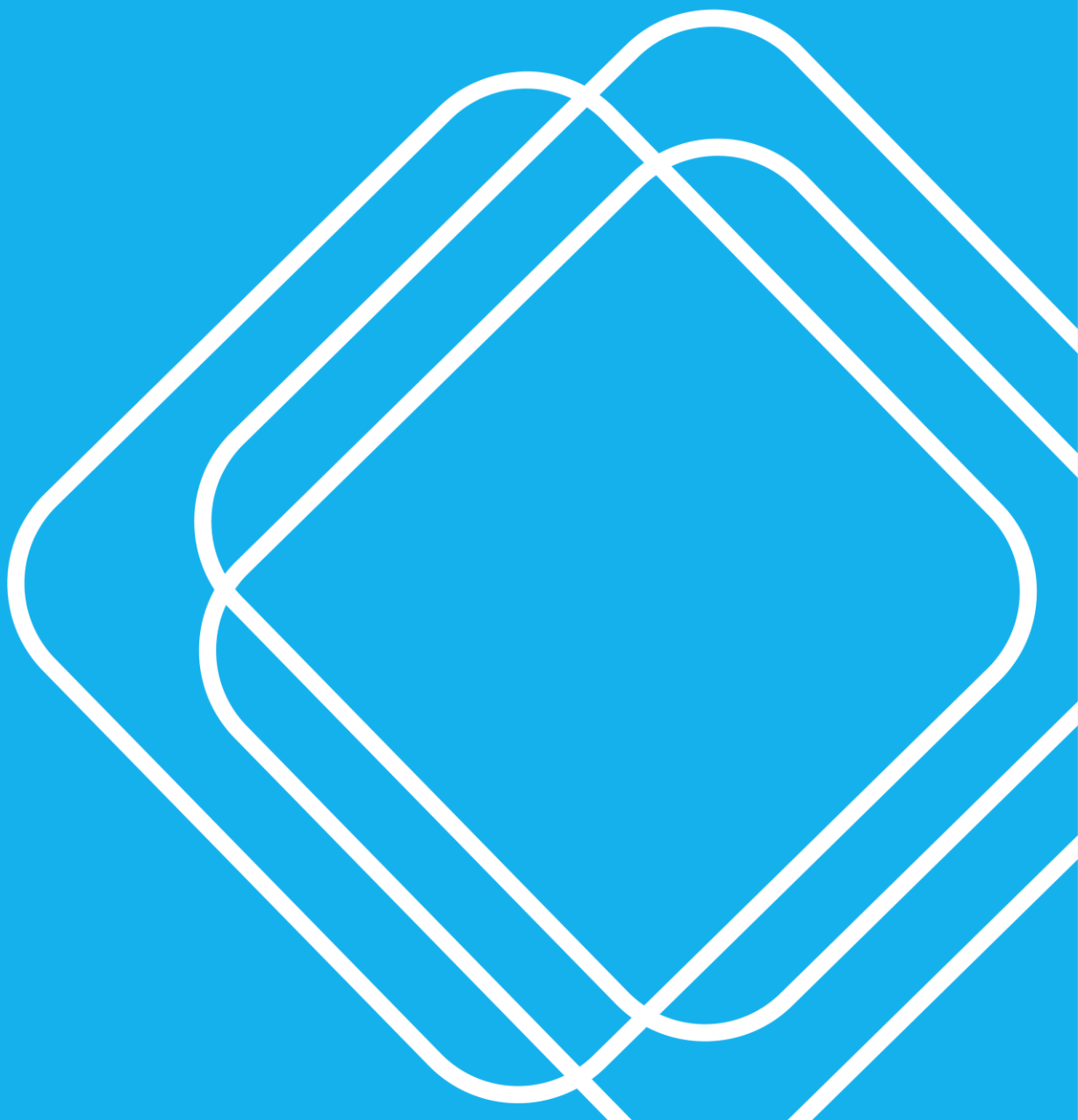
# APPENDIX H
# TRAFFIC AND TRANSPORT ASSESSMENT REPORT

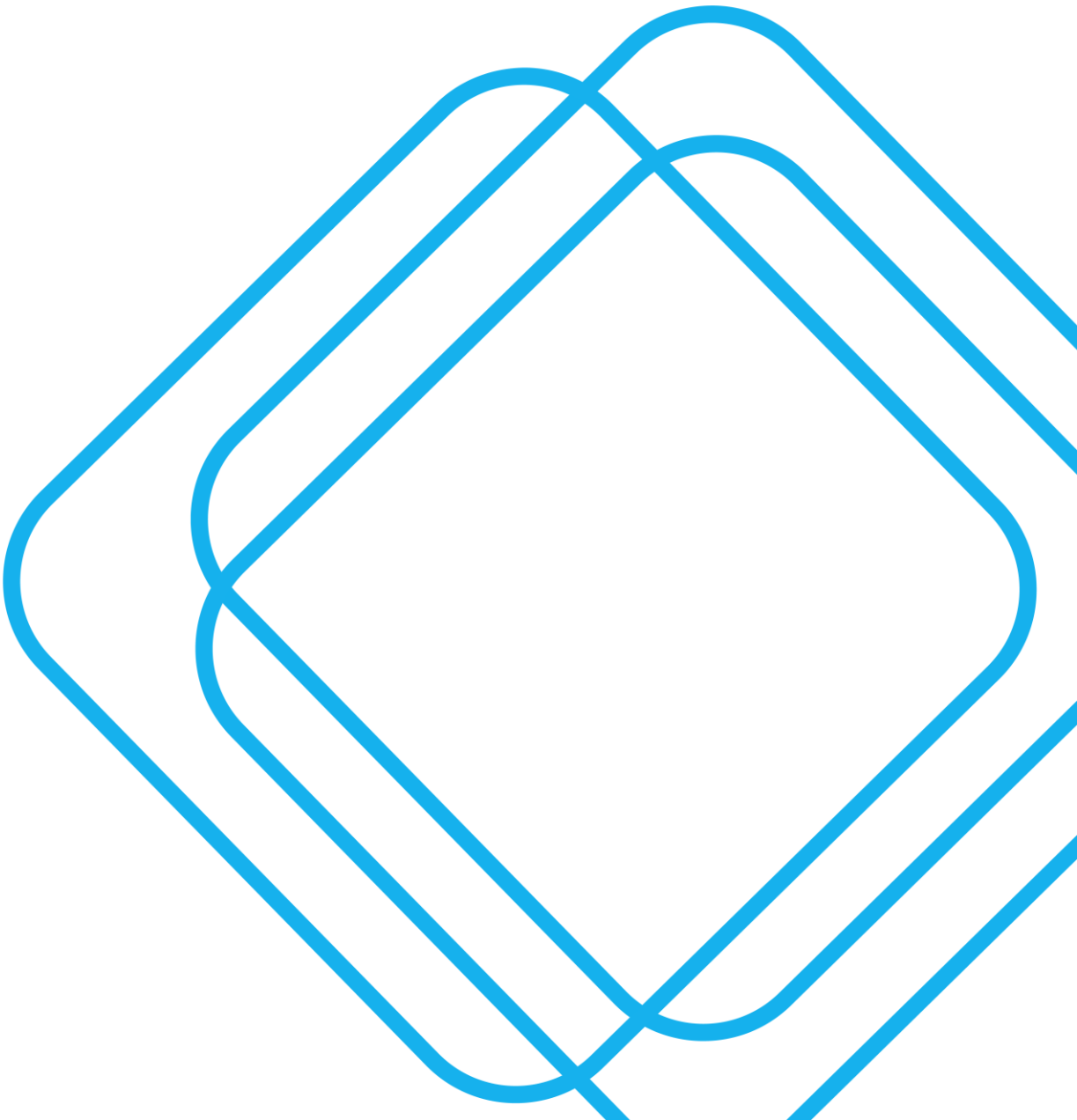
SCT Consulting

# STUBBO SOLAR FARM EIS

## Traffic and Transport Report

**9 DECEMBER 2020**





# Quality Assurance

| | | | |
|---|---|---|---|
| **Project:** | Stubbo Solar Farm EIS | | |
| **Project Number:** | SCT_00187 | | |
| **Client:** | UPC Renewables Australia Pty Ltd | **ABN:** | 27 616 856 672 |
| **Prepared by:** | SCT Consulting PTY. LTD. (SCT Consulting) | **ABN:** | 53 612 624 058 |

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| 1.0 | 25 September 2020 | Draft report |
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| 3.0 | 9 December 2020 | Updated final report |

# Contents

# Executive Summary

UPC Renewables Australia Pty Ltd proposes to develop the Stubbo Solar Farm, a grid-connected photovoltaic solar farm of up to 400 megawatts, located in the Central Tablelands region of New South Wales (the project). The project is located about 90km east of Dubbo and about 10km north of Gulgong in the Mid-Western Regional Council local government area. The project is a State Significant Development under the *State Environmental Planning Policy (State and Regional Development) 2011* and Part 4 of the *Environmental Planning and Assessment Act 1979*.

The construction of the project is expected to commence by early 2022 and last for about two years. The project would require up to 400 full time equivalent employees during the peak construction phase and would require 10 full time equivalent employees during the operation and maintenance of the solar farm.

Given the low trip volumes (about 10 vehicles per day) expected to be generated during the operation and maintenance phase of the project, and with a decommissioning phase expected to see lower traffic generation compared to the construction phase, this traffic and transport impact assessment deals primarily with the impact of the construction phase of the project.

During construction, it is forecast that construction material would be transported up the Golden Highway, irrespective of if its origin (e.g. Newcastle or Sydney), and then along Ulan Road, Cope Road and Blue Springs Road. Options have also been assessed for heavy vehicles to access the Barneys Reef Road entry to the study area using Black Lead Lane or Beela Road / Carramar Road / Stubbo Road. The construction workforce is expected to travel from or via Gulgong and Mudgee or other regional localities, as required. They would travel through Gulgong and use either Cope Road and Blue Springs Road or Barneys Reef Road to access the study area.

To assess the traffic and transport impact of the project, a review of existing conditions was undertaken, including collecting traffic survey data to establish a robust baseline for the traffic impact assessment. Future year traffic generation was estimated for the construction, operation, and decommissioning phases and an analysis of the future year conditions with and without the project was undertaken. This enabled an assessment to be made if any mitigation measures were required as a result of the project impact.

The key findings of the traffic and transport assessment for the project are:

– The project would have the most traffic and transport impact during the construction peak period, when 12 heavy vehicle trips and 230 light vehicle trips are forecast to be generated during the peak hours, i.e. six heavy vehicles entering and six heavy vehicles leaving the study area in each peak hour, and 230 light vehicles entering the study area in the AM peak hour and 230 light vehicles leaving in the PM peak hour.

– Given the low volume of background traffic in the vicinity of the study area, these additional trips are forecast to have minimal impact on the surrounding road network. The additional construction traffic does not trigger any road or intersection treatments. Should a B-double or larger vehicle need to make a left turn from Blue Springs Road onto Cope Road, this should be included in the construction traffic management plan (CTMP), which would detail if traffic marshalling, alternative routing, etc., would be required for those specific occasions.

– The new proposed project accesses would be constructed as basic rural property accesses, commensurate with the traffic volumes and vehicles expected.

– Parking for staff would be provided onsite for all phases of the project.

– The project is anticipated to have minimal public transport, rail crossing and pedestrian and cycle impacts.

– The cumulative traffic impact from other developments in the area, including the construction of the Wollar Solar Farm and, if approved, the Dunedoo Solar Farm, is considered to be minimal due to the low traffic volumes generated and the alternative routing used by the other developments.

– Once in operation, the project is forecast to generate about 10 vehicles to / from the project in each peak period, which is also forecast to have minimal impact on the road network.

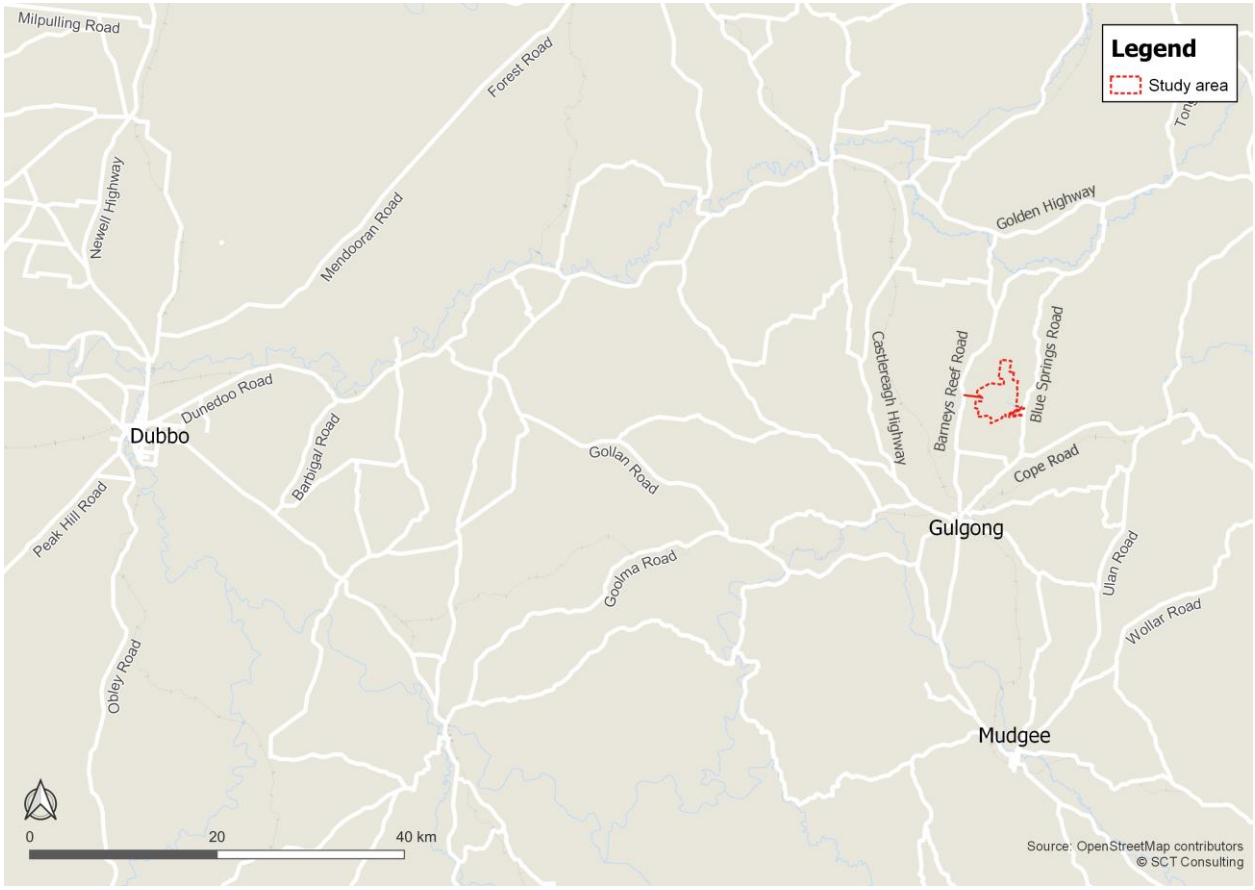
Prior to the commencement of construction of the project, a CTMP would be prepared in consultation with TfNSW and the Mid-Western Regional Council, which would seek to minimise any delays, disruptions, and safety risks and would include details such as temporary traffic management plans, Driver's Code of Conduct, dilapidation survey and controls for transport and use of dangerous goods, etc.

# 1.0 Introduction

## 1.1 Background

UPC Renewables Australia Pty Ltd (UPC) proposes to develop the Stubbo Solar Farm, a grid-connected photovoltaic (PV) solar farm of up to 400 megawatts, located in the New South Wales Central West Orana region (the project). The project is located approximately 90km east of Dubbo, in the Mid-Western Regional Council local government area (LGA). The regional context of the project is presented in **Figure 1–1**.

**Figure 1–1 Study area context**




Source: SCT Consulting, 2020

The project would be located on flat / gently rolling, predominantly cleared agricultural land primarily used for livestock grazing and intermittent cropping, which is consistent with the study area being zoned Primary Production (RU1) under the Mid-Western Regional Local Environmental Plan 2012 (LEP).

Native vegetation remains in the form of scattered trees, vegetation along riparian corridors and isolated areas of remnant vegetation. The proposed development footprint has been designed to avoid or minimise impacting on these creeks to the extent practicable.

The capital value of the project would be in excess of $30 million. Accordingly, the project is a State Significant Development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP SR&D) and Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

## 1.2 Project description

### 1.2.1 Solar farm infrastructure

The project would include the construction, operation and decommissioning of a 400-megawatt solar farm that would supply electricity to the National Electricity Market. Chapter 2 of the EIS provides a comprehensive project description, but key infrastructure for the project would include:

- Single axis tracking photovoltaic modules (solar panels) across the development footprint
- Power conversion units (PCUs)
- Onsite substation containing two main transformers and associated switchgear
- Transmission infrastructure, including:
  - Up to 33-kilovolt overhead and/or underground electrical reticulation connecting the power generating infrastructure to the onsite substation
  - Onsite connection from the substation to the existing 330-kilovolt transmission line (Line 79) operated by TransGrid
- A battery energy storage system (BESS)
- Operational and maintenance ancillary infrastructure including:
  - Staff office, operations and control room, meeting facilities and amenities
  - Car parking
  - A temperature-controlled spare parts storage facility
  - Supervisory control and data acquisition (SCADA) facilities
  - A workshop and associated infrastructure
  - Permanent security fencing
- Access roads, both to the project and internal access roads
- Temporary facilities required during the construction and decommissioning phases, such as:
  - Construction compounds and laydown areas suitable for plant and equipment
  - Site office and amenities
  - Parking areas
  - Containers for storage
  - Access tracks and associated infrastructure, including gates and fencing.

The permanent and temporary components associated with construction and operation would be located within the development footprint for the project, which would cover an area of approximately 1,250 hectares. Designated environmental exclusion zones (EEZ) would be included within the study area, intended to minimise impacts of the development in the areas of highest environmental value. An indicative project layout is provided in **Figure 1–2**.

### 1.2.2 Access

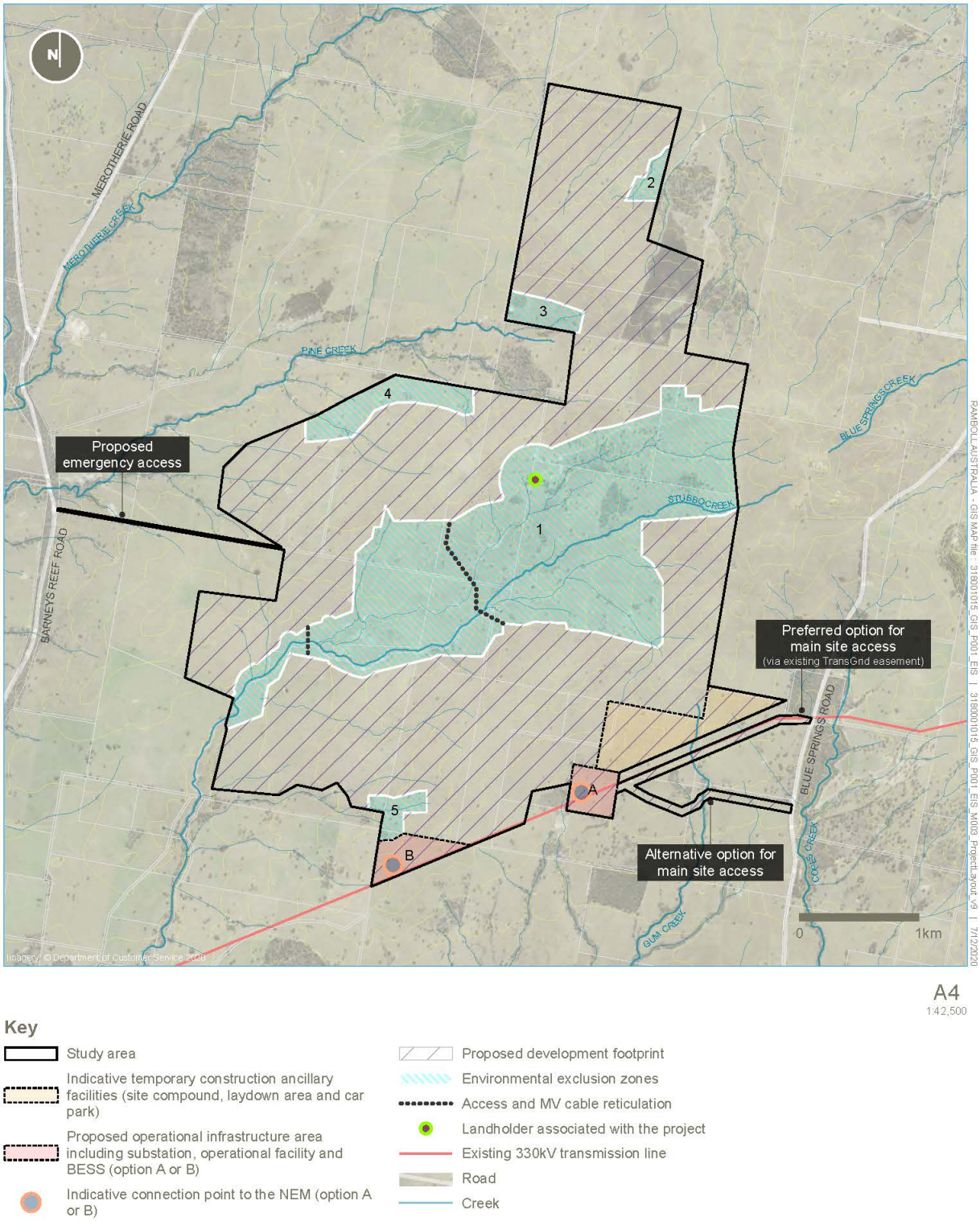
As indicated in the indicative project layout, access is proposed from Blue Springs Road to the east of the study area and from Barneys Reef Road to the west of the study area. The north and south portions of the proposed development footprint would be connected via up to two internal access tracks across the central EEZ.

During construction, it is forecast that construction material would be transported up the Golden Highway, irrespective of if it is coming from Newcastle or Sydney, and then along Ulan Road, Cope Road and Blue Springs Road. The construction workforce is expected to be travel from Gulgong and Mudgee and surrounding towns and localities. Workers would travel through Gulgong and use either Cope Road and Blue Springs Road or Barneys Reef Road to access the study area.

More detail on the trip generation and proposed access routes are provided in **Section 3.0**.

This traffic and transport assessment has also assessed options for heavy vehicles to access the Barneys Reef Road entry to the study area from Cope Road by using Black Lead Lane or Beela Road / Carramar Road / Stubbo Road. These were assessed on traffic considerations only. The main EIS chapter will highlight the proponent's access choice based on other environmental and planning considerations, including social impact, noise impact, community consultation feedback, etc.

**Figure 1–2 Proposed Stubbo Solar Farm layout**




Source: UPC Renewables Australia Pty Ltd, 2020

### 1.2.3 Employees and workforce

#### Construction phase

The construction of the project is expected to commence by early 2022 and last for about two years. It is assumed that the peak construction period could occur in 2023, which is used as the future year for the construction traffic impact assessment.

The project is expected to require up to 400 full time equivalent employees during the peak construction phase. The standard construction hours are planned to be:

– Monday to Friday 7am to 6pm

– Saturday 8am to 1pm

– No work on Sundays or public holidays.

Out of hours work and extended construction hours may be required on limited occasions.

#### Operational phase

The project is expected to require about 10 full time equivalent employees during the operation and ongoing maintenance of the solar farm.

#### Decommissioning phase

The decommissioning phase would be expected to see a reduced labour force and lower traffic generation, with regard to the expected mechanical decommissioning processes, compared to the construction phase.

## 1.3 Assessment methodology and guidelines

To assess the traffic and transport impact of the project, a review of existing conditions was undertaken. This involved undertaking traffic surveys along proposed access routes to the project. Intersection traffic surveys were undertaken on 8 September 2020[1] between 6am and 9am and between 4pm and 7pm. The data was obtained by 15-minute increments and classified by movement and vehicle type (light and heavy vehicles). The following intersections (see **Figure 1–3**), which are on potential haulage route options or on commuting routes for workers during the construction phase, were surveyed:

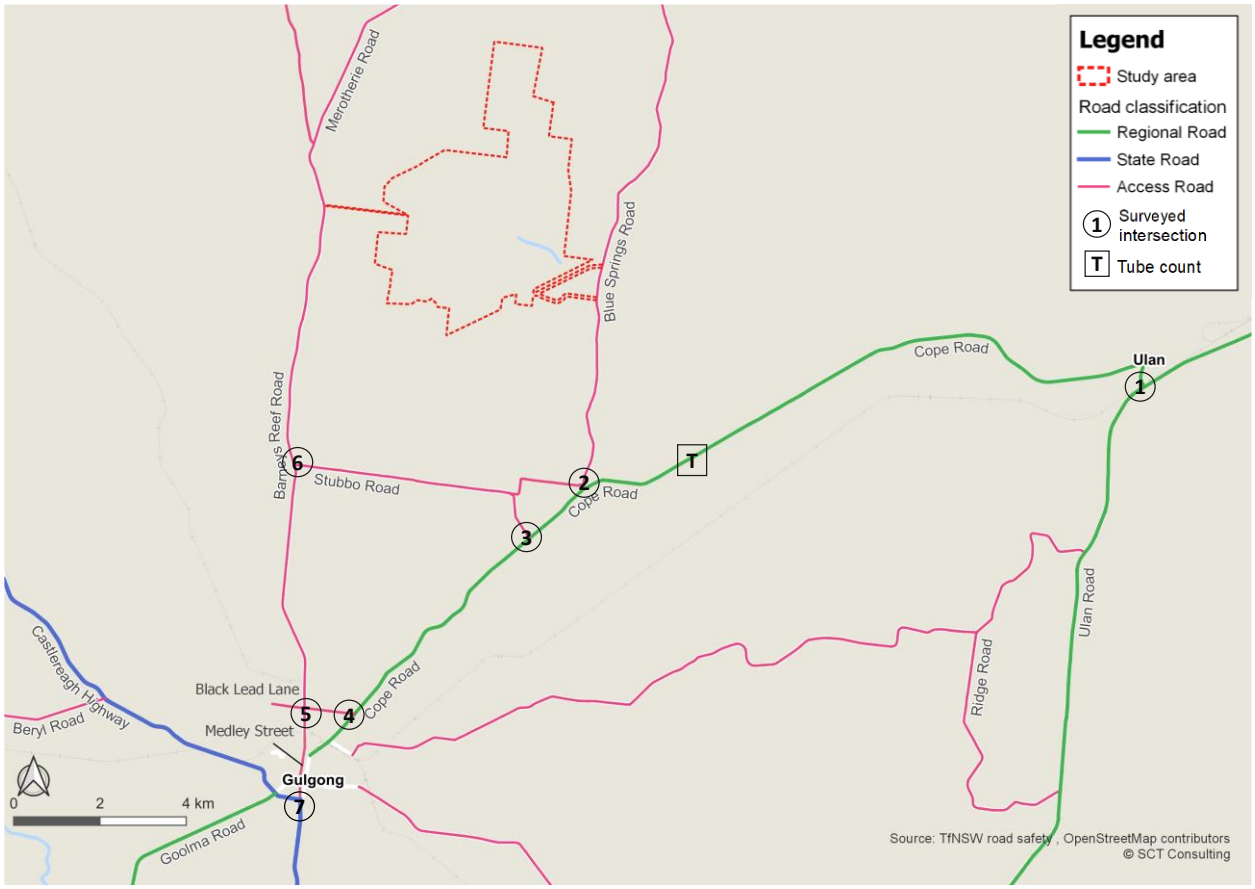
1. Ulan Road / Main Street
2. Cope Road / Blue Springs Road
3. Cope Road / Beela Road
4. Cope Road / Black Lead Lane
5. Barneys Reef Road / Black Lead Lane
6. Barneys Reef Road / Stubbo Road
7. Medley Street / Castlereagh Highway.

Tube count equipment was also installed on Cope Road, about 1.7km to the west of Blue Springs Road intersection (see **Figure 1–3**) from 8 September to 14 September 2020, to capture a 7-day, 24-hour mid-block traffic demand profile. The data was obtained by 15-minute increments and classified by direction and Austroads vehicle classes.

This traffic survey data was collected to establish a robust baseline for the traffic impact assessment. Future year traffic generation was estimated for the construction, operation, and decommissioning phases and an analysis of the future year conditions with and without the project was undertaken. This enabled an assessment to be made if any mitigation measures were required as a result of the project impact.

[1] Ulan Road / Main Street and Barneys Reef Road / Black Lead Lane adopts traffic volume collected on 9 September 2020 given equipment error for counts collected on 8 September 2020. The ATC weekly traffic profile on Cope Road indicates a very similar peak hour demand for 8 and 9 September (see Figure 2-11). Therefore, all intersection traffic volumes are presented as representing the same day (8 September 2020).

**Figure 1–3 Survey locations**




Source: SCT Consulting, 2020

As the traffic volumes at the intersections are generally low compared to the capacity of the roads and intersections, intersection level of service based on delay is not an appropriate measure of impact in the project location. The traffic volumes are also low compared to the mid-block capacity of the roadways, and so roadway level of service based on the volume to capacity ratio is not an appropriate measure of impact in the project location.

The focus of the traffic impact assessment was therefore on the following two criteria:

– Road width design: *Austroads Guide to Road Design Part 3 Geometric Design* specifies road width design standards for low volume (generally rural) roads, based on daily traffic volumes

– Intersection turning bays: *Austroads Guide to Road Design Part 4: Intersections and Crossings: General* specifies the need for additional intersection turning bays at an intersection, based on a combination of peak hour through and turning traffic movements.

The following guidelines were used in carrying out this assessment.

– *Guide to Traffic Generating Developments version 2.2* (RTA 2002)

– *Austroads Guide to Road Design Part 3: Geometric Design* (Austroads 2016)

– *Austroads Guide to Road Design Part 4: Intersections and Crossings: General* (Austroads 2017)

– *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development* (Austroads 2016).

## 1.4 SEARs and agency submissions

In preparing this traffic and transport assessment, the Secretary's Environmental Assessment Requirements (SEARs), issued for the project (SSD 10452) on 5 May 2020, have been addressed. The key matters raised by the SEARs for consideration in the traffic and transport assessment and where this report addresses these matters are outlined in **Table 1-1**.

**Table 1-1 Issued SEARS and where addressed in this report**

| Requirement | Section Addressed |
|---|---|
| An assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation | Section 4.1 |
| An assessment of the likely transport impacts to the site access route (including, but not limited to, Castlereagh Highway, Cope Road, Barneys Reef Road, Blue Springs Road and Merotherie Road), site access point, any Crown land, particularly in relation to the capacity and condition of the roads | Section 5 |
| A cumulative impact assessment of traffic from nearby developments (including cumulative impacts from Wollar Solar Farms and the proposed Dunedoo Solar Farm) | Section 5.8 |
| A description of any proposed road upgrades developed in consultation with the relevant road and rail authorities (if required) | Section 5 and 6 |
| A description of the measures that would be implemented to mitigate any transport impacts during construction | Section 6.2 |

In addition, agency letters that accompanied the SEARs, and were applicable to traffic and transport, were issued by Mid-Western Regional Council and Transport for NSW. Details of how these matters were addressed in this assessment are included as **Appendix A**.

## 1.5 Report structure

This report has been structured into the following sections:

- **Section 2** describes the existing transport conditions for all modes of transport
- **Section 3** forecasts the likely trip generation, access routes, and parking demand due to the project
- **Section 4** describes the likely traffic and transport impacts due to the project
- **Section 5** discusses mitigation measures, including any road and intersection treatments associated with the project
- **Section 6** summarises the assessment and presents conclusions.

# 2.0 Existing conditions

The purpose of this chapter is to provide an understanding of the current traffic and transport conditions in the vicinity of the project, which is located within in the Mid-Western Regional Council LGA.

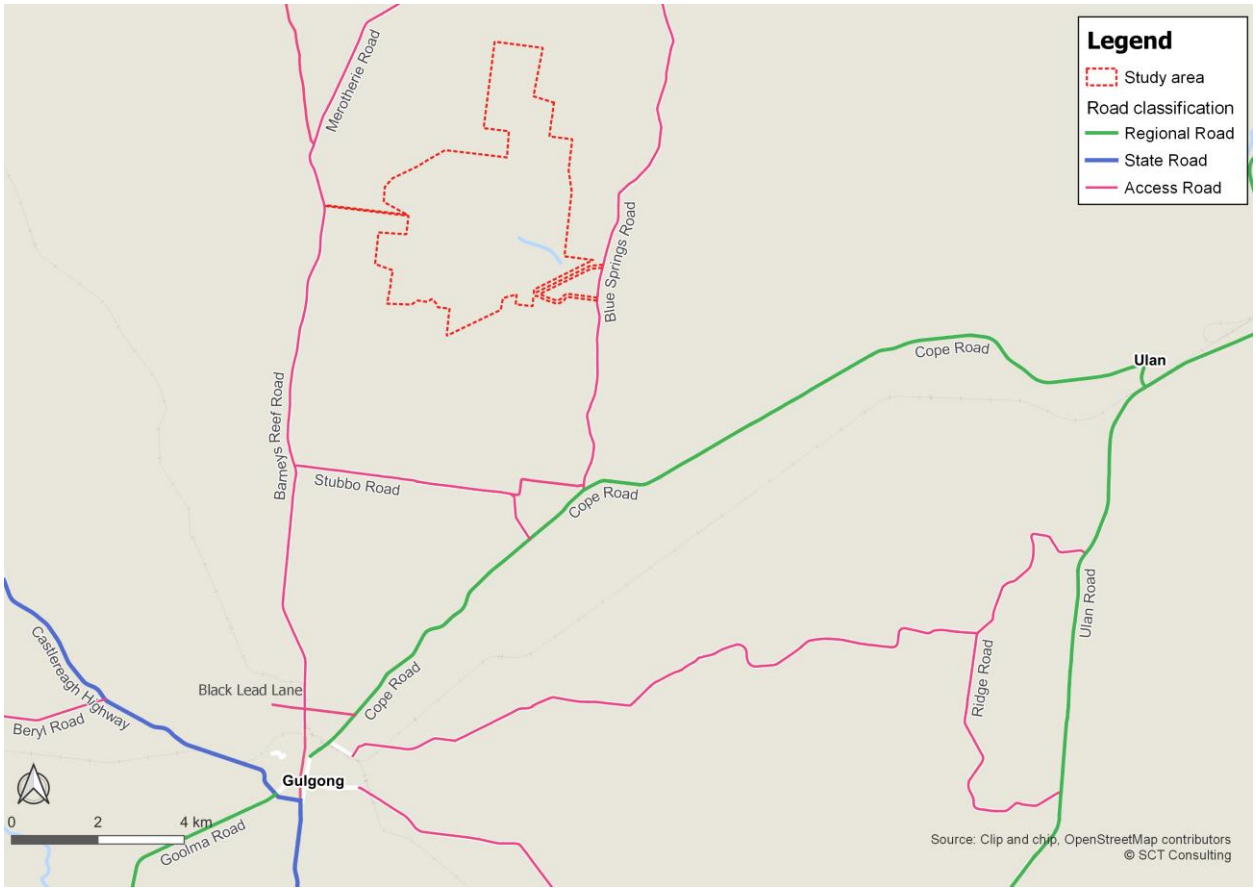
Traffic accessing the project from Sydney or Newcastle would use the Golden Highway, Ulan Road, Cope Road and then either Blue Springs Road or Barneys Reef Road (via Stubbo Road / Carramar Road / Beela Road or Black Lead Lane), while traffic from Mudgee would use the Castlereagh Highway, travel through Gulgong and then use either Barneys Reef Road or Cope Road and Blue Springs Road. Therefore, the focus of this existing conditions review is on these access routes.

While Merotherie Road is listed for assessment in the SEARs, it is not proposed to be used for access to the study area and so it has not been included in the assessment. The Golden Highway is fairly distant from the study area and the impact of any project-generated traffic will be minimal compared to the existing traffic volumes and available capacity, and so it has also not been included in the assessment.

## 2.1 Road network

A radial road network from the township of Gulgong exists, as shown in **Figure 2–1**.

**Figure 2–1 Road network around the site**




Source: SCT Consulting, 2020

The roads providing access to the proposed site are:

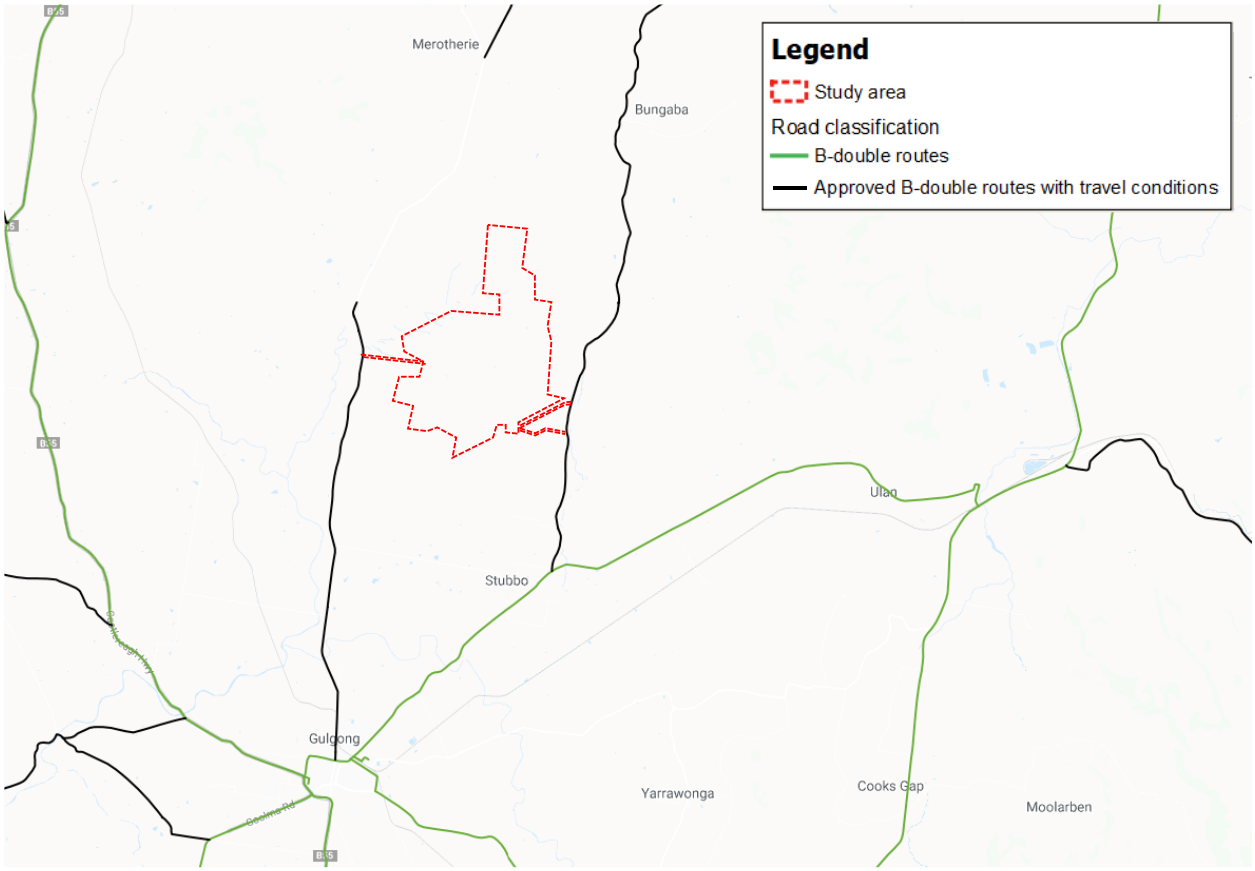
- **Castlereagh Highway** is a state road (B55) passing by Gulgong to the southwest of the town. It has one lane in each direction and intersects with Medley Street in Gulgong. The signposted speed limit within Gulgong is 50km/h, which rises to 80km/h outside of Gulgong. This road would be used for workers commuting between the project and their accommodation in Mudgee.
- **Ulan Road** is a regional road between Mudgee in the south and the Golden Highway in the north. This sealed road has one lane in each direction with a carriageway width of 10m. It forms a T-intersection with Main Street / Cope Road near Ulan Village. Construction heavy vehicle traffic from Newcastle and Sydney would use this road to access the site.
- **Main Street** / **Cope Road**, a regional road, starts from Ulan Road in the east and ends in Stubbo in the west. This sealed road has one lane in each direction. The centre line is marked in most sections whereas road edge lines are only provided between Blue Springs Road and Gulgong. Main Street in Ulan Village contains a school zone, while Cope Road has a variable signposted speed limit from 50-100km/h for different segments of the road. There is a railway crossing on Main Street, just north of Ulan Road, and on Cope Street on the approach to Gulgong.
- **Blue Springs Road** is a local access road starting from Cope Road in the south and provides sealed access to the project from the east. The unsealed section starts from about 8km north of the site and extends to the Golden Highway to the north. It has no centre line or road edge markings.
- **Barneys Reef Road** is a local access road, which extends from Medley Street in Gulgong to Merotherie Road (unsealed) to the north. It provides sealed access to the project from the west. There are minimal centre line or road edge markings. There is a railway crossing on Barneys Reef Road between Racecourse Road and Prosperity Lane.
- **Stubbo Road / Carramar Road / Beela Road** are connected local access roads to the south of the project connecting Blue Springs Road and Barneys Reef Road in the form of two T-intersections. They are unsealed roads that provide a potential route for project-related traffic travelling from / to the western study area access point.
- **Black Lead Lane** is a local access road on the northern periphery of Gulgong connecting Blue Springs Road and Barneys Reef Road. There are no centre line or road edge markings on this sealed road. A railway crossing exists close to the intersection with Barneys Reef Road. It provides a potential sealed route for project-related traffic travelling from / to the western study area access point.

**Figure 2–2** illustrates the approved B-double routes for the road network in the vicinity of the project from the TfNSW Restricted Vehicle Access map[2]. The map indicates that the proposed heavy vehicle route – via Ulan Road, Cope Road and Blue Springs Road or Barneys Reef Road – would occur along on designated B-double routes. Therefore, truck turning circles at intersections should be able to be accommodated along the proposed haulage route.

The only restriction noted is that the left-out movement from Blue Springs Road to Cope Road is prohibited for a 19m B-double or larger vehicle due to the existing skewed intersection geometry.

[2] https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html

**Figure 2–2 Restricted access vehicle map**




Source: TfNSW, 2020

## 2.2 Existing traffic conditions

### 2.2.1 Intersection layout and geometry

All the key intersections are priority intersections and their layouts are shown in **Figure 2–3** to **Figure 2–9** (the relevant intersection is highlighted in red in each network view).

Basic left turn / right turn treatments currently exist at the intersections, except for the Ulan Road / Main Street intersection, where auxiliary turning lanes are provided for the right turn and left turn on Ulan Road.

**Figure 2–3 Ulan Road / Main Street**


Source: Six maps, 2020

**Figure 2–4 Cope Road / Blue Springs Road**


Source: Six maps, 2020

**Figure 2–5 Cope Road / Beela Road**


Source: Six maps, 2020

**Figure 2–6 Cope Road / Black Lead Lane**


Source: Six maps, 2020

**Figure 2–7 Barneys Reef Road / Black Lead Lane**


Source: Six maps, 2020

**Figure 2–8 Barneys Reef Road / Stubbo Road**


Source: Six maps, 2020

**Figure 2–9 Medley Street / Castlereagh Highway**


Source: Six maps, 2020

### 2.2.2 Safe intersection sight distance review

The safe intersection sight distance (SISD) is the minimum sight distance that should be provided on the major road at any intersection. Due to the intersection of Cope Road and Blue Springs Road being the main convergence point for construction traffic, and the presence of a bend in Cope Road, a SISD assessment was undertaken at this intersection.

Based on *Austroads Guide to Road Design Part 4A*, and using a rule-of-thumb assumption of 10 per cent more than the speed limit for the 85th percentile speed, the sight distance at the existing Cope Road / Blue Springs Road intersection was assessed as follows:

– Assuming a speed limit of 100km/h (85th percentile operating speed of 110km/h), the required sight distance from Blue Springs Road would need to be about 256m.

– Assuming a speed limit of 80km/h (85th percentile operating speed of 88km/h), the required sight distance from Blue Springs Road would be about 188m.

– Assuming a speed limit of 70km/h (85th percentile operating speed of 77km/h), the required sight distance from Blue Springs Road would be about 158m.

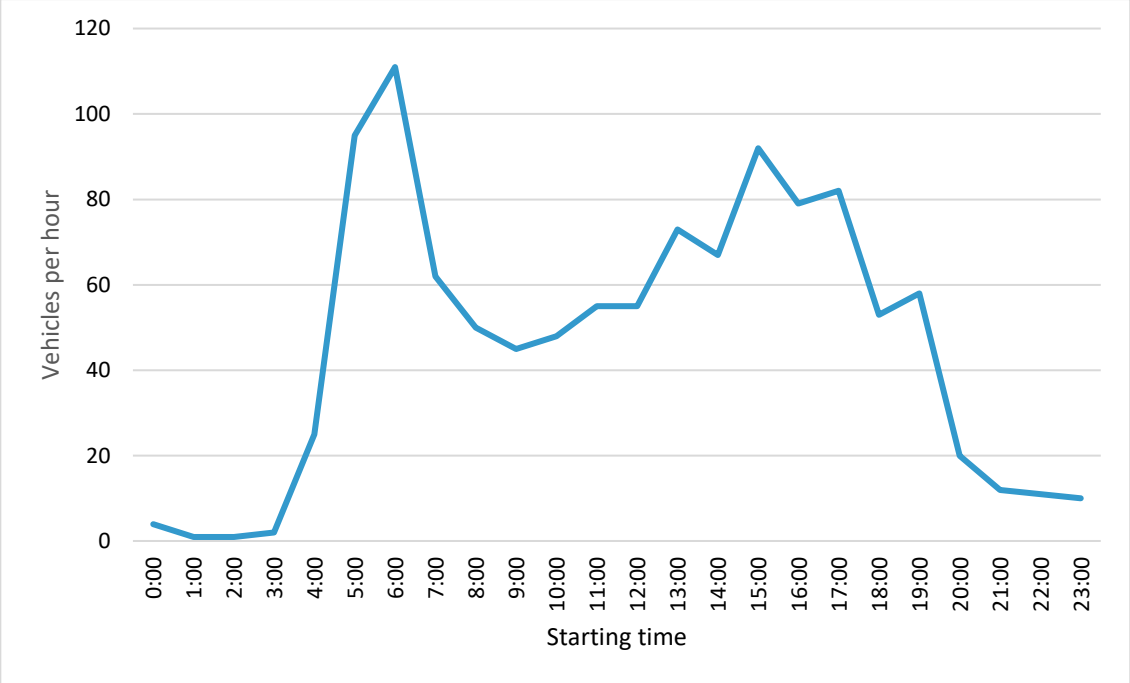
Depending on the extent of tree foliage / growth along the northern side of Cope Road either side of Blue Springs Road, some tree trimming or removal may be required to ensure SISD requirements and / or the speed limit on the Cope Road approach to the Blue Springs Road intersection may need to be reduced on the approaches to the intersection. This is required irrespective of the project development and should be confirmed in further project stages.

### 2.2.3 Traffic volumes and design standards

Baseline traffic volumes

**Figure 2–10** illustrates the daily profile on Cope Road, which shows a shorter AM peak period and a longer PM peak period. Based on the aggregated traffic demand for all surveyed intersections, 6-7am and 4-5pm were identified as the AM and PM peak hours, respectively, with the highest network traffic demand.

**Figure 2–10 Daily traffic demand profile on Cope Road**




Source: SCT Consulting, based on Matrix traffic survey data, 2020

The surveyed peak hour traffic volumes for key intersections around the development footprint are shown in **Table 2-1**.

**Table 2-1 Existing intersection peak hour traffic volumes**

| Intersection | Peak hour | Major Road (a) | | | Minor Road (b) | | |
|---|---|---|---|---|---|---|---|
| | | Total vehicle | Heavy vehicle | % of heavy vehicle | Total vehicle | Heavy vehicle | % of heavy vehicle |
| Ulan Road (a) / Main Street (b) | AM | 473 | 13 | 3% | 117 | 10 | 9% |
| | PM | 326 | 19 | 6% | 34 | 6 | 18% |
| Cope Road (a) / Blue Springs Road (b) | AM | 110 | 13 | 12% | 8 | 0 | 0% |
| | PM | 87 | 7 | 8% | 7 | 2 | 29% |
| Cope Road (a) / Beela Road (b) | AM | 117 | 14 | 12% | 2 | 0 | 0% |
| | PM | 98 | 9 | 9% | 2 | 0 | 0% |
| Cope Road (a) / Black Lead Lane (b) / Happy Valley (b) | AM | 105 | 10 | 10% | 4 | 0 | 0% |
| | PM | 130 | 8 | 6% | 7 | 1 | 14% |
| Barneys Reef Road (a) / Black Lead Lane (b) | AM | 20 | 1 | 5% | 1 | 0 | 0% |
| | PM | 44 | 2 | 5% | 4 | 0 | 0% |

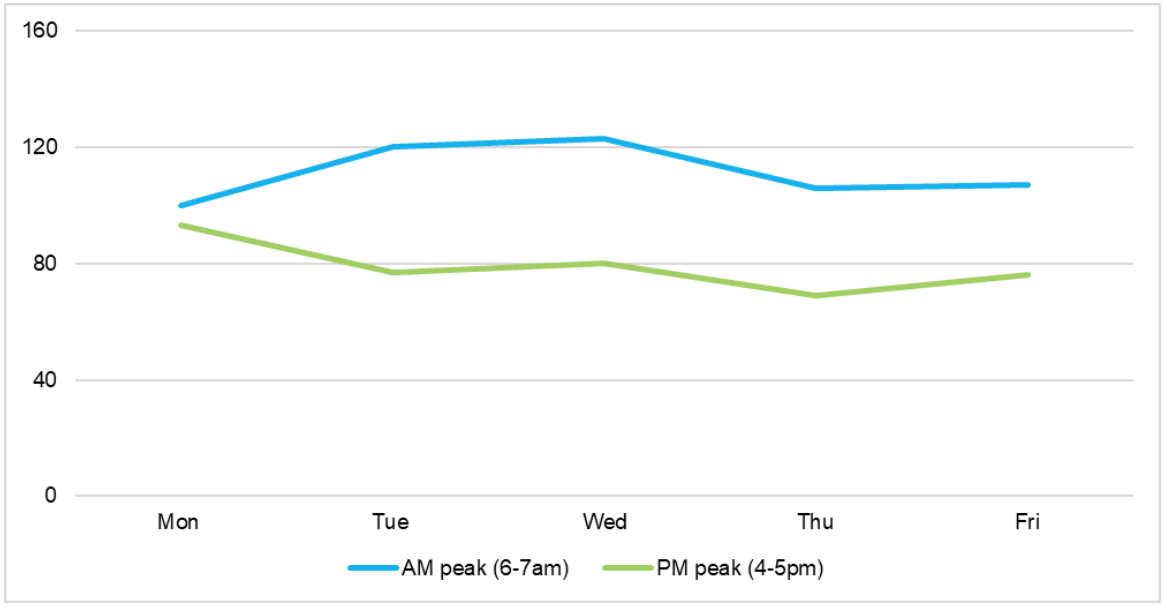
| Intersection | Peak hour | Major Road (a) | | | Minor Road (b) | | |
|---|---|---|---|---|---|---|---|
| | | Total vehicle | Heavy vehicle | % of heavy vehicle | Total vehicle | Heavy vehicle | % of heavy vehicle |
| Barneys Reef Road (a) / Stubbo Road (b) | AM | 8 | 1 | 13% | 0 | 0 | - |
| | PM | 15 | 2 | 13% | 4 | 1 | 25% |
| Medley Street (b) / Castlereagh Highway (a) | AM | 61 | 15 | 25% | 36 | 5 | 14% |
| | PM | 139 | 13 | 9% | 67 | 2 | 3% |

Source: SCT Consulting, based on Matrix traffic survey data, 2020

Using the weeklong data from the Cope Road traffic survey, the variation of weekday peak hour traffic volume on Cope Road is shown in **Figure 2–11**. This indicates there is no significant difference in peak hour traffic volume across the weekdays, with an average demand of about 110 vehicles (five heavy vehicles) in the AM peak hour and 80 vehicles (two heavy vehicles) in the PM peak hour. There is an average heavy vehicle percentage of 5 per cent in the AM peak hour and 2.5 per cent in the PM peak hour.

From the Cope Road traffic survey data, the average peak hour to daily traffic volume factor was about nine per cent for the weekdays, based on an average of about 1,110 vehicles per day. Historical TfNSW (formerly RMS) traffic data for major roads in NSW over the past three to four decades indicates the ratio of peak hour to daily traffic volume is between about 10 per cent and eight per cent. It was therefore conservatively assumed that the peak hour to daily traffic volume ratio for the roads in the area was at the higher end of this range (10%), and this ratio was applied for all the roads where daily traffic volumes have been estimated for this EIS.

**Figure 2–11 Variation of peak hour traffic volume on Cope Road**




Source: SCT Consulting, based on Matrix traffic survey data, 2020

## Roadway design standards

*Austroads Guide to Road Design Part 3 Geometric Design* specifies road width design standards for low volume (generally rural) roads based on daily traffic volumes. The corresponding design standards, based on 2020 surveyed traffic volume for the rural roads around the site, are shown in **Table 2-2**.

It is noted that, even though the current daily traffic volume on Blue Springs Road is greater than 150 vehicles per day, the sealed road width on Blue Springs Road varies between 4m and 6m, which is less than the 7.2m sealed width recommended in the Austroads guidance.

**Table 2-2 Daily traffic volumes and corresponding design standards**

| Daily traffic volume category | Applicable roads | Existing daily traffic volume | Austroads (2016) design standards* |
|---|---|---|---|
| 1-150 vehicles | Beela Rd / Stubbo Rd | 41 | 8.7m wide total carriageway (if unsealed); or minimum 3.7m wide seal |
| | Black Lead Lane | 128 | |
| 150-500 vehicles | Blue Springs Rd | 174 | Minimum 7.2m wide seal |
| | Barneys Reef Rd | 390 | |
| 500-1,000 vehicles | N/A | - | Minimum 7.2m – 8m wide seal |
| 1,000-3,000 vehicles | Cope Rd | 1,239 | Minimum 9m wide seal |
| | Main St | 1,483 | |
| >3,000 vehicles | Ulan Rd | 5,304 | Minimum 10m wide seal |

Source: SCT Consulting, based on Matrix traffic survey data, 2020

*Austroads Guide to Road Design Part 3, Table 4.5

## Warrants for intersection improvements

*Austroads Guide to Road Design Part 4: Intersections and Crossings: General* specifies warrants for additional intersection turning bays at an intersection, based on a combination of peak hour through and turning traffic movements. As shown in **Figure 2–12**, there are two separate design curves for roads with design speeds either 100 km/h and greater, or lower than 100 km/h:

– For design speeds 100 km/h or greater, additional left or right turn traffic lanes are only required where the major road peak hourly traffic volume exceeds 120 vehicles per hour and the minor road traffic also exceeds the level shown in the upper warrant chart (a).

– For design speeds lower than 100 km/h, additional left or right turn traffic lanes are only required where the major road peak hourly traffic volume exceeds 170 vehicles per hour and the minor road traffic also exceeds the level shown in the lower warrant chart (b).

Existing peak hour turning traffic movements at the key intersections were assessed against these warrants. The assessment considered the worst case between the AM and PM peak hours. The assessment of the existing intersection layout and traffic volumes indicated that no upgrades are currently required.

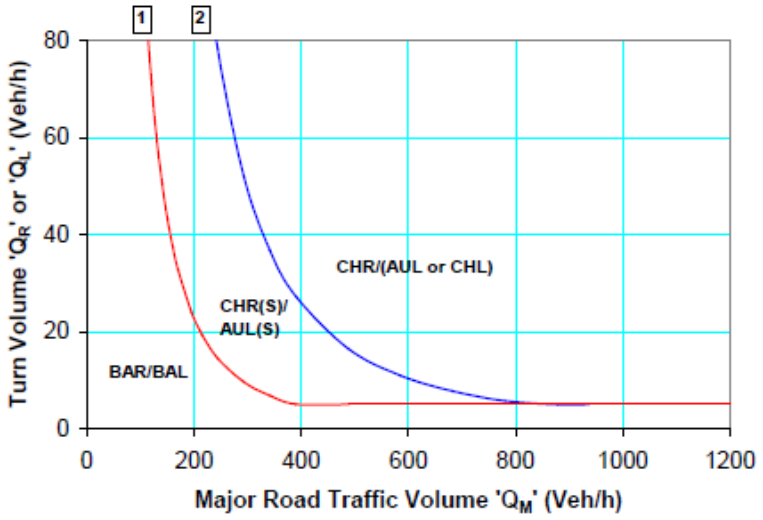
The assessment showed that:

– The traffic volumes at the Ulan Road / Main Street intersection warrants a dedicated left turn lane (auxiliary left turn or channelised left turn) and right turn lane (channelised right turn), which is already provided in the current intersection configuration.

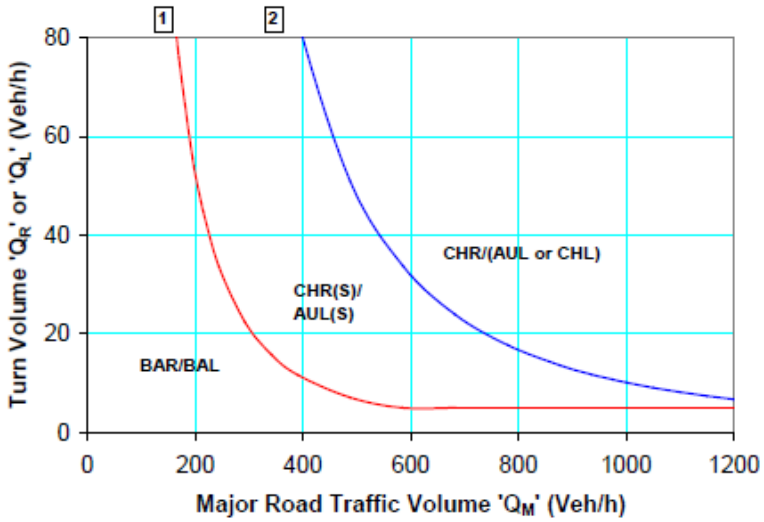
– The other intersections assessed require the basic rural intersection configuration without the need for dedicated left or right turn lanes, which is what is currently provided.

The intersection of Castlereagh Highway / Medley Street was not assessed, as the project-related traffic would only generate through movements and not turning movements.

**Figure 2–12 Warrants for turn treatments on the major road at unsignalised intersections**



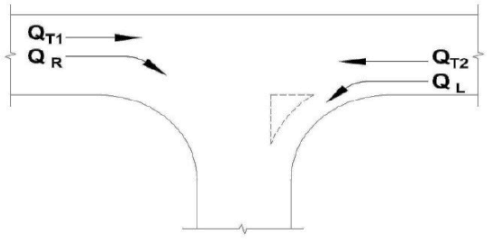

(a) Design speed ≥ 100 km/h




(b) Design speed < 100 km/h

Note:
BA = Basic Turn Treatments (R = Right, L = Left)
AU = Rural Auxiliary Lane Turn Treatments (R = Right, L = Left)
CH = Channelised Turn Treatments (R = Right, L = Left)

**Calculation of the major road traffic volume parameter QM**




| *Turn type* | *Splitter island* | *$Q_m$ (veh/h)* |
|---|---|---|
| *Right* | *No* | *= $Q_{T1}$ + $Q_{T2}$+$Q_L$* |
| *Right* | *Yes* | *= $Q_{T1}$ + $Q_{T2}$* |
| *Left* | *No/yes* | *= $Q_{T2}$* |

Source: Austroads Part 4 Intersection Design Standards, 2017

## 2.3 Crash data

Existing road crash data was sourced from the TfNSW road safety website[3]. The latest five-year period available was between 2014 and 2018. Only reported accidents are documented within the interactive accident history database, which are categorised into five levels of casualty severity (**Figure 2–13**):

– Killed

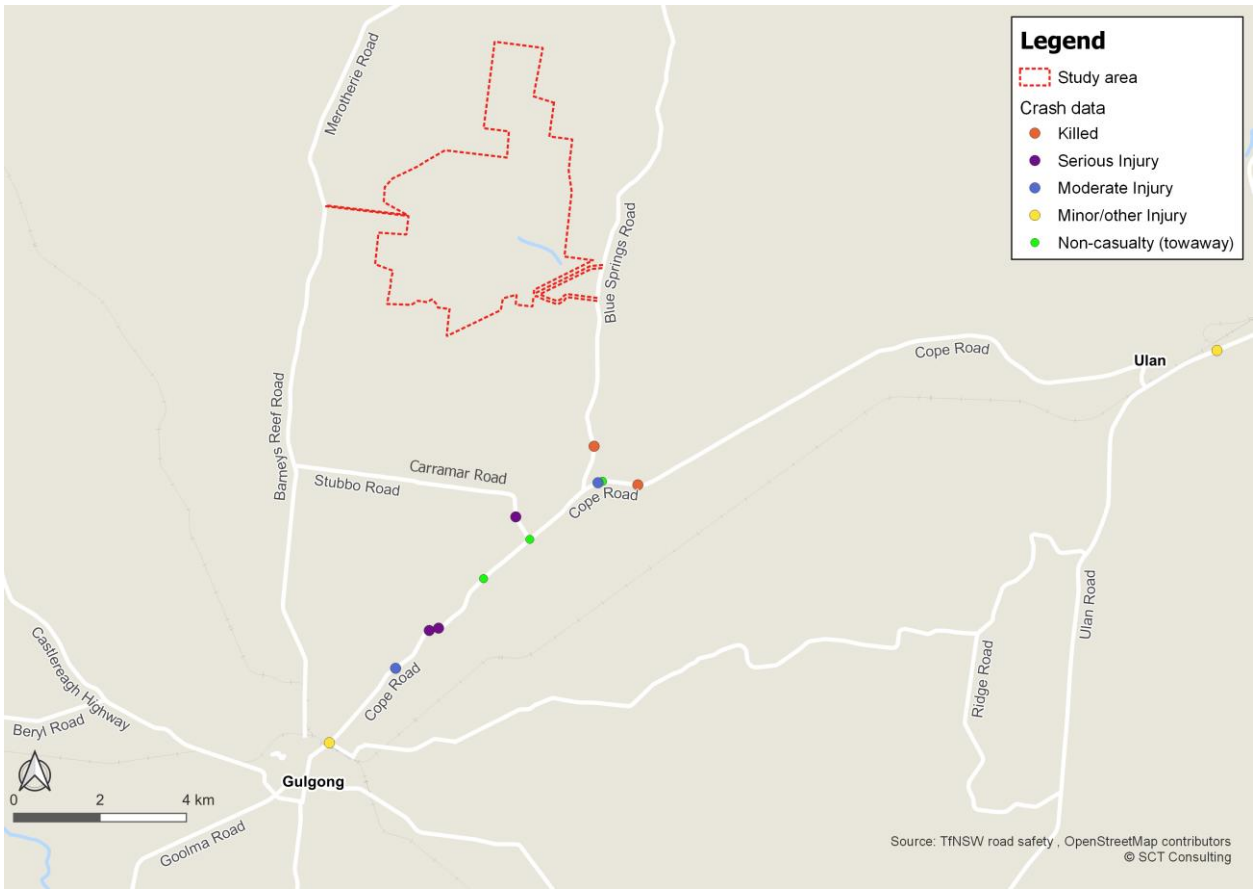
– Seriously injured

– Moderately injured

– Minor / other injured

– Non-casualty (towaway).

**Figure 2–13 Crash data in the vicinity of the project (2014-2018)**




Source: SCT Consulting, based on TfNSW crash data, 2020

The results show that Cope Road recorded four serious and moderate injuries over the five-year period between the vicinity of Blue Springs Road and Gulgong, while Carramar Road recorded one serious injury in 2014. Two fatal crashes took place in the area during the five-year period (in 2018) – one on Blue Springs Road and one on Cope Road (west of Blue Springs Road), which is a relatively high proportion of fatal accidents in comparison with the NSW average.

**Table 2-3** presents a summary of the fatal and seriously injured accidents in the vicinity of the development footprint. None of the fatal cases appear to be intersection-related, as they are about a kilometre away from the intersection, and the main cause of the accidents appears to be driver error or vehicles not travelling to the conditions of the road carriageway.

[3] https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/nsw.html?tabnsw=3

Table 2-3 Crash data analysis (ranked as Fatal and Serious Injury only)

| Location | Year | Severity | RUM* code | Description |
|---|---|---|---|---|
| Blue Springs Road (c. 1km to the north of Cope Road) | 2018 | Fatal | 82 | Off carriage way right on right bend |
| Cope Road (c. 1km to the east of Blue Springs Road Road) | 2018 | Fatal | 71 | Left off carriageway into object / parked vehicle |
| Cope Road (c. 700m to the east of Whitehouse Road) | 2014 | Serious Injury | 71 | Left off carriageway into object / parked vehicle |
| Cope Road (c. 550m to the east of Whitehouse Road) | 2014 | Serious Injury | 87 | Off carriage way left on left bend into object / parked vehicle |
| Carramar Road (c. 560m to the northwest of Cope Road) | 2014 | Serious Injury | 71 | Left off carriageway into object / parked vehicle |

Source: SCT Consulting, based on TfNSW crash data, 2020

*Road User Movement referenced from *Definitions and notes to support road crash data, TfNSW, 2019*

## 2.4 Rail crossings

As described in **Section 2.1**, some roads have level crossings including Barneys Reef Road, Black Lead Lane, Cope Road and Main Street.

The rail network to the south of the study area is owned by the Australian Rail Track Corporation (ARTC) and is part of the Sandy Hollow-Gulgong railway line[4], crossing Main Street about 40m from Ulan Road. The current train timetable for the corridor shows one train every 30 minutes or up to three trains per hour[5]. Previous traffic assessments in the area have estimated the probability of delay at this crossing location at 1.24 per cent[6] given the low train frequency.

At the time of writing this report, there is no evidence showing the rail track to the west of Gulgong, which includes level crossings on Cope Road / Station Street, Barneys Reef Road and Black Lead Lane, is in use.

## 2.5 Parking

There are no formal parking facilities in the vicinity of the study area given the rural nature of the area.

## 2.6 Active transport

There are no active transport facilities in the vicinity of the study area given the rural nature of the area. The absence of footpaths means that walking on the road verge may occur.

## 2.7 Public transport / school transport

There are no regular public bus services in the vicinity of the development footprint.

Eastend Bus Service operates several school-bus services to and from Gulgong, one of which travels in a loop along Cope Road, Blue Springs Road, Merotherie Road and Barneys Reef Road, with associated school bus stops located along the route.

[4] The Sandy Hollow-Gulgong line is in the central north of NSW, and forms a cross-country link between the Main North Line and the Gwabegar Line
[5] Ontoit (2018), Wollar Solar Farm Traffic Impact Assessment
[6] GTA (2015), Moolarben Coal Complex UG1 Optimisation Modification Road Transport Assessment

# 3.0 Traffic generation, access routes and parking demand

## 3.1 Traffic generation

There are no specific generation rates for a solar farm in the TfNSW trip generation guidelines. The traffic generation was therefore determined through the forecast employee, workforce and construction vehicles, which would cover the construction phase, operation phase and decommissioning phase for the proposed solar farm.

### 3.1.1 Construction phase

Based on conservative assumptions, the two-year construction phase of the solar farm is expected to generate the following peak construction traffic demand for the site:

– 60 heavy vehicles per day

– Up to 400 employees per day, who would likely travel in a combination of individual vehicles and minivans / shuttle buses. As part of the construction traffic management plan (CTMP), the contractor may consider providing minivans for moving non-local workers to site from the more populated townships, thus reducing the number of light vehicle movements. This impact assessment assumes no minivans /shuttle buses and is therefore based on a conservative assumption for light vehicle movements. Assuming sharing of private vehicles by construction staff staying in Gulgong or Mudgee, it is forecast that 230 light vehicles per day would be generated to transport construction staff.

– 20 over dimensional vehicles would access the site during construction, operation and maintenance phases of the project.

The vehicle movements would peak during 2023 of the construction phase, when the majority of PV modules are being delivered to site and the peak workforce numbers are reached. These traffic generation numbers also include other construction materials, such as gravel, sand, concrete, water trucks, etc. On either side of this peak time period, the vehicle movements would be fewer, as the level of activity and number of deliveries would be ramping up/down.

The daily trip generation and peak hour trip generation are summarised in **Table 3-1**. This indicates six heavy vehicles entering and six heavy vehicles leaving the site in each peak hour, and 230 cars entering the site in the AM peak hour and 230 cars leaving the site in the PM peak hour.

**Table 3-1 Traffic generation for peak construction phase**

| Vehicle type | Daily trips | Estimated peak hour trips | Assumption |
|---|---|---|---|
| Heavy vehicles | 60 vehicles*2=120 trips | 12 trips | • One vehicle generates two trips per day given vehicles do not stay on site over night<br>• 10% of the daily estimated goods vehicle trips are made in the peak hour. |
| Light vehicles (private cars used by staff) | 230 vehicles*2=460 trips | 230 trips | • Based on ~1.75 staff per car<br>• All staff arrive / leave during peak hour |
| **Total** | **580 trips** | **242 trips** | |

### 3.1.2 Operation phase

There is significantly less traffic during the operational phase than the construction phase.

A total of 10 operational staff is forecast to generate 20 daily light vehicle trips. It is assumed that 10 cars would enter the site during AM peak hour and 10 cars would leave the site in the PM peak hour respectively, assuming a worst case that staff do not share cars.

Heavy vehicles would be required only for infrequent repairs and maintenance.

### 3.1.3 Decommissioning phase

The decommissioning phase would see lower traffic generation with regard to the expected mechanical decommissioning processes and reduced labour force compared to the construction phase.

## 3.2 Access routes

As described in **Section 1.2**, the study area is separated into a north and south portion. The south portion is proposed to be accessed from Blue Springs Road, while the north portion is proposed (for the purpose of this assessment) to be accessed from Barneys Reef Road or from Blue Springs Road via an internal access. The access options assessed in this report are outlined below. These options were assessed on traffic considerations only. The main EIS chapter will highlight the proponent's access choice based on other environmental and planning considerations, including social impact, noise impact, community consultation feedback, etc.

### 3.2.1 Heavy vehicle route

Most of the heavy vehicles carrying large component logistics, such as solar panels, would come from Newcastle Port. Some heavy vehicles may also come from Sydney. However, due to steep grades on the route from Sydney to the Castlereagh Highway, it is forecast that construction material would be transported up the Golden Highway, irrespective of whether it is coming from Newcastle or Sydney.

The route to the **south portion** of the study area for heavy vehicles would be Golden Highway → Ulan Road → Cope Road → Blue Springs Road.

The route to the **north portion** of the study area for heavy vehicles would be the same from the Golden Highway to Cope Road, but with three options from the Blue Springs Road / Cope Road intersection that have been assessed for consideration:

– **Option 1**: 100% using Blue Springs Road → internal site roads

– **Option 2**: 75% using Blue Springs Road → internal site roads and 25% using Cope Road → Black Lead Lane → Barneys Reef Road

– **Option 3**: 75% using Blue Springs Road → internal site roads and 25% using Cope Road → Beela Road / Carramar Road / Stubbo Road → Barneys Reef Road.

The traffic distribution for construction heavy vehicles is indicated in **Figure 3–1** to **Figure 3–3**.

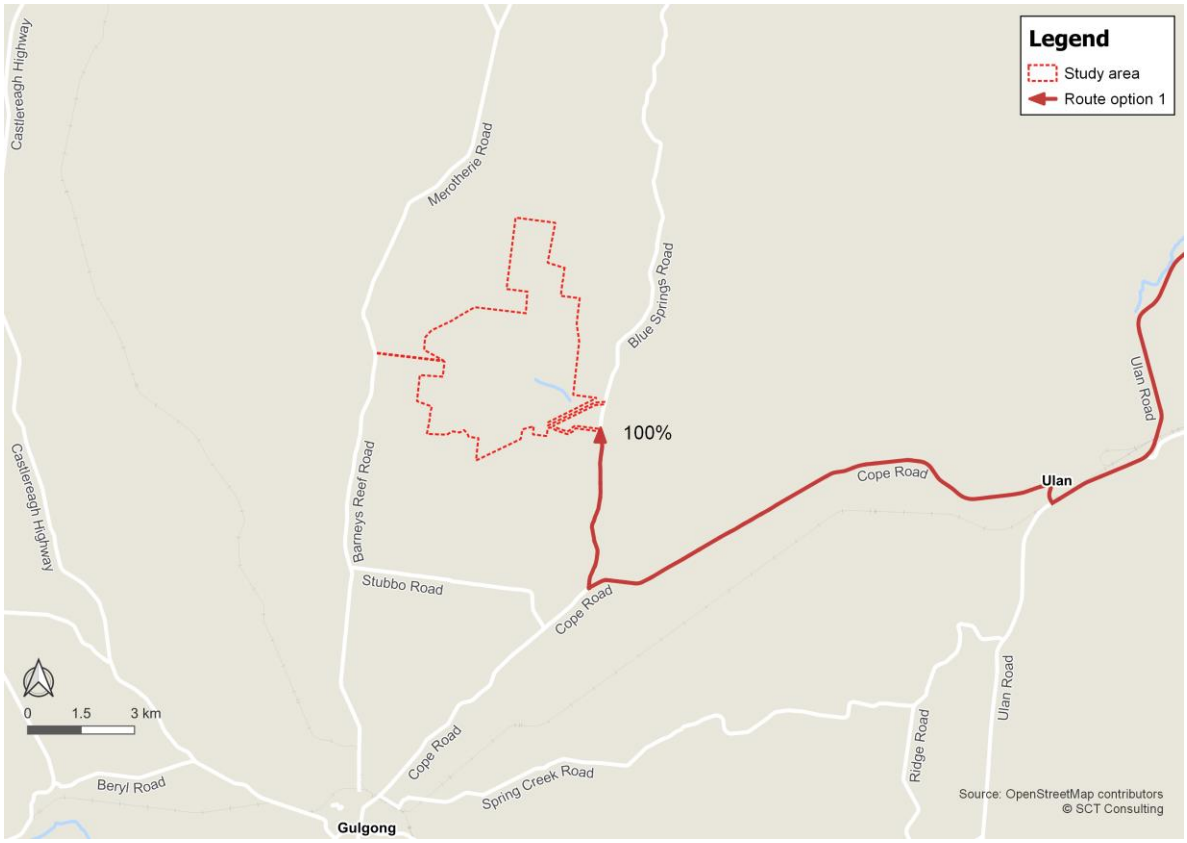
### 3.2.2 Light vehicle route

For the purpose of the traffic assessment, about 10 per cent of the construction workforce are expected to be generated from Gulgong and about 90 per cent from Mudgee. The methodology for this impact assessment assumed the workforce would choose an access route depending on which portion of the project they were working on. Combined with the forecast peak construction demands of each portion (about 75% and 25% for the south and north portion respectively), the workforce traffic distribution during construction is summarised in **Table 3-2**. These workforce location assumptions are subject to confirmation of the final social impact assessment outcomes.

**Table 3-2 Traffic generation and distribution for workforce private cars during construction phase**

| Origin | Site section | Percentage | Access route |
|---|---|---|---|
| Gulgong | South | 7.5% | Station Street → Cope Road → Blue Springs Road |
| | North | 2.5% | Medley Street → Barneys Reef Road |
| Mudgee | South | 67.5% | Castlereagh Highway → Herbert Street → Station Street → Cope Road → Blue Springs Road |
| | North | 22.5% | Castlereagh Highway → Medley Street → Barneys Reef Road |
| **Total** | | **100%** | |

**Figure 3–1 Construction traffic distribution – option 1 for heavy vehicle access to the north portion**




Source: SCT Consulting, 2020

**Figure 3–2 Construction traffic distribution – option 2 for heavy vehicle access to the north portion**


Source: SCT Consulting, 2020

**Figure 3–3 Construction traffic distribution – option 3 for heavy vehicle access to the north portion**


Source: SCT Consulting, 2020

## 3.3 Parking demand

### 3.3.1 Construction phase

Up to 230 parking spaces may be required for the construction workforce during the peak construction period. All parking demand during the construction phase will be accommodated onsite.

### 3.3.2 Operation phase

Parking spaces for employee use during the operation phase will be provided onsite, adjacent to the operations and maintenance building.

### 3.3.3 Decommissioning phase

Similar to the construction phase, all parking demand during the decommissioning phase will be accommodated onsite.

# 4.0 Traffic and transport impact assessment

Given the low trip volumes expected to be generated during the operation phase, the traffic and transport impact is considered to be minimal. A decommissioning phase is also expected to see lower traffic generation with regard to expected mechanical decommissioning processes and reduced labour force compared to the construction phase. Therefore, the impact assessment deals primarily with the impact of the construction phase of the project.

The construction shift times are planned to be 7am to 6pm Monday to Friday, so the construction workforce would be expected to arrive between 6am and 7am, which coincides with the AM peak hour of the surrounding road network. However, at the end of the shift, the construction workforce would depart after 6pm, which is outside the PM peak hour of the surrounding road network of 4pm to 5pm. Nevertheless, to present a worst-case scenario assessment, the construction workforce traffic was assumed to depart during the PM peak hour of the surrounding road network.

## 4.1 Future year background traffic growth

Background traffic in the area comprises both mine-related traffic from several coal mines in the area and general community-related traffic. The *Ulan Road Strategy (ARRB, 2011a)* analysed the forecast growth taking into account both traffic sources and forecasted a growth rate of 1.8 per cent per annum up to 2032.

Therefore, this traffic and transport impact assessment assumes an annual growth rate of 1.8 per cent per annum for major roads. The 1.8 per cent per annum growth was applied to the surveyed 2020 traffic on Ulan Road, Cope Road / Main Street and Castlereagh Highway to generate base traffic volumes for a 2023 peak construction year. It was assumed that no background traffic growth would take place on other roads due to their local nature.

## 4.2 Roadway impacts

**Table 4-1** identifies the forecast daily traffic volume during the peak construction phase, including the 'future year (2023) base' and the 'future year (2023) with construction' daily traffic volumes. The volumes include light and heavy vehicles and present the highest construction volume on each road depending on the heavy vehicle routing option for the north portion of the study area, as described in **Section 3.2**.

The traffic increase on Blue Springs Road and Barneys Reef Road during the peak construction period would temporarily move them into the next daily traffic volume category. However, because the minimum road width for both daily volume categories is the same, no upgrade relative to the baseline scenario is warranted. It is also noted that about 75-80 per cent of the forecast daily increase on these two roads would be light vehicles arriving in one direction in the morning and leaving in the other direction in the evening, so the width of the road lanes would be less significant than for a large volume of heavy vehicles travelling in both directions.

Black Lead Lane is also forecast to move into the next daily traffic volume category, however, as it would be only just over the threshold between categories and is a temporary construction route option, an upgrade is not considered warranted. Therefore, the additional temporary traffic increase during the peak construction phase does not warrant the need for road width upgrades.

**Table 4-1 Future daily traffic assessment for construction traffic**

| Daily traffic volume category | Applicable roads | Future year base daily traffic volume (2023) | Construction daily traffic volume (2023) | Future year with construction daily traffic volume (2023) | % increase | Upgrade needed (Y/N?) |
|---|---|---|---|---|---|---|
| 1-150 vehicles | Beela Rd/Stubbo Rd | 41 | 30 | 71 | 42% | N |
| | Black Lead Lane | 128 | 30 | 158 | 19% | N |
| 150-500 vehicles | Blue Springs Rd | 174 | 465 | 639 | 73% | N |
| | Barneys Reef Rd | 390 | 145 | 535 | 27% | N |
| 1,000-3,000 vehicles | Cope Rd | 1,288 | 120 | 1,408 | 9% | N |
| | Main St | 1,531 | 120 | 1,651 | 7% | N |
| >3,000 vehicles | Ulan Rd | 5,576 | 120 | 5,696 | 2% | N |

## 4.3 Intersection impacts

The six key intersections were assessed against the Austroads warrant design charts for rural intersection turning lanes including:

– Ulan Road / Main Street

– Cope Road / Blue Springs Road

– Cope Road / Beela Road

– Cope Road / Black Lead Lane

– Barneys Reef Road / Black Lead Lane

– Barneys Reef Road / Stubbo Road.

The assessment showed that, for both the 'future year (2023) base' and the 'future year (2023) with construction' scenarios, the forecast major road traffic volumes and turning volumes would not trigger any upgrade of the existing intersections related to additional turning lanes. Detailed charts for intersection treatment assessments are provided in **Appendix B**.

Based on the forecast traffic volumes, the new proposed project access intersections on Blue Springs Road and Barneys Reef Road would require a basic rural property access treatment, without additional turning lanes.

As mentioned in **Section 2.1**, the proposed heavy vehicle routes would occur along on designated B-double routes, as indicated on the TfNSW Restricted Vehicle Access map[7]. Therefore, truck turning circles at intersections should be able to be accommodated along the proposed haulage routes and have not been further assessed.

The TfNSW Restricted Vehicle Access map does indicate that the left turn movement from Blue Springs Road into Cope Road is prohibited for a 19m B-double or larger vehicle due to the existing skewed intersection geometry. Should a B-double or larger vehicle need to make a left turn from Blue Springs Road onto Cope Road, this should be included in the CTMP, which would detail if traffic marshalling, alternative routing, etc., would be required for those specific occasions.

A high-level review of the Castlereagh Highway / Herbert Street intersection on the approach to Gulgong town centre was done, as this may be used by construction staff to travel to and from Mudgee. It forms a skewed, priority intersection with Castlereagh Highway and connects to Station Street and then to Cope Road. Given it is a historical road and is signed for Gulgong Information Centre, it is more likely to be used by tourists, with a low volume of background traffic likely to use it during the construction commuting peak hours. The Castlereagh Highway is also wide at the Herbert Street intersection, with the northbound carriageway able to accommodate two lanes of traffic. Therefore, any right turn project-generated traffic into Herbert Street would have little impact on northbound through traffic movements on Castlereagh Highway. Any project-related traffic returning to Mudgee along Herbert Street would cause minimal impact as the southbound Herbert Street traffic gives way to the southbound Castlereagh Highway traffic.

## 4.4 Parking impacts

During construction, it is expected that a total of up to 230 parking spaces will be provided on site to accommodate the potential parking demand for staff. There is no formal parking provided in the vicinity of the study area due to the rural nature of the area and so any impact on existing parking is not anticipated.

Impacts on parking in Gulgong and Mudgee, due to construction workforce accommodation, would need to be assessed once these accommodation locations are confirmed. This should be included in the CTMP, which would detail any impacts at these locations.

## 4.5 Public transport / school transport impacts

The low volume of project-generated traffic is not forecast to impact on any public transport services.

Given the proposed weekday construction hours are from 7am to 6pm, the construction workforce trips would typically occur before 7am and after 6pm, which would generally not coincide with school bus services.

[7] https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html

Heavy vehicles would arrive and depart throughout the day, however, given the low forecast heavy vehicle demand (about six heavy vehicles arriving and six heavy vehicles departing the site per hour), minimal impact is expected on the school bus services. Any potential interaction with school bus operations and stops would be considered in the CTMP to minimise any delays, disruptions, and safety risks.

## 4.6 Rail crossing impacts

Given the low frequency of rail service and associated low probability of delay, no impact on rail corridor and level crossings is anticipated. Level crossing protection (e.g. flashing lights, stop signs, etc.) is already provided at the level crossings should a train be operating during the construction phase.

## 4.7 Pedestrian and cycle impacts

Given the proposed weekday construction working hours are from 7am to 6pm, the construction workforce trips would typically occur before 7am and after 6pm, which would be outside the normal peak period for walking and cycling activity in Gulgong.

Heavy vehicles would reduce speed at the school zone on Main Street in Ulan and given the low forecast daily heavy vehicle demand, there is no significant anticipated impact on pedestrian and cycle activities in Ulan.

## 4.8 Cumulative traffic impacts

Cumulative traffic from approved coal mines in the area has already been considered in the future year background traffic growth. A cumulative impact review was conducted in relation to nearby developments, including the Wollar Solar Farm and the proposed Dunedoo Solar Farm (not yet approved), which were referenced in the SEARs issued in May 2020.

Development consent was granted to the Wollar Solar Farm in February 2020. The approved construction access routes overlap with the proposed Stubbo Solar Farm construction routes as follows:

– AV/ B-double access route
  - Ulan Road (Golden Highway and Ulan Road / Ulan-Wollar Road intersection)
  - Ulan Road (Ulan Road / Cope Road and Ulan Road / Ulan-Wollar Road intersection)
– Shuttle bus / MRV / HRV access route
  - Cope Road and Ulan Road (Ulan Road / Cope Road and Ulan Road / Ulan-Wollar Road intersection).

The Wollar Solar Farm Addendum Traffic Impact Assessment[8] summarised the traffic distribution and traffic volumes for each of the access routes. Seven light vehicles and six shuttle buses from the Wollar Solar Farm site will be assigned on Ulan-Wollar Road during the peak hours, which are considered to overlap with the trips generated by the Stubbo project on Cope Road and Ulan Road. MRV / HRV and AV/B-double types of vehicles from the Wollar Solar Farm will avoid the peak hours for delivery. Given these low traffic volumes from the Wollar Solar Farm site, the cumulative traffic impact from the Wollar Solar Farm is considered to be minimal.

The traffic impact assessment for Dunedoo Solar Farm, located around 30km to the northwest of Stubbo Solar Farm, is under preparation at the time of this report. The Dunedoo Solar Farm Scoping Report[9] identifies that the site would be accessed from the Castlereagh Highway for haulage and site vehicles during construction and operation. Therefore, the cumulative impact of Dunedoo Solar Farm is also considered to be minimal

[8] Amber Organisation (2019), Wollar Solar Farm Traffic Impact Assessment
[9] NGH Consulting (2020), Dunedoo Solar Farm Scoping Report

# 5.0 Mitigation measures

Based on the assessment undertaken, mitigation measures considered to be required are summarised in **Table 5-1**.

**Table 5-1 Traffic and transport mitigation measures**

| Management/mitigation measure | Timing |
|---|---|
| UPC will continue to consult with Mid-Western Regional Council to agree the appropriate treatment or upgrade requirements for the safe use of Blue Springs Road during construction and the process for undertaking any treatment or upgrade works in accordance with Development Consent conditions | Prior to construction |
| A construction traffic management plan will be prepared in consultation with TfNSW and Mid-Western Regional Council. The plan will include:<br>– Details of the transport route to be used for all project-related traffic<br>– Details of any road upgrade works required by Development Consent<br>– A protocol for undertaking independent dilapidation surveys to assess the existing condition of the proposed construction routes prior to construction, upgrading or decommissioning activities and the condition of the proposed construction routes following construction, upgrading or decommissioning activities<br>– A protocol for the repair of the construction routes if dilapidation surveys identify these roads to be damaged during construction, upgrading or decommissioning works<br>– Details of the measures that will be implemented to minimise traffic impacts during construction, upgrading or decommissioning works, including:<br>• Temporary traffic controls, including detours and signage<br>• Notifying the local community about project-related traffic impacts<br>• Procedures for receiving and addressing complaints from the community about project-related traffic<br>• Minimising potential for conflict with school buses, other road users during peak hours and rail services as far as practicable (measures also required during operation of the project)<br>• Minimising dirt tracked onto the public road network from project-related traffic<br>• Scheduling of haulage vehicle movements to minimise convoy length or platoons<br>• Responding to local climate conditions that may affect road safety such as fog, dust and wet weather<br>• Responding to any emergency repair or maintenance requirements<br>• A traffic management system for managing over-dimensional vehicle trips to and from the project<br>– A program to ensure drivers associated with the project receive suitable training on the Driver Code of Conduct and any other relevant obligations under the CTMP<br>– A flood response plan detailing procedures and options for safe access to and from the site in the event of flooding<br>– Controls for transport and use of dangerous goods in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development, Australian Dangerous Goods Code and Australian Standard 4452 Storage and Handling of Toxic Substances. | Prior to construction |
| Site access roads from public roads will be constructed to an Austroads basic rural property access standard, commensurate with the traffic volumes and vehicles expected. | Prior to construction |
| The safe sight distance analysis undertaken at the Cope Road / Blue Springs Road intersection and at the proposed site access points from Blue Springs Road and Barneys Reef Road, will be ground-truthed to determine if vegetation trimming or speed limit reductions need to be applied to provide the required safe sight distance for all vehicle types expected to access the project. | Prior to construction |
| Parking requirements for the project construction and operation workforce will be provide onsite and parking will not be provided on public roads adjacent to the site. | Prior to construction |

# 6.0 Summary and conclusions

The key findings of the traffic and transport assessment for the project are:

– The project would have the most traffic and transport impact during the construction peak period, when 12 heavy vehicle trips and 230 light vehicle trips are forecast to be generated during the peak hours, i.e. six heavy vehicles entering and six heavy vehicles leaving the study area in each peak hour, and 230 light vehicles entering the study area in the AM peak hour and 230 light vehicles leaving in the PM peak hour.

– Given the low volume of background traffic in the vicinity of the study area, these additional trips are forecast to have minimal impact on the surrounding road network. The additional construction traffic does not trigger any road or intersection treatments. Should a B-double or larger vehicle need to make a left turn from Blue Springs Road onto Cope Road, this should be included in the construction traffic management plan (CTMP), which would detail if traffic marshalling, alternative routing, etc., would be required for those specific occasions.

– The two new proposed project access intersections on Blue Springs Road and Barneys Reef Road would be constructed as basic rural property accesses, commensurate with the traffic volumes and vehicles expected.

– Parking for staff would be provide onsite for all phases of the project.

– The project is anticipated to have minimal public transport, rail crossing and pedestrian and cycle impacts. Construction workforce trips would typically occur before and after school bus movements.

– The cumulative traffic impact from other developments in the area, including the construction of the Wollar Solar Farm and Dunedoo Solar Farm, is considered to be minimal due to the low traffic volumes generated and the alternative routing used by the other developments.

– Once in operation, the project is forecast to generate about 10 vehicles to / from the project in each peak period, which is also forecast to have minimal impact on the road network.

Prior to the commencement of construction of the project, a CTMP would be prepared in consultation with TfNSW and the Mid-Western Regional Council, which would seek to minimise any delays, disruptions, and safety risks and would include details such as temporary traffic management plans, Driver's Code of Conduct, dilapidation survey and controls for transport and use of dangerous goods, etc.

APPENDIX A

# Response to Agency comments

**Table A-1** provides an indication of where the specific agency comments have been discussed. While some of the detail requested may not be available at this stage of the project development, the intent of the requested item has been discussed to the extent possible.

**Table A-1 Agency comments and how they have been addressed**

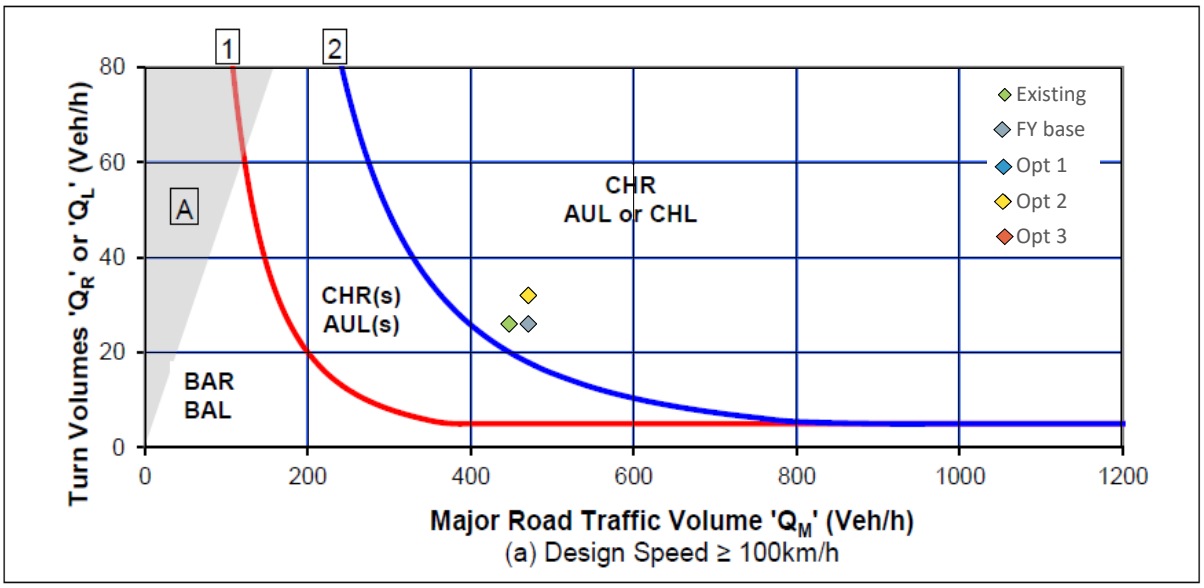
| Agency letters | Section Addressed |
|---|---|
| **Transport for NSW** | |
| The TIA is to address the following: | |
| Project schedule:<br>• Hours and days of work, number of shifts and start and end times.<br>• Project phases and stages, including construction, operation and decommissioning. | Section 3.2.1 |
| Traffic volumes:<br>• Existing background traffic<br>• Project related traffic for each phase or stage of the project<br>• Projected cumulative traffic at commencement of operation and a 10-year horizon. | Sections 2.2, 4.1 |
| Traffic characteristics:<br>• Number and ratio of heavy vehicles to light vehicles<br>• Peak times for existing traffic<br>• Peak times for project-related traffic including commuter periods<br>• Proposed hours for transportation and haulage<br>• Interactions between existing and project-related traffic. | Sections 2.2, 4.1 |
| Description of all over size and over mass vehicles and the materials to be transported. | Section 4.1.1 |
| The origins, destinations and routes for:<br>• Commuter (employee and contractor) light vehicles, pool vehicles and buses<br>• Heavy (haulage) vehicles<br>• Over size and over mass vehicles. | Section 5.1 |
| Road safety assessment of key haulage route/s | Section 2.1 |
| Assessment of the cumulative impacts on the road network from other construction projects and operation of nearby coal mines, solar and wind farms | Section 5.8 |
| Impact of traffic generation on public roads and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning | Section 5.3,5.4 |
| The need for improvements to the road network, including road widening and intersection treatments, to cater for and mitigate the impact of project related traffic. Road facilities, accesses and intersection treatments are to be in accordance with Austroads Guide to Road Design including provision of Safe Intersection Sight Distance (SISD) | Section 2.2.2 |
| Local climate conditions that may affect road safety during the life of the project (e.g. fog, wet and dry weather, icy road conditions) | Section 6.2 |
| The layout of the internal road network, parking facilities and infrastructure | N/A |
| Controls for transport and use of dangerous goods in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development, Australian Dangerous Goods Code and Australian Standard 4452 Storage and Handling of Toxic Substances. | Section 6.2 |
| Impact on rail corridors and level crossings detailing any proposed interface treatments. | Section 5.6 |
| Impact on public transport (public and school bus routes). | Section 5.6 |
| Identification and assessment of impacts of the project, such as blasting, lighting, visual, noise, dust and drainage on the function and integrity of affected public roads. | Refer to other specialist reports |

| Agency letters | Section Addressed |
|---|---|
| **Transport for NSW** | |
| A Traffic Management Plan (TMP) developed in consultation with relevant Councils and TfNSW. The TMP is to identify strategies to manage the impacts of project related traffic, including any community consultation measures for peak haulage periods. | Section 6.2 |
| A Driver Code of Conduct for haulage operations including, but not be limited to:<br>• Safety initiatives for haulage through residential areas and/or school zones<br>• An induction process for vehicle operators and regular toolbox meetings<br>• A public complaint resolution and disciplinary procedure. | Section 6.2 |
| **Mid-Western Regional Council** | |
| Council requests that a full traffic study be undertaken as part of the EIS which details the specific traffic route for all movements of materials and workforce, traffic volumes, size and timing of loads and expected impacts from heavy or oversize vehicles during both construction and operational phases | This report |
| Specific details should also be included for any road upgrades that will be expected/required as a result of the project. This includes intersection treatments, railway crossings, lane widths and surfacing details in accordance with the relevant Austroads Guidelines | Section 5.1 |
| Investigations into road ownership and required authorisations/approvals are also required, in the event the physical road does not sit within the road reserve, or alternatively the road belongs to Crown Roads, who have a separate approval process to that of Council. | N/A |

APPENDIX B

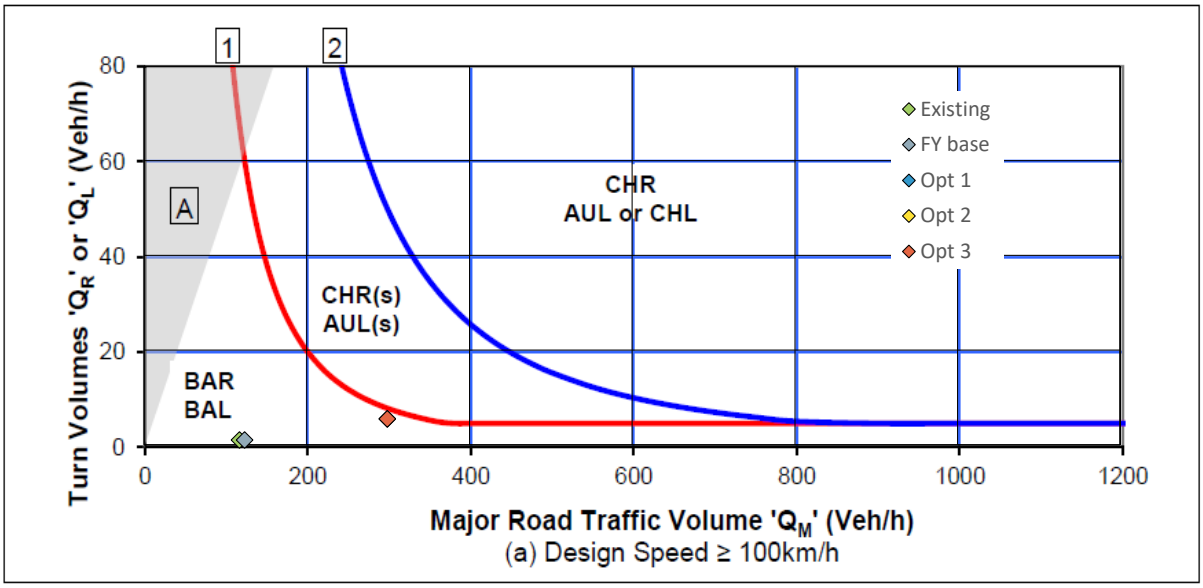
# Austroads intersection warrants assessment

**Main Street / Ulan Road**



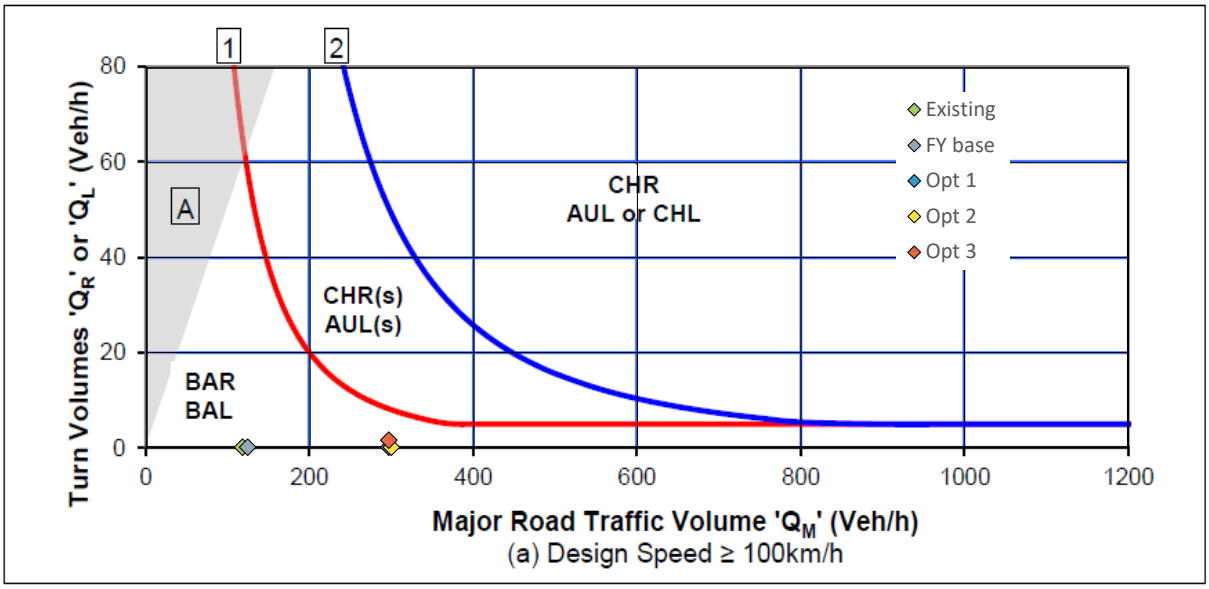

Note: Option 1, 2, 3 overlap

**Cope Road / Blue Springs Road**



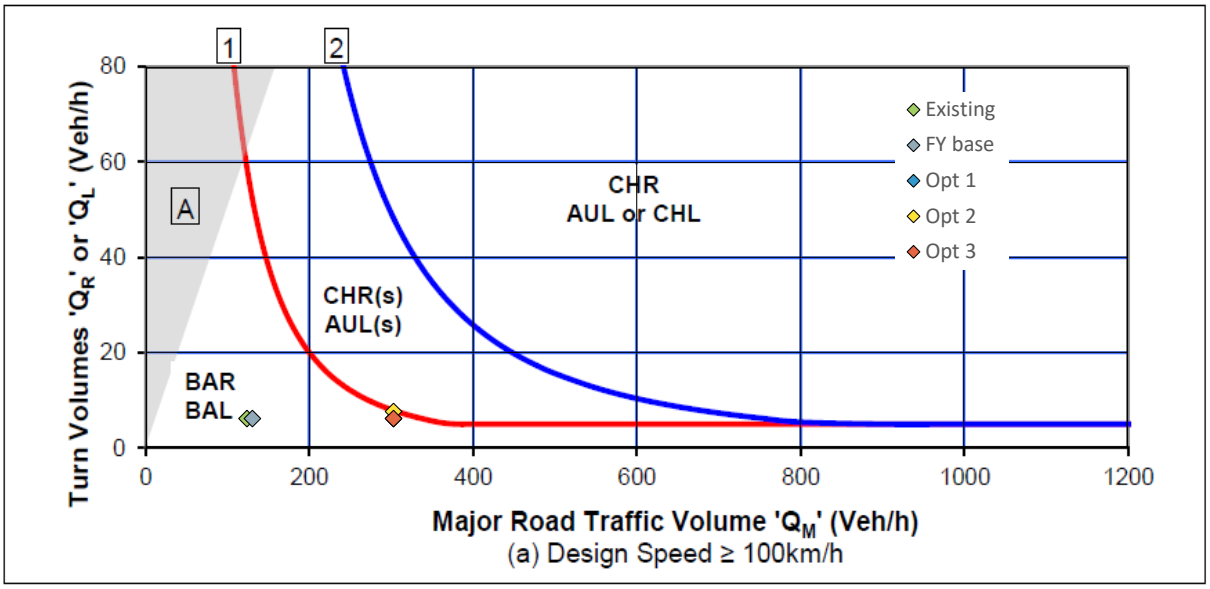

Note: Option 1, 2, 3 overlap

**Cope Road / Beela Road**



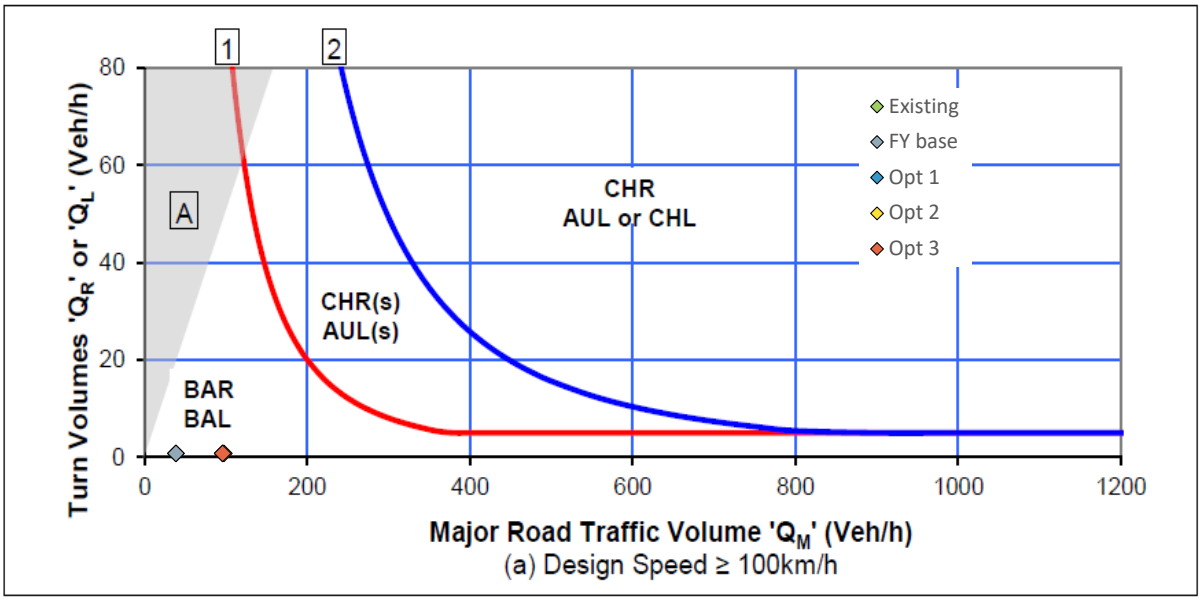

Note: Option 1, 2 overlap

**Cope Road / Black Lead Lane**



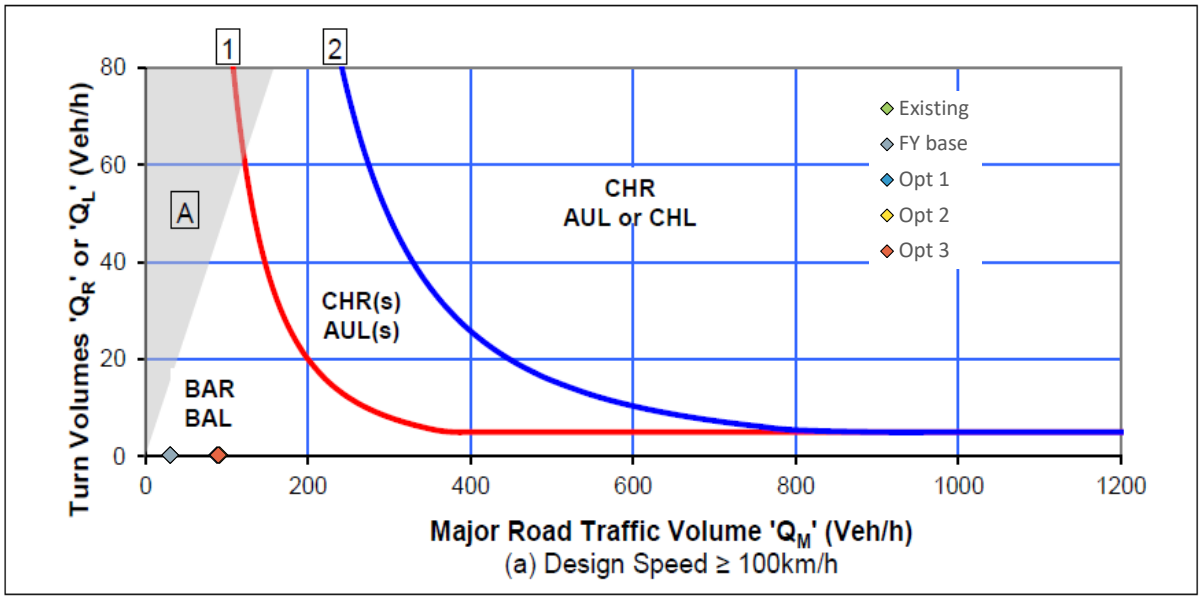

Note: Option 1, 3 overlap

**Barneys Reef Road / Black Lead Lane**



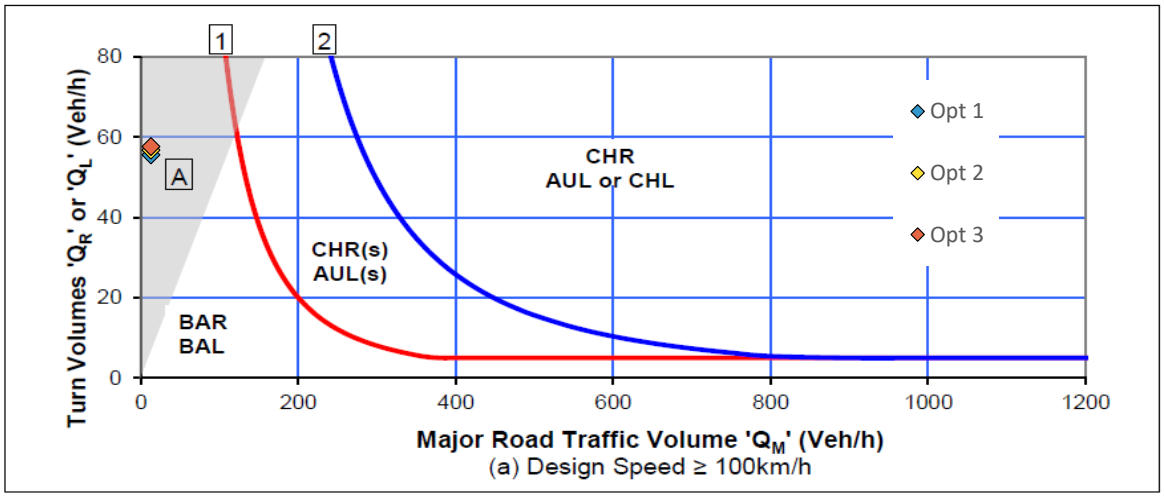

Note: Existing and Future year base overlap; Option 1, 2, 3 overlap

**Barneys Reef Road / Stubbo Road**

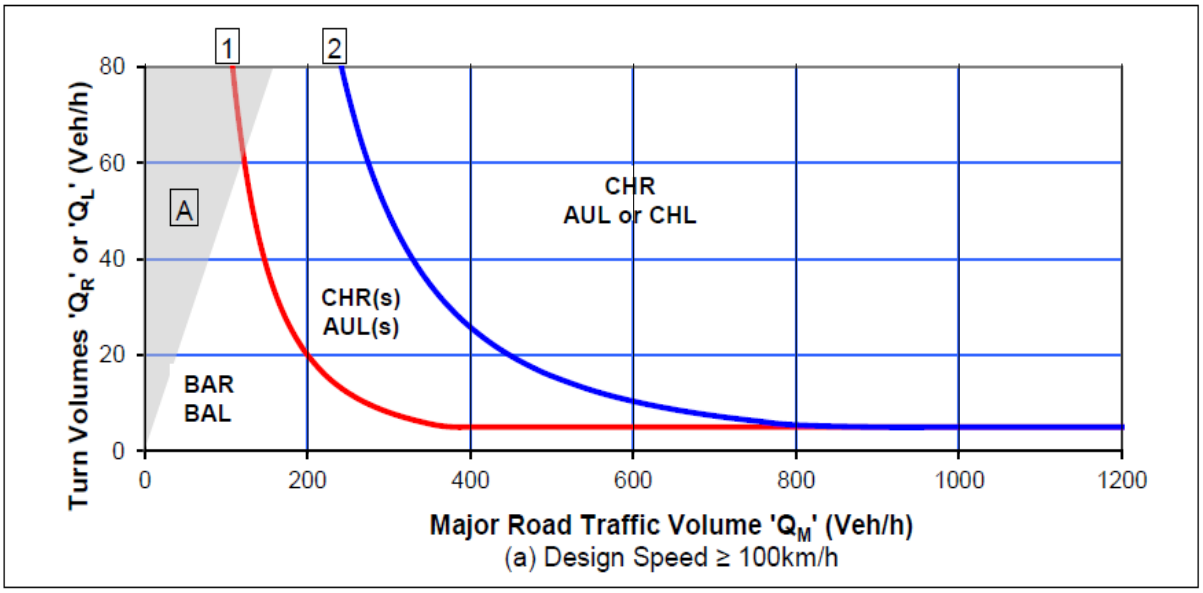



Note: Existing and Future year base overlap; Option 1, 2, 3 overlap

**Barneys Reef Road / Access Road**



**Blue Springs Road / Access Road**




Note: Option 1, 2, 3 overlap and located beyond the diagram area in BAR/BAL

SCT Consulting