



Traffic and Transport Impact Assessment

28-May-2025
Cobbora Solar Farm

Traffic and Transport Impact Assessment

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Terms and abbreviations

Term / acronym	Description
AC	alternating current
AADT	annual average daily traffic
AECOM	AECOM Australia Pty Ltd
AGRD Part 3	Austrroads Guide to Road Design Part 3 Geometric Design
AUL	auxiliary left turn treatment
AUL(S)	auxiliary left turn treatment – short lane
BAL	basic left-turn treatment
BAR	basic right-turn treatment
BESS	battery energy storage system
CHL	channelised left-turn treatment
CHR	channelised right-turn treatment
CHR(S)	channelised right-turn treatment – short turn lane
CSF	Cobbora Solar Farm Pty Ltd
CTMP	Construction Traffic Management Plan
CWCT	Central West Cycling Trail
CWO	Central West Orana
DA	Development Application
DC	direct current
Development Footprint	The indicative developable area whereby Project infrastructure (including access tracks and temporary construction support areas) would occupy, covering approximately 1,600 hectares
Dubbo Regional LEP	Dubbo Regional Local Environmental Plan 2022
EIS	Environmental Impact Statement
EP&A	Environmental Planning and Assessment
EP&A Regulation	Environmental Planning and Assessment Regulation 2000 (NSW)
EPA	Environment Protection Authority
EnergyCo	Energy Corporation of NSW
GIS	geographic information system
Ha	hectare
Km	kilometre
km/h	kilometres per hour
kV	kilovolt
LEP	Local Environmental Plan
LGAs	Local Government Areas
MW	megawatts

Term / acronym	Description
MWh	Megawatt hour
NEM	National Electricity Market
NSW	New South Wales
OSOM	Oversize and over mass; a heavy vehicle that is carrying or specifically designed to carry, a large indivisible item
PCU	Power Conditioning Unit
Project (the)	Construction, operation and decommissioning of the Cobbora Solar Farm and BESS. The Cobbora Solar Farm would be a large scale solar photovoltaic (PV) generation facility with associated infrastructure
Project Area (the)	Extends over approximately 21 land lots, covers approximately 3,000 hectares with a footprint of 1,600 hectares
PV	photovoltaic
REZ	Renewable Energy Zone
RU1	Primary Production
SCADA	supervisory control and data acquisition
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
TfNSW	Transport for New South Wales
Warrumbungle LEP	Warrumbungle Local Environmental Plan 2013

Executive Summary

Cobbora Solar Farm Pty Ltd (CSF), in its capacity as trustee for the Cobbora Solar Farm Trust (a wholly owned subsidiary of Pacific Partnerships Pty Ltd) is seeking development consent to construct, operate and decommission Cobbora Solar Farm and BESS in the central west region of New South Wales (NSW). The solar farm would be a large-scale solar photovoltaic (PV) generation facility with a battery energy storage system (BESS) and associated infrastructure for its management and connection to the national electricity market (NEM) (the Project). The Project would be located nearby Cobbora, approximately 20 kilometres (km) south-west of the township of Dunedoo and 55 km east of Dubbo in Central West NSW (the Project Area). The Project is located within the Warrumbungle Shire Council and Dubbo Regional Council.

The objective of the Project is to develop a viable, utility-scale solar energy plant, which would deliver low cost, low carbon, renewable energy for the benefit of all energy users within the NEM.

The Project is considered State Significant Development (SSD) under the Environmental Planning and Assessment Act 1979 (EP&A Act). As such, this Environmental Impact Statement (EIS) has been prepared in accordance with the relevant provisions of the EP&A Act. It has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the Secretary of the Department of Planning, Housing and Infrastructure (DPIE) (previously referred to as Department of Planning and Environment (DPE) on 4 February 2021) and the relevant provisions of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (NSW) (EP&A Regulation).

This traffic and transport impact assessment report is one of a number of technical documents that forms part of the EIS to support an SSD for the Project. This assessment addresses the relevant SEARs, aiming to identify any likely impacts of the Project and to outline mitigation measures, if required, relating to traffic and access during detail design, construction, operation, and decommissioning of the Project.

Existing environment

The Project Area is approximately 3,000 hectares in size with a footprint of 1,600 hectares and is predominately located within the suburb of Cobbora. The Project Area is bordered by the Golden Highway to the north and Spring Ridge Road to the east. Several council operated roads run adjacent to the Project Area, including Sandy Creek Road, Danabar Road and Sweeneys Lane. The Project Area is zoned Primary Production (RU1) under both the *Dubbo Regional Local Environmental Plan 2022* (Dubbo Regional LEP) and the *Warrumbungle Local Environmental Plan 2013* (Warrumbungle LEP).

Land within the Project Area is characterised by undulating cleared land used primarily for sheep and cattle grazing or dry land cropping. The Project Area contains canopy in the north and central sections; however, these areas will be retained throughout the project. The Project Area are largely clear of canopy vegetation, with some scattered trees and rows of trees along fence lines. Rural land surrounds the Project Area with residential premises located at varying distances.

Construction impact assessment

Construction traffic volumes during network peak hours

During the peak construction vehicle traffic period (likely to occur during August 2028), it is expected that up to 7 light vehicles and 44 heavy vehicles per day would be required to access the Project Area, and up to one oversize and overmass (OSOM) vehicles per day, as required. Heavy vehicles would be required for various tasks, including the delivery of construction equipment, removal of spoil (if required) and the delivery of various Project components.

The majority of construction staff are expected to be picked up from nearby airports (Dubbo or Mudgee). They are expected to be transported to the Project Area by shuttle buses on the scheduled pick-up day, staying on-site for approximately two weeks (with accommodation provided on site) and departing on the scheduled fly-out day.

Shuttle bus transportation between the Project Area and nearby airports will preferably occur on weekdays outside rush hour, however, for the purposes of assuming the worst case, it has been assumed that all shuttle buses will arrive at the Project Area during the morning road network peak hour

on the scheduled pick-up day and depart from the Project Area during the evening road network peak hour on the fly-out day. It is anticipated that up to 17 shuttle buses will be required. This equates to 34 shuttle bus movements per fortnight (two weeks).

OSOM vehicles are expected to be required to deliver large and heavy elements, such as transformers and prefabricated buildings. OSOM vehicles would be used on an 'as needs' basis only and is not expected to occur daily. All OSOM movements will occur outside of the road network peak periods

Peak hour traffic generation associated with the Project have been estimated for the morning peak hour on a scheduled pick-up day and the evening peak hour on a scheduled fly-out day during the peak construction vehicle traffic period, as summarised in the table below:

Vehicle type	AM Peak Hour (on a scheduled pick-up day)		PM Peak Hour (on a scheduled fly-out day)	
	Inbound	Outbound	Inbound	Outbound
Light Vehicles	7	0	0	7
Shuttle Bus	17	0	0	17
Heavy Vehicles	4	0	0	4
OSOM	0	0	0	0
Combined	28	0	0	28

Based on the forecast construction traffic volumes during network peak hours, the Golden Highway and Spring Ridge Road would be subject to approximately 30 and 25 additional vehicles for the combined inbound and outbound construction traffic during peak construction hours, respectively. Given the low traffic volumes on the Golden Highway and Spring Ridge Road, it is expected that they will have sufficient capacity to facilitate the additional traffic volume associated with the Project.

Road width

The expected annual average daily traffic (AADT) on the Golden Highway in the future scenario in 2028 with construction is expected to be approximately 1,475 vehicles. Based on the 'single carriageway rural road width requirements' specified in the *Austrroads Guide to Road Design Part 3: Geometry Design* (AGRD Part 3), Golden Highway would fall within the category of 'between 1,000 and 3,000 vehicles daily', similar to the future base scenario in 2028.

The expected AADT on Spring Ridge Road in the future scenario in 2028 with construction is expected to be approximately 80 vehicles. Based on the AGRD Part 3, Spring Ridge Road would fall within the category of 'between 1 and 150 vehicles daily', similar to the future base scenario in 2028. It is noted that the existing the existing Spring Ridge Road does not meet the width requirements under future base scenario in 2028, irrespective of the construction traffic associated with the Project.

The increase in traffic during the construction phase is of a temporary nature and would have a temporary and short-term impact. These impacts would be managed by road condition inspections and maintenance procedures in accordance with the Construction Traffic Management Plan. Conditions along Spring Ridge Road would be restored to its pre-existing conditions as at the commencement of construction.

Intersection performance

Based on the Austrroads warrant for type of intersection treatment specified in the *Austrroads Guide to Transport Management Part 6: Intersections, Interchanges and Crossings Managements*, the eastbound approach along the Golden Highway would require a basic left-turn and right-turn treatment to safely accommodate traffic movements into Spring Ridge Road. The existing west approach already has an exclusive right turn lane which can facilitate these right-turns and, as such, no upgrades are considered to be required.

A site access point is proposed along the Golden Highway (Golden Highway Access Point) approximately 4 km west of Spring Ridge Road, which will allow for left-in, left-out and right out

movements. Based on the Austroads warrant, the Golden Highway Access Point would require a basic left-turn treatment and, as such, no upgrades are considered to be required.

A small proportion of construction light vehicles are likely to travel to and from Mudgee / Gulgong and may access Spring Ridge Road via Laheys Creek Road at the Castlereagh Highway / Laheys Creek Road intersection. However, intersection upgrades are not expected to be required at this intersection due to low expected volume of construction traffic.

Swept path analysis

Swept path analysis was undertaken at the Golden Highway / Spring Ridge Road intersection, and the Project Area access points along the Golden Highway and Spring Ridge Road. The largest construction heavy vehicle assessed (excluding OSOM vehicles) was a 26 m B-double.

Widening of the pavement curves at the Golden Highway / Spring Ridge Road intersection would be required to accommodate these turning movements. However, it is noted that this intersection would be upgraded as part of the Port to REZ project, led by Transport for NSW (TfNSW) and The Energy Corporation of NSW (EnergyCo). Coordination with the relevant parties will be necessary to ensure these upgrades are completed to meet the requirements of the Project.

Furthermore, local widening of Spring Ridge Road and Golden Highway near the proposed Project Area access points would also be required to accommodate entry and exit turning movements into and out of the Project Area respectively.

Swept path analyses were undertaken based on indicative dimensions of the road layout determined through a desktop assessment using Google Maps. Any widening requirements would be subject to detailed design investigations of the Project Area undertaken in subsequent design stages. The Proponent will consult with the Councils and key stakeholders to determine road maintenance contributions required to complete any upgrades in line with proposed mitigation measures.

OSOM vehicle access

The Port to REZ project has planned upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Saxa Road intersection. The OSOM vehicles utilised to transport equipment for the Project will fit within the OSOM design vehicle envelop used for the Port to REZ studies. Therefore, it is expected that the Project will not require any additional upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Spring Ridge Road intersection and the Golden Highway access point.

Swept path analysis of OSOM vehicle movements at the Golden Highway / Spring Ridge Road intersection and the Spring Ridge Road access points will be undertaken in subsequent design stages. The following considerations are likely to be required for OSOM movements:

- OSOM vehicle movements will need to occur with the assistance of escort vehicles and/or police following standard protocols
- OSOM vehicle body may overhang above road kerbs at some locations
- Relocation of traffic signages and tree trimming may be required at some locations
- Further investigations will be required in the subsequent stages to determine vertical clearance at the traffic signal poles, and power transmission line at some locations.

OSOM vehicles used during construction would obtain an OSOM Permit from the National Heavy Vehicle Regulator through a licensed haulage contractor with experience in operating over-dimensional vehicles and transporting similar loads. The haulage contractor shall be responsible for obtaining all required approvals and permits from the relevant road authorities and Councils and for complying with conditions specified in the approvals. Detailed assessments along the haulage route would be undertaken as part of the approval process.

Other considerations

Pavement conditions are considered to be acceptable along parts of the proposed haulage route consisting of State roads. However, pavement condition assessment and dilapidation surveys are required to assess if conditions are suitable along Spring Ridge Road to determine if it will be able to accommodate construction traffic movements generated by the Project. Depending on the outcomes of

this assessment, Spring Ridge Road may need to be upgraded. Sections of Spring Ridge Road are anticipated to be upgraded as part of the CWO REZ project for the Elong Elong Energy Hub including: road widening near Dapper Road, installing a new bridge at the crossing of Laheys Creek, Dapper Road and Spring Ridge Road intersection upgrade (intersection tie-in)¹. Pavement conditions of these roads will be restored to its pre-existing condition as at the commencement of construction.

Local access to properties along Spring Ridge Road are expected to be minimal due to the low number of properties (5) along Spring Ridge Road and the low number of vehicles (up to two vehicles during the peak hour) feeding in from the Golden Highway due to low population residing along Spring Ridge Road. Partial or temporary road closures and traffic diversions would be required to facilitate widening of Spring Ridge Road. These are likely to be short-term measures and are not expected to result in any significant impacts to local access along Spring Ridge Road. No formal parking exists on public roads within the vicinity of the Project Area and, as such, no parking impacts are expected.

The increase in construction vehicles would likely have minimal impacts on road safety given the historically low crash rates, low population and low traffic movements within the vicinity of the Project Area. The proposed access point at the Golden Highway may pose safety risks due to interactions between slow-moving construction vehicles and fast-moving traffic. While no upgrades are deemed necessary based on the Austroads warrant assessment, implementation of acceleration and deceleration lanes could be considered to enhance safety. Appropriate turning treatments are available at the Golden Highway / Spring Ridge Road intersection and, though impacts are likely to be minimal, any potential impacts would be mitigated through the implementation of a Traffic Management Plan.

There are limited public transport services in the vicinity of the Project Area due to the low population density and associated lack of demand. Only one coach service line (one service per weekday peak period) runs along the section of the Golden Highway to the north of the Project Area and no other public coach or bus services operate. A rail line runs parallel to the Golden Highway (on the north side); however, transportation of materials by rail is not proposed for the construction of the Project.

The Dunedoo to Mendooran section of the Central West Cycling Trail, via Cobbora, is located 7 km from the Project Area. The CWCT route will be highlighted within the site induction and driver's code of conduct to increase awareness of cyclists' presence in the area. Drivers will be instructed to respect the safety of cyclists using local and regional roads, including complying with legal passing separation distances. No formal walking facilities are provided in the vicinity of the Project Area.

The construction periods of Elong Elong Energy Hub and Sandy Creek Solar Farm are likely to align with the Project, potentially causing cumulative traffic impacts such as localised congestion and longer travel times. Material transportation is expected to overlap the Project's haulage route, particularly between the Port of Newcastle and the Golden Highway / Castlereagh Highway intersection. Planned upgrades to the OSOM haulage route as part of the Port to REZ project, including at the Golden Highway / Spring Ridge Road intersection, are anticipated to minimise these impacts.

While the Golden Highway is expected to accommodate cumulative traffic outside peak hours, Spring Ridge Road may require further upgrades to handle combined traffic volumes.

While the Project's construction traffic alone may not necessitate additional road upgrades within the locality, peak cumulative traffic volumes from multiple concurrent construction projects may warrant further improvements. The need for these upgrades will be assessed in consultation with other project proponents as construction timelines become clearer.

Operational impact assessment

It is expected that 20 full time workers would be required which, for a worst-case scenario, would result in 40 additional vehicle movements daily. Based on AGRD Part 3, the Golden Highway would fall within the category of 'between 1,000 and 3,000 vehicles daily', similar to the future base scenario in 2038. Spring Ridge Road would fall within the category of 'between 1 to 150 vehicles daily', also similar to the future base scenario in 2038.

¹ https://www.energyco.nsw.gov.au/sites/default/files/2024-12/Appx%20A_Updated%20project%20description.pdf

Given the low operational vehicle movements and low background traffic, the Golden Highway and Spring Ridge Road have the capacity to facilitate these movements. The existing turning treatment at the Golden Highway / Spring Ridge Road intersection is appropriate and no upgrades are required.

No access impacts are expected given the low traffic volumes and no parking impacts are expected as no formal parking exists within the vicinity of the Project Area.

About 30-40 permanent parking spaces would be required during the operational phase. Sufficient parking would be provided within the Development Footprint to account for the operational staffing needs of the Project plus any contractors or visitors to site.

Heavy vehicles may be required occasionally for replacing large components such as inverters, transformers or components of the BESS. Sufficient heavy vehicle parking spaces are expected to be provide on-site.

Road safety impacts are expected to be minimal. No public transport and coach impacts are expected, and no active transport impacts are expected.

The proposed projects near the Project are expected to be operational during the operation of the Project. Traffic generated from these projects are expected to be low, similar to the Project, and no potential cumulative traffic and transport impacts are expected.

Decommissioning impact assessment

Impacts resulting from the decommissioning phase have not been assessed. As decommissioning would likely occur after 30-35 years of operation, background traffic growth rates associated with future development projects and land use changes in the area cannot be accurately determined at this stage. It is anticipated that the decommissioning of the Project would generate traffic volumes less than the volumes generated during the construction phase. The proposed plan for the decommissioning phase is unknown at this stage; however, decommissioning activities would likely be undertaken in stages over a shorter time frame.

Similarly, any cumulative impacts associated with the construction or decommissioning of nearby projects at the time of Project decommissioning cannot be accurately determined at this stage.

As decommissioning is expected to begin in 35 years, forecasting traffic movements to assess the decommissioning phase is not feasible at this stage due to evolving decommissioning technology and requirements. It is suggested that assessments be undertaken in subsequent stages once further details are available regarding decommissioning.

1.0 Introduction

Cobbora Solar Farm Pty Ltd (CSF), in its capacity as trustee for the Cobbora Solar Farm Trust (a wholly owned subsidiary of Pacific Partnerships Pty Ltd) is seeking development consent to construct, operate and decommission Cobbora Solar Farm in the central west region of New South Wales (NSW).

The solar farm would be a large-scale solar photovoltaic (PV) generation facility with a battery energy storage system (BESS) and associated infrastructure for its management and connection to the national electricity market (NEM) (the Project). The Project would be located near Cobbora, approximately 20 kilometres (km) south-west of the township of Dunedoo and 55 km east of Dubbo in Central West NSW (the Project Area).

AECOM Australia Pty Ltd (AECOM) has been commissioned to undertake a traffic and transport impact assessment for the Project. The assessment considers both construction, operational and decommissioning (where relevant) traffic and transport impacts associated with the Project.

1.1 Project overview

The Project would connect to the Central West Orana (CWO) Renewable Energy Zone (REZ) grid infrastructure via up to four onsite grid substations, connecting to the Elong Elong Energy Hub.

Key features of the Project would include:

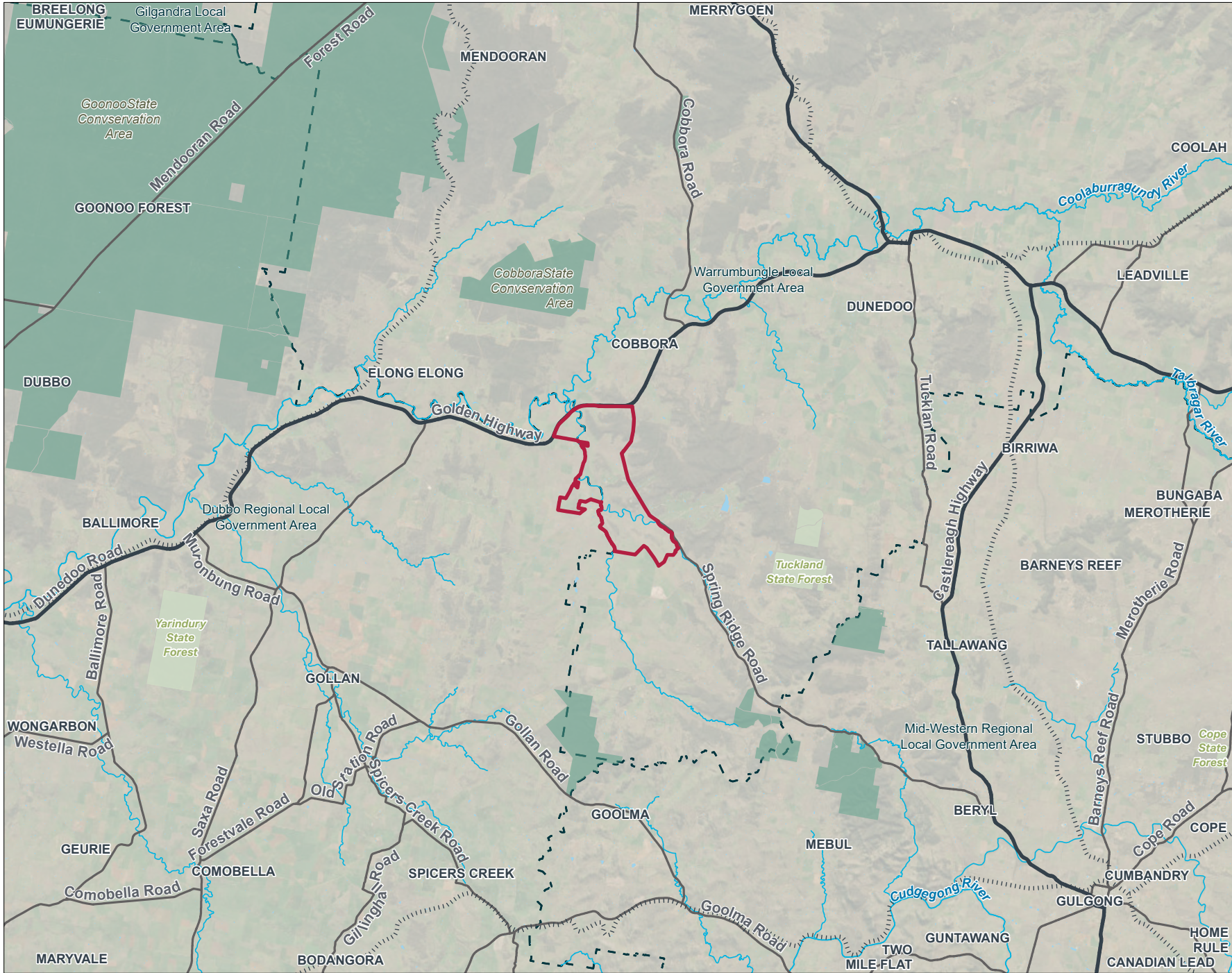
- Construction and operation of a 700 megawatt (MW) (AC) solar farm
- A 400 MW / 1,600 megawatt hour (MWh) BESS
- Up to four substations, comprising:
 - one substation connecting the BESS to the Elong Elong Energy Hub
 - up to three substations connecting the solar farm to the Elong Elong Energy Hub.
- Support facilities and infrastructure, including internal roads, upgrades to external access roads (if required), underground and overhead cabling, waterway crossings, staff office, meeting facilities, operations and control room, workshop, amenities, temporary accommodation, car parking, storage facilities, fencing, and landscaping.

1.2 Project area

The Project Area is approximately 3,000 hectares (ha) in size and spans two local government areas (LGAs): Warrumbungle Shire Council and Dubbo Regional Council. To the north the Project Area is bordered by the Golden Highway and to the east by Spring Ridge Road. The Project Area is zoned Primary Production (RU1) under both the *Dubbo Regional Local Environmental Plan 2022* (Dubbo Regional LEP) and the *Warrumbungle Local Environmental Plan 2013* (Warrumbungle LEP). There is also a small area which is not zoned under either of the LEPs. The Development Footprint is the actual disturbance area (i.e. Project infrastructure, access tracks and temporary construction support areas) and is approximately 1,600 ha.

Land within the Project Area is characterised by undulating cleared land used primarily for sheep and cattle grazing or dry land cropping. The Project Area contains canopy in the north and central sections; with most of these areas being retained throughout the Project Area. The Development Footprint is largely clear of vegetation with some scattered trees and rows of trees along fence lines. Rural land surrounds the Project Area with residential premises located at varying distances.

A figure showing the Project Area location is presented on Figure 1-1.



- Legend**
- Project Area
 - Local government area
 - State forest
 - National parks and reserves
 - Waterbody
 - Watercourses
 - Motorway
 - Main road
 - Railway



FIGURE 1-1: LOCALITY MAP AND REGIONAL CONTEXT

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1.3 Development footprint

The Development Footprint covers approximately 1,600 ha of land, which would be occupied by the solar farm and associated infrastructure (including access tracks and temporary construction support areas) within the Project Area (the developable area). This area was identified through eliminating land which is subject to environmental constraints (for example, areas with high biodiversity value, Aboriginal heritage sites or areas subject to flooding).

The Project Area and the surrounding road network are assessed as part of this traffic and transport impact assessment.

1.4 Purpose of this report

1.4.1 Assessment objectives

This traffic and transport impact assessment report is one of a number of technical documents that forms part of the EIS to support a State Significant Development (SSD) application for the Project. The purpose of this report is to provide a traffic and transport assessment which addresses the following overarching objectives:

- Address the relevant Secretary's Environmental Assessment Requirements (SEARs) as outlined in Section 1.4.2
- Identify potential traffic and transport impacts during the construction, operation, and decommissioning phases of the Project
- Outline mitigation measures, if required, relating to traffic and transport during the construction, operational, and decommissioning phases of the Project.

1.4.2 Secretary's Environmental Assessment Requirements

SEARS for the Project were initially issued on 11 November 2021, with the latest update issued on 07 November 2024. The SEARs relating to traffic and transport and where these requirements are addressed in this report are outlined in Table 1-1.

Table 1-1 SEARs – traffic and transport

Relevant SEARs	
General	Where addressed
An assessment of the peak and average traffic generation, including light vehicles, shuttle buses, heavy vehicles and heavy vehicles requiring escort, construction worker transportation and transport of materials by rail.	Section 5.1 Traffic demand and growth rates, Section 5.2 Future base scenarios, Section 5.3.1 Road network, and Section 5.4.1 Road network. Transportation of materials by rail is not proposed.
An assessment of the likely transport impacts to the site access route (including, but not limited to, Golden Highway, Spring Ridge Road, Danabar Road, Sandy Creek Road, Sweeneys Lane and Tallawonga Road), site access points, particularly in relation to the capacity and condition of the roads.	Section 5.0 Impact assessment Note that under the revised project description Sandy Creek Road, Sweeneys Lane and Tallawonga Road are no longer being utilised as part of the Project and hence have not been assessed.
An assessment of whether there will be any likely transport impacts to local heritage items which adjoin any proposed haulage routes.	Appendix K Aboriginal Cultural Heritage Assessment Report and Appendix L Heritage Impact Assessment

Relevant SEARs	
<p>A cumulative impact assessment of traffic from nearby developments including but not limited to Spicers Creek Wind Farm, Dunedoo Solar Farm, Birriwa Solar Farm, Tallawang Solar Farm and Barneys Reef Wind Farm.</p>	<p>Section 5.3.6 Cumulative traffic impacts, and Section 5.4.6 Cumulative traffic impacts Note that assessment has also been included for Sandy Creek Solar Farm, but has excluded Barneys Reef Wind Farm due to that project's withdrawal.</p>
<p>Provide details of measures to mitigate and/or manage potential impacts (developed in consultation with the relevant road authorities) including:</p> <ul style="list-style-type: none"> • a schedule of all required road upgrades (including resulting from heavy vehicle and over mass/over dimensional traffic haulage routes) • clear figures of proposed road upgrades (including the site access point) • road maintenance contributions, and any other traffic control measures. 	<p>Section 6.0 Mitigation and management measures and Appendix C</p>

2.0 Project description

2.1 Summary of the Project

The Project involves the construction, operation and decommissioning of the Cobbora Solar Farm and BESS. The Project would connect to the CWO REZ grid infrastructure via the Elong Elong Energy Hub. The Elong Elong Energy Hub was approved as part of EnergyCo's Central-West Orana Renewable Energy Zone Transmission project EIS (EnergyCo, 2023) and is intended to connect renewable energy generators to the CWO REZ grid infrastructure.

Key features of the Project are summarised in **Table 2-1**.

Table 2-1 Key features of the Project

Project	Cobbora Solar Farm
Key features	<p>Key infrastructure: 700 MW AC solar farm, 400 MW / 1,600 MWh BESS and up to four substations</p> <p>Ancillary infrastructure: Internal roads, waterway crossings, car parking, operation offices and control room, workshop, amenities, storage facilities, underground and overhead cabling, fencing and landscaping.</p> <p>Temporary construction areas: Compounds, laydowns, stockpiles, parking, helipad and workforce accommodation.</p>
Project location	Approximately 20 km south-west of Dunedoo and 55 km east of Dubbo in the CWO REZ.
Development Footprint	Approximately 1,600 ha and includes all disturbance areas (i.e. key infrastructure, ancillary infrastructure and temporary construction areas).
Access	Primary access would be via four access points along Spring Ridge Road and one on the Golden Highway.
Grid connection	Grid connection would be via up to four grid substations connecting to the Elong Elong Energy Hub.
Construction	<p>Expected duration: 47 months (including commissioning)</p> <p>Construction hours: Standard working hours (EPA, 2020)</p> <p>Number of workers: Up to 734 full-time-equivalent (FTE) workers during peak</p> <p>Number of vehicle movements: Up to 14 light, 88 heavy and 2 OSOM (when required) per day and 34 shuttle buses per fortnight during peak construction.</p>
Operation	<p>Expected lifespan: 35 years for the solar farm and 25 years for the BESS</p> <p>Operational hours: daylight hours, 7 days a week for the solar farm and 24 hours per day, 7 days a week for the BESS</p> <p>Number of workers: 20 FTE workers</p>
Decommissioning and rehabilitation	At the end of the Project's operational life all above ground components would be removed and re-purposed where possible and land rehabilitated to achieve pre-existing conditions as far as reasonably practicable.

The road network hierarchy surrounding the Project is shown on Figure 2-1 and the Project layout is shown on Figure 2-2.



Legend

- Project Area
- State road
- Primary road
- Local road
- Key Centre

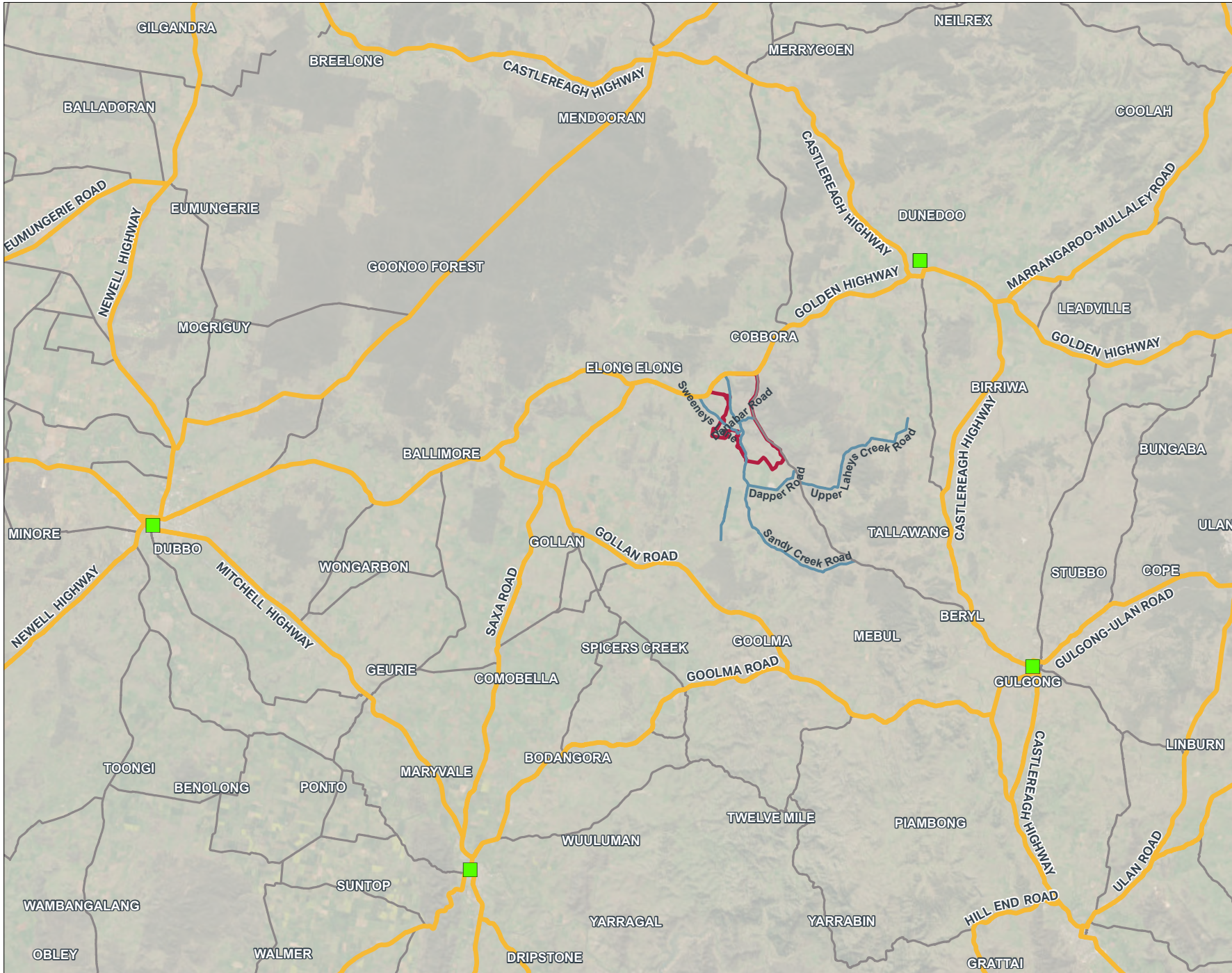


FIGURE 2-1: SURROUNDING ROAD NETWORK HIERARCHY

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Source: Earthstar Geographics



Legend

- Project Area
- 33 kV easement
- 330 kV easement
- Solar array area
- Main construction area
- Construction areas
- Proposed tree planting locations
- BESS
- Accomodation camp
- Helipoint
- Secondary substations
- Roads
- Main substation
- Waterbody
- Motorway
- Main road
- Local road
- Watercourses
- Primary access point
- Secondary access point
- 33 kV poles
- 330 kV towers
- Proposed bridge crossings

FIGURE 2-2: PROJECT LAYOUT

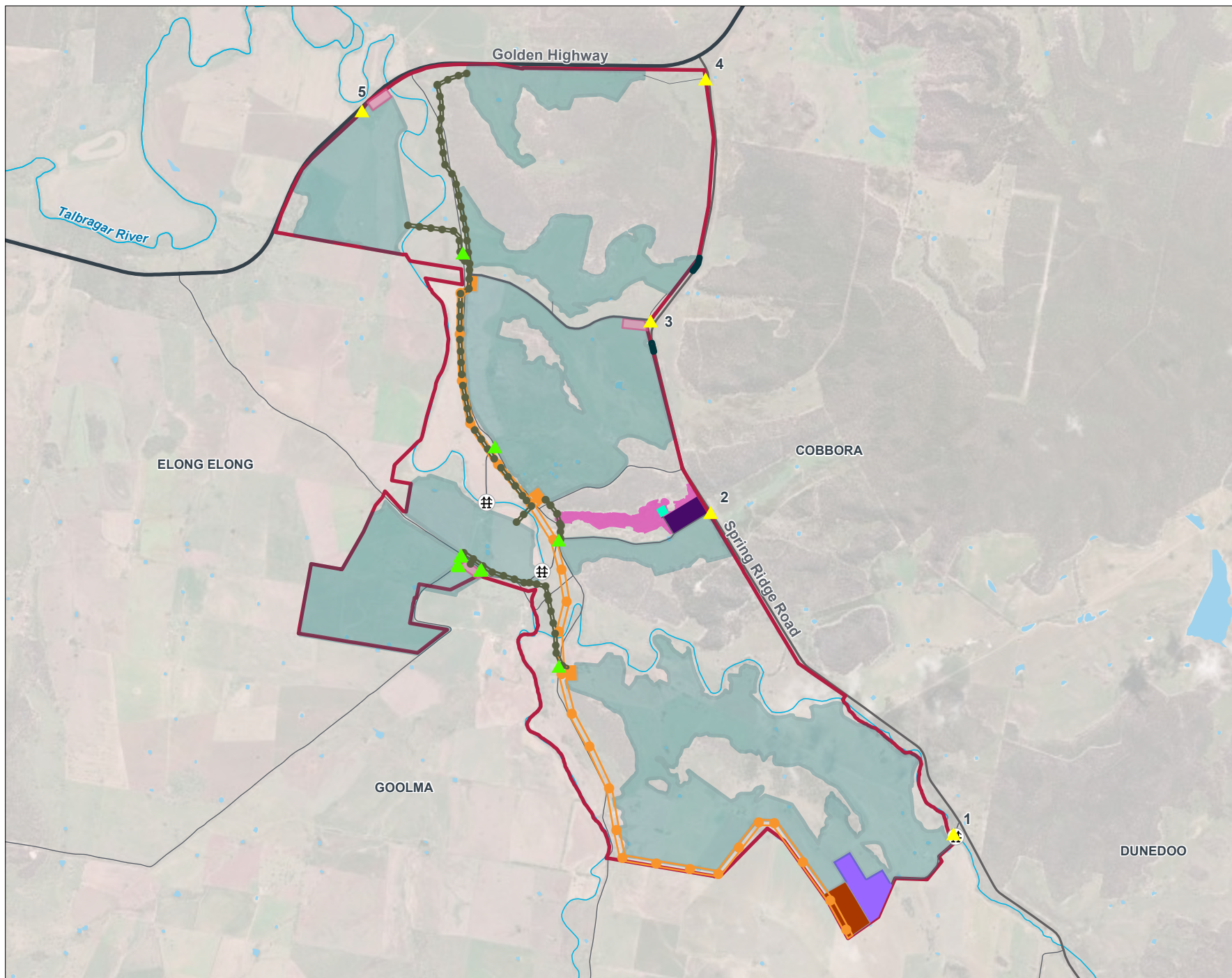
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Source: Earthstar Geographics



2.2 Construction

2.2.1 Overview

Construction of the Project would be carried out in one stage involving the construction of the solar farm and BESS. Construction is expected to start in late 2027 (subject to planning approval and other authorisations) and is expected to take around 47 months to complete, including 36 months for construction of the infrastructure and an additional 7 to 11 months for commissioning.

2.2.2 Construction plant and equipment

During the construction phase of the Project, construction vehicles would be required to transport materials and equipment to the Project Area using the existing road network. The peak construction period (greatest amount of construction activities) is likely to occur during late Q2 and early Q3 2028, about 11 months into the construction program. The peak construction vehicle traffic period however has been identified as August 2028 (the greatest number of vehicles associated with the Project's construction). Substantial construction activity would occur outside this peak period and be distributed over the construction program, as discussed in Section 2.2.4.

The final equipment and plant requirements would be determined by the construction contractor; however, an outline of the plant and equipment required for each construction stage is provided in Table 2-2.

Table 2-2 Indicative plant and equipment for the construction of the Project

Equipment to be used during construction	
Site establishment activities and enabling works	
Front end loaders	Dump trucks
Road trucks	Water trucks
Excavators	Graders
Compactors	Light vehicles / vans
Construction of solar farm and BESS	
Front end loaders	Dump trucks
Bobcat/excavators	Hydraulic piling machines
Graders	Scrapers
Compactors and rollers	Water trucks
Hydro vacuum excavator	Concrete trucks and pumps
Elevated work platforms	Cranes
Concrete saws and grinders	Scrapers
Backhoe	Generators
Light vehicles, vans, heavy rigid and articulated trucks (including multi trailer)	Telehandlers
Construction of grid substations and connection to the Elong Elong Energy Hub	
Directional drilling rig truck and associated infrastructure (i.e. drilling fluid recovery and recycling unit)	Pump/s for dewatering
Hydro vacuum excavator	Telehandlers
Water trucks	Excavators/backhoe
Graders	Compactors
Light vehicles, vans, heavy rigid and articulated trucks (including multi trailer)	Concrete saws and grinders

Equipment to be used during construction	
Crane truck	Tipper truck
Cable installation kit: Rollers, crawlers, cable winchers, synthetic draw ropes	Concrete trucks
Commissioning	
Elevated work platforms	Diesel generators
Cranes	Light vehicles / vans
Demobilisation and rehabilitation works	
Heavy vehicles	Water trucks
Backhoe	Compactors
Light vehicles / vans	

2.2.3 Construction traffic and access routes

During construction, the Project Area would be accessed from the Golden Highway and Spring Ridge Road via the Golden Highway. There would be one access point along the Golden Highway and four access points along Spring Ridge Road, as shown on Figure 2-2, and described below:

- Access 1 to 4: Spring Ridge Road access points – access would be via Spring Ridge Road, turning into the Project Area:
 - Access 1: about 10 km south of Golden Highway
 - Access 2: about 5 km south of Golden Highway
 - Access 3: about 3 km south of Golden Highway
 - Access 4: about 300 m south of Golden Highway
- Access 5: Golden Highway Access Point – access would be via the Golden Highway, turning into the Project Area, approximately 4 km west of Spring Ridge Road

Sandy Creek runs through the Project Area dividing it into two areas. The Golden Highway Access Point provides access to the area west of Sandy Creek whilst the Spring Ridge Road access points provide access to the area east of Sandy Creek.

The Golden Highway access point would allow for left-in, left-out and right-out turning movements. No oversize and over mass (OSOM) vehicles would use this access point.

The use of different access points and allowed movements at each access during the construction will be defined in the Construction Traffic Management Plan (CTMP).

Construction deliveries would primarily use 19 m articulated vehicles (19m AVs), with occasional 26 m B-doubles. Heavy vehicles would be required for various tasks, including the delivery of construction equipment, removal of spoil (if required) and the delivery of various Project components. OSOM vehicles are expected to be required to deliver large and heavy elements, such as transformers and prefabricated buildings. OSOM vehicles would be used on an 'as needs' basis only and are not expected to occur daily.

The largest heavy vehicles expected at each access point is summarised in Table 2-3:

Table 2-3 Largest heavy vehicles expected at each access point

Access Point	Largest general heavy vehicles expected	OSOM Access
Access 1	26 m B-doubles	Expected
Access 2	26 m B-doubles	Not expected
Access 3	26 m B-doubles	Expected
Access 4	19 m AVs	Not expected
Access 5	19 m AVs	Not expected

Internal access roads would be provided to enable vehicular access around the Project Area (within the Development Footprint) during both construction and operation. Passing lanes and turning circles would be provided in line with the requirements of the Bushfire Management Plan and as relevant to ensure worker safety generally.

Local public roads within the Project Area, including Danabar Road, Sandy Creek Road, and Sweeneys Lane, would not be used by the Project during construction except where crossing or access is required (secondary access points). Light vehicles may use these local Council roads during operation.

The Project is expected to add traffic to the surrounding road network during construction. During the 2028 peak construction vehicle traffic period (as noted in Section 2.2.2), it is expected that up to 51 vehicles (7 light vehicles and 44 heavy vehicles) per day would be required to access the Project Area, and if required, up to 1 OSOM vehicle per day. This equates to 14 light vehicle movements, 88 heavy vehicle movements, and potentially 2 OSOM vehicle movements per day.

Shuttle buses would transport construction workers from nearby airports to the Project Area on scheduled pick-up days and drop them off at the airport approximately two weeks later. It is anticipated that up to 17 shuttle buses would be required, resulting in a total of 34 shuttle bus movements every fortnight.

Light and heavy construction vehicles are expected to travel to and from the Project Area from the direction of the townships of Dubbo and Dunedoo, as shown on Figure 2-3. The assumed light and heavy construction vehicle distributions are discussed in detail in Section 4.5.2. Links to the wider NSW road network are available from both directions.

OSOM vehicles are expected to travel to the Project Area from the Port of Newcastle. From the Port of Newcastle an indicative route to the Project Area would include Industrial Drive (A43), Pacific Highway (A43), New England Highway (A1 and A15), John Renshaw Drive (B68), Hunter Expressway (M15) and Golden Highway (B84). The proposed OSOM haulage route is shown on Figure 2-4.

Legend

- Project Area
- Site access point
- Construction haulage route
- State road
- Primary road
- Local road
- Vehicular track
- Watercourse

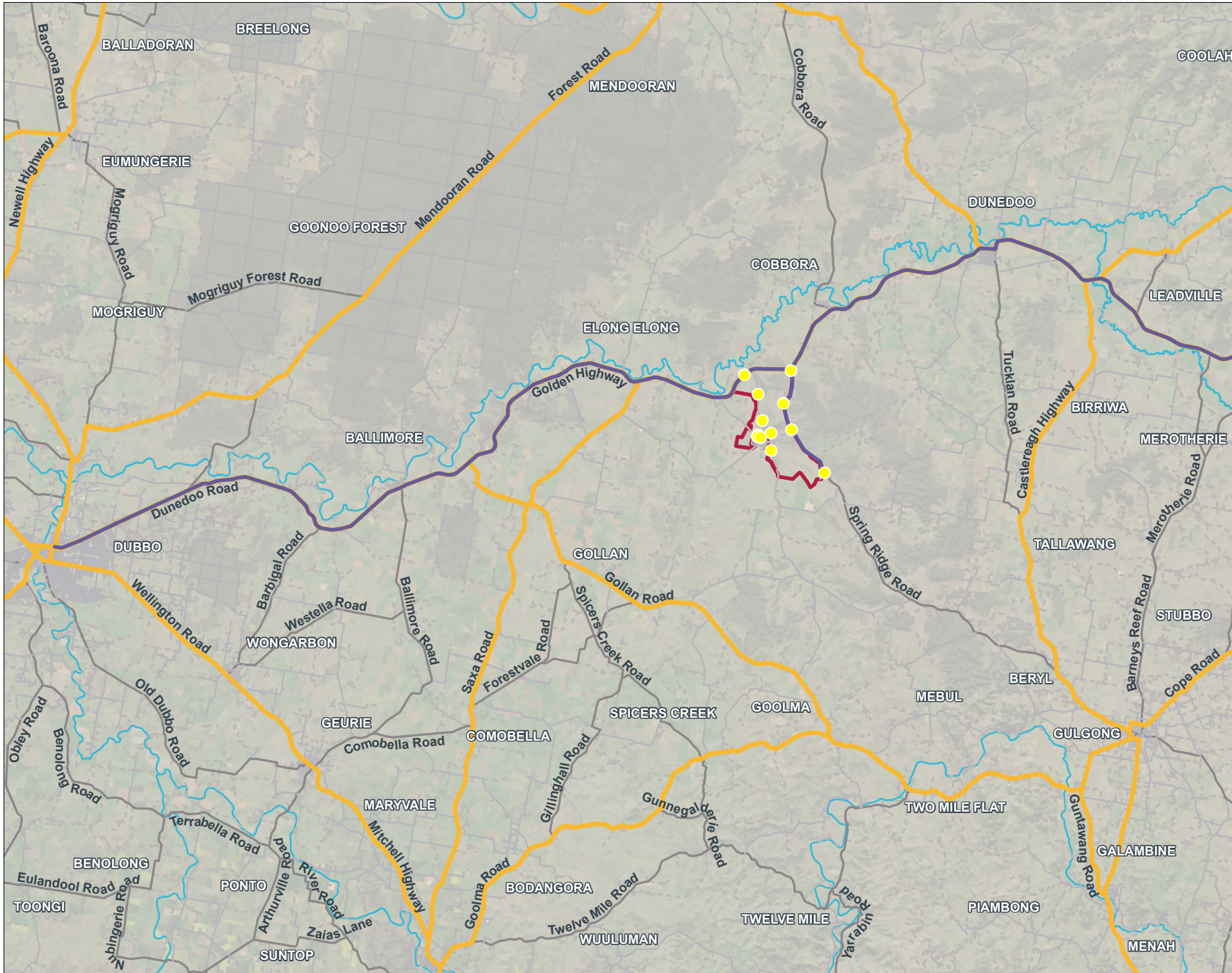


FIGURE 2-3: CONSTRUCTION HAULAGE ROUTE

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Source: Earthstar Geographics



Legend

- Project Area
- Proposed OSOM haulage vehicle route
- State road
- Primary road

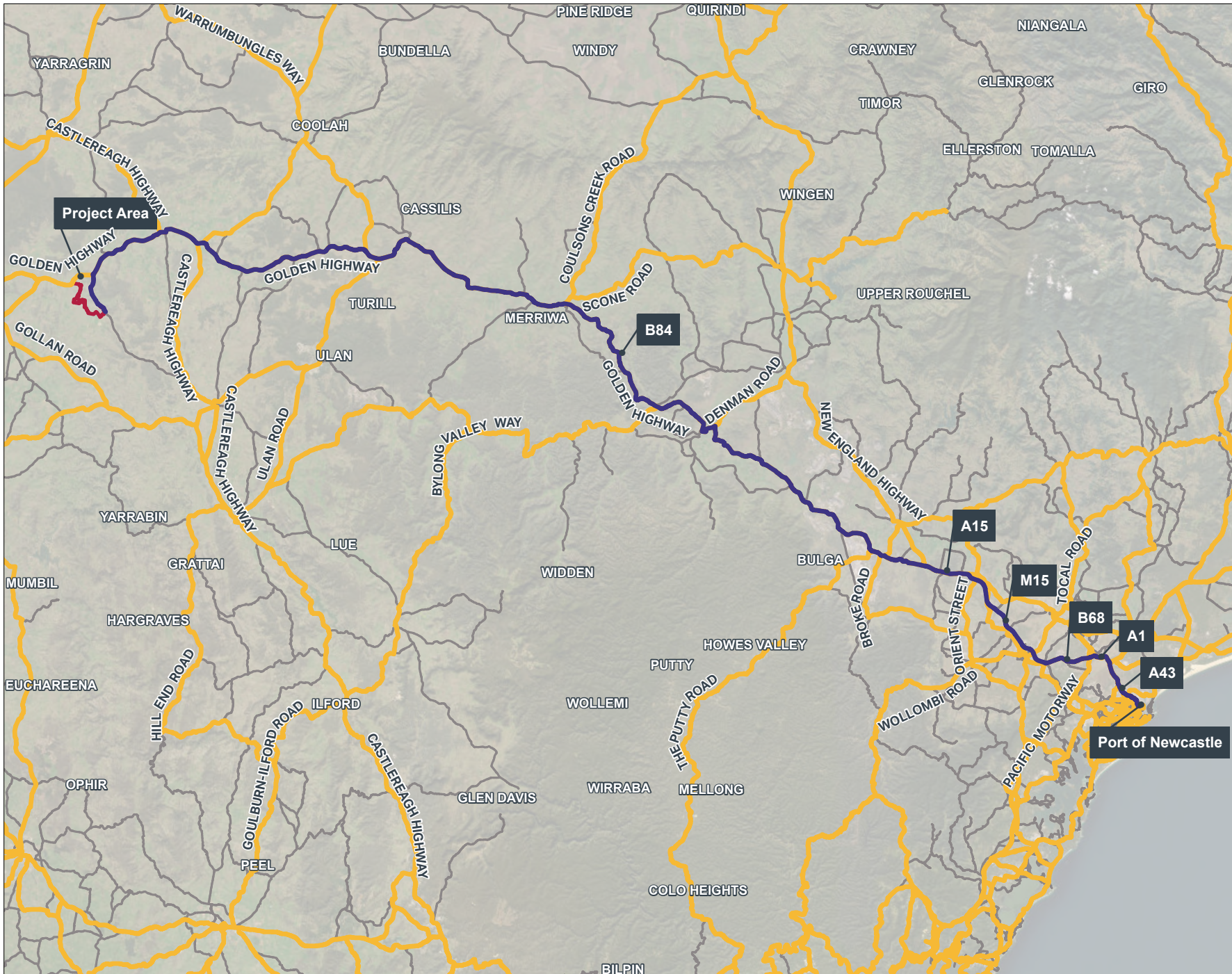


FIGURE 2-4: PROPOSED HAULAGE ROUTE FOR OSOM VEHICLES

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Source: Earthstar Geographics

2.2.4 Construction workforce and parking

For the purpose of this assessment, the peak construction vehicle traffic period (August 2028) has been used for assessing the worst-case scenario for the construction phase. It is anticipated that the workforce will include up to 734 workers on site per day during the peak construction vehicle traffic period.

The workforce for the Project would be primarily sourced externally, though some local workers would commute daily between nearby towns and the Project Area. The majority of workers are expected to fly-in on the scheduled pick-up day and fly-out approximately two weeks later. To limit light vehicle movements on public roads, most of the workforce would be transported to the Project Area using shuttle buses from nearby airports. To assess the worse-case scenario, it is assumed that all shuttle buses will arrive at the Project Area during the morning road network peak hour on the scheduled pick-up day and depart from the Project Area during the evening road network peak hour on the fly-out day.

On-site accommodation would be provided for the duration of their stay. During construction, parking would be provided for up to 100 light vehicles and shuttle buses within the Development Footprint, as indicatively shown in the 'construction support area' on Figure 2-2. Based on the projected number of vehicles during the peak construction vehicle traffic period, sufficient parking spaces will be able to be provided on site to accommodate all light vehicles, buses and construction-related plant and machinery.

2.2.5 Construction program

Construction is expected to commence late 2027 (subject to planning approval and other authorisations) and is likely to take around 47 months to complete (including commissioning). Table 2-4 presents the indicative program for the Project. As noted in Section 2.2.4, the peak construction vehicle traffic period for assessing the worst-case scenario from a traffic and transport perspective is likely to occur during August 2028.

Table 2-4 Indicative program for the Project

Task	Timing	Duration
Site establishment activities and enabling works	September 2027 to December 2027	3 months
Solar		
Construction of solar farm and grid substations	December 2027 to September 2030	33 months
Commissioning	September 2030 to August 2031	7 to 11 months
Demobilisation and rehabilitation works	March to April 2031	2 months
BESS		
Construction of BESS	May 2028 to October 2029	17 months
Commissioning	October 2029 to April 2030	7 months
Demobilisation and rehabilitation works	April 2030	1 month

2.2.6 Construction hours

Construction would be carried out during standard working hours, as defined by the NSW Environment Protection Authority's (EPA) Interim Construction Noise Guideline (2020), being:

- 7:00 am to 6:00 pm, Monday to Friday
- 8:00 am to 1:00 pm, Saturdays
- No work on Sundays or public holidays.

While it is anticipated that most work would take place during standard construction hours, some works may be required to be undertaken outside of standard hours. If so, relevant authorities and any sensitive receptors would be notified.

2.3 Operation

2.3.1 Workforce and hours

Once operational, the Project would require 20 FTE workers which would be preferentially sourced locally where feasible. The Project has the ability to run unmanned, as it would largely be controlled remotely through the Supervisory Control and Data Acquisition (SCADA) system.

Regular maintenance activities would be generally conducted during standard working hours (refer to Section 2.2.4). If necessary, reactive or emergency maintenance may need to occur outside of standard working hours; however, this is expected to be rare.

2.3.2 Access and parking

The Project Area is proposed to be accessed via the Golden Highway and Spring Ridge Road during operation, using the same access points as the construction phase. Operation staff will be informed on the use of different access points and allowed movements at each access.

About 30-40 permanent parking spaces would be required during the operational phase. Sufficient parking would be provided within the Development Footprint to account for the operational staffing needs of the Project plus any contractors or visitors to site. Heavy vehicles may be required occasionally for replacing large components such as inverters, transformers or components of the BESS. Sufficient heavy vehicle parking spaces will be provided on-site.

2.4 Decommissioning and rehabilitation

Once the Project reaches the end of its anticipated 35 year operational life, it would be decommissioned and the Project Area returned to its previous land use (grazing), or another permissible land use as agreed by the Project owner and the landholder at that time, subject to relevant planning approvals.

Decommissioning would involve some disturbance of the Project Area during the removal of infrastructure and equipment, and subsequent rehabilitation. All dismantled and decommissioned infrastructure and equipment would be recycled where practicable. Infrastructure and equipment that cannot be recycled would be disposed of at an approved waste management facility.

A crew of workers, including both white collar staff and contractors, would be required during the decommissioning phase of the Project. The exact number of workers required will depend on factors such as equipment improvements over 35 years and available recycling technologies. Traffic generated during the decommissioning phase is anticipated to be less than the peak construction vehicle traffic period and likely to be undertaken in stages over a shorter timeframe.

3.0 Existing environment

3.1 Context

The Project Area is located in the central west of NSW within the Warrumbungle Shire Council and Dubbo Regional Council LGAs. The Project Area is approximately 270 km north-west of Sydney, 6 km south-west of Cobbora, 20 km south-west of Dunedoo and 55 km east of Dubbo. The Project Area boundary covers an area of approximately 3,000 ha.

Population centres in the vicinity of the Project are outlined below. The population of each centre, as outlined by the Australian Bureau of Statistics Census (2021)², is also noted:

- Cobbora (population 25), approximately 6 km northeast
- Elong Elong (population 142), approximately 13 km west
- Dunedoo (population 1,097), approximately 20 km north-east of the Project Area
- Gulgong (population 2,680), approximately 30 km south-east of the Project Area
- Mudgee (population 11,457), approximately 50 km south-east of the Project Area
- Wellington (population 4,096), approximately 50 km south-west of the Project Area
- Dubbo (population 43,516), approximately 55 km west of the Project Area.

Land surrounding the Project Area is generally undulating and is largely cleared of vegetation. The main land uses are sheep and cattle grazing or dry land cropping. Renewable energy development is a rapidly growing land use within the area. This includes several proposed, approved, under construction and operational renewable energy projects within and around the CWO REZ (see Figure 3-1). The renewable energy projects nearest to the Project Area include the Sandy Creek and Dapper solar farms located south of the Project Area. These and other relevant renewable energy projects are discussed in Section 6.15 Cumulative impacts of this EIS.

² <https://www.abs.gov.au/census/find-census-data/search-by-area>



Legend

- Project Area
- Local government area
- Waterbody
- State road
- Main road
- Watercourses

Surrounding renewable projects

- ⦿ Solar
- ⦿ Wind
- ⦿ Battery Energy Storage System

Land Zoning

- C1 - National parks and nature reserves
- C3 - Environmental management
- E1 - Local centre
- E4 - General industrial
- R1 - General residential
- R5 - Large lot residential
- RE1 - Public recreation
- RE2 - Private recreation
- RU1 - Primary production
- RU3 - Forestry
- RU5 - Village
- SP2 - Infrastructure
- W2 - Recreational waterways

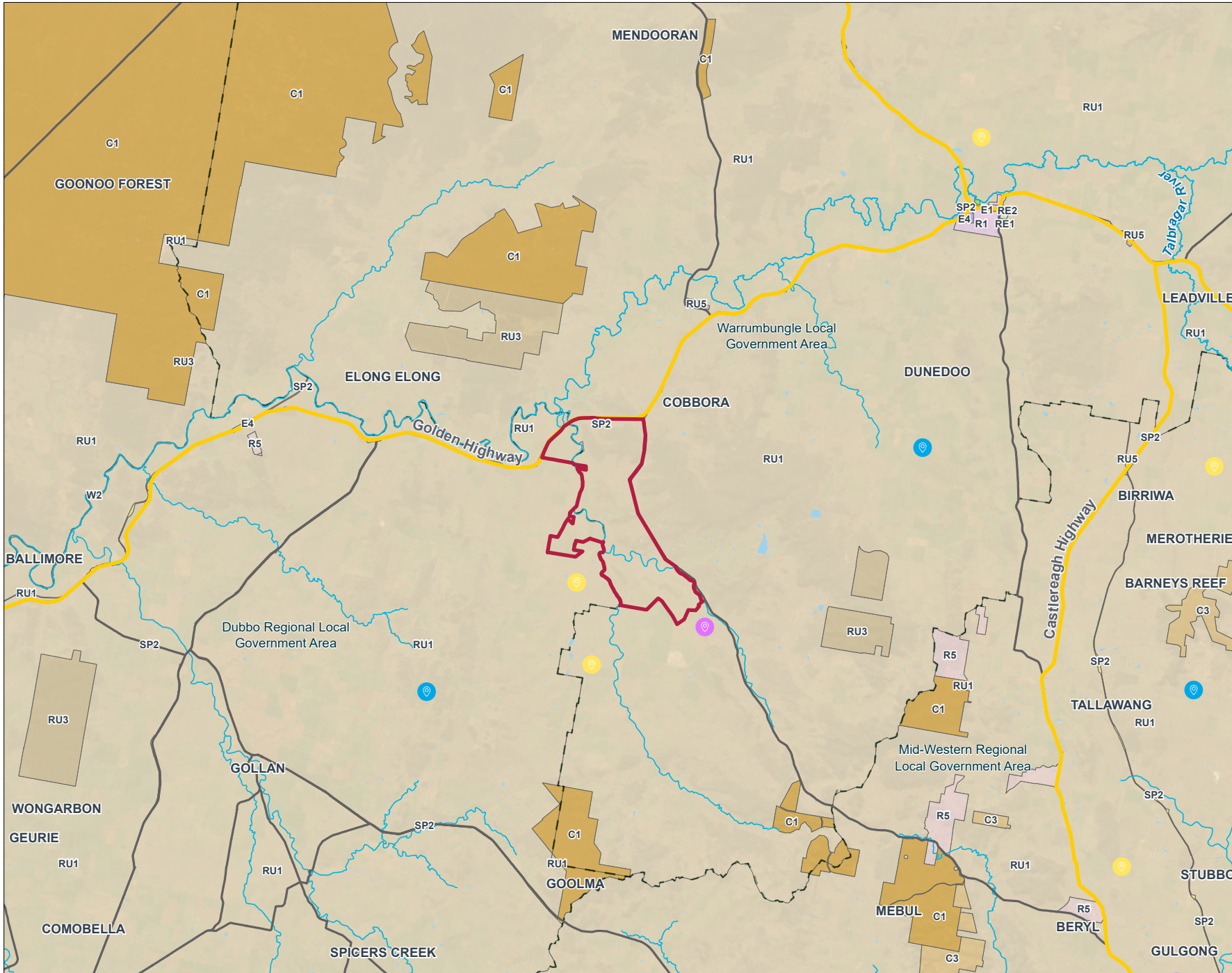
FIGURE 3-1: STRATEGIC CONTEXT

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Source: Earthstar Geographics



3.2 Road network

3.2.1 Key roads

The road network in the vicinity of the Project Area includes Spring Ridge Road, the Golden Highway, Danabar Road, Dapper Road, Sandy Creek Road, Sweeneys Lane, and Tallawonga Road (see Figure 3-2).

Golden Highway

The Golden Highway is a classified State Road (B84) operated by TfNSW and is generally aligned in an east-west direction to the north of the Project Area. The highway connects Dubbo in the west to Newcastle in the east. The highway is an undivided carriageway within the vicinity of the Project Area, with one lane in each direction. The posted speed limit is 100 km per hour for vehicles travelling both eastbound and westbound. No parking or footpaths are provided on either side of the highway near the Project Area. 7 dwellings within the vicinity of the Project can be accessed from the Golden Highway.

Spring Ridge Road intersects with the Golden Highway to the east of the Project Area. At this intersection additional short turning lanes are available for turning vehicles approaching the intersection from either direction (approximately 45 m from the intersection in the western approach and 85 m in the eastern approach).

Spring Ridge Road

Spring Ridge Road is a two-way sealed rural road with an undivided carriageway operated by Warrumbungle Shire Council and is generally aligned in a north-south direction adjacent to the Project Area. Spring Ridge Road is fed by the Golden Highway to the north and the Castlereagh Highway to the south, via Laheys Creek Road. Spring Ridge Road also provides access to other rural roads in the vicinity of the Project Area including Danabar Road, Dapper Road, Sandy Creek Road and Laheys Creek Road. No formal parking or footpaths are provided on either side of the road. Five dwellings within the vicinity of the Project can be accessed from Spring Ridge Road.

Danabar Road

Danabar Road is an unsealed rural road operated by Warrumbungle Shire Council and is generally aligned in an east-west direction within the Project Area. This road connects to Spring Ridge Road in the east and Sandy Creek Road in the west.

Dapper Road

Dapper Road is an unsealed rural road operated by Warrumbungle Shire Council and is generally aligned in an east-west direction to the south of the Project Area. The road connects to Spring Ridge Road in the east and Sandy Creek Road in the west. Three dwellings within the vicinity of the Project can be accessed from Dapper Road.

Sandy Creek Road

Sandy Creek Road is an unsealed rural road operated by Warrumbungle Shire Council and is generally aligned in a north-south direction through the Project Area, connecting the Golden Highway in the north and Spring Ridge Road in the south. Two dwellings within the vicinity of the Project can be accessed from Sandy Creek Road.

Sweeneys Lane

Sweeneys Lane is an unsealed rural road operated by Dubbo Regional Council (west of Sandy Creek) and Warrumbungle Shire Council (east of Sandy Creek) and is generally aligned in a north-south direction adjacent to the Project Area. Sweeneys Lane connects the Golden Highway in the north and Sandy Creek Road in the south and provides access to Tallawonga Road. Two dwellings within the vicinity of the Project can be accessed from Sweeneys Lane.

Tallawonga Road

Tallawonga Road is an unsealed rural road generally aligned in an east-west direction west of the Project Area. It connects to Sweeneys Lane to the east and Saxa Road to the west. Two dwellings within the vicinity of the Project can be accessed from Tallawonga Road.

Laheys Creek Road

Laheys Creek Road is an unsealed rural road generally aligned in an east-west direction south of the Project Area. It connects Spring Ridge Road to the west and Castlereagh Highway to the east. Ten dwellings within the vicinity of the Project can be accessed from Laheys Creek Road.



Legend

- Project Area
- Site access point
- State road
- Road
- Vehicular Track

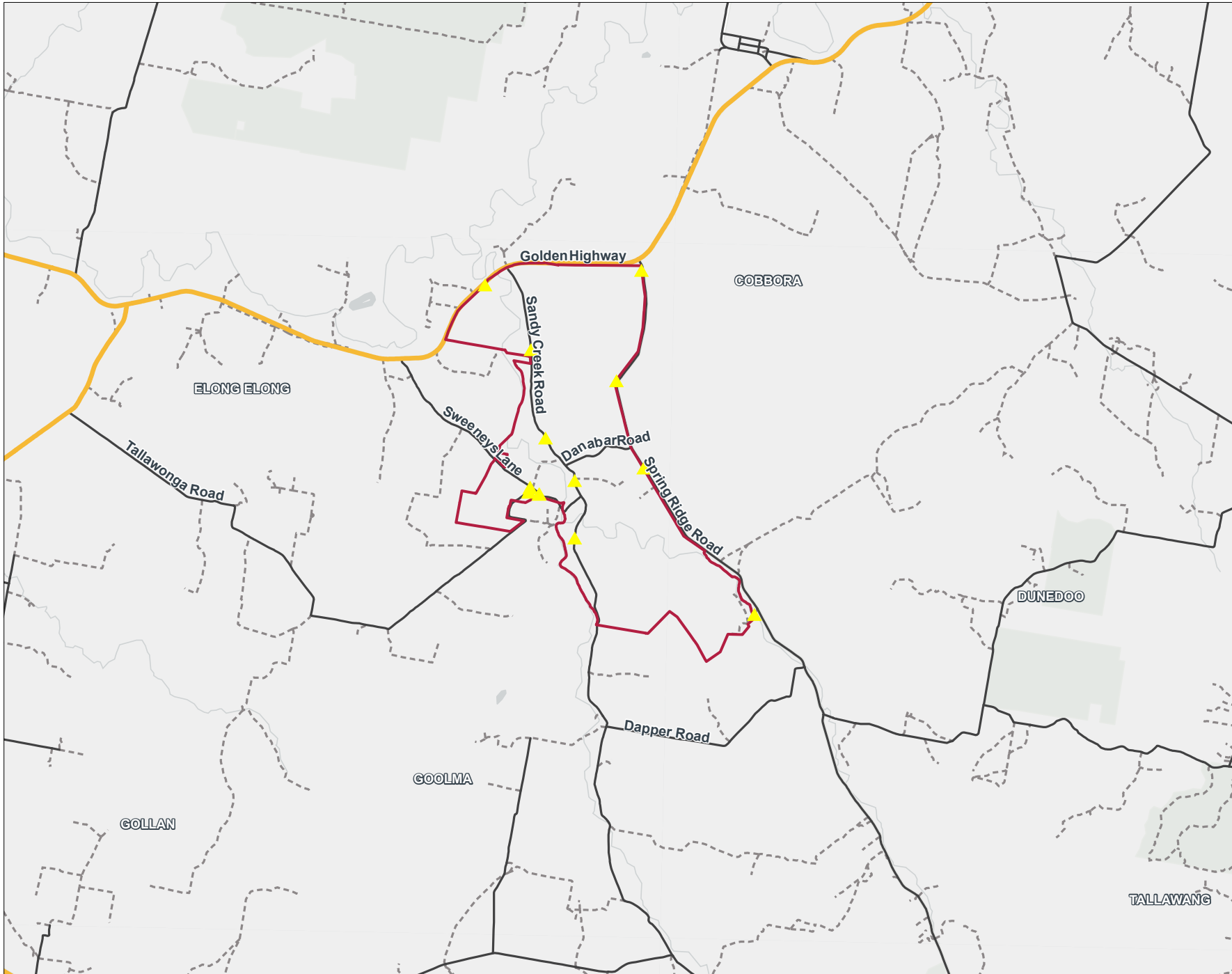


FIGURE 3-2: KEY ROADS NEAR THE PROJECT

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3.2.2 Road safety

TfNSW provides interactive crash and casualty statistics by LGA. This data was reviewed to obtain a general understanding of crash statistics within 10 km of the Project Area. These statistics provided an overview of all crashes for the five-year period between 2019 and 2023. The location of these crashes within 10 km of the Project Area is shown on Figure 3-3.

The review of the crash data indicates that only a small number of crashes (7) occurred within 10 km of the Project Area during the selected five-year period. All of these crashes occurred along the Golden Highway north of the Project Area. Of these:

- two resulted in minor injury
- four resulted in moderate injury
- one resulted in serious injury
- no casualties or fatalities were recorded.

3.2.3 Public transport and coaches

There are limited public transport services in the vicinity of the Project Area due to the low population density and associated lack of demand. Though public transport services do run from nearby key towns, such as Dubbo and Dunedoo, only a limited number of coach services run along the section of Golden Highway to the north of the Project Area.

Coach services which run along this section of the Golden Highway operate to link schools in Dubbo to the west with the township of Dunedoo to the east. The number of coach services operating during the AM and PM peak periods along the Golden Highway between Dubbo and Dunedoo are shown in Table 3-1.

Table 3-1 Regional school coach services linking Dubbo, Elong Elong, and Dunedoo

Direction	AM Weekday Peak (6:00 am – 9:00 am)	PM Weekday Peak (3:00 pm – 6:00 pm)
S137 – Dunedoo to Dubbo	1	-
S137 – Dubbo to Dunedoo	-	1

Outside of these school coaches, no other public coach services operate along the Golden Highway north of the Project Area.

There are no public bus services operating along the Golden Highway near the Project Area.

A rail line runs parallel to the Golden Highway (on the northern side); however, no public rail services run between Dubbo, Elong Elong and Dunedoo.

3.2.4 Active transport

The Central West Cycling Trail³ (CWCT) is a 400 km loop through New South Wales' Central West Region, connecting towns such as Mudgee, Gulgong, Dunedoo, Mendooran, Ballimore, Dubbo, Geurie, Wellington, and Goolma. Designed to follow quiet backroads, the trail provides cyclists with a scenic journey through rolling rural landscapes, away from main roads. The Dunedoo to Mendooran section, via Cobbora, is located approximately 7 km to the northeast of the Project Area. Spanning approximately 67 km, this section of the trail briefly overlaps the Golden Highway for about 700 m, 7 km north-east of the Project Area. The Central West Cycling Trail and Project Area are shown in Figure 3-4.

There are no formal walking facilities in the vicinity of the Project Area.

3.2.5 Parking

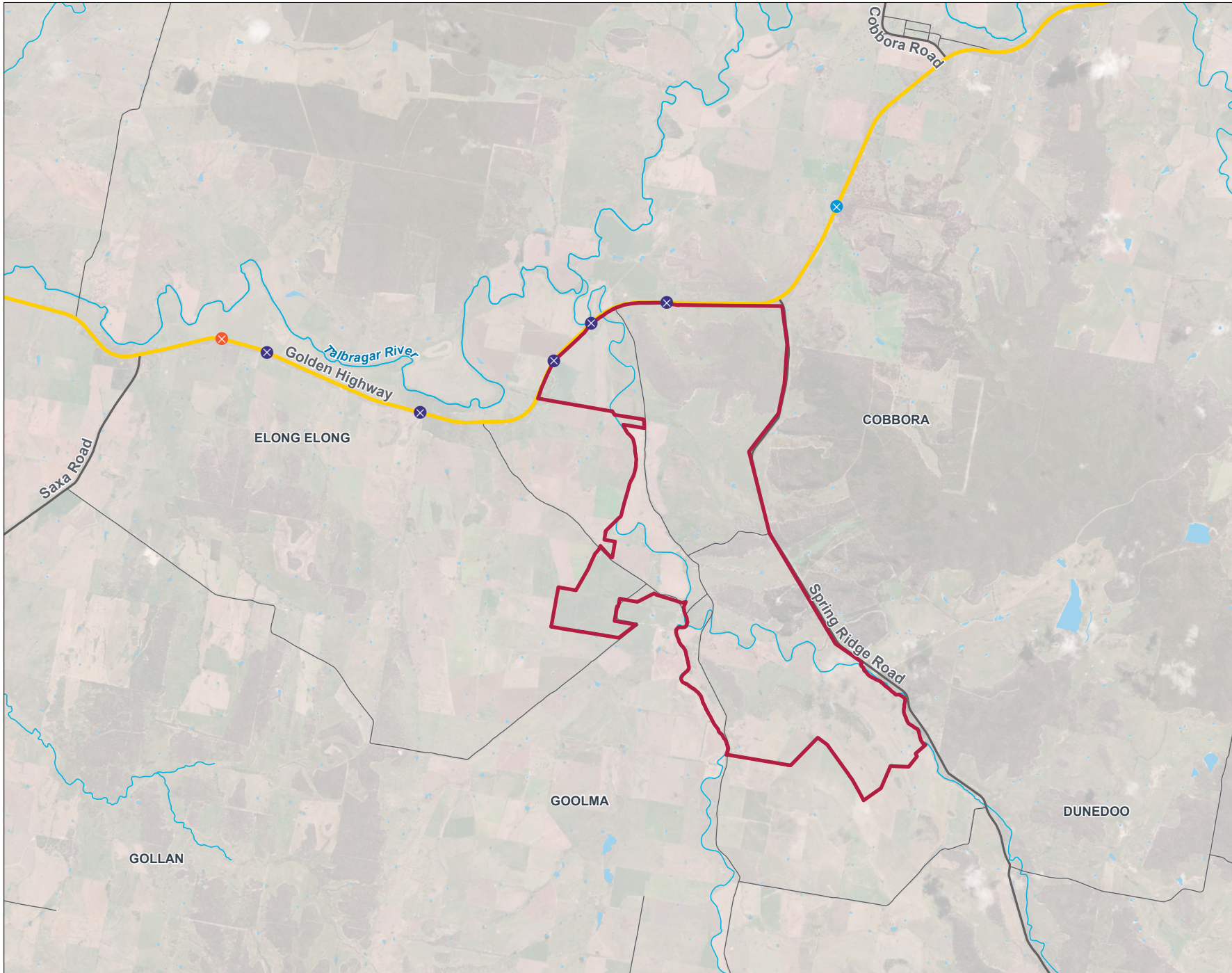
There are no formal parking facilities in the vicinity of the Project Area.

³ <https://centralwestcycletrail.com.au/>



Legend

- Project Area
- Waterbody
- Watercourses
- State road
- Main road
- Local road
- Severity of crash**
 - Minor/other injury
 - Moderate injury
 - Serious injury



**FIGURE 3-2 ROAD CRASHES WITHIN 10 KILOMETRES OF THE SITE
TFNSW CRASH STATISTICS (ACCESSED 2024, MODIFIED BY AECOM)**

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Source: Earthstar Geographics



Legend

- Project Area
- State forest
- National parks and reserves
- Waterbody
- Watercourses
- State road
- Main road
- Central West Cycling Trail

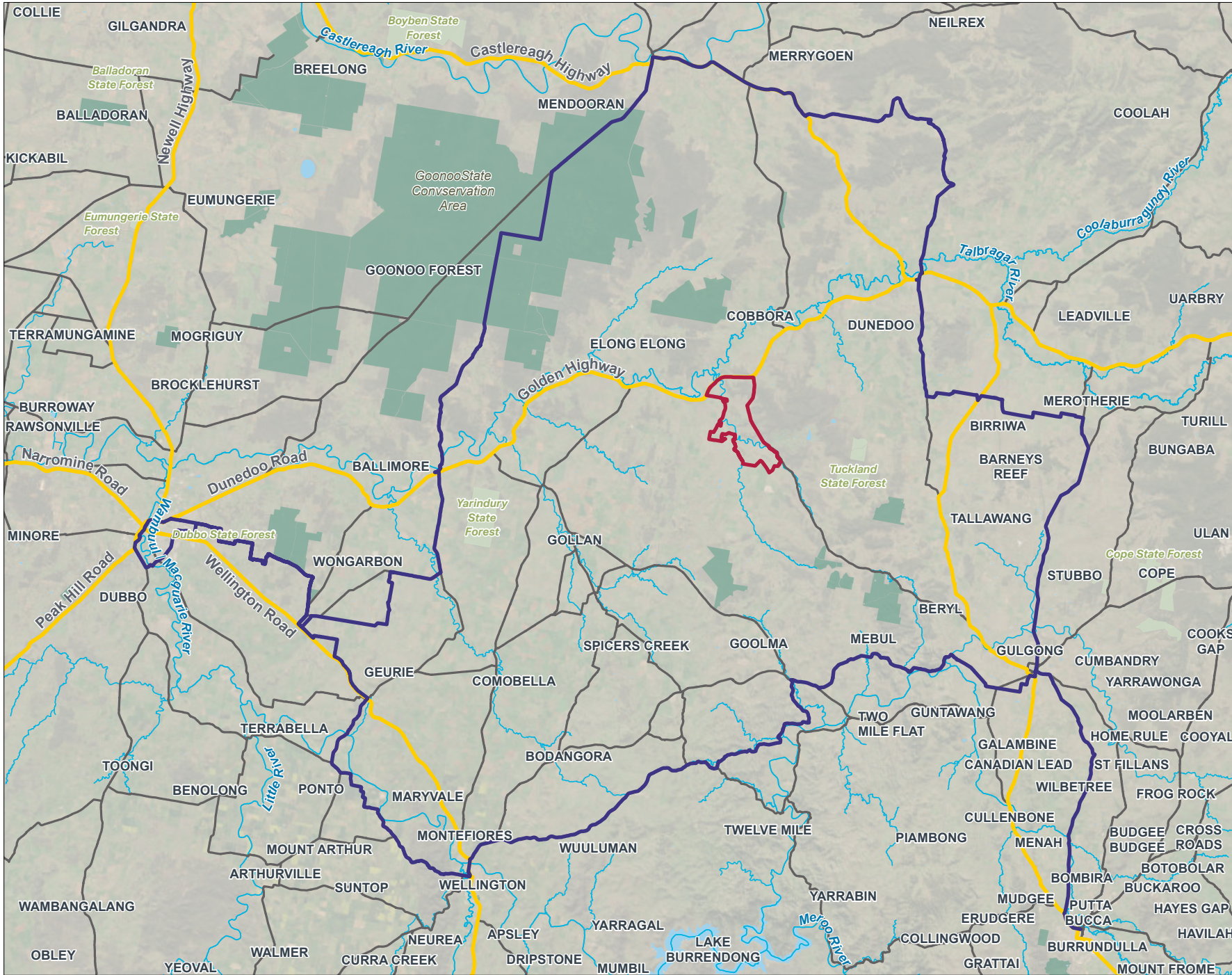


FIGURE 3-4: CENTRAL WEST CYCLING TRAIL

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4.0 Assessment methodology

4.1 Overview

The scope of this assessment is to establish the potential traffic and transport impacts of the construction, operation, and decommissioning phases of the Project. This includes the following key elements:

- Establish the existing traffic and transport access conditions, as well as the current status of active transport and public transport networks near the Project, as discussed in Section 3.0.
- Confirm the location of access points, anticipated vehicle movements and likely routes during the construction of the Project, as discussed in Section 2.0.
- Prepare a qualitative impact assessment of the potential impacts of the Project on the local traffic and transport access environment during the construction, operation, and decommissioning phases of the Project, and propose mitigation measures for managing these impacts should they be required
- Prepare a qualitative impact assessment of the potential cumulative impacts of the Project alongside other nearby developments surrounding the Project.

4.2 Assessment scenarios

As detailed in Section 2.2.4, the peak construction vehicle traffic period is likely to occur in August 2028 and, as such, 2028 has been used as the assessment year for construction impacts to assess a worst-case scenario. To assess the impacts of the proposed construction and operational traffic on the surrounding road network, the following scenarios were assessed for a typical weekday during the AM and PM peak hours:

- Future base scenario in 2028 – the future year 2028 scenario with background traffic growth only (as detailed in Section 5.1 and Section 5.2)
- Future base scenario in 2028 with construction – the future year 2028 scenario with background traffic plus Project construction traffic (as detailed in Section 5.2)
- Future base scenario in 2038 – the future year 2038 scenario with background traffic growth only (as detailed in Section 5.4.1)
- Future scenario in 2038 with operation – the future year 2038 scenario with background traffic plus Project operational traffic (as detailed in Section 5.4.1).

There is potential for cumulative transport impacts from the Project and other proposed developments surrounding the Project if construction timelines overlap. Some of the haulage routes proposed by other projects are likely to overlap with the haulage routes proposed to be used by the Project as detailed in Section 2.2.3. Before commencing any upgrades, review of the road upgrade requirements for the other proposed developments would be undertaken and an appropriate upgrade schedule agreed upon in consultation with local government. Further details regarding the cumulative impacts are included in Section 5.3.6 and Section 5.4.6.

The decommissioning phase would likely occur after 35 years of operation and background traffic growth rates associated with future development projects and land use changes in the area cannot be accurately determined at this stage. It is anticipated that the decommissioning of the Project would generate less traffic compared to the traffic likely to be generated during the construction phase. The proposed plan for the decommissioning phase is unknown at this stage; however, decommissioning activities would likely be undertaken in stages over a shorter timeframe.

4.3 Assessment of road widths

Assessment of road widths along routes likely to be used by Project-generated traffic is required to ensure the safe movement of vehicles and minimise impacts on the road network. The *Austrroads Guide to Road Design Part 3: Geometric Design* (AGRD Part 3) specifies road width design standards for rural roads based on daily traffic volumes (annual average daily traffic (AADT)). AGRD Part 3 sets out the typical single carriageway rural road widths for varying AADT, as summarised in Table 4-1.

Table 4-1 Single carriageway rural road width requirements (m)

Element	Design AADT (vehicles per day)				
	1-150	150-500	500-1,000	1,000-3,000	>3,000
Traffic lanes	3.7 (1 x 3.7)	6.2 (2 x 3.1)	6.2 – 7.0 (2 x 3.1/3.5)	7.0 (2 x 3.5)	7.0 (2 x 3.5)
Total shoulder	2.5	1.5	1.5	2.0	2.5
Minimum shoulder seal	0	0.5	0.5	1.0	1.5
Total carriageway	8.7	9.2	9.2 – 10.0	11.0	12.0

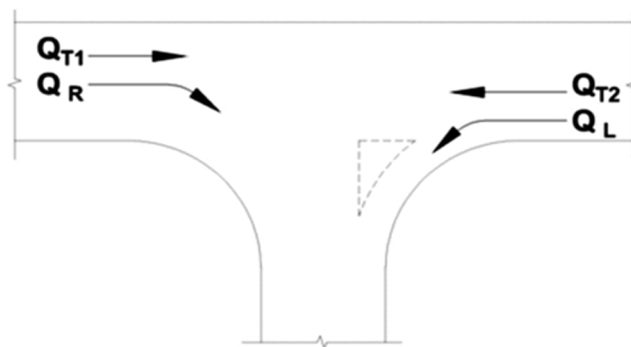
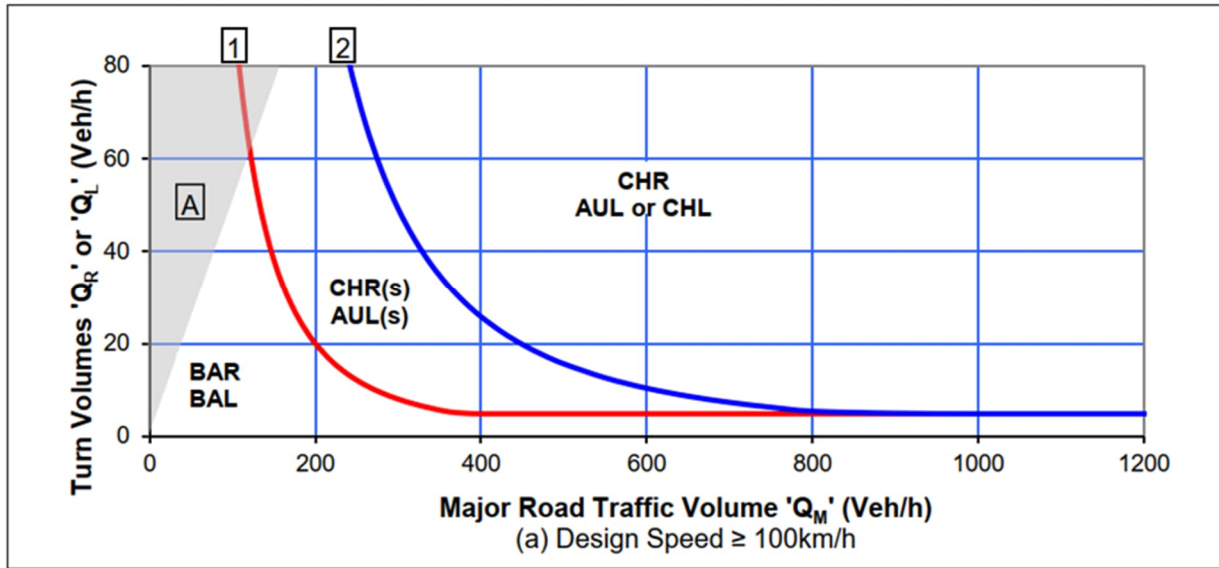
Source: Table 4.5 of *Austrroads Guide to Road Design Part 3: Geometric Design*

4.4 Intersection assessment

Assessment of turning treatments at the intersection providing access to the Project Area is required to ensure the safe movement of Project generated traffic and minimise potential impacts on the road network. The *Austrroads Guide to Road Design Part 4: Intersections and Crossings – General* comments that the layout of an intersection is determined by the type of turning treatments required for the safe and efficient operation of the intersection. The *Austrroads Guide to Transport Management Part 6: Intersections, Interchanges and Crossings Management* details the warrants that determine the type of turn treatment required at an intersection, based on a combination of peak hour through and turning traffic movements from the major road.

Figure 4-1 presents the warrants for turn treatments on major roads with design speeds greater than or equal to 100 kilometres per hour (km/h) at unsignalised intersections. Two design curves separate the required treatments as follows:

- Curve 1 (in red) represents the boundary between:
 - a basic left-turn treatment (BAL) and auxiliary left-turn treatment – short turn lane (AUL(S))
 - a basic right-turn treatment (BAR) and channelised right-turn treatment – short turn lane (CHR(S)).
- Curve 2 (in blue) represents the boundary between:
 - an AUL(S) and auxiliary left-turn treatment (AUL) or channelised left-turn treatment (CHL)
 - a CHR(S) and channelised right-turn treatment (CHR).



Road type	Turn type	Splitter island	Q _M (veh/h)
Two-lane two-way	Right	No	= Q _{T1} + Q _{T2} + Q _L
		Yes	= Q _{T1} + Q _{T2}
	Left	Yes or no	= Q _{T2}

Source: Figure 3.25 of Austroads Guide to Transport Management Part 6 2020

Figure 4-1 Warrants for type of intersection treatment

Swept path analysis has also been undertaken to assess the suitability of the turning movement of heavy construction vehicles at key intersections.

4.5 Data sources and assumptions

4.5.1 Data sources

The following data sources were used to undertake this assessment:

- A desktop assessment of the Project Area and surrounds based on available aerial photography and other geographic information system (GIS) mapping information
- Classified intersection traffic count surveys undertaken on Thursday 4 August 2022 at the Golden Highway / Spring Ridge Road intersection between 6:00 am to 9:00 am, as well as 4:00 pm to 7:00 pm.

- Mid-block traffic count surveys conducted over one week, commencing Monday 21 November 2022, at the Golden Highway and Spring Ridge Road near the Project Area. This data was sourced from the Sandy Creek Solar Farm Traffic Impact Assessment⁴
- Historical traffic count volumes obtained from the TfNSW sample classifier located on the Newell Highway (Station Id 6145) approximately 100 km north-west of the Project Area
- Construction information for the Project including construction traffic numbers and access arrangements, schedule of construction works, construction durations, work hours and workforce numbers
- Plans showing the Project Area layout
- Other documents as referenced throughout this report.

4.5.2 Assumptions

The assessment of the traffic and transport impacts were based on the following assumptions:

- The peak construction vehicle traffic period is likely to occur in August 2028 as detailed in Section 2.2.4. Therefore, 2028 has been used as the year to assess the construction scenario.
- It is expected that most of the construction activities would be carried out during standard construction hours: Monday to Friday from 7:00 am to 6:00 pm, Saturday from 8:00 am to 1:00 pm and no works on Sunday or public holidays. As such, an 11-hour work day was assumed to determine the peak hour construction volumes.
- Construction site access points and routes were based on information included in Chapter 3.0 Project description of the EIS.
- The construction heavy vehicle distribution was identified based on construction haulage routes included in Chapter 3.0 Project description of the EIS. To assess a worst-case scenario, during the peak construction vehicle traffic period, the anticipated light and heavy vehicles have been assumed to use only the Golden Highway / Spring Ridge Road intersection to access the Project Area.
- Background traffic growth in the area was determined based on a review of the available traffic information at a permanent classifier on the Newell Highway (Station Id 6145), north-west of the Project Area, and the intersection traffic count survey at the Golden Highway / Spring Ridge Road intersection, north of the Project Area. It is assumed that the average annual growth rate is likely to remain similar across the region.
- The majority of construction staff are expected to be picked up from nearby airports (Dubbo or Mudgee). They are expected to be transported to the Project Area by shuttle buses on the scheduled pick-up day, staying on-site for approximately two weeks (with accommodation provided on site) and departing on the scheduled fly-out day. Shuttle buses would have a standard capacity of 40 seats.
- Shuttle bus transportation between the Project Area and nearby airports will preferably occur on weekdays outside rush hour, however, for the purposes of this assessment, a conservative approach has been undertaken assuming that all shuttle buses will arrive at the Project Area during the morning road network peak hour on the scheduled pick-up day and depart from the Project Area during the evening road network peak hour on the fly-out day.
- All light vehicle movements will arrive during the morning road network peak hour and depart during the evening road network peak hour.
- Construction heavy vehicles (up to 26 m B-doubles) are anticipated to begin arriving at the Project Area at around 7:30 am and the last vehicle will depart before 5:30pm. It is expected that the movements of heavy vehicles will be evenly distributed during the day, and heavy vehicles will

⁴ <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-41287735%2120240325T120457.773%20GMT>

arrive and depart during the same hour. Therefore, it is assumed that only 10 per cent of the daily heavy vehicle traffic would arrive or depart during peak hours.

- All OSOM movements will occur outside of the road network peak periods.
- Five per cent of white-collar workers are expected to travel to and from the Project Area during construction hours.
- Sandy Creek runs through the Project Area, dividing it into two areas. To minimise construction works over Sandy Creek, access to the smaller area of the Project Area is provided via the Golden Highway Access Point, while all other access points serve the larger area of the Project Area. It is assumed that the distribution of construction traffic between these two areas is proportional to their respective sizes, being 15% of the construction traffic using the Golden Highway access point and 85% of the construction traffic using the Spring Ridge Road access points.
- There are four working weeks per month, 24 working days per month, and 11 working hours per day.
- For the purpose of this assessment, peak hour traffic generation associated with the Project have been estimated for the morning peak hour on a scheduled pick-up day and the evening peak hour on a scheduled fly-out day during the peak construction vehicle traffic period.
- The following traffic distribution was assumed for construction vehicle movements along the Golden Highway:
 - light vehicles: 70% from/to west and 30% from/to east
 - heavy vehicles: 50% each from/to west and east.
- Assessment of operational impacts have been undertaken based on the proposed site access strategy, number of staff likely to be employed onsite and proposed staff parking.

4.6 Assessment guidelines

The following guidelines were considered during the preparation of this report:

- *Guide to Traffic Management – Part 3: Traffic Studies and Analysis Methods* (Austroads 2020)
- *Guide to Traffic Generating Developments Version 2.2* (RTA 2002)
- *Guide to Road Design Part 3: Geometric Design* (Austroads 2021)
- *Guide to Road Design Part 4: Intersections and Crossings – General* (Austroads 2021)
- *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management* (Austroads 2020)
- *Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments* (Austroads 2020).

These guidelines provide an overview of available methods for undertaking traffic and transport studies and analysis, as well as guidance on identifying, assessing and mitigating traffic impacts.

5.0 Impact assessment

5.1 Historical AADT and growth rates

The Project is located in a regional area, characterised with low traffic volumes. There are no known major trip attractors or generators located near the Project Area.

No historical count information is available along the section of the Golden Highway north of the Project Area (between Dubbo and Dunedoo) or along Spring Ridge Road east of the Project Area.

A classified intersection turning movement survey was undertaken on Thursday 4 August 2022 to assess the turning movement counts at the Golden Highway / Spring Ridge Road intersection. This indicated that the AM peak hour occurs from 8:00 am to 9:00 am and the PM peak hour is between 4:15 pm to 5:15 pm. Traffic volumes at the intersection are low, with recorded peak hour volumes being less than 100 vehicles an hour in total.

The Sandy Creek Solar Farm is proposed to be developed just south of the Project Area. As part of the Traffic Impact Assessment⁵ for that project, mid-block count surveys were undertaken by Trans Traffic Survey over a one-week period commencing Monday 21 November 2022, at the Golden Highway and Spring Ridge Road near the Project Area. A review of these surveys, with the classified intersection turning movement survey, indicates relatively similar traffic volumes near the Project Area. As such, the mid-block count surveys for that project have been adopted for this assessment.

The classified intersection turning movement and mid-block count surveys are shown in Appendix A.

Based on the traffic surveys, the Golden Highway recorded an AADT of approximately 1,365 vehicles, while Spring Ridge Road had an AADT of approximately 50 vehicles in 2022.

The traffic volumes along other rural roads (Danabar Road, Sandy Creek Road, Sweeneys Lane, Dapper Road, Laheys Creek Road and Tallawonga Road) in the vicinity of the Project Area are considered to be similar to, or less than, Spring Ridge Road.

Growth rates

The average annual growth rate in the area was estimated based on publicly available information from the TfNSW Traffic Volume Viewer website⁶. The Golden Highway traffic counter (Station Id 92747), which is approximately 50 km east of the Project Area, is the nearest TfNSW permanent counter to the Project Area. However, the most recent volumes available for this classifier were recorded in 2009. The Newell Highway permanent classifier (Station Id 6145) is the next available TfNSW traffic counter in the region with recent recorded volumes (2015 to 2024). This counter is approximately 100 km north-west of the Project Area. Considering the availability of recent data at this counter, traffic volumes from this permanent classifier were used to estimate the background traffic growth rates in the area.

The historical traffic count data spanning 10 years (2015 to 2024) at Station Id 6145 were analysed to estimate an average annual growth rate for the area. The historical AADT between 2015 and 2024 for Station Id 6145 is presented in Table 5-1.

Table 5-1 Historical AADT trends at Station Id 6145

Direction	Annual average daily traffic (AADT) ¹									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Northbound	1,361	1,431	1,461	1,435	1,415	1,238	1,239	1,443	1,389	1,433
Southbound	1,428	1,379	1,437	1,407	1,380	1,202	1,199	1,419	1,363	1,428
Combined	2,789	2,810	2,898	2,842	2,795	2,440	2,438	2,862	2,752	2,861

Notes:

- Station Id 6145 is a permanent classifier and the AADT is shown in vehicles. (Source: TfNSW, 2024).

⁵ [Sandy Creek Solar Farm | Planning Portal - Department of Planning and Environment](#)

⁶ <https://maps.transport.nsw.gov.au/egeomaps/traffic-volumes/index.html/?z=6>

The traffic flows presented in the table above were used to determine the average annual growth rates for traffic in the region, which are summarised in Table 5-2.

Table 5-2 Station Id 6145 growth rates

Station	2015	2016	2017	2018	2019	2022	2023	2024	Average ¹
Id 6145	-	+0.8%	+3.1%	-1.9% ²	-1.7%	+0.8%	-3.8%	+4.0%	+0.17%

Notes:

1. Growth rates between 2019 and 2021 were not considered as traffic volumes would likely have not been representative of general road network conditions due to the impacts of the COVID-19 restrictions.
2. Traffic volumes observed in 2017 were significantly higher than the other years. This increase could potentially be the result of localised activities during that period.

Based on the data available from the Newell Highway permanent classifier (Station Id 6145), the analysis indicates that the average annual increase in background traffic over the 10 years is at a rate of 0.17%. This average excluded the non-typical traffic numbers from 2020 and 2021 associated with travel restrictions which were in place during the COVID-19 pandemic.

It is assumed that the average annual growth rate is likely to remain similar across the region. The estimated annual average growth rate could therefore be applied to the traffic survey data to forecast the future year background traffic volumes along the Golden Highway. However, to assess a worst-case scenario, a conservative growth rate of one per cent (1%) has been adopted for this assessment. This also aligns with the Dunedoo Solar Farm traffic impact assessment report⁷ which assumed an annual average growth rate of one per cent (1%) for forecasting traffic along the Golden Highway.

Future year traffic demand

The peak construction vehicle traffic period is expected to occur in 2028, as detailed in Section 2.2.4. In addition, 2038 has been considered for assessing the future year for operation of the Project. By applying a 1% average annual growth rate to the existing traffic volumes, the AM peak hour and PM peak hour traffic volumes for the 2028 and 2038 future year scenarios were estimated for the Golden Highway and Spring Ridge Road.

The expected AADT for the Golden Highway is approximately 1,445 vehicles and 1,600 vehicles for the future base scenario in 2028 and 2038, respectively. The expected AADT for Spring Ridge Road is approximately 55 vehicles and 60 vehicles for the future base scenario in 2028 and 2038, respectively.

5.2 Future base scenarios

5.2.1 Road network performance

Assessment of the recommended road widths along the Golden Highway has been based on the 'single carriageways' assessment criteria defined by Austroads, as outlined in Section 4.3.

As outlined in Section 5.1, the expected AADT for the Golden Highway in the future base scenario in 2028 is expected to be approximately 1,445 vehicles (this equates to approximately 115 vehicle movements in the peak hour), which falls into the category of 'between 1,000 and 3,000 vehicles daily'. Based on the Austroads design standards, the recommended width of the Golden Highway is 11 m. The typical width of the Golden Highway in the existing conditions is greater than the recommended width (approximately 11.3 m based on desktop measurements) and as such requires no widening in the future year base conditions without the Project.

The expected AADT for Spring Ridge Road during the future base scenario in 2028 is expected to be approximately 55 vehicles (this equates to approximately five vehicle movements in the peak hour), which falls into the category of 'between 1 to 150 vehicles daily'. Based on the Austroads design standards, the required width of Spring Ridge Road is 8.7 m. The current typical width of Spring Ridge Road is about 7 m, which is less than the required width. Therefore, widening of Spring Ridge Road is required to comply with Austroads standards.

⁷ <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8847%2120200930T023753.193%20GMT>

It is noted that the approximate widths were measured on Google Maps and further field investigations would be required to confirm these widths.

As discussed in Section 5.1, peak hour traffic volumes in the vicinity of the Project are low. The Golden Highway and Spring Ridge Road have sufficient capacity to accommodate the estimated future base case traffic flows.

At the Golden Highway / Spring Ridge Road intersection, the Golden Highway is a two-lane two-way intersection with auxiliary lanes for traffic turning left onto Spring Ridge Road approaching from the east, and traffic turning right approaching from the west. There are no splitter islands at this intersection. Assessment of the type of turning treatment required at the Golden Highway / Spring Ridge Road intersection has been based on the Austroads warrants chart.

Table 5-3 presents the future base scenario in 2028 AM peak hour and PM peak hour traffic movements at the Golden Highway / Spring Ridge Road intersection.

Table 5-3 Turning movement volumes from the Golden Highway to Spring Ridge Road – future base scenario in 2028

Peak Hour	Traffic Volumes (vehicles per hour)			
	Golden Highway			
	East Approach		West Approach	
	Left Turn	Through	Right Turn	Through
AM	2	44	2	50
PM	0	36	1	53

The forecast peak hour traffic movement volumes were assessed against the Austroads warrant design chart during the AM peak hour and PM peak hour. The assessment of the existing intersection layout and traffic volumes indicate that no upgrade is required for both the AM peak hour and PM peak hour during the future base scenario in 2028, as shown on Figure 5-1.

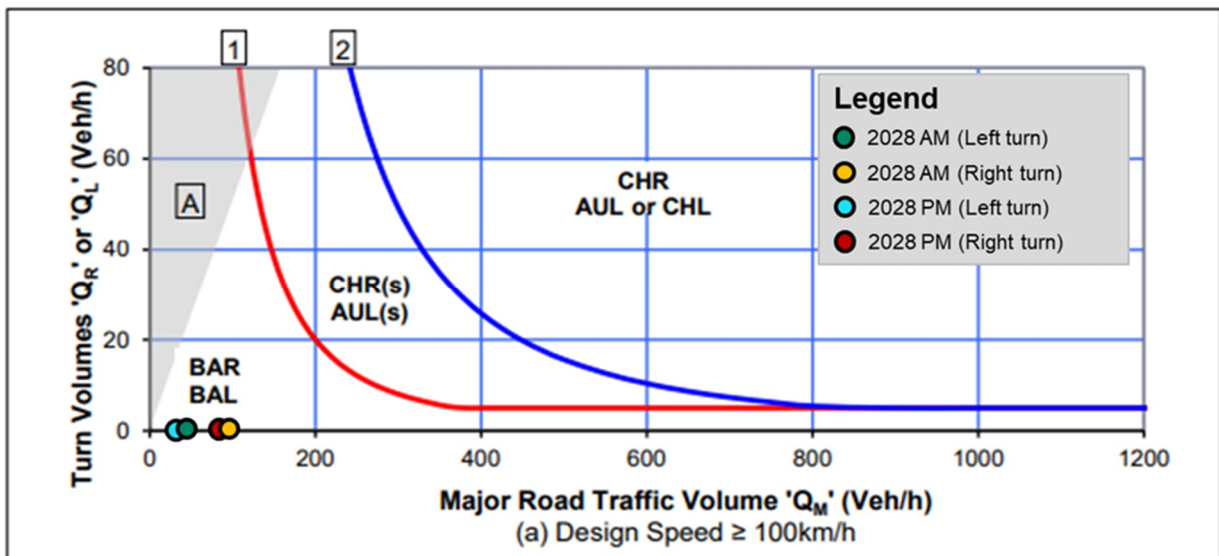


Figure 5-1 Warrant for turn treatments on the major road at unsignalised intersections – future base scenario in 2028

The increase in the background traffic between the future base scenarios in 2028 and 2038 is only minor (approximately 150 vehicles and five vehicles AADT for the Golden Highway and Spring Ridge Road, respectively). As such, the future base scenario in 2038 is expected to have similar results to the future base scenario in 2028, remaining within the same daily traffic volumes categories. Warrant assessments would also be comparable and, as such, no upgrades are deemed to be required in the future base scenario in 2038.

5.3 Construction phase

5.3.1 Road network capacity

5.3.1.1 Construction traffic volumes during network peak hours

As described in Section 2.2.3, it is expected that up to 51 vehicles (7 light vehicles and 44 heavy vehicles) per day would be required to access the Project Area, and if required, up to 1 OSOM vehicle per day. This equates to 14 light vehicle movements, 88 heavy vehicle movements and 2 OSOM vehicle movements per day.

Additionally, it is anticipated that up to 17 shuttle buses would be required to transport construction staff between the Project Area and nearby airports, resulting in a total of 34 shuttle bus movements per fortnight (two weeks).

For the purpose of this assessment, peak hour traffic generation associated with the Project have been estimated for the morning peak hour on a scheduled pick-up day and the evening peak hour on a scheduled fly-out day during the peak construction vehicle traffic period. This is to assess the worst case, where:

- On the scheduled pick-up day, shuttle bus movements are expected to transport construction staff from the nearby airports to the Project Area.
- On the scheduled fly-out day, shuttle bus movements are expected to transport construction staff from the Project Area to the nearby airports.

The worst-case scenario is expected to only occur once a week.

As noted in Section 4.5.2, key assumptions associated with construction have been conservatively adopted as the following:

- All light vehicle movements will arrive during the morning road network peak hour and departure during the evening road network peak hour.
- 10 per cent of the daily heavy vehicle traffic would arrive or depart during peak hours.
- All shuttle buses will arrive at the Project Area during the morning road network peak hour on the scheduled pick-up day and depart from the Project Area during the evening road network peak hour on the fly-out day.
- All OSOM movements will occur outside of the road network peak periods.

The resultant inbound and outbound construction traffic generated during the morning peak hour on a scheduled pick-up day and during the evening peak hour on a scheduled fly-out day are presented in Table 5-4.

Table 5-4 AM peak hour and PM peak hour inbound and outbound construction traffic volumes (trips per hour)

Vehicle type	AM Peak Hour (on a scheduled pick-up day)		PM Peak Hour (on a scheduled fly-out day)	
	Inbound	Outbound	Inbound	Outbound
Light Vehicles	7	0	0	7
Shuttle Bus	17	0	0	17
Heavy Vehicles	4	4	4	4
OSOM	0	0	0	0
Combined	28	4	4	28

As detailed in Section 4.5.2, in order to assess a worst-case scenario, it is assumed that all construction traffic movements would pass through the Golden Highway / Spring Ridge Road intersection.

The anticipated peak hour traffic volumes near the Project for the future base scenario in 2028 are low as detailed in Section 5.1. Golden Highway is expected to carry at the most approximately 140 vehicles combined in both directions during the peak hour, and Spring Ridge Road is expected to carry approximately 30 vehicles combined in both directions.

Based on the forecast construction traffic volumes (inbound and outbound) during network peak hours, the Golden Highway and Spring Ridge Road would be subject to approximately 30 and 25 additional vehicles respectively. Given the low traffic volumes on the Golden Highway and Spring Ridge Road, it is expected that they will have sufficient capacity to facilitate the additional traffic volume associated with the Project.

5.3.1.2 Road width

Golden Highway

Assessment of the recommended road width along the Golden Highway was undertaken based on the 'single carriageways' assessment criteria defined by Austroads as outlined in Section 4.3. The expected AADT as calculated in Section 5.1 for the Golden Highway in the future scenario in 2028 with construction is expected to be approximately 1,475 vehicles (i.e. will fall within the category of 'between 1,000 and 3,000 vehicles daily'). This scenario remains within the same daily traffic volume category as the future base scenario in 2028, therefore the assessment remains consistent with Section 5.2.1 and widening would not be required.

Spring Ridge Road

As calculated in Section 5.1 the expected AADT for Spring Ridge Road in the future scenario in 2028 with construction is expected to be approximately 80 vehicles (i.e. will fall within the category of 'between 1 to 150 vehicles daily'). This scenario remains within the same daily traffic volume category as the future base scenario in 2028. As discussed in Section 5.2.1, the existing road does not meet the width requirements under the future base scenario in 2028, irrespective of the addition of construction traffic associated with the Project.

It is noted that sections of Spring Ridge Road are proposed to be upgraded as part of the CWO REZ project for the Elong Elong Energy Hub including: road widening near Dapper Road, installing a new bridge at the crossing of Laheys Creek, Dapper Road and Spring Ridge Road intersection upgrade (intersection tie-in) as part of the Elong Elong Energy Hub project, as detailed in Section 5.3.6.

The increase in construction traffic is of a temporary nature and would have a temporary and short-term impact. These impacts would be managed by road condition inspections and maintenance procedures in accordance with the Construction Traffic Management Plan. Conditions along Spring Ridge Road would be restored to its condition as at the commencement of construction.

Detailed assessments will be undertaken prior to commencement of construction and the Proponent will consult with Warrumbungle Shire Council and key stakeholders to determine the road maintenance contributions.

Castlereagh Highway

A small proportion of construction light vehicles are likely to travel to and from Mudgee/Gulgong using the Castlereagh Highway. The Castlereagh Highway is expected to have sufficient capacity to accommodate this minor increase in traffic during the peak construction vehicle traffic period. No impacts are expected as a result of this minor increase in traffic.

5.3.1.3 Intersection performance

Assessment of the type of turning treatment required at the Golden Highway / Spring Ridge Road intersection and the Golden Highway Access Point has been based on the warrant design chart defined by Austroads, as outlined in Section 4.4.

The forecast turning movements from the Golden Highway onto Spring Ridge Road during the future scenario in 2028 with construction are presented in Table 5-5. The forecast peak hour traffic movement volumes were assessed against the Austroads warrant design chart for the Golden Highway / Spring Ridge Road intersection as illustrated on Figure 5-2.

Based on the Austroads warrant design chart, for the future scenario in 2028 with construction, a basic left-turn and right-turn treatment would be required from the Golden Highway into Spring Ridge Road. The Golden Highway west approach already has an exclusive right turn short lane at the intersection which can facilitate these right-turns and, as such, no upgrades are considered to be required.

Table 5-5 Turning movement volumes from the Golden Highway to Spring Ridge Road – future scenario in 2028 with construction

Scenario	Golden Highway / Spring Ridge Road intersection			
	Traffic Volumes (vehicles)			
	East Approach		West Approach	
	Left Turn	Through	Right Turn	Through
Future scenario in 2028 with construction (AM peak)	11	49	20	50
Future scenario in 2028 with construction (PM peak)	0	36	1	58

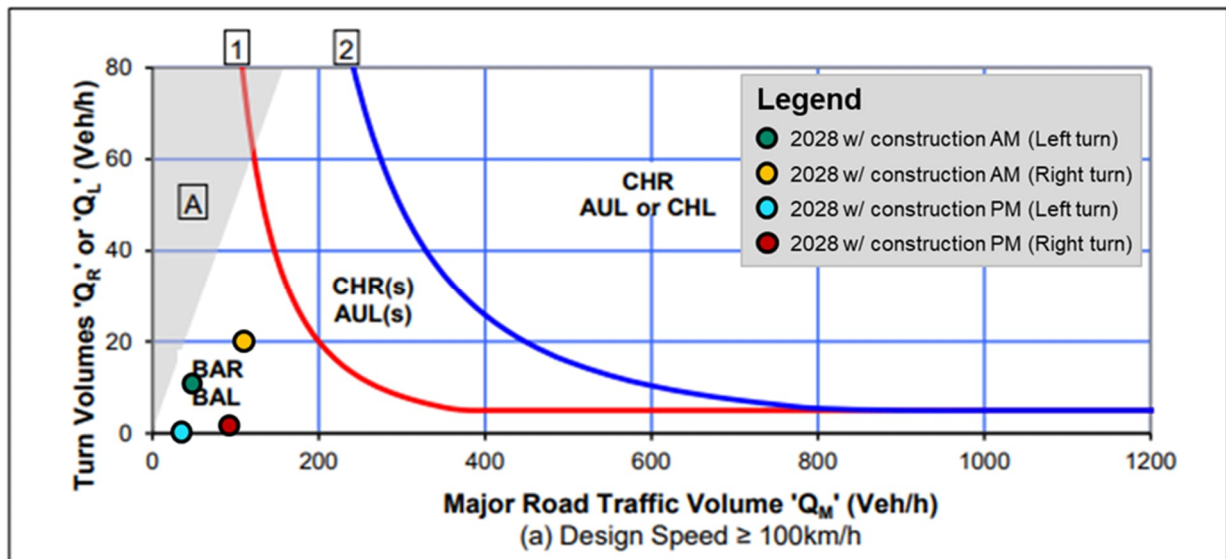


Figure 5-2 Warrant for turn treatments on the major road at unsignalised intersections – future scenario in 2028 (Golden Highway / Spring Ridge Road intersection)

The forecast turning movements from the Golden Highway Access Point during the future scenario in 2028 with construction are presented in Table 5-6. The forecast peak hour traffic movement volumes were assessed against the Austroads warrant design chart for the Golden Highway Access Point as illustrated on Figure 5-3.

Based on the Austroads warrant design chart, for the future scenario in 2028 with construction, a basic left-turn treatment would be required. Right-in access is not proposed at the Golden Highway Access Point.

Table 5-6 Turning movement volumes from the Golden Highway Access Point – future scenario in 2028 with construction

Scenario	Golden Highway Access Point			
	Traffic Volumes (vehicles)			
	East Approach		West Approach	
	Left Turn	Through	Right Turn	Through
Future scenario in 2028 with construction (AM peak)	5	44	0	69
Future scenario in 2028 with construction (PM peak)	0	53	0	54

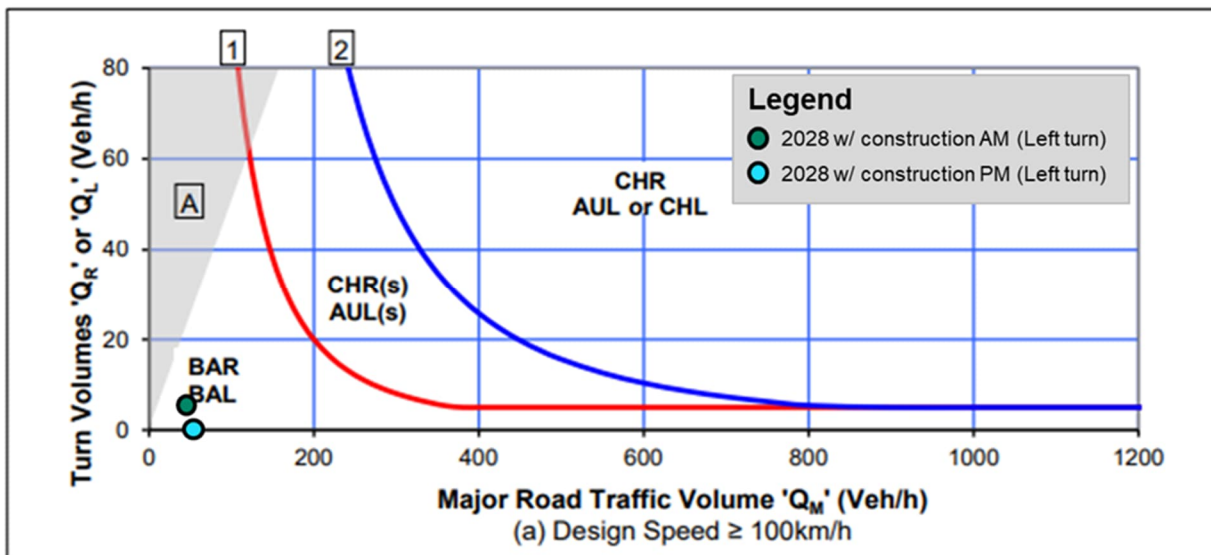


Figure 5-3 Warrant for turn treatments on the major road at unsignalised intersections – future scenario in 2028 (Golden Highway Access Point)

A small proportion of construction light vehicles are likely to travel to and from Mudgee / Gulgong and may access Spring Ridge Road via Laheys Creek Road at the Castlereagh Highway / Laheys Creek Road intersection. However, no right-turn movements are expected to be made from the Castlereagh Highway (major road) to Laheys Creek Road (minor road) at this intersection. As outlined in Section 4.4, right-turn movements warrant more critical turning treatments at intersections and, as such, intersection upgrades are not expected to be required at this intersection.

5.3.1.4 Pavement condition

Based on a desktop review, the pavement condition is considered to be acceptable along the State roads on the haulage routes. Site photographs showcasing the pavement condition of some of the key roads are included in Appendix B. Spring Ridge Road, a Council road, is a sealed rural road. The condition of the road pavement may not be suitable for construction traffic; however, it is expected to be suitable after upgrades associated with the Elong Elong Energy Hub project are completed.

Pavement condition and dilapidation surveys will be required to assess if conditions are suitable along Spring Ridge Road to facilitate the Project’s construction traffic movements. The Proponent will consult with the Council and key stakeholders, including other projects within the vicinity of the Project Area, to determine the road maintenance contributions required to complete the upgrades.

5.3.1.5 Swept path analysis

Swept path analysis was undertaken at the Golden Highway / Spring Ridge Road intersection and the access points outlined in Section 2.2.3, as presented in Appendix C. The largest construction heavy vehicle assessed (excluding OSOM vehicles) was a 26 m B-double.

Based on the swept path analysis, the Golden Highway / Spring Ridge Road intersection would require widening at the intersection corners. As illustrated in Appendix C, the indicative widening extents required at this intersection are shown to accommodate the safe turning movement of 26 m B-double heavy vehicles. In addition, changes to line marking will be required to facilitate the safe movement of construction heavy vehicles. It is noted; however, the Golden Highway / Spring Ridge Road intersection is proposed to be upgraded as part of the Port to REZ project, led by TfNSW and the Energy Corporation of NSW (EnergyCo), as shown in Figure 5-4.

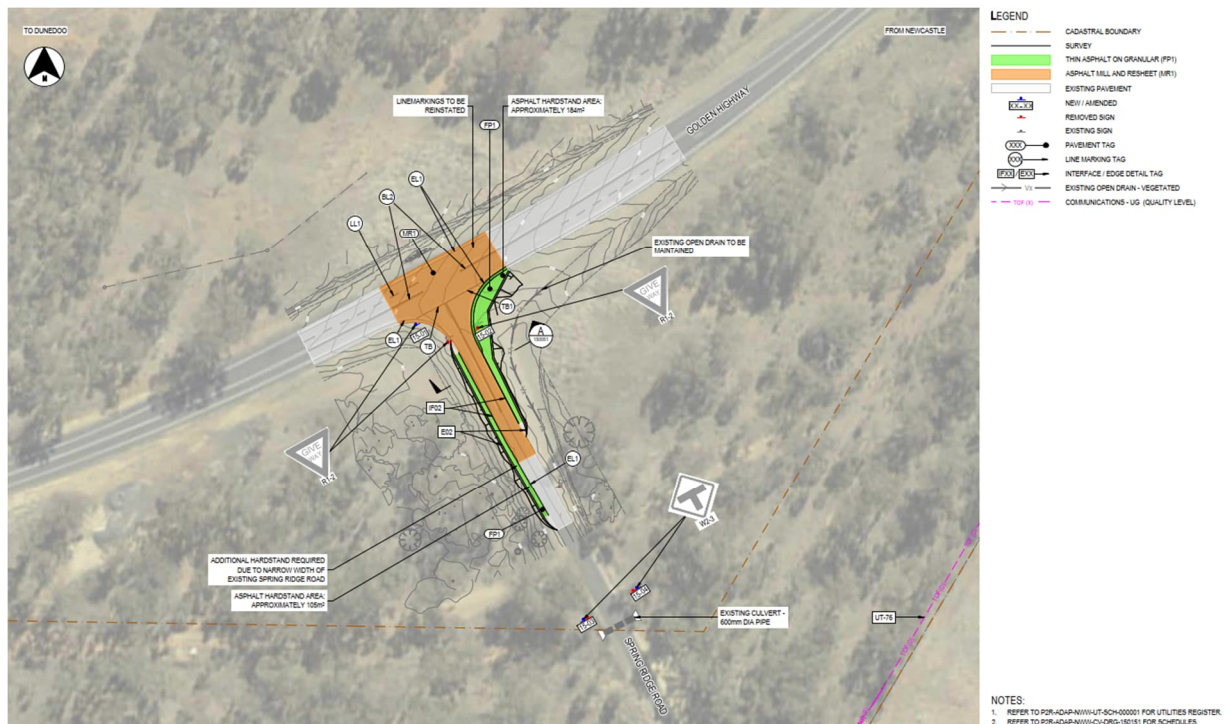


Figure 5-4 Detailed Design of the Golden Highway / Spring Ridge Road Intersection Modification

(Source: Port To Rez Road Upgrade Program: I-015 Golden Highway / Spring Ridge Road Intersection Modification – Detailed Design, EnergyCo, 2024)

Coordination with the relevant parties will be necessary to ensure these upgrades are completed to meet the requirements of the Project.

Furthermore, as demonstrated by the swept path analysis presented in Appendix C, local widening of Spring Ridge Road and Golden Highway near the proposed Project Area access points would also be required to accommodate entry and exit turning movements into and out of the Project Area respectively.

A strategic design of the Golden Highway access point is provided in Appendix D. The following assumptions have been taken into account when preparing the strategic design:

- The strategic design has been prepared on the basis that no trucks would simultaneously enter and exit this access point.
- The 19m AVs are needed for the delivery of the invertors only. The 19m AVs will only be needed for 1-3 months depending on the timing of the concrete pad construction for the invertors. Each invertor will require the use of a full 19 m AV.
- The delivery of the invertors can be outside the morning and afternoon peak hour for Golden Highway

Key findings from the strategic design are as follows:

- Shoulder widening is required on the southbound approach to accommodate left turn movements.
- Shoulder widening opposite the access point is required to accommodate the right turn movements out of the access.
- A tree to the south of the access will likely need to be removed to accommodate sight lines.
- The sign to the north of the access may need to be relocated to accommodate the sight lines, shoulder widening and barrier realignment, in consultation with the Dubbo Regional Council.

It should be noted that swept path analyses and the strategic design of Golden Highway access point were undertaken prepared based on indicative dimensions of the road layout determined through a desktop assessment using Google Maps. Any specific requirements would be subject to detailed design investigations of the Project Area undertaken in subsequent design stages. The Proponent will consult with the Councils and key stakeholders to determine road maintenance contributions required to complete any upgrades in line with proposed mitigation measures included in Section 6.2. An indicative schedule of road upgrades is included in Appendix E.

5.3.1.6 Oversize and over mass vehicle access

The proposed haulage route for OSOM vehicles is detailed in Section 2.2.3. A portion of the proposed route was previously assessed in the *Great Western Battery Project Route Study*⁸, which assessed the route between Newcastle and Wallerawang in 2021. Several sections of that route are common to this Project⁹, specifically those between the Port of Newcastle and the Golden Highway / Castlereagh Highway intersection, east of Dunedoo. Table 5-7 reproduces the common sections of the OSOM assessment within the *Great Western Battery Project Route Study*, indicating locations that require further assessment.

Table 5-7 Locations with potential impacts to OSOM vehicles along the haulage route

Location	Section of road	Notes
Mayfield	Selwyn Street GPS link: https://goo.gl/maps/AmohE54hKSz	Approval required to cross the rail crossing. Cross with caution
Mayfield	Industrial Drive GPS link: https://goo.gl/maps/ptcS8LY9bGGUw5nK8	Potential for collision with low traffic signals. Lowest traffic signal on route is at the Steel River Boulevard intersection. Trucks that exceed 5.3 m will need to travel in the right-hand lane to avoid collision with traffic signals. Clearance in the right end lane is 6.0 m.
Sandgate	Maitland Road GPS link: https://goo.gl/maps/W2JWWjhfvq5UMviB7	Approval from Rail company required to cross rail bridge. Travel over this structure may have specific conditions. Travel in the right-hand lane.
Hexham	New England Highway GPS link: https://goo.gl/maps/YTMoFe7Aick	Potential for collision with gantry. There is no bypass around the gantry. A maximum loaded height of 5.9 m should not be exceeded. This is the lowest structure on route.
Tarro	New England Highway GPS link: https://goo.gl/maps/tTnWLwQC2hzSPhAp6	Approval from Rail company required to cross rail bridge. Travel over this structure may have specific conditions. Travel in the right-hand lane.

⁸ <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-12346552%2120220225T015703.824%20GMT>

⁹ Google GPS link to overlapping route: <https://goo.gl/maps/fdFQcqbZf4DnWpwT8>

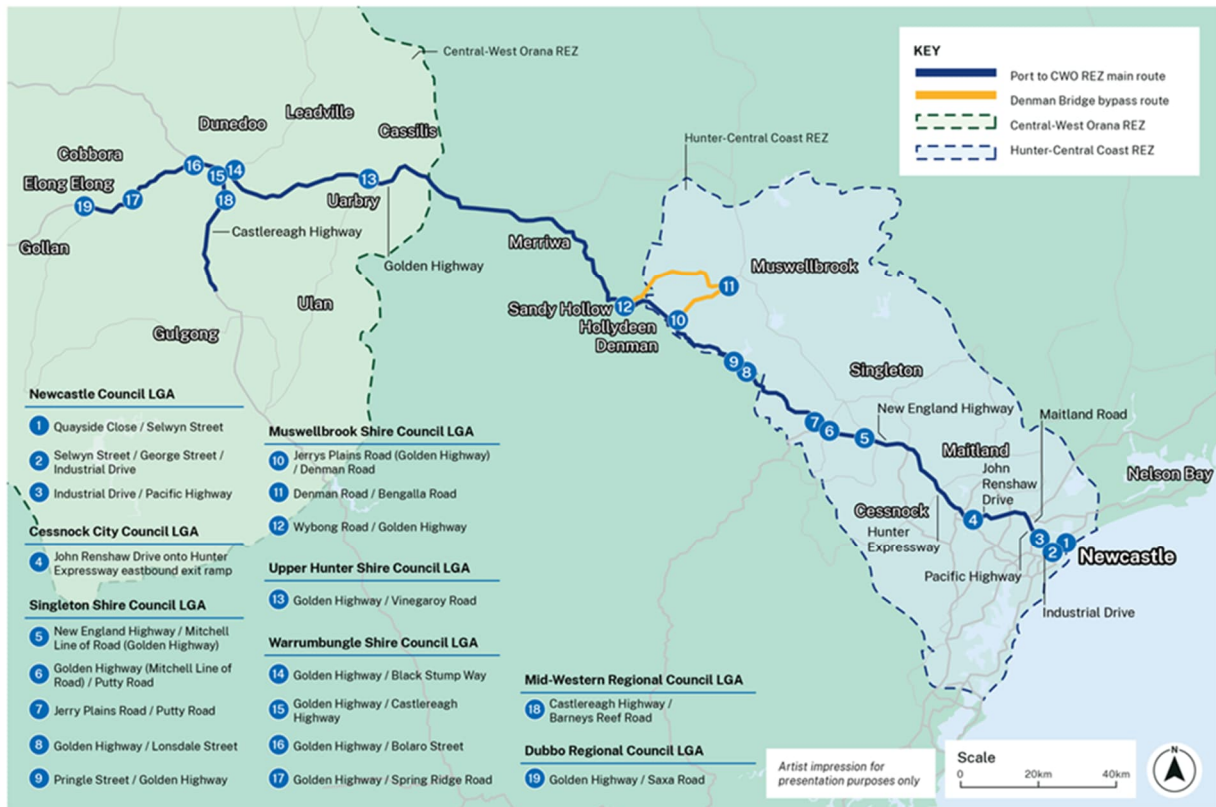
Location	Section of road	Notes
Whittingham	New England Highway, Golden Highway intersection GPS link: https://goo.gl/maps/nAnfkYfeUn42	The NSW Government ¹⁰ is currently upgrading this intersection. It is recommended to monitor the progress of the upgrades, and that any changes are thoroughly looked at.
Whittingham	Golden Highway GPS link: https://goo.gl/maps/5NwDQofandvMKfY9	Approval from Rail company required to cross rail bridge. Travel over this structure may have specific conditions.
Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/qTxSbKxPu87L5hx4A	Approval from Rail company required to cross rail bridge. Travel over this structure may have specific conditions.
Mount Thorley	Golden Highway GPS link: https://goo.gl/maps/ipGU4USXmWZ8GkJs6	Approval from Rail company required to cross rail bridge. Travel over this structure may have specific conditions.
Mount Thorley	Putty Road GPS link: https://goo.gl/maps/SMzSLP1kvQYDMqa86	Mt Thorley Road underpass is 6.3 m in the centre of the road. Advised to travel under the bridge in the left lane.
Ogilvy	Golden Highway GPS link: https://goo.gl/maps/58Tj9ojs7CC2	This section of road has a steep mountain range that will require additional pull trucks to assist loads that exceed 80 tonnes gross weight.

Source: Great Western Battery Project Route Study (accessed December 2024, modified by AECOM)

Despite the above detail, the Port to REZ project has planned upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Saxa Road intersection. The proposed route and upgrade locations are illustrated on Figure 5-5.

EnergyCo and TfNSW are working to upgrade road intersections and pinch-points along the network to enable the movement of OSOM loads for renewable energy equipment. With these upgrades in place, the potential impacts outlined in Table 5-7 are expected to be sufficiently addressed to accommodate OSOM vehicle movements.

¹⁰ <https://roads-waterways.transport.nsw.gov.au/projects/new-england-highway/belford-golden-highway.html>



Source: Transport for NSW (accessed December 2024)

Figure 5-5 Port of Newcastle to Central-West Orana Renewable Energy Zone route and locations

The OSOM design vehicle envelope used for the Port to REZ studies was provided by TfNSW in March 2025. The OSOM vehicles utilised to transport equipment for the Project will fit within the indicated dimensions. Therefore, it is expected that the Project will not require any additional upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Spring Ridge Road intersection and the Golden Highway access point.

Swept path analysis of OSOM vehicle movements at the Golden Highway / Spring Ridge Road intersection and the Spring Ridge Road access points will be undertaken in subsequent design stages. The following considerations are likely to be required for OSOM movements:

- OSOM vehicle movements will need to occur with the assistance of escort vehicles and/or police following standard protocols
- OSOM vehicle body may overhang above road kerbs at some locations
- Relocation of traffic signages and tree trimming may be required at some locations
- Further investigations will be required in the subsequent stages to determine vertical clearance at the traffic signal poles, and power transmission line at some locations.

OSOM vehicles used during construction would obtain an OSOM Permit from the National Heavy Vehicle Regulator through a licensed haulage contractor with experience in operating over-dimensional vehicles and transporting similar loads. The haulage contractor shall be responsible for obtaining all required approvals and permits from the relevant road authorities and Councils and for complying with conditions specified in the approvals. Detailed assessments along the haulage route would be undertaken as part of the approval process.

5.3.2 Access and parking

Potential impacts to local access of properties along Spring Ridge Road are expected to be minimal due to the low number of properties (5) along Spring Ridge Road. It is expected that up to 5 general traffic vehicles will feed into Spring Ridge Road from the Golden Highway during the peak hour.

Partial or temporary road closures and traffic diversions may be required to facilitate improvements at the Golden Highway and Spring Ridge Road intersection and local widening of Spring Ridge Road at the Project Area access points to accommodate construction traffic volumes and movement of OSOM vehicles. However, these are likely to be short-term measures and are not expected to result in any significant impacts to local access along Spring Ridge Road.

No formal parking exists on public roads within the vicinity of the Project Area and, as such, no parking impacts are expected.

5.3.3 Road safety

There is an increased safety risk associated with construction traffic interacting with general traffic, especially where construction vehicles are entering Spring Ridge Road from the Golden Highway. However, considering the low crash rate in the vicinity of the Project Area and availability of appropriate turning treatment at the Golden Highway / Spring Ridge Road intersection, the impacts on road safety as a result of additional Project traffic is likely to be minimal.

Given the low population and low traffic movements in the vicinity of the Project, the potential road safety impacts on the Golden Highway and Spring Ridge Road are considered to be minimal. However, the proposed access point at the Golden Highway may pose safety risks due to interactions between slow-moving construction vehicles and fast-moving traffic. While no upgrades are deemed necessary based on the Austroads warrant assessment detailed in Section 5.3.1.3, implementation of acceleration and deceleration lanes could be considered to enhance safety.

Although impacts on road safety for all users during construction are likely to be minimal, potential impacts would be mitigated through the implementation of a Construction Traffic Management Plan and other measures, as discussed in Section 6.0.

5.3.4 Public transport and coaches

No significant impacts are expected on the school coach line that operates along the Golden Highway between Dubbo and Dunedoo. This operates as one scheduled service in the AM peak hour and PM peak hour during the weekday.

No other public bus services operate in the vicinity of the Project Area.

No public rail services run in the vicinity of the Project Area.

5.3.5 Active transport

The Dunedoo to Mendooran section of the CWCT, via Cobbora, is located 7 km from the Project Area, as outlined in Section 3.2.4. The CWCT route will be highlighted within the site induction and driver's code of conduct to increase awareness of cyclists' presence in the area. Drivers will be instructed to respect the safety of cyclists using local and regional roads, including complying with legal passing separation distances.

5.3.6 Cumulative traffic impacts

There is potential for cumulative transport impacts from the Project and other proposed developments surrounding the Project. The projects that have the potential to result in a cumulative impact alongside the Project have been considered and screened in Section 6.15 Cumulative impacts of the EIS. The projects considered to be relevant for this assessment are:

- Spicers Creek Wind Farm
- Dunedoo Solar Farm
- Birriwa Solar Farm
- Tallawang Solar Farm

- Elong Elong Energy Hub (CWO REZ Transmission)
- Sandy Creek Solar Farm

Of these developments, only the Spicers Creek Wind Farm, Dunedoo Solar Farm, Birriwa Solar Farm and Elong Elong Energy Hub projects have been approved. The Tallawang Solar Farm and Sandy Creek Solar Farm projects are still pending approval.

Spicers Creek Wind Farm

The 700 MW Spicers Creek Wind Farm was granted approval in October 2024. This project includes the construction of up to 117 wind turbine generators, along with battery storage. It is proposed to be located less than 10 km west of the Project Area.

According to the project's EIS¹¹, construction traffic would primarily use the Golden Highway and either Sweeneys Lane or Saxa Road to access the Project Area. Peak construction activity is estimated to generate up to 590 light vehicle trips and up to 106 heavy vehicle trips per day, inclusive of 10 OSOM vehicle trips, under a conservative scenario. Under an average scenario, daily traffic would include 320 light vehicle trips and up to 66 non-OSOM heavy vehicle trips. The OSOM haulage route is expected to originate from the Port of Newcastle and align with the proposed haulage route for the Project.

Construction of Spicers Creek Wind Farm is proposed to commence within one to five years of being awarded and is expected to take approximately 40 months to complete. While construction may overlap with the Project's construction phase, cumulative construction traffic impacts are not anticipated. The Golden Highway is expected to accommodate the additional traffic due to low existing traffic volumes. As Spring Ridge Road is not proposed for use by the Spicers Creek Wind Farm project, no cumulative impacts are expected.

Dunedoo Solar Farm

The 55 MW AC Dunedoo Solar Farm project was granted approval in September 2021. This project is located approximately 23 km north-east of the Project Area.

According to the project's EIS¹², light construction vehicles would access the Dunedoo Solar Farm site from the Golden Highway / Digilah Street intersection. Heavy vehicles would access the Project Area from the Castlereagh Highway / All Weather Road intersection. This intersection provides a link to the townships of Dubbo, Dunedoo and Mudgee, and ultimately the wider NSW road network. The project would require approximately 24 light vehicle and 80 heavy vehicle movements per day (two-way).

The majority of the components of the solar farm would be sourced from Sydney or arrive at one of NSW's ports. If the haulage route originates from the Port of Newcastle, it may overlap with the proposed Project haulage route; otherwise, it is expected that majority of the movements would be made along Castlereagh Highway from Sydney. It is also noted that rail transportation may be used to Dubbo, if viable. Locally sourced materials would be transported to the Dunedoo Solar Farm from the towns of Dunedoo, Dubbo, Mudgee and Tamworth. Haulage routes to and from Dubbo would include the Golden Highway, north of the Cobbora Solar Farm Site, overlapping with the Projects proposed haulage route.

Based on the project's EIS, construction of the Dunedoo Solar Farm was expected to have commenced in late 2022 and take 10 to 12 months to complete, finishing by the end of 2024. As the construction activities for the Dunedoo Solar Farm were expected to be completed before 2025, this project has not been considered for the cumulative assessments during construction. It is to be noted that the Dunedoo Solar Farm has not yet begun construction, however, if construction of the Dunedoo Solar Farm were to coincide with the Project, it is expected that traffic volumes similar to the Project would be generated, according to traffic assessment included in the project's EIS. The Golden Highway and other State roads would have the capacity to accommodate the cumulative increase in traffic volumes considering background traffic volumes are low. Therefore, no cumulative impacts are expected.

Birriwa Solar Farm

¹¹ <https://www.planningportal.nsw.gov.au/major-projects/projects/spicers-creek-wind-farm>

¹² <https://www.planningportal.nsw.gov.au/major-projects/projects/dunedoo-solar-farm>

The 600 MW Birriwa Solar Farm was granted approval in August 2024. This project is located approximately 28 km east of the Project Area and involves the development of a 600 MW solar PV farm and a 600 MW / 2-hour BESS.

According to the project's EIS¹³, construction traffic would travel along the Golden Highway before turning onto the Castlereagh Highway to access the Project Area via Barneys Reef Road or Birriwa Bus Route South. Construction activity is expected to generate approximately 988 vehicle trips per day, comprising 720 light vehicles, 26 shuttle buses, and 240 heavy vehicles, with up to one OSOM round trip per day.

Construction was anticipated to commence early 2024; however, this cannot be confirmed with publicly available information at this stage. Construction is expected to take up to 28 months from the start of site establishment works to completion. If peak construction of the Birriwa Solar Farm were to overlap with the Project, cumulative traffic impacts are not anticipated. The Golden Highway has sufficient capacity to accommodate the increased traffic, given the existing low traffic volumes, and no other roads overlap with those proposed for the Project.

Tallawang Solar Farm

The 500 MW AC Tallawang Solar Farm project, including a 500 MW / 1000 MWh BESS, a 300 kilovolt (kV) overhead transmission line approximately 13 km in length, and associated infrastructure, is located approximately 27 km south-east of the Project Area.

According to the project's EIS¹⁴, construction traffic would travel along the Golden Highway and Castlereagh Highway to access the Project Area. Construction activity is expected to generate approximately 462 vehicle trips per day, comprising 140 light vehicles, 320 heavy vehicles, and up to two OSOM vehicle trips. OSOM vehicles are expected to follow a route from the Port of Newcastle that aligns with the proposed Project route up to the Golden Highway / Castlereagh Highway intersection.

Construction is anticipated to commence in Q4 2026 and is expected to take approximately 38 months to complete. While this timeline overlaps with the proposed construction phase of the Project, no cumulative traffic impacts are anticipated. The Golden Highway is projected to have adequate capacity to accommodate the combined traffic from both projects, and no additional roads are expected to be affected.

Elong Elong Energy Hub

The Elong Elong Energy Hub is being developed as part of the Central-West Orana Renewable Energy Zone Transmission project to connect renewable energy generation projects within the CWO REZ to the 500 kV network infrastructure. The project is located adjacent to the southern section of Project Area.

According to the project's EIS¹⁵, construction traffic would use the Golden Highway and Spring Ridge Road, aligning with the proposed transport routes for the Project, and access the Project Area via Dapper Road. Peak construction activity is expected to generate 24 vehicle movements per hour, comprising four light vehicles and 20 heavy vehicles. An additional 32 vehicle movements (30 light vehicles and two heavy vehicles) and 13 vehicle movements (12 light vehicles and one heavy vehicle) would be required for access to the transmission line and switching station work sites, respectively. The OSOM haulage route is expected to originate from the Port of Newcastle and follow a similar path to the proposed Project haulage route.

Construction is anticipated to commence in the second half of 2024, subject to NSW Government and Commonwealth planning approvals, and is estimated to take approximately four years to complete. As the end of construction is expected to overlap with the start of the Project's construction phase, cumulative traffic impacts are anticipated to be minimal. While the Golden Highway is expected to have sufficient capacity to accommodate the increased traffic due to low existing traffic levels, Spring Ridge Road may require further upgrades to support traffic generated by both projects.

Sandy Creek Solar Farm

¹³ <https://www.planningportal.nsw.gov.au/major-projects/projects/birriwa-solar-farm>

¹⁴ <https://www.planningportal.nsw.gov.au/major-projects/projects/tallawang-solar-farm>

¹⁵ [Central-West Orana REZ Transmission | Planning Portal - Department of Planning and Environment](#)

The Sandy Creek Solar Farm project involves the development of a 700 MW AC solar farm, a 700 MW / 2.8 GWh BESS and associated infrastructure. This project is located adjacent to the southwest of the Project Area and is currently in a Response to Submissions phase at the time of this assessment.

According to the project's EIS¹⁶, construction traffic would travel along the Golden Highway and Spring Ridge Road, aligning with the proposed transport routes for the Project, and access the Project Area via Dapper Road. Peak construction activity is anticipated to generate approximately 117 daily vehicle trips, comprising 60 light vehicles, 20 shuttle buses, and 37 heavy vehicles, resulting in 234 daily vehicle movements. If on-site workforce accommodation is provided, daily vehicle movements are expected to reduce by 50 per cent, to approximately 118. The expected OSOM haulage route would originate from the Port of Newcastle and is assumed to follow a similar path to the proposed Project haulage route.

Construction of the Sandy Creek Solar Farm is expected to commence in Q2 2026 and take 22 to 28 months to complete, concluding between Q2 and Q4 2028. As construction would overlap with the Project, cumulative construction traffic impacts are anticipated. Any construction overlap between The Project and the Sandy Creek Solar Farm is likely to occur at or near the end of the construction period of the Sandy Creek Solar Farm, typically, the end of a construction period is associated with low traffic movement. While the Golden Highway is expected to have sufficient capacity to accommodate the increased traffic due to low existing traffic levels, Spring Ridge Road may require further upgrades to support traffic generated by both projects.

Conclusion

The construction periods of Elong Elong Energy Hub and Sandy Creek Solar Farm are likely to align with the proposed construction phase of the Project. Transportation of materials for these projects is anticipated to originate from Newcastle, with routes overlapping the Project's haulage route, particularly between the Port of Newcastle and the Golden Highway / Castlereagh Highway intersection, east of Dunedoo.

As outlined in Section 5.3.1.6, TfNSW and EnergyCo are currently planning necessary upgrades to the OSOM haulage route from the Port of Newcastle to the CWO REZ, including the Golden Highway / Spring Ridge Road intersection. These upgrades are expected to address the cumulative traffic impacts along the proposed OSOM haulage route.

Furthermore, since construction traffic is anticipated to occur outside of network peak hours, the Golden Highway is expected to have sufficient capacity to accommodate the traffic generated by these projects. However, access to both the Sandy Creek Solar Farm and the Elong Elong Energy Hub projects align with the Project's proposed route via Spring Ridge Road, which may experience cumulative traffic impacts. Further upgrades to Spring Ridge Road may be required to accommodate the combined traffic volumes generated by these projects, if the AADT on Spring Ridge Road is expected to exceed 150 vehicles per day, in accordance to the Austroads design standards.

While the Project's construction traffic alone may not necessitate additional road upgrades within the locality, peak cumulative traffic volumes from multiple concurrent construction projects may warrant further improvements. The need for these upgrades will be assessed in consultation with other project proponents as construction timelines become clearer.

5.3.7 Summary

Assessment of the traffic and transport impacts during the peak construction vehicle traffic period indicate the following:

- For the Golden Highway:
 - the expected annual average daily traffic (AADT) on the Golden Highway in the future scenario in 2028 without construction is expected to be approximately 1,445 vehicles
 - the addition of approximately 30 Project construction traffic vehicles is expected during the peak construction vehicle traffic period hour, which the Golden Highway has sufficient capacity to accommodate

¹⁶ <https://www.planningportal.nsw.gov.au/major-projects/projects/sandy-creek-solar-farm>

- the Golden Highway / Spring Ridge Road intersection has existing auxiliary turn lanes to handle the additional construction traffic expected during the peak construction vehicle traffic period and, as such, no intersection upgrades are considered to be required
- widening of the intersection at the corners of the Golden Highway / Spring Ridge Road intersection would be required to facilitate turning movements of heavy construction vehicles; additionally, changes to the line marking would be required.
- For Spring Ridge Road:
 - the expected AADT on Spring Ridge Road in the future scenario in 2028 without construction is expected to be approximately 55 vehicles
 - the addition of approximately 25 Project construction traffic vehicles is expected during the peak construction vehicle traffic period hour, which Spring Ridge Road has sufficient capacity to accommodate
 - local widening of Spring Ridge Road at the Project Area access points would be required to facilitate turning movements of heavy construction vehicles into/out of the Project Area.
- The Port to REZ project has planned upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Saxa Road intersection. The OSOM vehicles utilised to transport equipment for the Project will fit within the OSOM design vehicle envelop used for the Port to REZ studies. Therefore, the Project is not expected to require any additional upgrades to the OSOM haulage route from the Port of Newcastle to the Golden Highway / Spring Ridge Road intersection and the Golden Highway access point.
- Pavement conditions are considered to be acceptable along the parts of the proposed haulage route using State roads. However, pavement condition assessment and dilapidation surveys are required to assess if conditions are suitable along Spring Ridge Road, to determine if they will be able to accommodate construction traffic movements generated by the Project. Spring Ridge Road may need to be upgraded, subject to outcomes from the pavement condition assessments. Spring Ridge Road is expected to be suitable after upgrades associated with the Elong Elong Energy Hub project.
- Potential impacts to local access onto Spring Ridge Road from the Golden Highway are expected to be minimal.
- Partial or temporary road closures and traffic diversions may be required to facilitate improvements at the Golden Highway and Spring Ridge Road intersection and local widening of Spring Ridge Road at the Project Area access points to accommodate construction traffic volumes and movement of OSOM vehicles. No permanent road closures are required.
- Road safety impacts are likely to be minimal given the low population and low traffic movements in the vicinity of the Project.
- Minimal impacts are expected on public transport and coaches, or active transport facilities in the vicinity of the Project Area.
- Cumulative traffic impacts may arise during the peak construction period if the construction timelines of nearby projects align with the Project's. However, planned upgrades to the OSOM haulage route from the Port of Newcastle, as part of the Port to REZ project, are expected to mitigate cumulative heavy vehicle and OSOM traffic along the proposed Project haulage route. Specifically, cumulative impacts with the Sandy Creek Solar Farm and Elong Elong Energy Hub are anticipated. Once the timing of these adjacent construction activities is confirmed, the Proponent would coordinate construction vehicle movements in line with the proposed mitigations in Section 6.2.

5.4 Operational phase

5.4.1 Road network capacity

The Project is anticipated to operate for 35 years, unless the solar farm is re-powered at the end of the PV modules' technical life, which may extend the lifespan up to 50 years (subject to additional planning

assessment). It is expected that 20 full time workers would be required during the operational phase. Assuming the worst-case scenario where 20 light vehicles would be required to transport the workers to and from the Project Area, 40 vehicle movements would occur daily.

The expected AADT for the Golden Highway in the future scenario in 2038 with operation is expected to be approximately 1,640 vehicles (i.e. will fall within the category of 'between 1,000 and 3,000 vehicles daily'). This falls within the same daily traffic volume category as the future base scenario in 2038. The expected AADT for Spring Ridge Road in the future scenario in 2038 with operation is expected to be approximately 100 vehicles (i.e. will fall within the category of 'between 1 to 150 vehicles daily'). This falls within the same daily traffic volumes category as the future base scenario in 2038.

The anticipated peak background traffic volumes near the Project Area are low during the operational phase. The Golden Highway is expected to carry an approximate combined traffic of 140 vehicles during the peak period of the future base scenario in 2038. Spring Ridge Road is expected to carry an approximate total combined traffic of six vehicles. As outlined above, under a worst-case scenario, up to 20 light vehicles would be required for the operational phase during the peak hour. These numbers are low and would not affect the overall capacity of the Golden Highway and Spring Ridge Road.

Similarly, turning movement volumes from the Golden Highway into Spring Ridge Road would be low and produce similar results as the future base scenario in 2038, when assessed against the Austroads warrant design charts. The existing turning treatments would be adequate for the future scenario in 2038 with operation and, as such, no turning upgrades would be required at the Golden Highway / Spring Ridge Road intersection.

5.4.2 Access and parking

No access impacts are expected given the low traffic volumes required during Project operations.

About 30-40 permanent parking spaces would be required during the operational phase. Sufficient parking would be provided within the Development Footprint to account for the operational staffing needs of the Project plus any contractors or visitors to site.

Heavy vehicles may be required occasionally for replacing large components such as inverters, transformers or components of the BESS. Sufficient heavy vehicle parking spaces are expected to be provide on-site.

No formal parking exists in the vicinity of the Project Area and, as such, no parking impacts are expected.

5.4.3 Road safety

Given the low traffic volumes expected to be generated by the operation of the Project, it is expected that any adverse impacts on road safety arising from the Project will be minimal.

5.4.4 Public transport and coaches

No impacts are expected given the low traffic volumes required to operate the Project.

5.4.5 Active transport

No impacts to the CWCT along the Golden Highway are expected given the distance between the Project Area and the low traffic volumes required to operate the Project.

No impacts to walking facilities are expected, given that none are in the vicinity of the Project Area.

5.4.6 Cumulative traffic impacts

The projects outlined in Section 5.3.6 are expected to be operational during the future scenario in 2038 with operation. Up to 20 workers are expected for each, similar to the Project. Given operational traffic volumes arising from the Cobbora Solar Farm and the other projects would be low, no cumulative operational traffic and transport impacts are expected.

5.4.7 Summary

Overall, traffic and transport impacts are expected to be minimal during the operational phase of the Project. Approximately 1,640 vehicles and 100 vehicles are expected daily on the Golden Highway and Spring Ridge Road, respectively. The existing turning treatments at the Golden Highway / Spring Ridge

Road intersection are adequate. No access and parking, public transport and coach, or active transport impacts are expected. Minimal road safety impacts are expected, and no cumulative traffic and transport impact is expected during operations.

5.5 Decommissioning phase

Decommissioning would likely occur after 35 years of operation. Background traffic growth rates associated with future development projects and land use changes in the area cannot be accurately determined at this stage. It is anticipated that decommissioning of the Project would generate traffic volumes less than the volumes generated during the construction phase. The proposed plan for the decommissioning phase is unknown at this stage; however, decommissioning activities would likely be undertaken in stages over a shorter timeframe.

Similarly, any cumulative impacts associated with the construction or decommissioning of nearby projects at the time of Project decommissioning cannot be accurately determined at this stage.

As decommissioning is expected to begin in 35 years, forecasting traffic movements to assess the decommissioning phase is not feasible at this stage due to evolving decommissioning technology and requirements. It is suggested that assessments be undertaken in subsequent stages once further details are available regarding decommissioning.

6.0 Mitigation and management measures

6.1 Overview

This chapter describes the environmental management approach for traffic, transport and access during the construction and decommissioning of the Project. The assessments have demonstrated that operational impacts are minimal and as such mitigation measures for that phase are not warranted.

6.2 Mitigation and management measures

Table 6-1 outlines the mitigation and management measures that would be implemented to minimise traffic and access impacts during construction and decommissioning of the Project.

Table 6-1 Mitigation and management measures

ID	Management and mitigation measure	Timing
T1	A Construction Traffic Management Plan (CTMP) will be prepared as a sub plan to the CEMP, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW. The CTMP will include a Drivers Code of Conduct and will be designed to minimise the impact of Project construction traffic (including OSOM vehicles) on the external road network.	Detailed design and Construction
T2	A Traffic Management Plan will be prepared, as required, prior to large-scale maintenance activities with the potential to impact traffic.	Operation
T3	Where required, Project accesses will be upgraded to a Typical Rural Property Access standard in consultation with Transport for NSW, Warrumbungle Shire Council and Dubbo Regional Council.	Detailed design and Construction
T4	Vehicle access to and from the Development Footprint will be via the designated access points (unless agreed with the relevant road authority). Access points will be designed and managed to minimise safety risks to motorists and other road users.	Construction
T5	All vehicles will enter and exit the Development Footprint in a forward direction. Provision will be made within the Development Footprint to allow vehicles to turn around without the need for reversing.	Detailed design and Construction
T6	Appropriate signage, line marking and/or traffic control measures will be used near access points to direct and guide motorists past the Project Area, if required.	Detailed design and Construction
T7	Sufficient designated parking will be provided within the Development Footprint for all construction vehicles (light and heavy vehicles), and no parking or storing of materials will occur on the public road network in the vicinity of the Project Area.	Construction
T8	A maximum speed limit of 20 km/h will be enforced throughout the Development Footprint.	Construction
T9	An independent dilapidation survey will be undertaken to assess the condition of the pavement and drainage and bridge structures along the proposed construction route(s) (between the Golden Highway/Spring Ridge Road intersection and site access points) prior to and following construction or decommissioning activities.	Construction
T10	Over-dimensional vehicles will only travel to the Project once an Over Size Over Mass (OSOM) Permit from the National Heavy Vehicle Regulator and any required approvals/permits from the relevant road authorities have been obtained.	Construction

ID	Management and mitigation measure	Timing
T11	A Traffic Management Plan specific to the decommissioning phase will be prepared prior to decommissioning which reflects changes in background traffic volumes and work procedures, and in consultation with Warrumbungle Shire Council, Dubbo Regional Council and Transport for NSW.	Decommissioning
T12	The Central West Cycling Trail (CWCT) route will be highlighted within the site induction and driver's code of conduct to increase awareness of cyclists' presence in the area. Drivers will be instructed to respect the safety of cyclists using local and regional roads, including complying with legal passing separation distances.	Construction

7.0 References

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Appendix A

Traffic Surveys

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Golden Hwy and Spring Ridge Rd, Cobbar

GPS -32.104807, 149.229244

Date:	Thu 04/08/22
Weather:	Fine
Suburban:	Cobbora
Customer:	N/A

North:	N/A
East:	Golden Hwy
South:	Spring Ridge Rd
West:	Golden Hwy

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	4:00 PM-7:00 PM
Traffic Peak	AM:	8:00 AM-9:00 AM
	PM:	4:15 PM-5:15 PM

All Vehicles

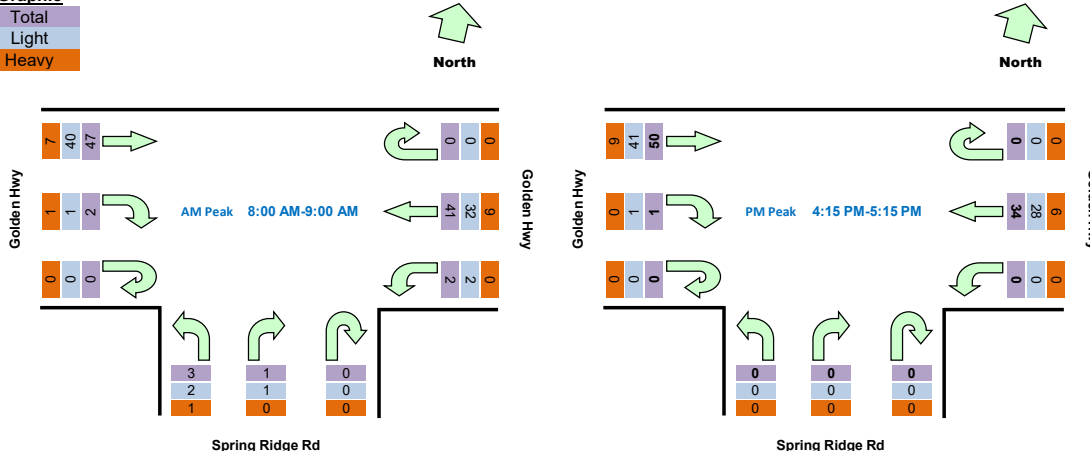
Time		East Approach Golden Hwy			West Approach Spring Ridge			West Approach Golden Hwy			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
6:00	6:15	0	5	0	0	0	0	0	0	5	45	
6:15	6:30	0	0	0	0	0	0	0	0	0	58	
6:30	6:45	0	9	0	0	0	0	0	0	6	76	
6:45	7:00	0	8	0	0	0	0	0	0	12	82	
7:00	7:15	0	13	0	0	0	0	0	0	10	81	
7:15	7:30	0	9	0	0	1	0	0	0	8	82	
7:30	7:45	0	9	0	0	0	1	0	1	10	89	
7:45	8:00	0	9	0	0	0	0	0	0	10	94	
8:00	8:15	0	9	0	0	1	0	0	2	12	96	Peak
8:15	8:30	0	11	2	0	0	0	0	0	12		
8:30	8:45	0	9	0	0	0	1	0	0	16		
8:45	9:00	0	12	0	0	0	2	0	0	7		
16:00	16:15	0	9	0	0	0	0	0	1	9	79	
16:15	16:30	0	11	0	0	0	0	0	0	14	85	Peak
16:30	16:45	0	7	0	0	0	0	0	0	12	78	
16:45	17:00	0	6	0	0	0	0	0	0	10	74	
17:00	17:15	0	10	0	0	0	0	0	1	14	58	
17:15	17:30	0	12	0	0	0	0	0	0	6	47	
17:30	17:45	0	3	0	0	2	0	0	0	10	29	
17:45	18:00	0	0	0	0	0	0	0	0	0	22	
18:00	18:15	0	3	0	0	0	0	0	0	11	30	
18:15	18:30	0	0	0	0	0	0	0	0	0		
18:30	18:45	0	4	0	0	0	0	0	0	4		
18:45	19:00	0	5	0	0	0	0	0	0	3		

Peak Time		East Approach Golden Hwy			West Approach Spring Ridge			West Approach Golden Hwy			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
8:00	9:00	0	41	2	0	1	3	0	2	47	96
16:15	17:15	0	34	0	0	0	0	0	1	50	85

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

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T. 1300 82 88 82 - F. 1300 83 88 83 - E. traffic@trafficsurvey.com.au - W. www.trafficsurvey.com.au

AUTOMATIC COUNT SUMMARY

Street Name :	Golden Hwy	Location :	West of Spring Ridge Rd
Suburb :	Cobbora	Start Date :	00:00 Mon 21/November/2022
Machine ID:	MF43H27H	Finish Date :	00:00 Mon 28/November/2022
Site ID:	2272	Speed Zone :	100 km/h
Prepared By :	Vo Son Binh	Email:	binh@trafficsurvey.com.au

GPS information	Lat 32° 6' 21.69 South	Direction of Travel		
	Long 149° 12' 56.79 East	Both directions	Westbound	Eastbound
Traffic Volume :	Weekdays Average	1,405	714	691
(Vehicles/Day)	7 Day Average	1,363	694	669
Weekday AM	11:00	108	53	55
Peak hour start PM	14:00	123	67	56
Speeds :	85th Percentile	105.2	106.1	104.4
(Km/Hr)	Average	98.8	99.4	98.2
Classification % :	Light Vehicles up to 5.5m	82.0%	82.3%	81.8%

Location

GPS Information [Load Google Map \(internet required\)](#)
 (Latitude, Longitude) -32.106025, 149.215776



[Speed Data](#) [Speed Graph](#) [Speed Bin](#)
[Volume Data](#) [Volume Graph](#) [Classification](#)



QUALITY ASSURED COMPANY BY ISO 9001:2015
OH&S SYSTEM CERTIFIED TO ISO 4801:2001
ENVIRONMENT MANAGEMENT SYSTEM CERTIFIED TO ISO14001:2015

Status of movement – Covid 19

"Traffic behaviour is not the same as pre-pandemic (traditional morning/afternoon peak is much less pronounced and school start/finish times are much more pronounced), the current patterns are close enough to what probably is going to be a 'COVID normal' situation for at least the next year or two. Workplaces are currently not all yet open. These results should be used for indicative assessment only."

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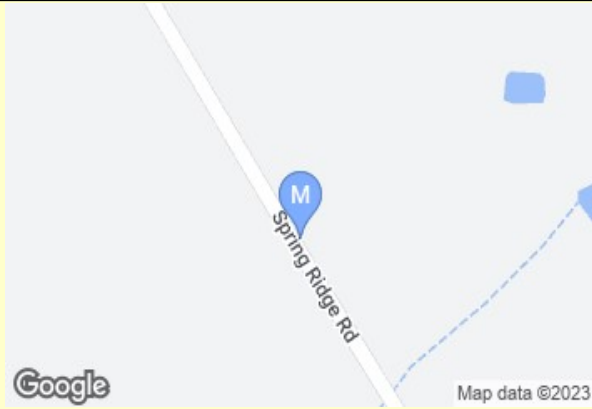
AUTOMATIC COUNT SUMMARY

Street Name :	Spring Ridge Rd	Location :	South of Golden Hwy
Suburb :	Cobbora	Start Date :	00:00 Mon 21/November/2022
Machine ID:	CX18D4QB	Finish Date :	00:00 Mon 28/November/2022
Site ID:	2273	Speed Zone :	100 km/h
Prepared By :	Vo Son Binh	Email:	binh@trafficsurvey.com.au

GPS information		Lat 32° 9' 36.50 South	Direction of Travel		
		Long 149° 14' 23.69 East	Both directions	Northbound	Southbound
Traffic Volume : (Vehicles/Day)		Weekdays Average	50	23	27
		7 Day Average	46	20	26
Weekday	AM	07:00	4	3	1
Peak hour starts	PM	17:00	6	2	4
Speeds : (Km/Hr)		85th Percentile	96.4	95.6	99.6
		Average	93.0	92.9	95.0
Classification % :		Light Vehicles up to 5.5m	95.7%	95.2%	96.0%

Location

GPS Information [Load Google Map \(internet required\)](#)
(Latitude, Longitude) -32.160140, 149.239913



[Speed Data](#) [Speed Graph](#) [Speed Bin](#)
[Volume Data](#) [Volume Graph](#) [Classification](#)



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ENVIRONMENT MANAGEMENT SYSTEM CERTIFIED TO ISO14001:2015

Status of movement – Covid 19

"Traffic behaviour is not the same as pre-pandemic (traditional morning/afternoon peak is much less pronounced and school start/finish times are much more pronounced), the current patterns are close enough to what probably is going to be a 'COVID normal' situation for at least the next year or two. Workplaces are currently not all yet open. These results should be used for indicative assessment only."

Appendix B

Site Photographs

Appendix B Site Photographs



Figure B-1 Spring Ridge Road at the Golden Highway / Spring Ridge Road intersection



Figure B-2 Spring Ridge Road near Danabar Road



Figure B-3 Sandy Creek Road (minor crossing)

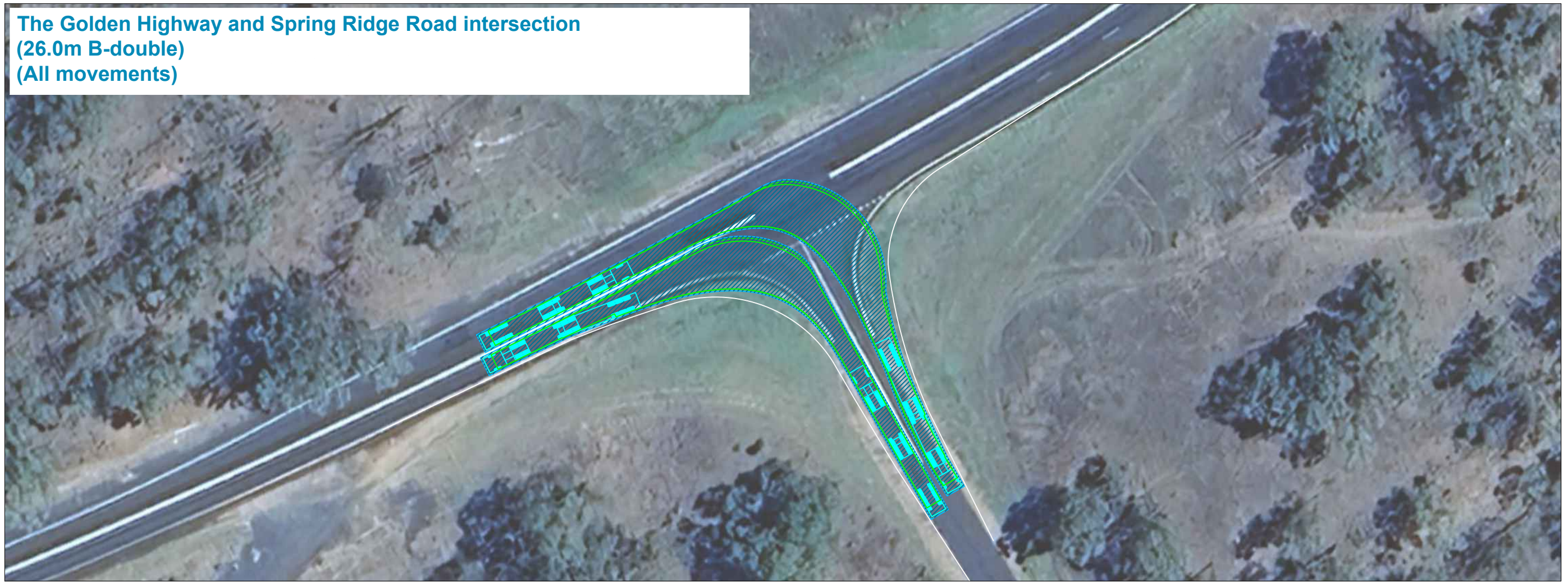


Figure B-4 Sweeneys Lane (crossing)

Appendix C

Swept Path Analysis

The Golden Highway and Spring Ridge Road intersection
(26.0m B-double)
(All movements)



Note:
Indicative local widening extents.
Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.
Consideration should also be given to the
proposed intersection upgrades as part of the
Port to REZ project.

Spring Ridge Road Access Point 1
(26.0m B-Double access via Golden Hwy / Spring Ridge Rd)
(Right in & Left out)

Note:
Indicative local widening extents.
*Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.*



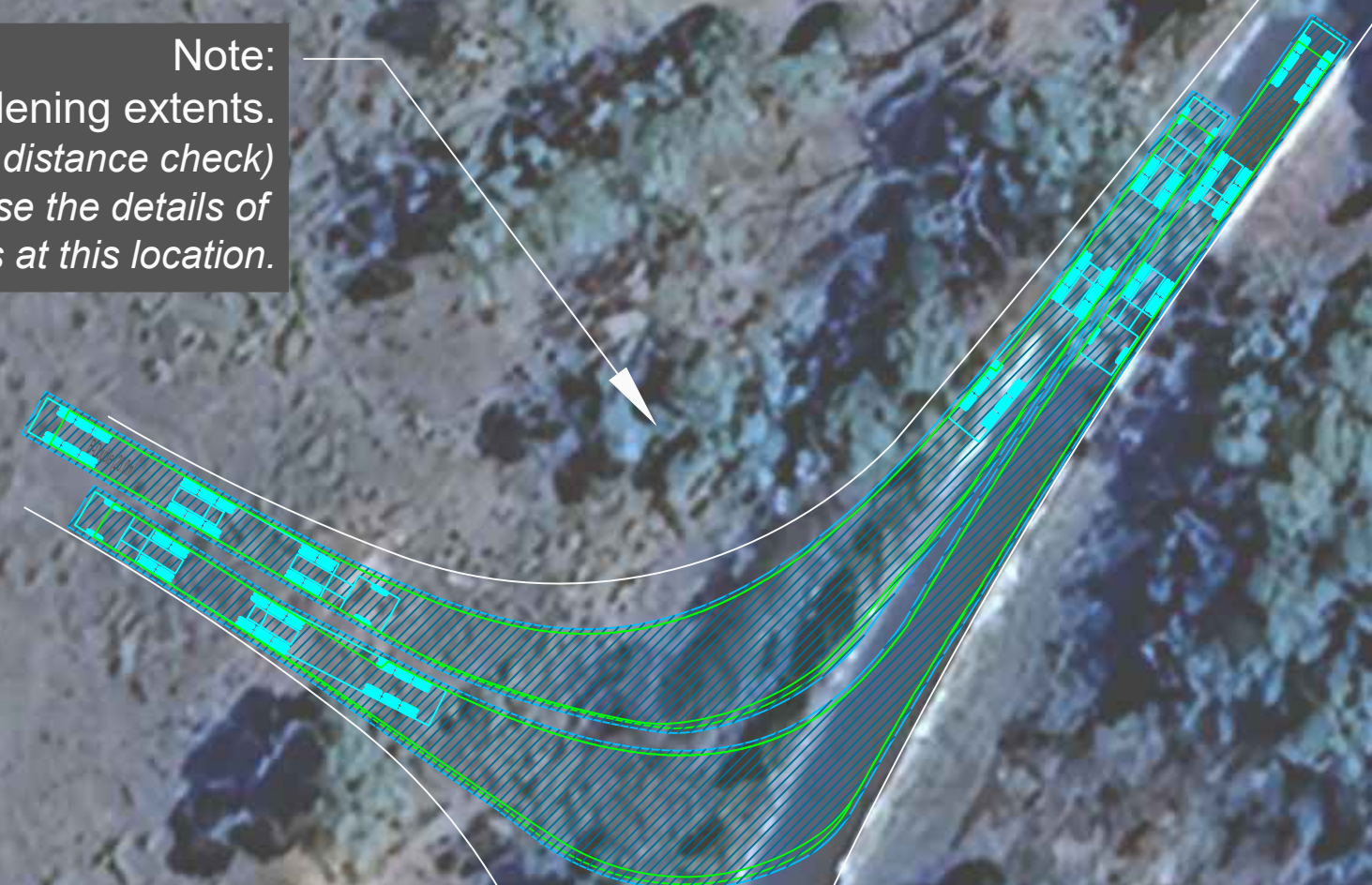
Spring Ridge Road Access Point 2
(26.0m B-Double access via Golden Hwy / Spring Ridge Rd)
(Right in & Left out)

Note:
Indicative local widening extents.
*Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.*



Spring Ridge Road Access Point 3
(26.0m B-Double access via Golden Hwy / Spring Ridge Rd)
(Right in & Left out)

Note:
Indicative local widening extents.
*Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.*



Spring Ridge Road Access Point 4
(19.0m AV access via Golden Hwy / Spring Ridge Rd)
(Right in & Left out)

Note:
Indicative local widening extents.
*Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.*



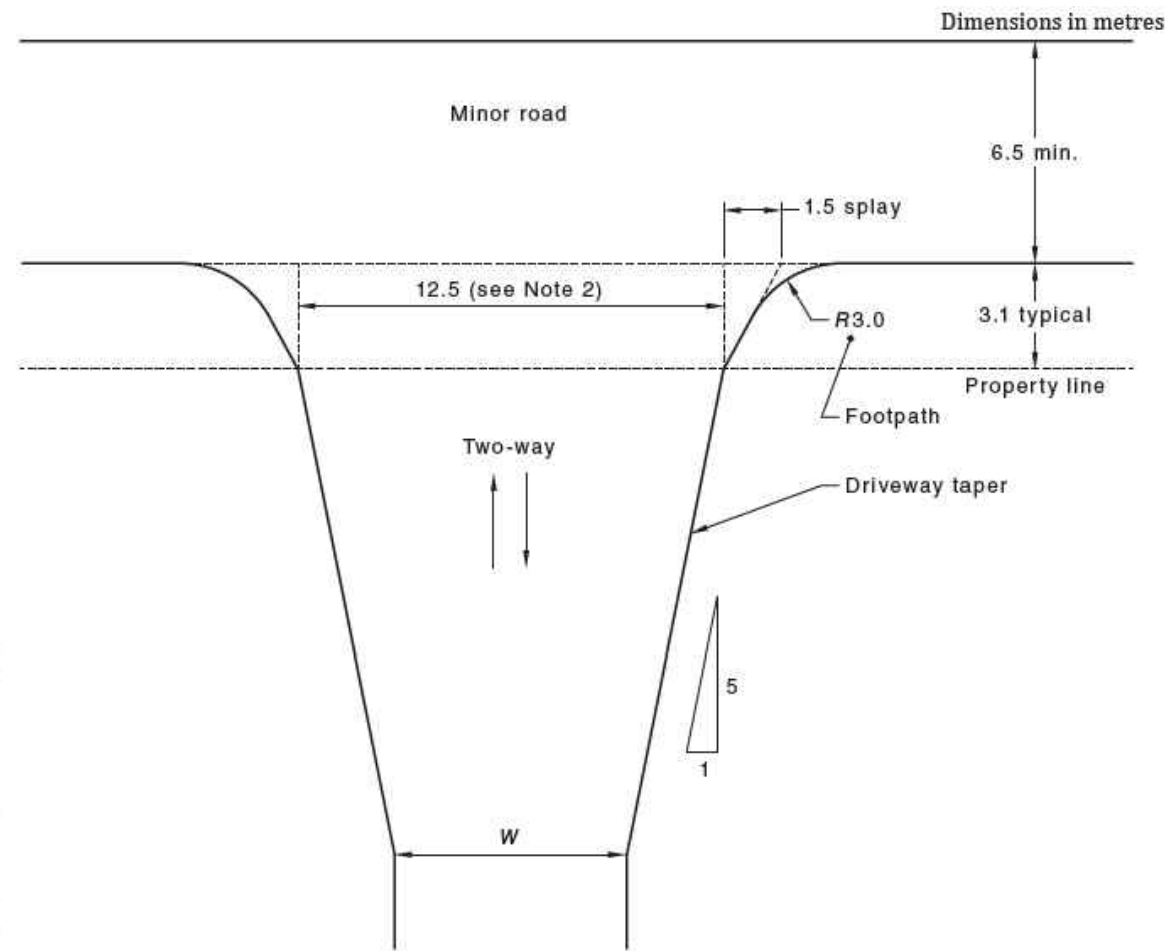
Golden Highway Access Point
(19.0m AV)
(Left in, Left out & Right out)



Note:
Indicative local widening extents.
*Further investigation (incl. sight distance check)
is required at later stages to advise the details of
required upgrades at this location.*

Minimum design for an access driveway on a minor road catering AVs

Reference: AS 2890.2 (2018)



Key

W = width of circulation roadway (see Table 3.1)

NOTE 1 Figure 3.1 shows the HRV can turn left into the driveway from the left-hand side of the public road. The design (20.0 m long) AV will take up most of the public road width when turning left into or out of the driveway, as will the HRV when turning out.

NOTE 2 Corresponding dimensions for the MRV and SRV are 9 m and 6 m respectively. Larger vehicles may be able to use these narrower driveways depending on the width of public road available for manoeuvring in or out.

Figure 3.1 — Minimum design for an access driveway on a minor road catering for HRVs and AVs

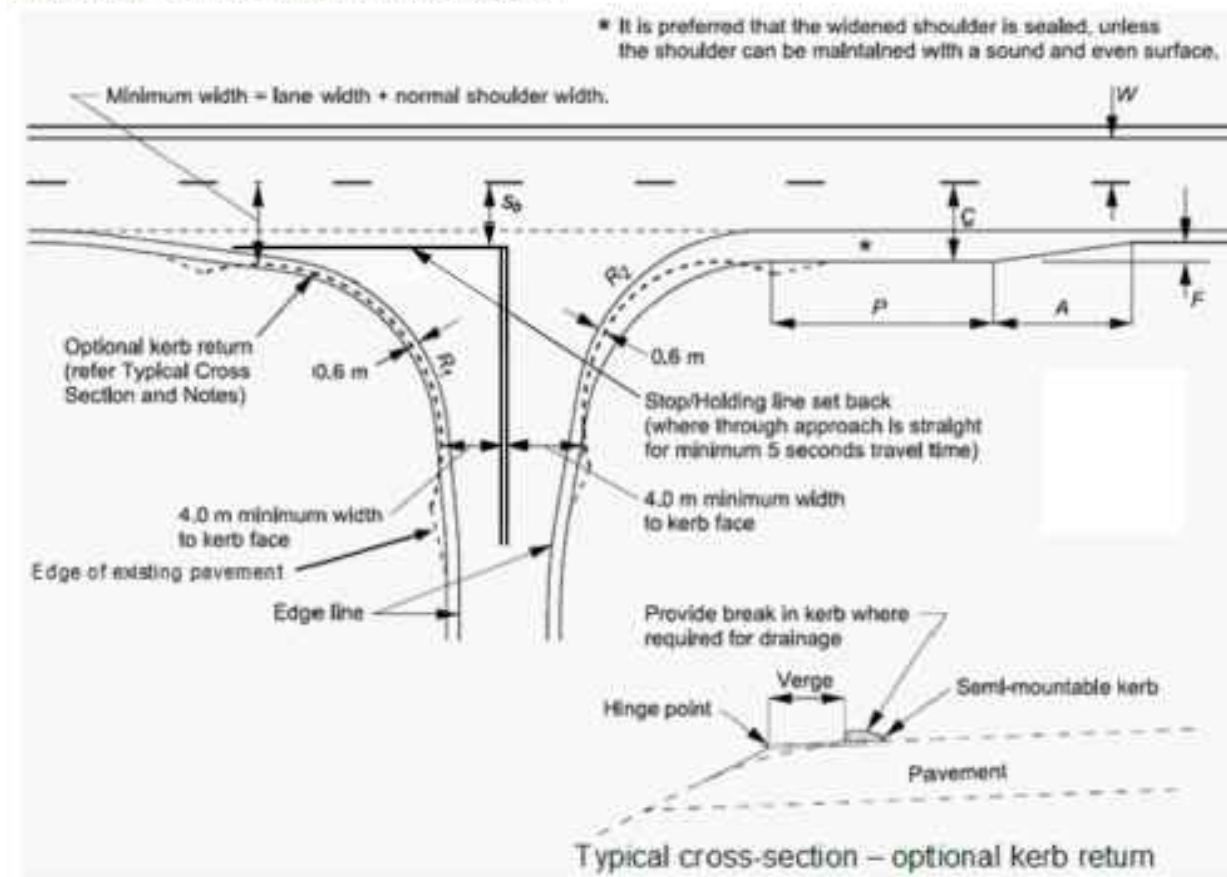
Table 3.1 (continued)

Design vehicle	Curve radius (inside edge of curve)	Swept path width of design vehicle	Road width, kerb to kerb		Without intervisibility (see Note 2)
			Two-way		
			Single lane	With intervisibility (see Note 1)	
AV	Less than 40	—	See Note 3	See Note 3	See Note 3
	40 to 49	4.3	5.2	8.1	10.1
	50 to 69	4.0	4.9	7.8	9.5
	70 to 99	3.6	4.5	7.4	8.7
	100 to 199	3.2	4.1	7.0	7.9
	200 to 499	2.9	3.8	6.5	7.4
	500 to 800	2.6	3.5	6.5	6.7
> 800 (including straight)	2.5	3.5	6.5	6.5	

Rural basic left-turn treatment (BAL)

Reference: Austroads AGRD04A (2023)

Figure 8.2: Rural basic left-turn treatment (BAL)

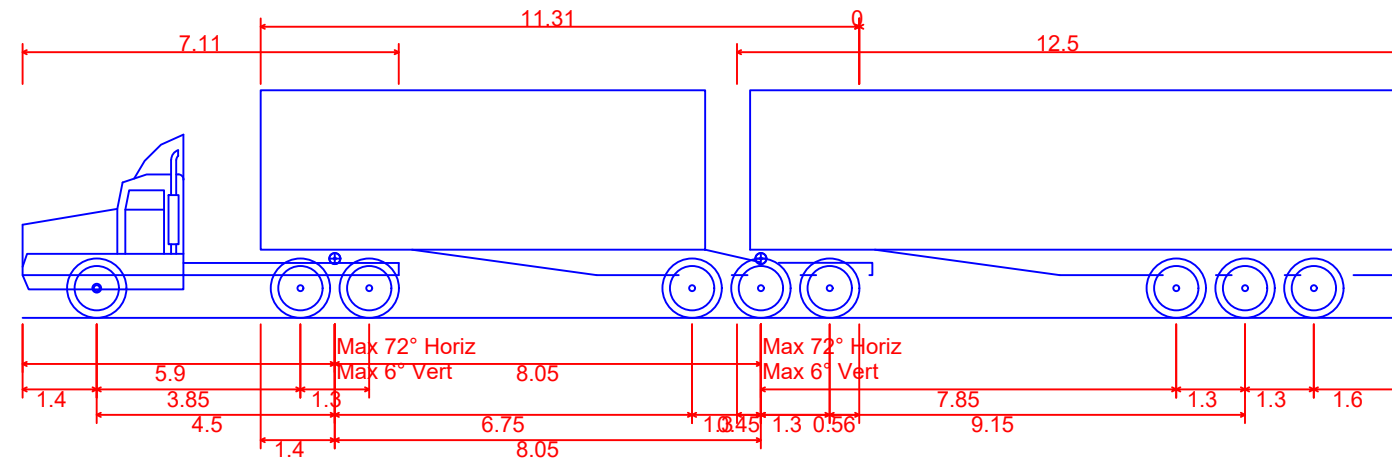


Notes:

- R_1 and R_2 are determined by the swept path of the design vehicle.
- The dimensions of the treatment are defined thus:
 - W = Nominal through lane width (m) (including widening for curves).
 - C = On straights – 6.0 m minimum.
On curves – 6.0 m plus curve widening (based on widening for the design turning vehicle plus widening for the design through vehicle).
 - $A = \frac{0.5VF}{3.6}$
 - V = Design speed of major road approach (km/h).
 - F = Formation/carrageway widening (m).
 - P = Minimum length of parallel widened shoulder (Table 8.1).
 - S_0 = Setback distance between the centre of the major road and the give way or stop line in the minor road. The holding line is typically placed in prolongation of the kerb line or edge line, however, it may be set back if there is a problem with the design vehicle over-running the holding line, or if it is desired to hold vehicles back some distance from the intersecting roadway (AS 1742.2 - 2009). The setback needs to be balanced such that sight distance is not negatively impacted to create a safety issue and the needs of pedestrians is met.

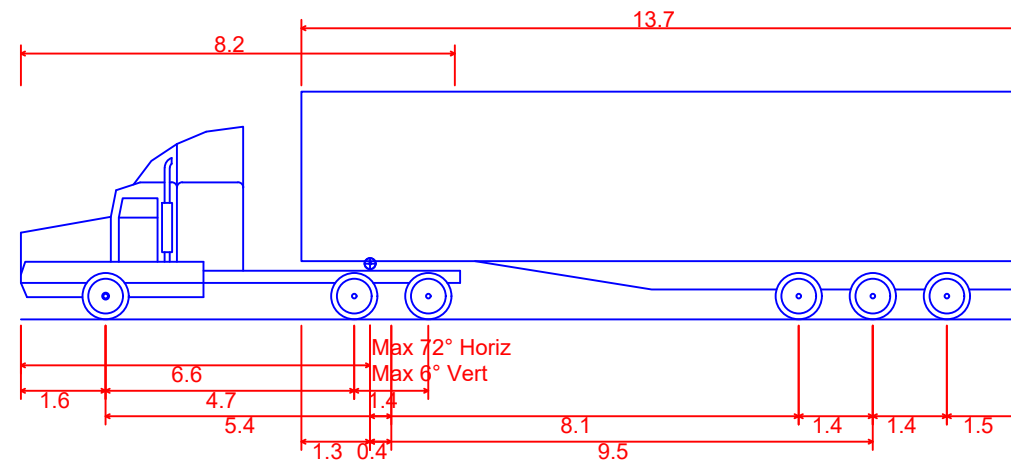
Design Vehicle:

26.0m B-double



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

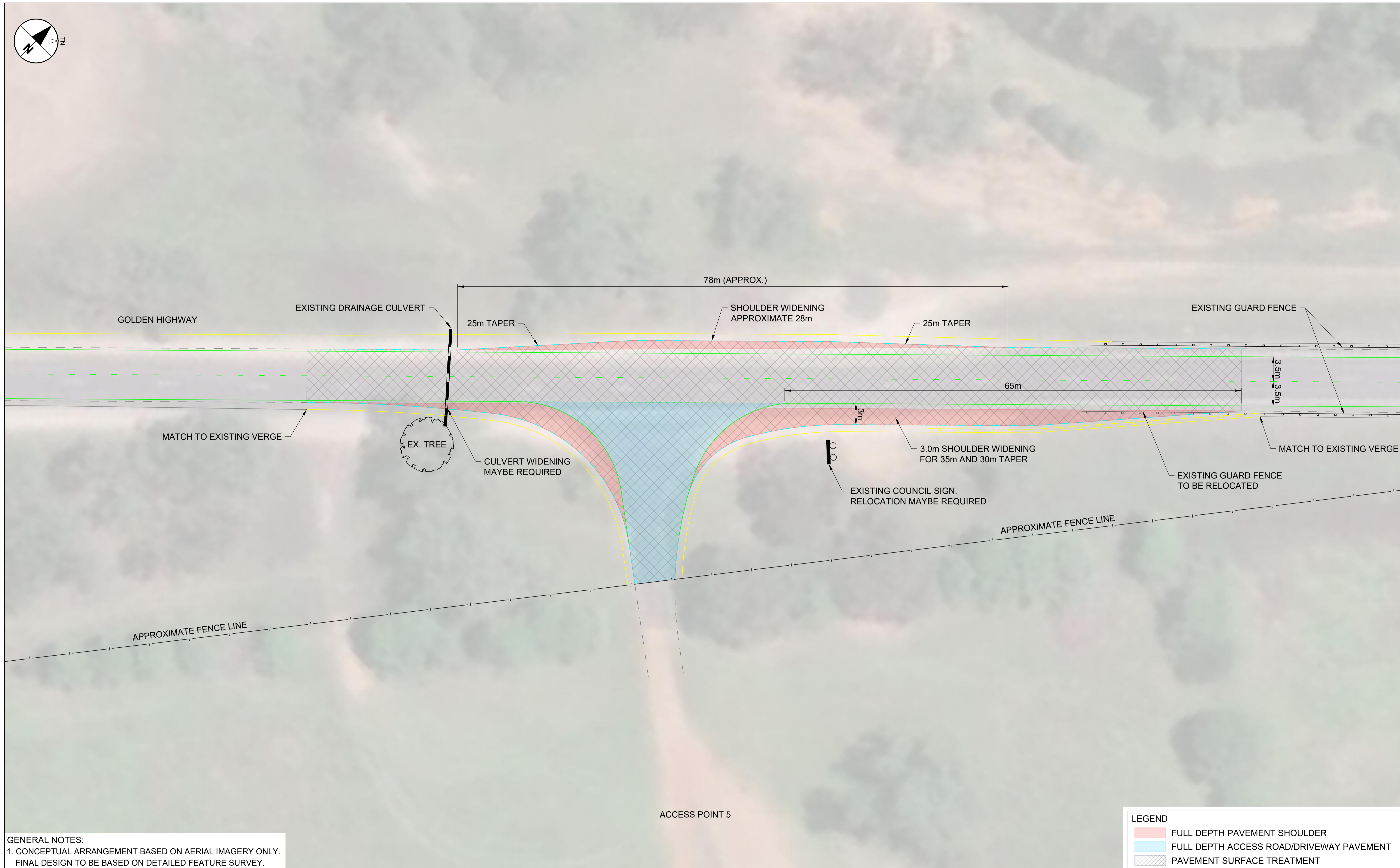
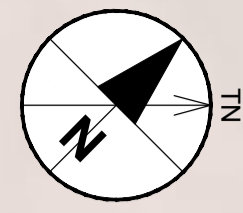
19.0m AV



AV - Articulated Vehicle	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

Appendix D

Strategic Design – Golden Highway Access



GENERAL NOTES:
 1. CONCEPTUAL ARRANGEMENT BASED ON AERIAL IMAGERY ONLY.
 FINAL DESIGN TO BE BASED ON DETAILED FEATURE SURVEY.

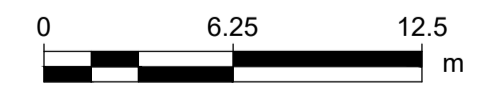
This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the AECOM quality assurance system to ISO 9001-2000.

LEGEND	
	FULL DEPTH PAVEMENT SHOULDER
	FULL DEPTH ACCESS ROAD/DRIVEWAY PAVEMENT
	PAVEMENT SURFACE TREATMENT

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PROJECT
 COBBORA SOLAR FARM

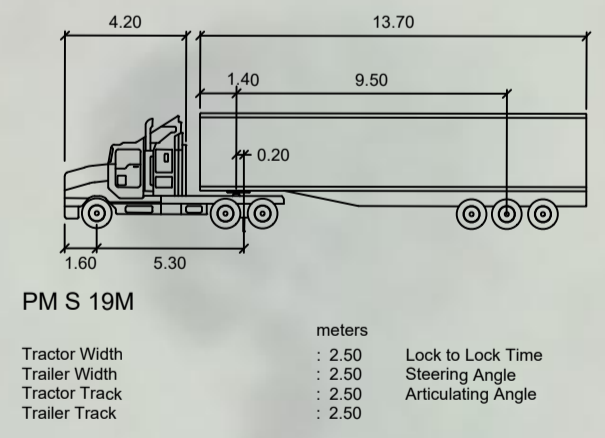
CLIENT
 PACIFIC PARTNERSHIPS PTY LTD



PROJECT MANAGEMENT INITIALS		
TM	TB	RW
DESIGNER	CHECKED	APPROVED

ISSUE/REVISION		
I/R	DATE	DESCRIPTION
A	30/05/2025	FOR REVIEW

PROJECT NUMBER
 60734058
SHEET TITLE
 COBBORA ACCESS POINT 5
 GOLDEN HIGHWAY AND
 ACCESS POINT 5 ADJUSTMENTS
SHEET NUMBER
 60734058-SKT-0001
REVISION
 A



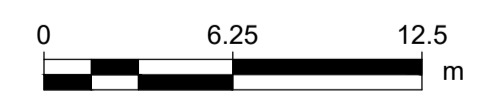
GENERAL NOTES:
 1. CONCEPTUAL ARRANGEMENT BASED ON AERIAL IMAGERY ONLY.
 FINAL DESIGN TO BE BASED ON DETAILED FEATURE SURVEY.

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PROJECT
 COBBORA SOLAR FARM

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PROJECT MANAGEMENT INITIALS		
TM	TB	RW
DESIGNER	CHECKED	APPROVED

ISSUE/REVISION		
A	30/05/2025	FOR REVIEW
I/R	DATE	DESCRIPTION

PROJECT NUMBER
 60734058
SHEET TITLE
 COBBORA ACCESS POINT 5
 SWEEP MOVEMENTS
 LEFT IN AND RIGHT OUT
SHEET NUMBER
 60734058-SKT-0002
REVISION
 A

Appendix E

Schedule of Road Upgrades

Appendix E Schedule of Road Upgrades

Table C-1 Indicative schedule of road upgrades

Location	Type of upgrade	Timing
Spring Ridge Road, at Site Access Road (access 1)	<ul style="list-style-type: none"> Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles 	Construction phase
Spring Ridge Road, at Site Access Road (access 2)	<ul style="list-style-type: none"> Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles 	Construction phase
Spring Ridge Road, at Site Access Road (access 3)	<ul style="list-style-type: none"> Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles 	Construction phase
Spring Ridge Road, at Site Access Road (access 4)	<ul style="list-style-type: none"> Local widening of Spring Ridge Road to facilitate turning movements of heavy construction vehicles 	Construction phase
Golden Highway, at Site Access Road (access 5)	<ul style="list-style-type: none"> Local widening of Golden Highway to facilitate left-in, left-out and right-out turning movements of heavy construction vehicles 	Construction phase