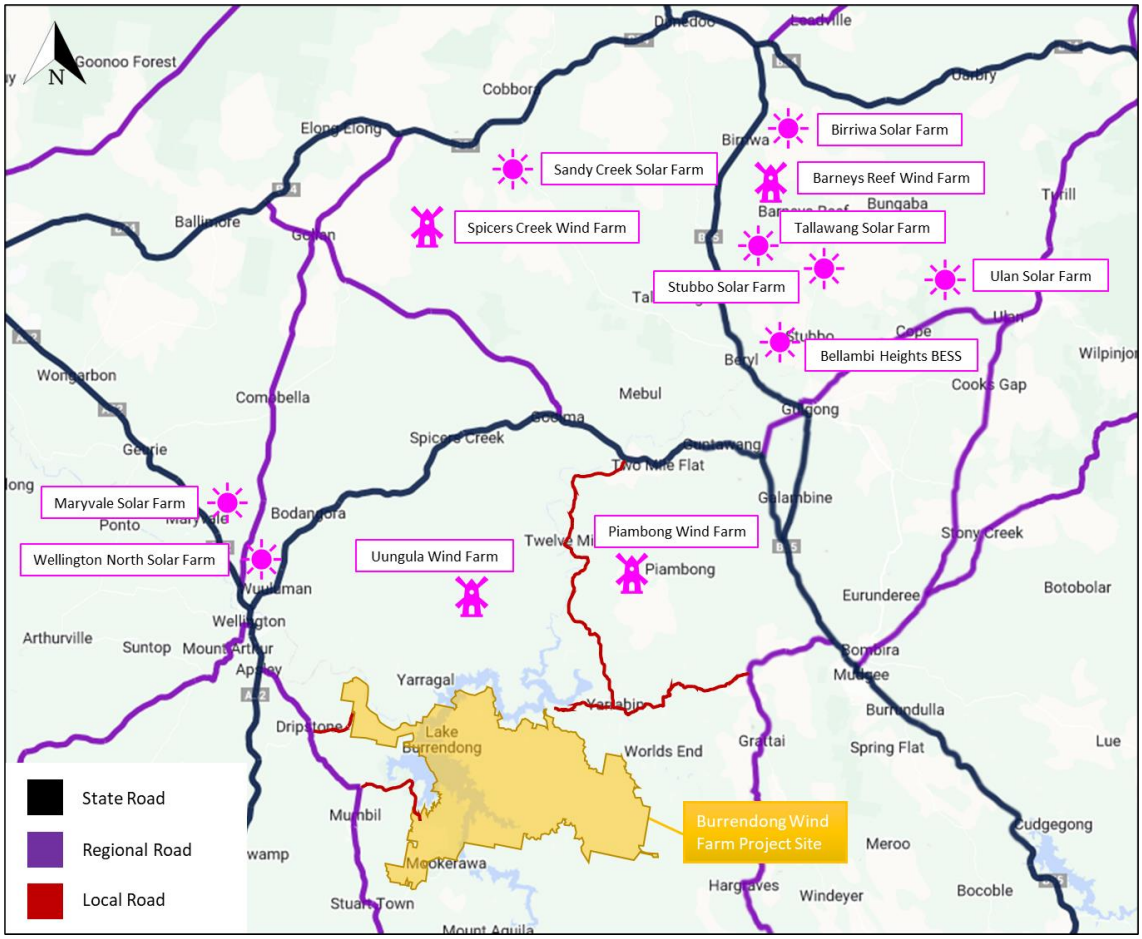
Light and Heavy Vehicles

Known renewable energy projects in the region that are either under construction or in the pre-construction stage include:

- Piambong Wind Farm (indicatively 93 wind turbines) – initial planning stage (construction expected to commence in 2026).
- Spicers Creek Wind Farm (122 wind turbines) – EIS being prepared.
- Barneys Reef Wind Farm (63 wind turbines) – EIS being prepared.
- Sandy Creek Solar Farm (up to 750 MW) – EIS being prepared.
- Ulan Solar Farm (up to 50 MW) – EIS being prepared.
- Bellambi Heights Battery Energy Storage System – EIS being prepared.
- *Burrendong Wind Farm (70 wind turbines) – EIS being prepared.*
- Birriwa Solar Farm (up to 600 MW) – EIS submitted.
- Tallawang Solar Farm (up to 500 MW) – EIS submitted (expected completion in 2026).
- Maryvale Solar Farm – approved, construction expected to commence in late 2023.
- Uungula Wind Farm – approved, construction expected to commence in 2023.
- Stubbo Solar Farm – currently under construction (expected completion in 2025).
- Wellington North Solar Farm – currently under construction (expected completion in 2024).

The locations of these major development sites are shown in **Figure 5.7**.

Figure 5.7 – Major Renewable Energy Sites near the Project



Base image source: TfNSW Road Network Classifications Map

As Burrendong Wind Farm is yet to be approved, it is predicted that construction may commence in late 2025. This means that construction of Burrendong Wind Farm would be unlikely to overlap with the construction of Stubbo Solar Farm or Wellington North Solar Farm (which have already commenced construction).

For the purposes of a cumulative traffic assessment, it is assumed that the construction of Ungula Wind Farm and Maryvale Solar Farm will coincide with the Project's construction months with the highest traffic generation (months 9 and 10). In reality, both Ungula Wind Farm and Maryvale Solar Farm have already been approved by DPE and it is likely that these sites will be close to operational by the time Burrendong Wind Farm commences construction in late 2025.

Assuming the overlap of construction periods, Goolma Road (between Mitchell Highway and Twelve Mile Road) and Mitchell Highway (between Dubbo and Wellington) will experience a cumulative construction traffic increase from Burrendong Wind Farm, Uungula Wind Farm and Maryvale Solar Farm. Based on previous traffic assessments, Uungula Wind Farm will generate 240 light vehicle trips per day on Goolma Road and 120 light vehicle trips per day on Mitchell Highway (on average). Maryvale Solar Farm will generate 150 light vehicle trips per day, with only half of those trips assumed to travel on Mitchell Highway to/from Dubbo (i.e. the other half would be generated from other origins such as Wellington).

The cumulative traffic impacts are shown in **Table 5.7**.

Table 5.7 – Cumulative Traffic Generation

Road	Existing traffic volume (1)	Traffic generated by Uungula Wind Farm (1)	Traffic generated by Maryvale Solar Farm (2)	Traffic generated by the Project	Cumulative traffic volume	Percentage Increase
Daily Traffic (vehicles per day)						
Goolma Rd	750 (120)	240 (90)	None	90 (41)	**1080 (251)**	10.9%
Mitchell Highway	2150 (370)	120 (45)	75 (20)	58 (26)	**2403 (461)**	3.0%

Road	Existing traffic volume [1]	Traffic generated by Uungula Wind Farm [1]	Traffic generated by Maryvale Solar Farm [2]	Traffic generated by the Project	Cumulative traffic volume	Percentage Increase
Peak Hour Traffic (vehicles per hour)						
Goolma Rd	100 (20)	120 (16)	None	45 (4)	**265 (40)**	19.1%
Mitchell Highway	200 (30)	60 (15)	38 (2)	28 (3)	**326 (50)**	9.0%

Notes: (1) Source: Uungula Wind Farm Project – Transport Assessment, Samsa Consulting (2020)
(2) Adapted from source: Solar Farm Project, Maryvale NSW – Traffic Assessment Report, SECA solution (2018)
(3) Values shown in format 'LV (HV)'

The table above shows that the cumulative impacts are expected to be minor, with the Project adding 49 vehicles to Goolma Road during peak hour and 31 vehicles to Mitchell Highway during peak hour. It is also reiterated that these are the highest traffic generation months for the Project (Months 9-10) and hence the impact would only be experienced over 2 months.

Given Mitchell Highway's road conditions, it is assumed that Mitchell Highway will have sufficient capacity to cater for construction traffic generated by Burrendong and Uungula Wind Farms as well as Maryvale Solar Farm. Goolma Road has an existing traffic volume of 120 veh/h, with Uungula Wind Farm construction traffic generating 136 veh/h and construction traffic from the Project generating 49 veh/h during peak construction months. This would give a combined peak hour traffic flow of 305 veh/h, meaning that Goolma Road would operate satisfactorily at LOS C.

Three are multiple other known renewable energy projects in the region (listed above) that are currently being assessed by others / yet to be assessed in terms of their traffic generation and impact. Piambong Wind Farm will be of particular significance given its close proximity to Burrendong Wind Farm, with both light and heavy vehicle construction traffic potentially using Twelve Mile Road, Goolma Road and Hill End Road to access the site. This project is still in the early planning stages and is yet to be lodged as a State Significant Development. If the proposed Piambong Wind Farm continues through to EIS submission, it is expected that a cumulative traffic assessment would be undertaken by the applicant to include the impacts of Burrendong Wind Farm.

OSOM Vehicles

The delivery of wind farm turbines and associated infrastructure using OSOM vehicles is a highly meticulous process which takes time to coordinate and plan, given the slower travelling speeds and larger sizes of OSOM vehicles.

At this stage, it is too early to definitively determine if other wind farms in the region (including Spicers Creek Wind Farm, Piambong Wind Farm and Barneys Reef Wind Farm) will have similar OSOM transport timelines to Burrendong Wind Farm. However it is recommended that consultation take place with the other wind farms post-EIS approval to see if the OSOM transport deliveries can be coordinated to occur at the same time / on the same nights to minimise impacts on the road network.

5.4.2 Operational Stage

Given the traffic impacts during the operational stage of Burrendong Wind Farm are expected to be minor (in the order of 20-30 trips per day), it is anticipated there will be a negligible cumulative traffic impact with other wind farms and solar farms in the region which are already operational.

Known renewable energy projects that already operational in the region include:

- Beryl Solar Farm
- Bodangora Wind Farm
- Burrendong Hydro Power Station
- Crudine Ridge Wind Farm
- Dubbo Solar Farm
- Suntop Solar Farm
- Wellington Solar Farm.

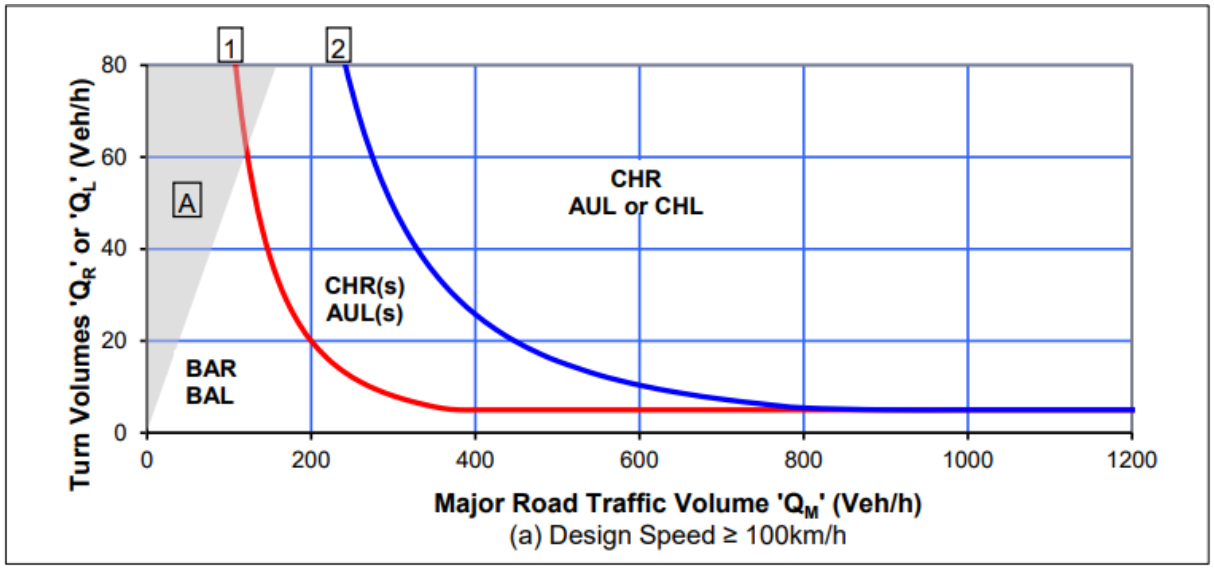
5.5 Intersection Considerations

Based on the traffic generation and likely routes for contractors and heavy vehicles, the following junctions have been further considered with regard to their existing arrangement:

- Goolma Road / Twelve Mile Road (eastern location)
- Castlereagh Highway / Hill End Road
- Hill End Road / Yarrabin Road.

Reference is made to Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management, which outlines the intersection turning warrants for intersection treatments. The intersections listed above operate within 100km/h speed zones. The corresponding turning warrant criteria is shown in **Figure 5.8** below.

Figure 5.8 – Austroads Turn Warrant Criteria

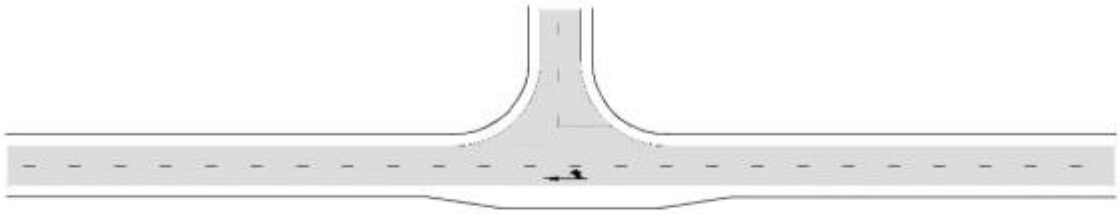


Source: Austroads Guide to Traffic Management Part 6

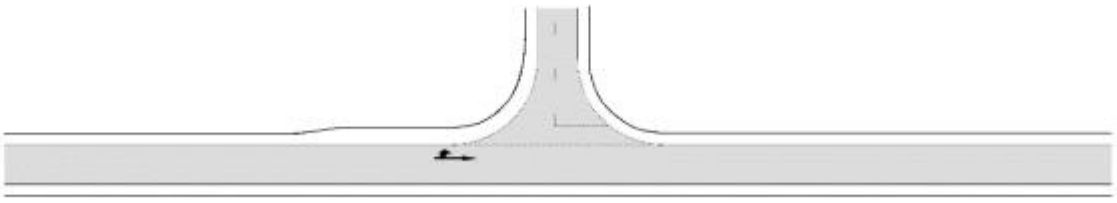
The general arrangement for Basic Right and Left turn (BAR and BAL), Auxiliary Right and Left turn (AUR and AUL) and Channelised Right and Left turn (CHR and CHL) are outlined below.

Any resulting intersection upgrades would include a Safe Intersection Sight Distance check when designed during the detailed design stage of the project.

Figure 5.9 – General BAR and BAL treatments



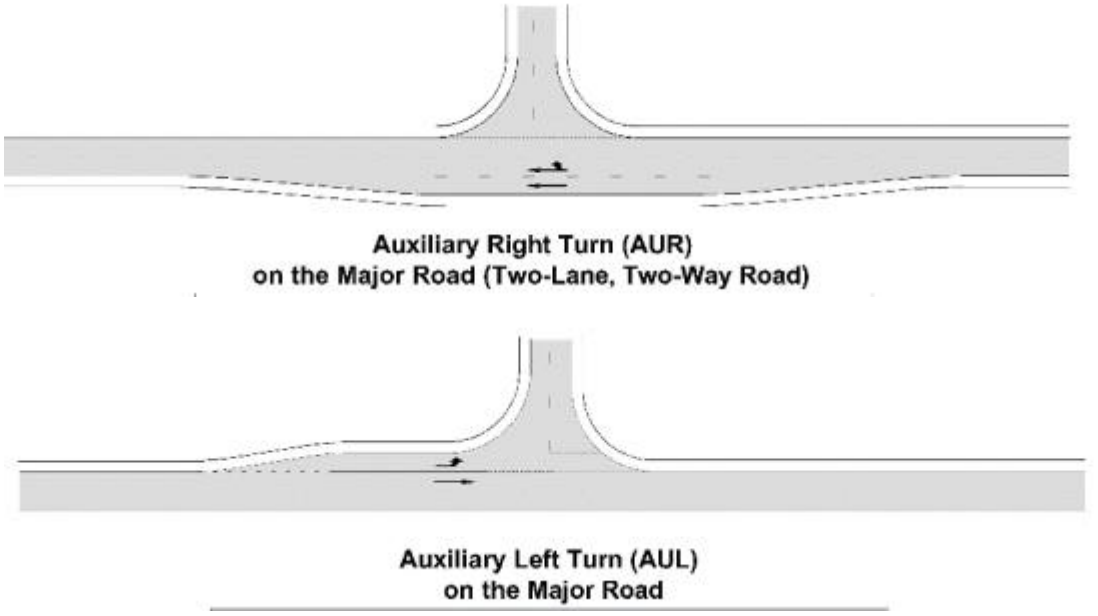
Basic Right Turn (BAR)
on the Major Road (Two-Lane, Two-Way Road)



Basic Left Turn (BAL)
on the Major Road

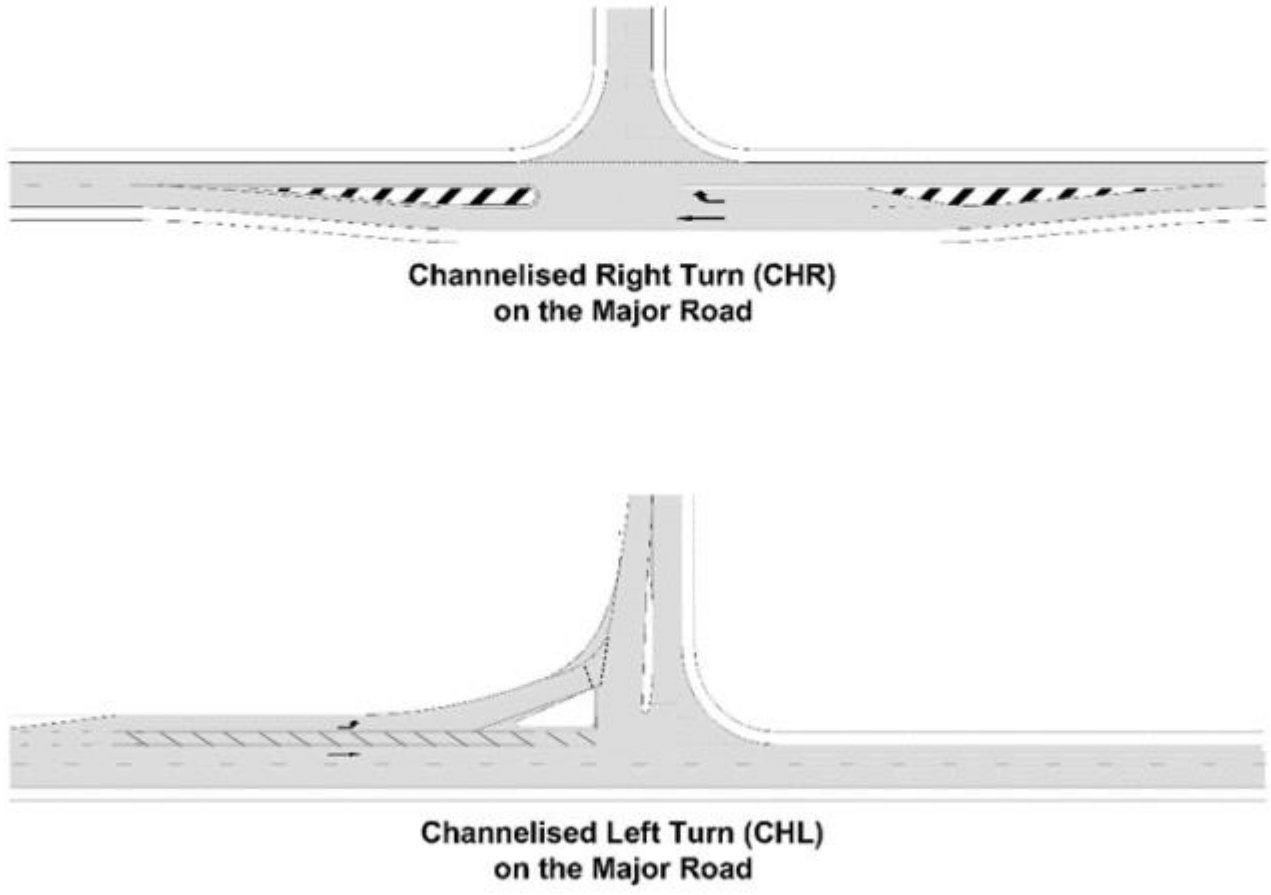
Source: Austroads Guide to Traffic Management Part 6

Figure 5.10 – General AUR and AUL treatments



Source: Austroads Guide to Traffic Management Part 6

Figure 5.11 – General CHR and CHL treatments



Source: Austroads Guide to Traffic Management Part 6

5.5.1 Goolma Road/ Twelve Mile Road

The intersection of Goolma Road/ Twelve Mile Road is signposted as a give-way priority-controlled intersection, whereby Goolma Road has the priority. Goolma Road in both directions has a 1-2m wide sealed shoulder and a further 1m unsealed area.

The key movement at this intersection are the right turns from Goolma Road to Twelve Mile Road associated with traffic generated from the townships of Wellington and Dubbo. The OSOM route also includes this intersection.

The OSOM route will require this intersection to be upgraded to accommodate the vehicle path. With regard to the traffic generated during construction, the additional traffic added to Twelve Mile Road is shown in **Table 5.6** with up to 49 peak hour vehicles, of which 39 vehicles are in the peak direction. This is in addition to the approximate 14 peak hour vehicles that currently travel on Twelve Mile Road.

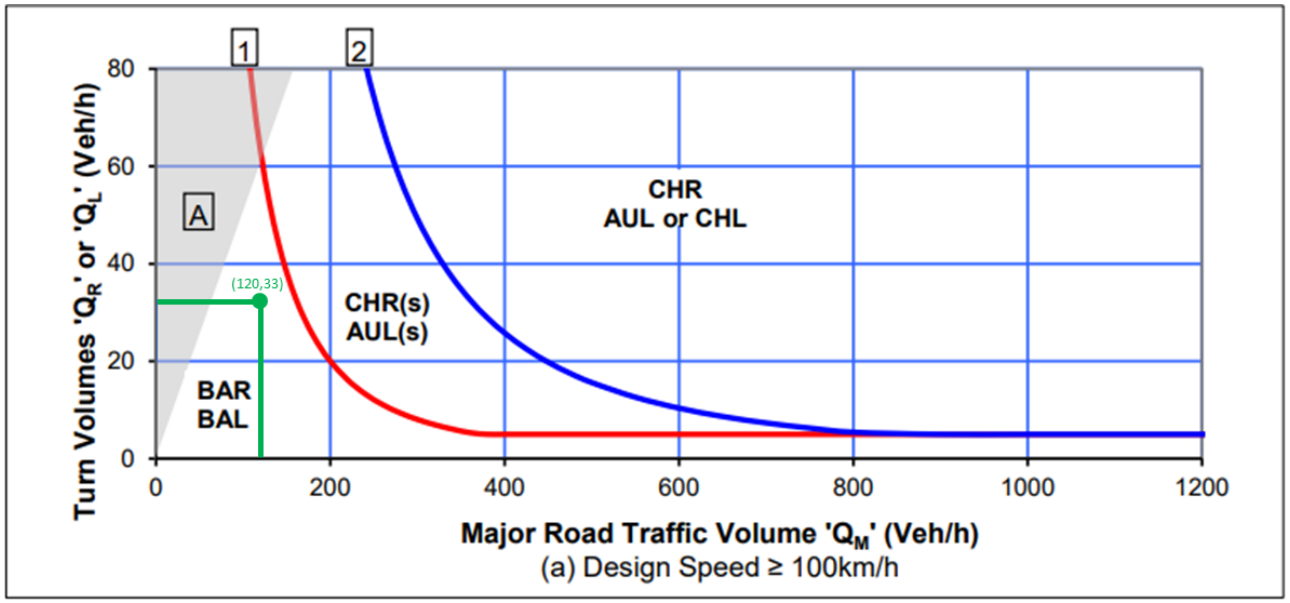
Goolma Road in this location is estimated to increase by the same 49 peak hour vehicles in addition to the 120 that currently travels along this road. Uungula Wind Farm project is estimated to add a further 136 vehicles in the peak hour to Goolma Road.

Without the additional traffic generated by the Uungula Wind Farm, the turn warrant indicated is a BAR treatment for right turn movements. The addition of the Uungula Wind Farm would necessitate an improvement to a shortened Channelised Right turn treatment (albeit just above the threshold of a BAR treatment).

Given the peak period of the Project is for a 2-month period, and the average traffic generation is some 16% less than the peak period, the average traffic increase on both Twelve Mile Road and Goolma Road would be 41 vehicles, of which 33 vehicles travel in the peak direction.

As the average traffic generation is considerably less than the peak, which would reduce the turning movements at the Twelve Mile Road / Goolma Road intersection, the BAR treatment should be incorporated into the upgrade design. This takes into account the reduced traffic generation on average and the unlikely scenario that both the Project and Uungula Wind Farm are constructed with overlapping peak periods.

Figure 5.12 – Turn Treatment Warrants – Goolma Road/ Twelve Mile Road



Base image source: Austroads Guide to Traffic Management Part 6

5.5.2 Castlereagh Highway/ Hill End Road

The intersection of Castlereagh Highway/ Hill End Road is sign posted as a give-way priority-controlled intersection, whereby Castlereagh Highway has the priority. The intersection is constructed with an AUR and AUL treatment.

The key movement at this intersection associated with the Project traffic generation is the left turn from Castlereagh Highway to Hill End Road.

The Project is estimated to add up to 73 additional vehicles on Hill End Road, of which 58 are in the peak direction to / from Mudgee in the morning and afternoon peak. Based on the average traffic generation, this would be some 61 peak hour vehicles with 49 in the peak direction. This is in addition to the 200 peak hour vehicles that currently utilise Hill End Road.

Castlereagh Highway is estimated to carry some 300 peak hour vehicles, increasing to some 373 peak hour vehicles with the addition of the Project.

As the current AUL arrangement is the best turn treatment available, no further upgrades would be required.

5.5.3 Hill End Road/ Yarrabin Road

The intersection of Hill End Road/ Yarrabin Road is sign posted as a give-way priority-controlled intersection, whereby Hill End Road has the priority. The intersection is constructed with a wide sealed shoulder on the southbound carriageway of Hill End Road which presents similarly to a BAR treatment.

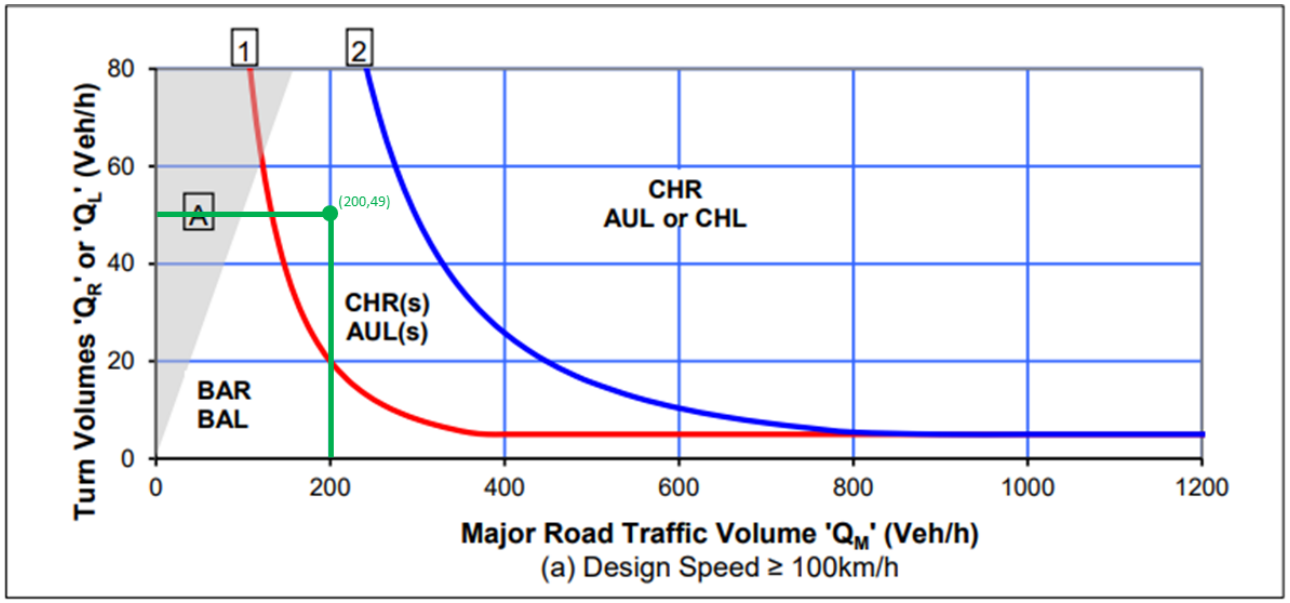
The key movement at this intersection associated with the Project traffic generation is the right turn from Hill End Road into Yarrabin Road.

The Project is estimated to add up to 73 additional vehicles on Yarrabin Road on top of the approximate 31 that currently use this road. Of the additional 73 vehicles, 58 are in the peak direction. Hill End Road has been identified to carrying up to 200 peak hour vehicles.

Based on the turn warrant assessment, the additional traffic to the right turn movement on Hill End Road would place it over the threshold for a CHR(s) treatment, based on the average traffic generation (being some 49 vehicles in the peak direction).

The current intersection arrangement of a BAR permits passing of right turning vehicles on Hill End Road, however the additional traffic generated by the Project justifies an upgrade to a higher order treatment.

Figure 5.13 – Turn Treatment Warrants – Hill End Road/ Yarrabin Road



Base image source: Austroads Guide to Traffic Management Part 6

5.6 Traffic Impact on Railway Level Crossings

All identified railway level crossings (refer to **Section 3.4**) are located on the OSOM transport routes only. In considering that Saxa Road is the nearest railway level crossing to the Site (approximately 1.5 hours away), it is unlikely that light and heavy vehicles generated by the Project will significantly impact the condition of crossings on the OSOM routes.

The OSOM vehicle transportation process is a highly controlled process with a number of escort vehicles leading and trailing behind the OSOM vehicles at relatively low speeds.

As typically required post approval of a wind farm SSD application, a TMP covering OSOM transportation and consultation with the relevant road authorities will also introduce a level of management and mitigation when traversing railway level crossings. Due to this, it is anticipated that the OSOM vehicles are a low safety risk in traversing over the crossings.

6. Traffic Management

In order to mitigate the impact of the Project on the local road network, a high-level traffic management strategy has been developed for the Project's critical areas / activities. This strategy is outlined below.

6.1 Traffic Management Plan

A TMP should be prepared to address the impact of the development on traffic throughout the life of the Project, including the construction, maintenance, operation and decommissioning stages. The TMP should be prepared in accordance with the consent conditions, and may include the following components:

- Measures to minimise the traffic safety impacts of the development and disruptions to local road users during construction and decommissioning of the development, such as:
    - temporary traffic controls, including detours and signage
    - notifying the local community about development-related traffic impacts
    - minimising potential conflict between development-related traffic and:
        - stock movements
        - domestic animals
        - school buses, in consultation with local schools
        - mining related traffic.
    - implementing measures to minimise development-related traffic on the public road network outside of standard construction hours
    - ensuring development-related traffic does not track dirt onto the public road network
    - ensuring loaded vehicles entering or leaving the site have their loads covered or contained
    - providing sufficient parking within the Project Site for all development-related traffic
    - responding to any emergency repair requirements or maintenance during construction and/or decommissioning
    - a traffic management system for managing over-dimensional vehicles
    - fatigue management.
- Suitable rest stop areas (for OSOM vehicle drivers) that are spaced no more than 2 hours apart. Refer to **Appendix A** for suggested fatigue break locations.
- A Driver Code of Conduct which addresses:
    - travelling speeds
    - procedures to ensure that drivers to and from the development adhere to the designated over dimensional and heavy vehicle routes
    - procedures to ensure that drivers to and from the Project implement safe driving practices.
- A detailed program to monitor and report on the effectiveness of these measures and the code of conduct.
- Consultation with TfNSW and relevant stakeholders to consider future projects in the region with a similar timeframe to the Project, and the combined impact they may have on traffic management.

6.2 Stakeholder Management Plan

A Stakeholder Management Plan, inclusive of a Communications Plan, is to be developed to provide relevant information to the public, general stakeholders (including Cudgegong River Holiday Park), other major nearby developments and affected landowners. This should include, but not be limited to, the following:

- Issues that have been raised, inclusive of method of resolution and achievement of resolution
- A communications matrix that clearly defines responsibility of each party including individuals and companies
- A product delivery campaign which will include truck volumes and durations.

Communications methods to key stakeholders to inform them of heavy vehicle haulage routes and project progress should include, but not be limited to:

- Notifications in local newspapers
- Notifications in online news outlets and local news social media pages
- Notifications via local radio stations.

Key stakeholder communications will detail that in the event of any complaints, a contact phone number (or other communication method technologically relevant at the time) be made available.

6.3 Internal Management

An internal management strategy will be established within the Project Boundary. This strategy will form part of the site's induction that will be undertaken by all personnel on-site.

The following key items are to be implemented:

- 40 km/h speed limit on internal access roads
- Radio communication between construction vehicles available at all times
- All loads to be correctly restrained
- Warning signage to be provided at critical areas and intersection points.

The on-site parking within the construction compound is required to provide a dedicated safe area where personnel can access their vehicles.

Once a transport contractor has been nominated, they will be required to produce a Job Safety Assessment (or similar) specific to the Project.

6.4 Work Hours

The NSW Interim Construction Noise Guideline recommends that the standard hours of a normal construction site are:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- No work on Sundays or public holidays.

These guidelines are not mandatory and variations to these hours may be approved by the local council. Construction sites must adhere to the approved hours for construction work as set out in the relevant development application.

6.5 Code of Conduct

During construction of the site and ongoing operation, a code of conduct should be issued to all contractors to ensure impacts to surrounding residents and general road users is minimised.

6.5.1 Driver Induction

Prior to commencing construction activities, regular and returning drivers of semi-trailers, rigid vehicles and/or B-Double and OSOM vehicles that will access and egress the site for pick-up and delivery of material will be required to undertake a driver induction. The induction course will need to be developed early to ensure that it is ready prior to construction activity (including any site preparation works) commencing. Irregular and one-off drivers of pick-ups and deliveries would be considered exempt to this induction requirement. The induction course would cover:

- Suitable routes to and from the site
- Suitable times of travel (i.e. outside of school bus times)
- Applicable traffic management procedures that will need to be in place prior to approaching or departing the site (if required)
- Communications and notification procedures
- Speed restrictions (on the road network and the site)
- Environmental procedures

- Safety procedures (during transportation and in the evident of an incident / emergency).

6.5.2 Contractor Liaison

A nominated contractor will be responsible for liaising with appropriate contractor(s) responsible for delivery of materials to/from the site to ensure that they comply with the TMP, including adherence to specified construction traffic routes. It will be the contractor's responsibility to ensure routes are satisfactory and that appropriate measures (traffic management or other mitigation measures as well as liaison with relevant local authorities) are in place to ensure safe movement of vehicles to/from the site.

6.5.3 Vehicle Access

Construction Vehicle Access

All vehicle access during the construction phase will be via the identified site access locations and haulage routes described in **Section 5.2.1**.

Vehicle Height Specifications

Generally, all vehicles accessing the Project Site (with exception of OSOM vehicles) will operate within the permitted height requirements. If necessary, the applicable approvals will be sought in instances where vehicle height exceeds that which is permitted on the public road network.

Oversized Vehicles

OSOM vehicles will access the site via the identified site access locations and OSOM routes described in **Section 4.1**. The OSOM routes are subject to the separate permit and approval processes which will be undertaken by accredited transport providers.

Local residents would be informed of such activities via letter drop or by electronic communications at least 1 week in advance.

Emergency Services

Emergency service vehicles will be permitted unrestricted access to the Project Site.

Construction Staging / Parking

All car parking will be provided within the confines of the site and will therefore not encroach on the local road network. There will be sufficient area within the Project Site during differing phases of construction to accommodate vehicle parking, including construction traffic deliveries and on-site manoeuvring as and when required.

A nominated contractor will continually monitor parking provisions within the Project Boundary, as well as the staging of construction vehicles into and out of the Project Site, to ensure no impact on the local road network occurs. If required, the day-to-day vehicle parking demands could be reduced via the promotion and consideration of car sharing and mini-bus services.

Signage

Construction vehicle signage is to be considered and implemented prior to any works being undertaken. There may potentially be the need to further reduce speed limits on some roads to facilitate safe vehicle access around sites. Appropriate signage will be required in these instances to inform road users. This is to be developed following nominated contractor commission and agreed with key stakeholders.

7. Conclusion

This report has presented and detailed the Project on behalf of the Proponent, and assessed the impact to the existing road network during the construction, operational and decommissioning phases. All SEARs requirements related to traffic and transport issues as listed in **Section 1.3** have been addressed throughout the report.

The key findings of this TTIA are:

- The selected routes (Routes 2A and 2B) in the detailed swept path Route Study (**Appendix A**) from the Port of Newcastle to the Project Site contains shortfalls in accommodating an OSOM vehicle transporting an 82m wind turbine blade. The route will require improvement works before being deemed suitable for transportation of the WTG components.
    - Some of the major works required will include road widening on Twelve Mile Road, Yarrabin Road and Burrendong Dam Road, replacement of the Piambong Road Bridge, modification of a number of floodways and culverts, crest removals, and vegetation removal for vertical clearance. These would be addressed as part of the detailed design.
- The construction phase of the Project is likely to generate the highest levels of vehicle movements. The peak period of the Project will consist of approximately 182 one-way daily trips during months 9 and 10, of which 57 are heavy vehicles (31%).
- The work force is expected to be distributed between Mudgee (60%), Wellington (20%) and Dubbo (20%).
- The key roads accessing the Project Site will be Twelve Mile Road, Yarrabin Road and Burrendong Dam Road from the north (i.e. servicing Wellington and Dubbo), and Hill End Road, Yarrabin Road and Burrendong Dam Road from the east (i.e. servicing Mudgee).
- To access the western side of Site, a small number of light and heavy construction vehicles will take one of two route options either via Fashions Mount Road (preferred) or Burrel Creek Road (alternate). No OSOM vehicles will be used on the western route. The final western access route will be selected post-EIS approval.
- During the operational phase, there is expected to 10-15 personnel on-site. The level of traffic generated during the operation of the Project is considerably lower than that assessed as part of the construction phase. It is unlikely to result in adverse road conditions during the operation.
- Decommissioning of the Project will see traffic generation levels lower than the construction phase due to a number of services not being required (e.g. concrete mixers, delivery of construction material etc).
- The midblock road capacities have been assessed with due regard to other projects / developments in the region. Although unlikely, it has been assumed that the Project will have overlapping construction periods with Uungula Wind Farm and Maryvale Solar Farm. During peak hours of the peak construction months, Project-related traffic is estimated to only have a minor impact, increasing cumulative traffic volumes on Goolma Road from 256 veh/h to 305 veh/h, and from 345 veh/h to 376 veh/h on Mitchell Highway. Both roads would still operate satisfactorily within their road capacities.
- Intersection assessments show that the junction of Castlereagh Highway / Hill End Road is considered to be satisfactory for the traffic generated during construction. The intersection of Goolma Road and Twelve Mile Road (eastern location) should be constructed with a BAR treatment when works are carried out to accommodate the OSOM vehicle route. The intersection of Hill End Road / Yarrabin Road should be upgraded to a CHR(s) treatment.
- A high-level traffic management strategy has been developed for the Project's critical areas/activities. This strategy includes a Traffic Management Plan, Stakeholder Management Plan and Driver Code of Conduct, identifying hours of construction activities and internal site management.

Appendix A. Rex J Andrews Route Study

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