
Valley of the Winds
Renewable Energy from ACEN
Appendix 7
Traffic and transport technical note
RAMBOLL
ACEN Australia

Technical Advisory Note

Quality Information			
Project	Valley of the Winds Wind Farm		
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Document Name	Girragulang Road cluster alternative access - Traffic assessment		
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Background

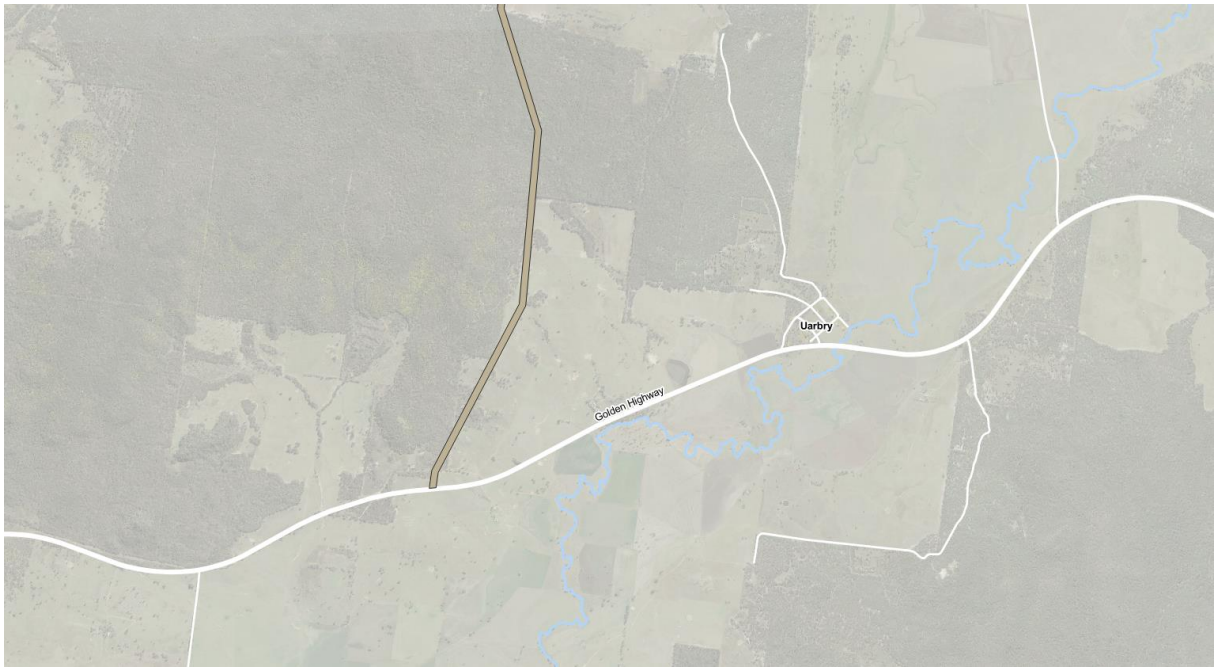
As part of the Valley of the Winds wind farm project (the project), a traffic and transport assessment was prepared by SCT Consulting in February 2022 to inform the environmental impact statement (EIS) and development application (DA) for the project. It assessed the traffic and transport impacts associated with the development of approximately 148 wind turbines and supporting infrastructure with a peak construction workforce of approximately 400 full-time staff and 50 full-time staff once the project is operational.

The project consists of three worksites close to the townships of Coolah and Leadville. These consist of the Leadville, Girragulang Road and Mount Hope cluster worksites, with major construction haulage via Golden Highway for all three of the sites. For works associated with the Girragulang Road cluster worksite, the EIS traffic and transport assessment considered the transportation of construction workers and construction material, including over-sized over-mass (OSOM) movements associated with the wind turbine blades, via the existing road network within the township of Uarbry, with access off the Golden Highway via Short Street.

Further project investigations have identified an alternative route to access the Girragulang Road cluster work site from Golden Highway that bypasses Uarbry. This route would be aligned parallel to the EnergyCo transmission line easement between the Golden Highway and Moorefield Road to the west of Uarbry, as shown in **Figure 1**.

This technical advisory note provides a traffic and transport assessment of the alternative access route to minimise the project's impact on Uarbry.

Figure 1 Alternative heavy vehicle access route for Girragulang Road work site



Source: Ramboll, 2023

Traffic Generation

The EIS assessment identified that the construction phase is associated with the greatest traffic generation for the project, with traffic generation during the operations phase significantly lower. The Girragulang Road cluster worksite is forecast to generate the following peak construction traffic demands:

- Peak generation of 48 heavy vehicle trips per day (24 heavy vehicles to site and 24 heavy vehicles from site) equating to six heavy vehicle trips during the peak hour (three heavy vehicles to site and three heavy vehicles from site)
- Up to 400 employees per day, who would likely travel in a combination of individual vehicles and minivans/shuttle buses. Two construction workforce accommodation scenarios were considered:
    - Regional distribution of workforce accommodation: this scenario assumes that construction workers would be distributed across six localities, including the townships of Coolah, Dunedoo, Cassilis, Coonabarabran, Gulgong and Mudgee; and would travel from established accommodation facilities in these towns. These workforce location assumptions are subject to confirmation of the final social impact assessment outcomes and ongoing consultation with Warrumbungle Shire Council. This scenario is considered the worst-case traffic impact and assumes travel to the site with about 25% shuttled staff with the remainder using private vehicles. As such, it is forecast that 506 light vehicle trips per day would be generated to transport construction staff (253 light vehicles to the site in the morning and 253 light vehicles from the site in the evening).
    - Centralised workforce accommodation: this scenario assumes the bulk of the construction workforce is accommodated at a temporary workers accommodation camp located on site, accessed off Moorefield Road. This scenario assumes travel to the site with up to 90% shuttled staff, due to the remote centralised location, with the remainder using private vehicles. As such, it is forecast that only 128 light vehicle trips per day would be generated to transport construction staff (64 light vehicles to the site in the morning and 64 light vehicles from the site in the evening) in this scenario.

The daily trip generation and peak hour trip generation for the Girragulang Road cluster under the two construction workforce accommodation scenarios are summarised in the following **Table 1**. These are the same trip volumes as in the EIS traffic assessment.

Table 1 Traffic generation for the construction phase

Vehicle type	Daily Trips	Estimated peak hour trips	Assumption
Regional distribution of workforce accommodation			
Heavy vehicles	24 HVs x 2 = 48 HVs	6 HVs	– One vehicle generates two trips per day given vehicles do not stay on site overnight. – 10% of the daily estimated goods vehicle trips are made in the peak hour.
Light vehicles (min-buses / private cars used by staff)	253 LVs x 2 = 506 LVs	253 LVs	– Based on 25% shuttled on 12-seater mini-buses. – All staff drive / leave during peak hour.
Total	**554 trips**	**259 trips**	
Centralised workforce accommodation			
Heavy vehicles	24 HVs x 2 = 48 HVs	6 HVs	– One vehicle generates two trips per day given vehicles do not stay on site overnight. – 10% of the daily estimated goods vehicle trips are made in the peak hour.
Light vehicles (min-buses / private cars used by staff)	64 LVs x 2 = 128 LVs	64 LVs	– Based on 90% shuttled on 12-seater mini-buses. – All staff drive / leave during peak hour.
Total	**176 trips**	**70 trips**	

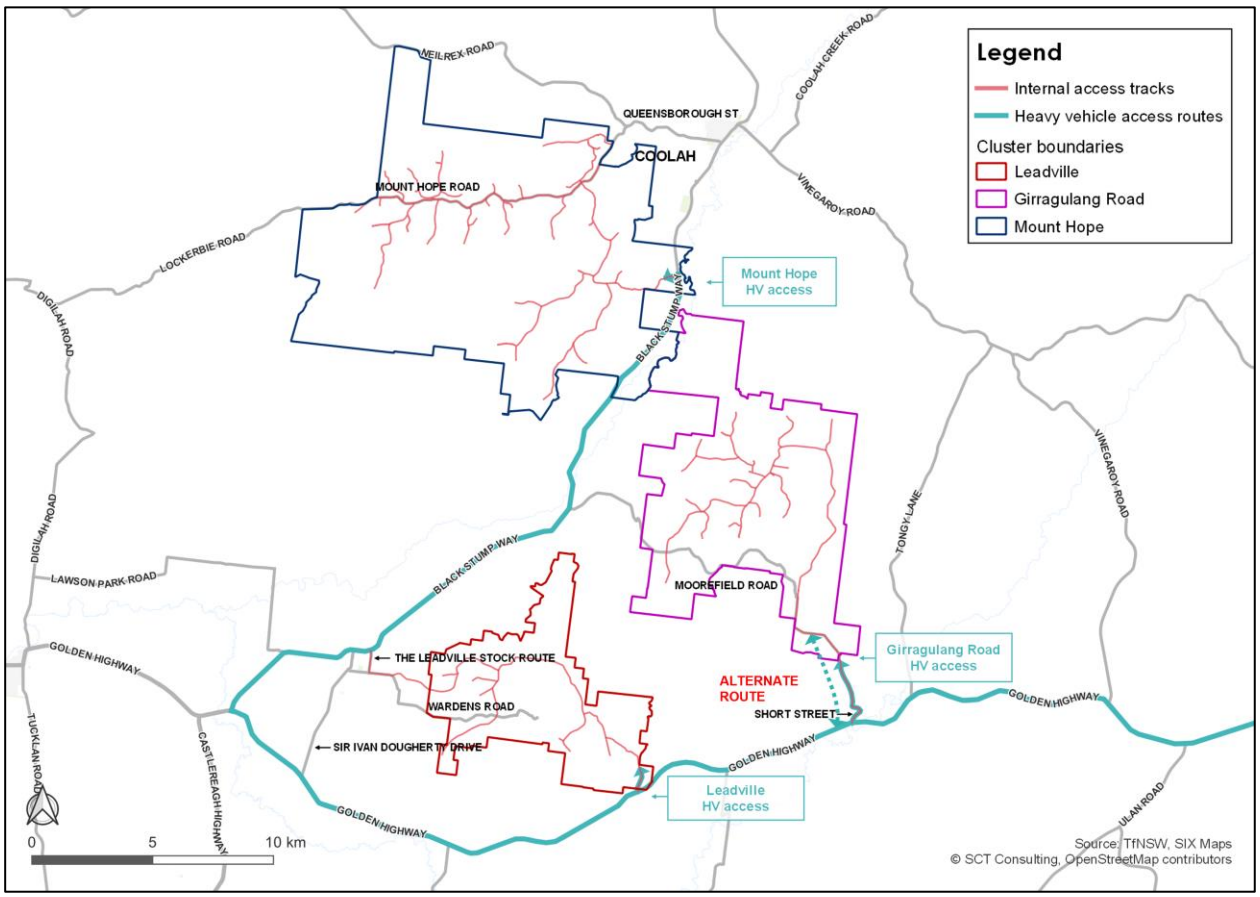
Heavy vehicle route

Large components, such as wind turbine blades, will be shipped to Australia from overseas and transported to the site from the Port of Newcastle and access the worksites by the following route:

- Industrial Drive
- Pacific Highway
- New England Highway
- Hunter Expressway
- New England Highway
- Golden Highway.

For the Girragulang Road cluster, heavy vehicles would access the cluster via the alternate road parallel to the EnergyCo transmission line easement and Moorefield Road, as shown in **Figure 2**.

Figure 2 Heavy vehicle access route to worksite clusters



Light vehicle routes

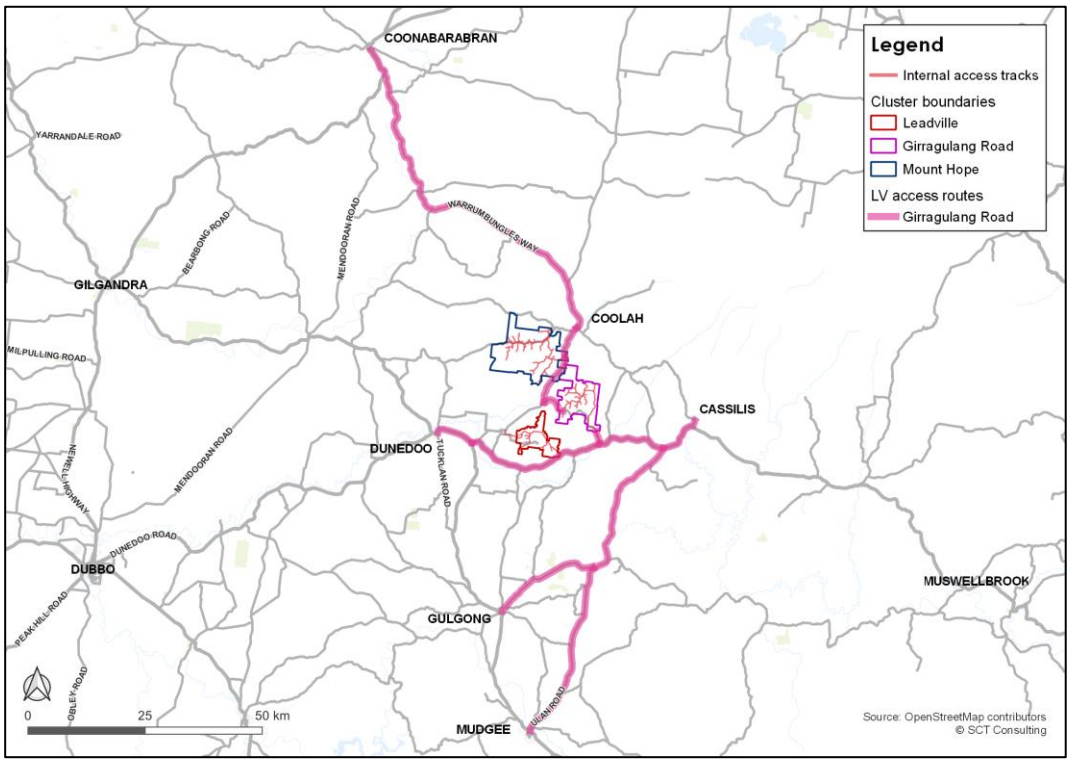
The construction phase is likely to generate a peak workforce of 400 equivalent full-time staff. Prior assessments for the regional distribution of the workforce assumed that they would be distributed across six localities with established accommodation facilities as shown in **Table 2**.

Table 2 Regional distribution of construction workforce accommodation

Location	Workers	Percentage
Coolah	60	15%
Dunedoo	60	15%
Cassilis	20	5%
Gulgong	60	15%
Coonabarabran	120	30%
Mudgee	80	20%
Total	**400**	**100%**

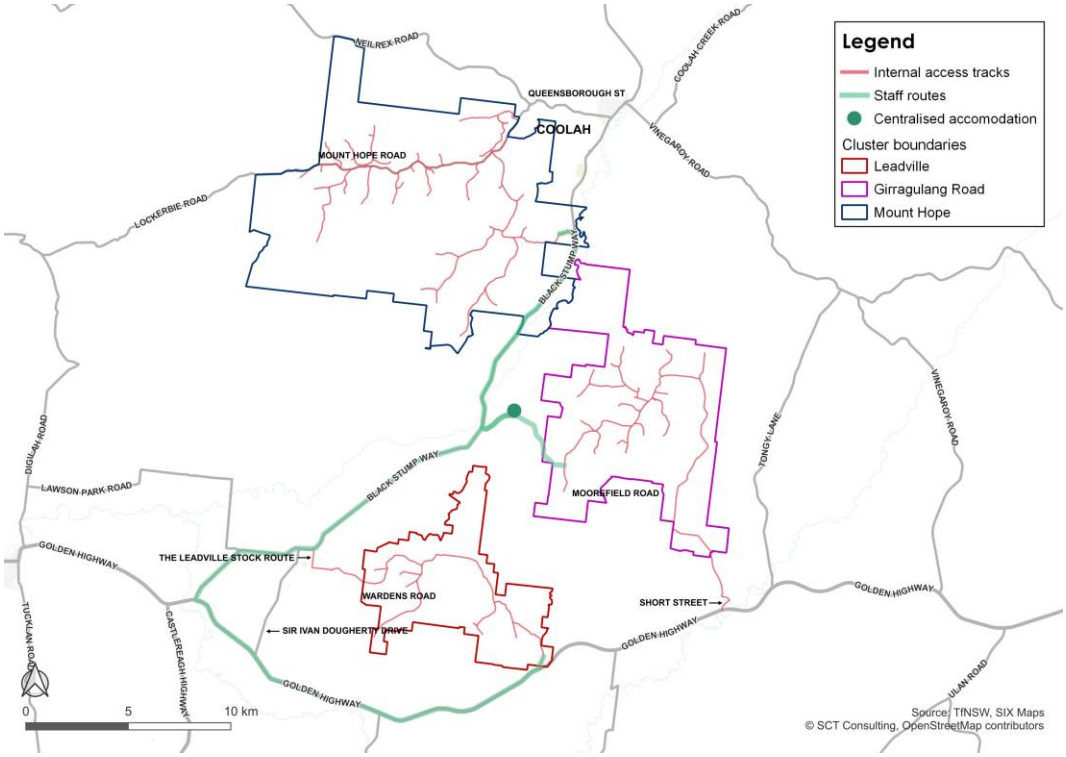
The light vehicle routes to the Girragulang Road cluster, via the alternative access road, is shown in Figure 3.

Figure 3 Staff access routes to Girragulang Road cluster: Regional distribution of workforce accommodation



A centralised workforce accommodation at a temporary accommodation camp, accessed via Moorefield Road, is shown in **Figure 4**. The figure shows workers would access the Girragulang Cluster directly via Moorefield Road with minimal impact to adjacent townships. The alternative access route would therefore have no change to this scenario.

Figure 4 Staff access routes to the worksite clusters: Centralised workforce accommodation



Intersection warrants

To identify any intersection treatment required for the new intersection to allow vehicle access from the Golden Highway via the alternative route, the forecast construction vehicle turning movements and the through movements along Golden Highway in the peak hours were assessed against the *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* intersection warrants.

Figure 5 to **Figure 8** shows that the forecast turn movements fall within the limits of the basic intersection arrangement. As such, no additional left or right turn turning lanes in either of the AM or PM peak flow periods for both types of workforce distribution are warranted.

Widening of the new intersection will still be required to allow access for OSOM vehicles, especially related to the wind turbine blade deliveries, as indicated in the Transport Route Assessment for the Golden Highway / Short Street intersection, which is contained in Appendix A of the EIS traffic assessment.

Figure 5 Alternative access AM peak with regional workforce distribution

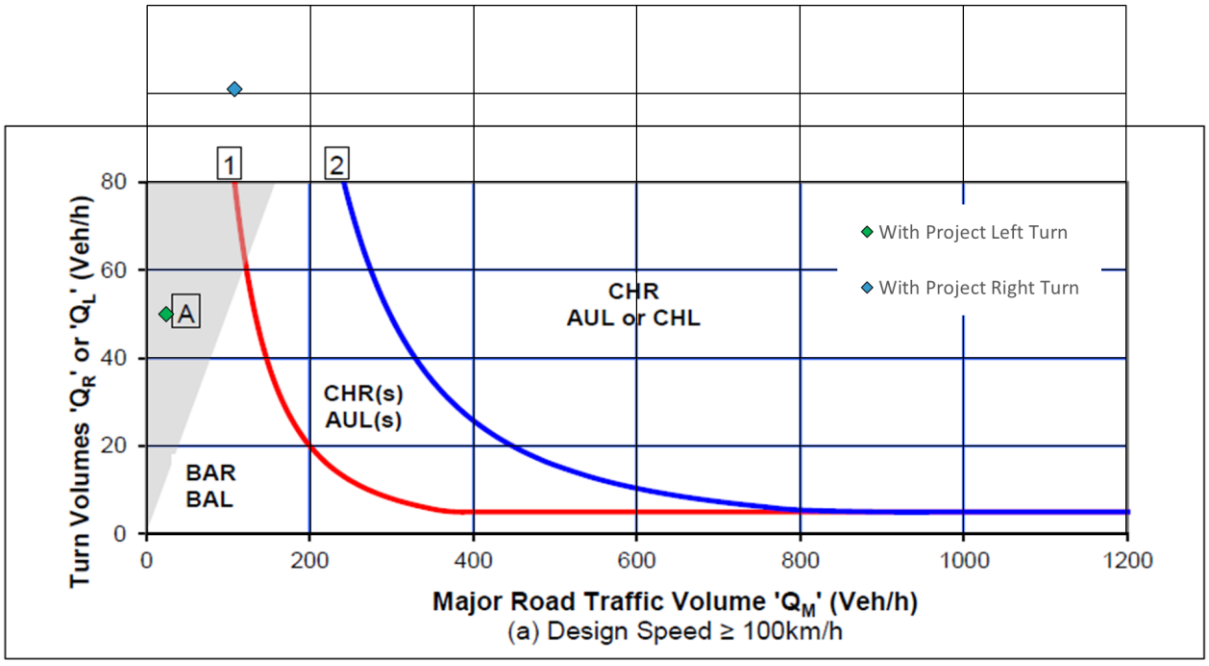


Figure 6 Alternative access PM peak with regional workforce distribution

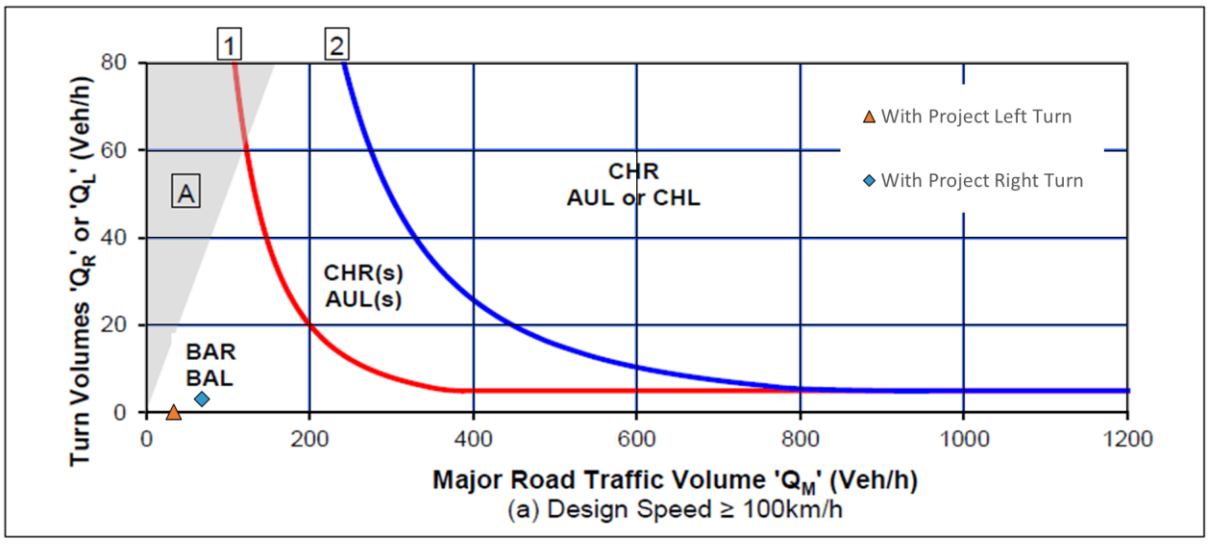


Figure 7 Alternative access AM peak with centralised workforce distribution

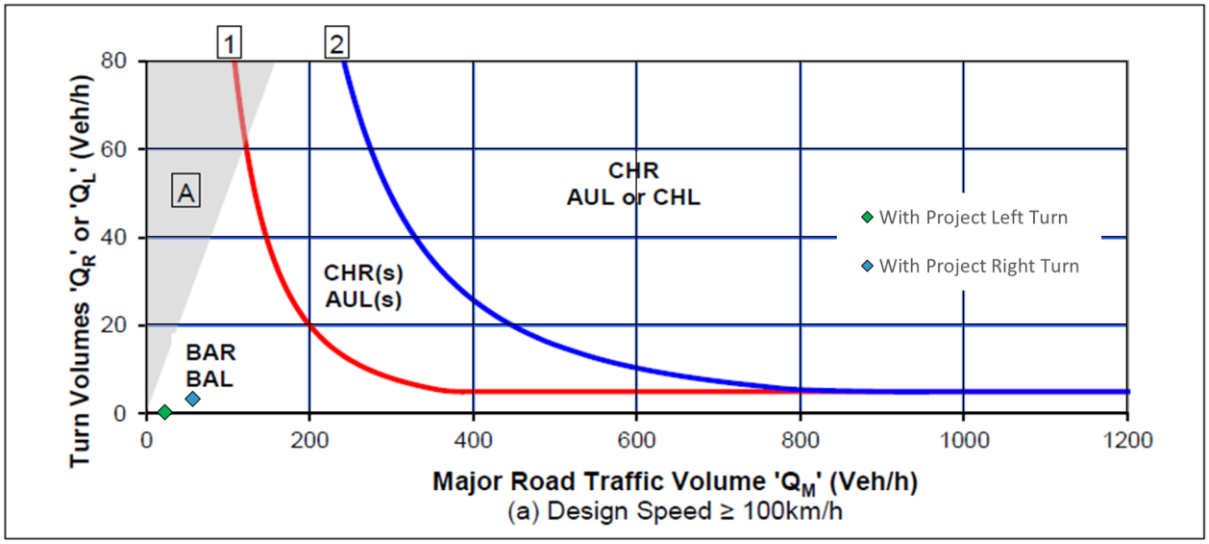
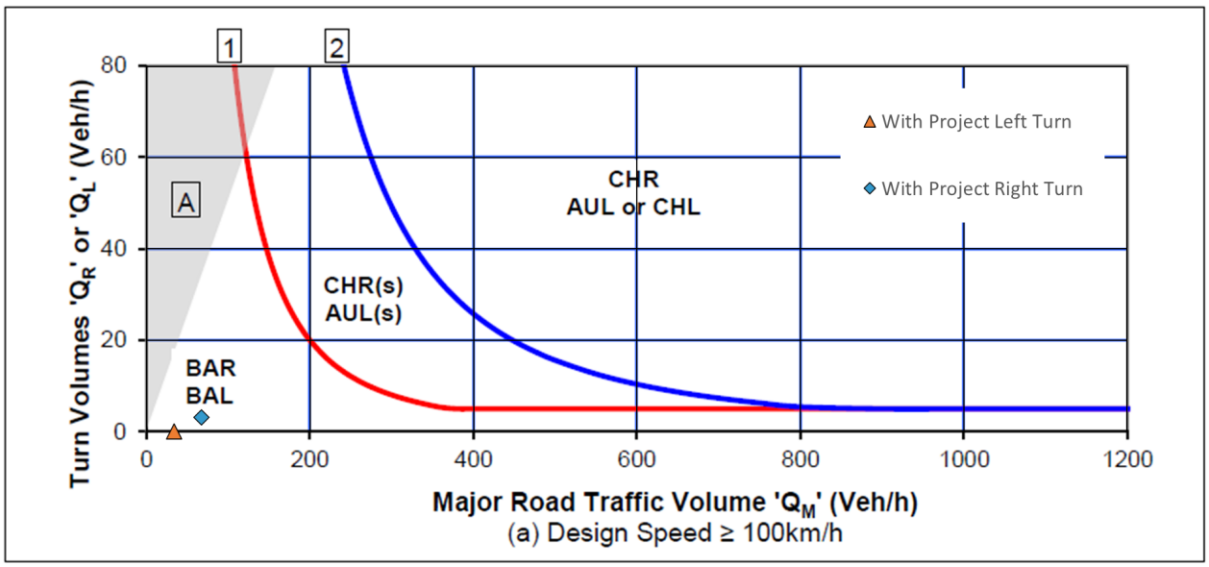


Figure 8 Alternative access PM peak with centralised workforce distribution



Safe intersection sight distance review

Safe intersection sight distance (SISD) is defined by the *Austroads Guide to Road Design Part 4A* (AGRD04a) as the "*minimum sight distance that should be provided on a major road at any intersection*". AGRD04a provides the following equation to determine the SISD:

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where:

D_T = decision time (sec) = observation time (3 sec) + reaction time (sec)

V = operating (85th percentile) speed (km/h)

d = coefficient of deceleration

a = longitudinal grade in %

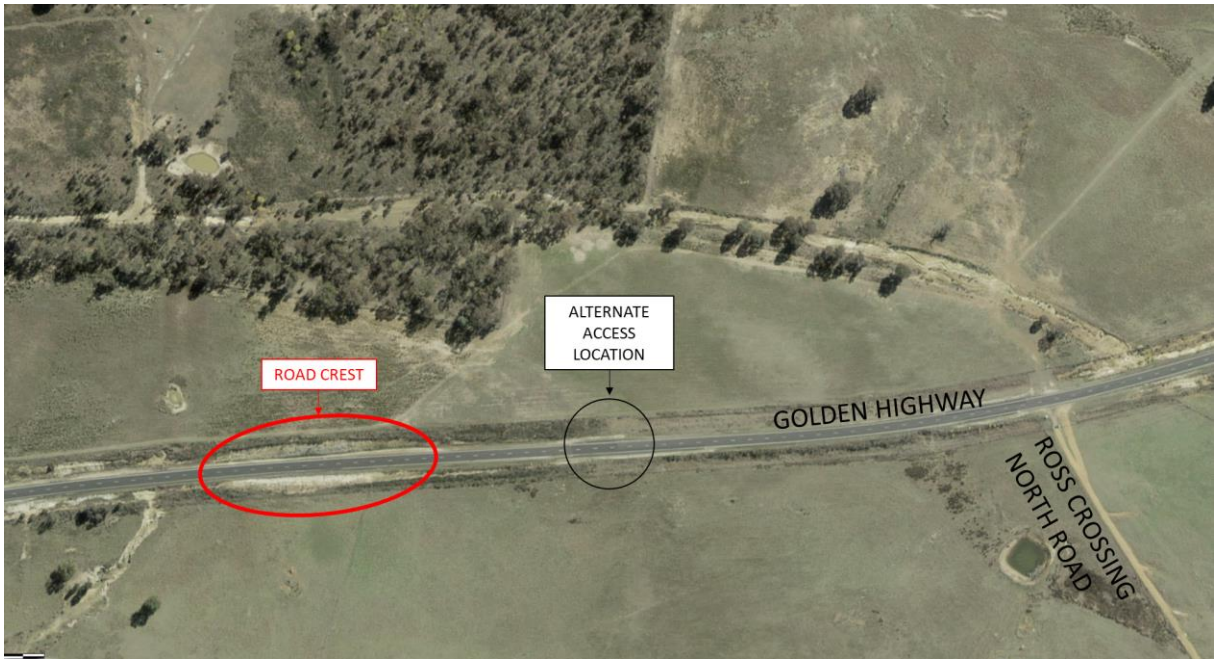
With a reaction time of 2.5 seconds and heavy vehicle coefficient of deceleration of 0.29, and assuming that the 85th percentile speeds are as per the posted speed limit of 100km/h, a SISD for the new intersection on the Golden Highway is determined to be 284m.

To the west of the alternative access location, the alignment of the Golden Highway has a vertical crest where the highway has been 'cut' into the terrain. This may limit the SISD for vehicles exiting from the new intersection if it is located within 284m of the crest, as shown in **Figure 9**.

To the east of the alternative access location, there is sufficient sight distance of over 550m, as shown in **Figure 10**.

As such, a vehicle access may be provided 284m east of the crest, towards Ross Crossing North Road, to satisfy the SISD for both directions of travel. Alternatively, a temporary reduction of the speed limit could be explored in the vicinity of the alternative access to satisfy a lower SISD at the alternative access location.

Figure 9 Road crest west of the alternative access location



Source: www.maps.six.nsw.gov.au

Figure 10 View east of the alternative access location

Source: Google Street View, 2023

Conclusion

The proposed alternative access from the Golden Highway west of Uarbry seeks to minimise the impact on the Uarbry township by diverting construction traffic away from the town. The alternative access does not result in a greater impact on the Golden Highway as the forecast volumes along the highway remain constant from the EIS traffic assessment.

Based on the forecast volumes, a basic intersection arrangement with no turn bays is sufficient for the proposed new intersection at Golden Highway, although widening of the intersection will be required to allow access for OSOM vehicles, especially related to the wind turbine blade deliveries, as indicated in the EIS traffic assessment.

However, the location of the access point must consider the limitation of the vertical road alignment of the Golden Highway such that the minimum SISD of 284m is provided for both directions of travel along the Golden Highway. This could be achieved by locating the access point away from the road crest, toward the Ross Crossing North Road. Alternatively, a reduction of the speed limit on the approach to the alternative access location could be explored to satisfy a reduced SISD requirement. These could be explored further during the development of the construction management plan and detailed design of the alternative access.