Appendix

E

E.6 | Traffic Impact Assessment

EMM creating opportunities | SPARK RENEWABLES

Dinawan Wind Farm

Traffic Impact Assessment

Prepared for Spark Renewables Pty Ltd

May 2024

Dinawan Wind Farm

Traffic Impact Assessment

Spark Renewables Pty Ltd

E220305 RP1

May 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	10 May 2024	Dr John Mai	Abdullah Uddin	Draft for client review
V2	28 May 2024	Dr John Mai	Abdullah Uddin	Final for client review

Approved by

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28 May 2024

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Executive summary

ES1 Introduction

Spark Renewables Pty Limited (Spark Renewables) proposes to develop the Dinawan Wind Farm (the project). The project includes the installation, operation, maintenance and decommissioning of up to approximately 200 wind turbine generators (WTGs) and associated infrastructure. The project will have a generation capacity of up to approximately 1,200 megawatts (MW) (AC), equivalent to the needs of 700,000 NSW households per year. It will assist in meeting New South Wales (NSW) and Australian Government emissions reduction targets and will abate approximately 3.2 million tonnes of greenhouse gases (GHG) annually. The project is State significant development (SSD) pursuant to schedule 1 of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP).

The project is on the traditional lands of the Wiradjuri people and several smaller nations of the Murrumbidgee plains, about halfway between the towns of Coleambally and Jerilderie and lies within the Murrumbidgee and Edward River local government areas (LGAs) in NSW.

This traffic impact assessment (TIA) forms part of the environmental impact statement (EIS) for the project.

ES2 Existing conditions

Traffic generated as a result of the project is anticipated to approach the project area via Kidman Way, coming from both the north and south, before turning onto McLennons Bore Road or Cadell Road (south). Existing traffic volumes on Kidman Way are approximately 1,000 vehicles per day, and significantly less than this on the unsealed local roads that will be used by project traffic.

Crash data between 2018 and 2022 shows that there were five crashes along Kidman Way within 30 kilometres (km) of the project, none of which resulted in fatalities. The crash data does not show any road safety deficiencies on the road network in the vicinity of the project.

Public transport and pedestrian facilities do not exist in the vicinity of the project due to its rural setting.

ES3 Assessment of impacts

Site access points for the project will be on McLennons Bore Road, Fernbank Road, Goolgumbla Road and Kidman Way (access to temporary accommodation facilities during Stage 1). Traffic generated by the project will be the highest during construction and is expected to be negligible during operations. There are expected to be a maximum of approximately 600 workers during peak construction and 330 workers on average throughout the 60-month construction period. The project will directly employ up to 50 people during operations.

Daily traffic during peak construction is expected to reach 462 light vehicle movements and 176 heavy vehicle movements across eight site access points, for a total of 638 vehicle movements. During both the AM and PM peak hour during peak construction, 231 light vehicle movements and 18 heavy vehicle movements will occur across six site access points, for a total of 249 vehicle movements in each peak hour.

The intersection of Kidman Way/McLennons Bore Road is predicted to maintain a Level of Service (LOS) A when the project's construction traffic is included and LOS B when combined with traffic from neighbouring developments. However, this won't adversely affect the intersection's performance. Other intersections along Kidman Way are expected to retain LOS A in all scenarios.

Regarding the mid-block capacity of Kidman Way, it will maintain LOS A when the project's construction traffic is included and LOS B when combined with traffic from nearby developments. McLennons Bore Road is anticipated to maintain LOS A in all scenarios. Consequently, no significant disruptions to traffic flow or road safety are predicted.

Potential issues with the sight lines have been identified at Cadell Road/McLennons Bore Road intersection and Wilson Road/McLennons Bore Road intersection. Mitigation measures will be implemented prior to commencement of construction for the relevant stages to address these issues.

There are not expected to be any impacts on public transport, school bus, pedestrian or cycling routes.

Car parking and accommodation will be provided on-site during construction. As a result, no cars will be parked on public roads. The use of on-site accommodation facilities will greatly reduce traffic impacts.

ES4 Road upgrades and mitigation measures

A schedule of road upgrades is proposed to facilitate construction traffic movements to and from the development footprint, including the following:

- McLennons Bore Road between Cadell Road and Kidman Way will be upgraded to an all-weather unsealed road, while the entire length of McLennons Bore Road will be upgraded (where necessary) to an 8 m trafficable width plus 1 m unsealed shoulder on both sides to accommodate the project's construction traffic volumes (unless agreed otherwise with Murrumbidgee Council).
- Sections of Fernbank Road, Wilson Road and Goolgumbla Road that will be used by project-related traffic will be upgraded to an 8 m trafficable width plus 1 m unsealed shoulder on both sides to cater for the project's construction traffic volumes (unless agreed otherwise with Murrumbidgee Council and/or Edward River Council).
- A basic left turn (BAL) and short channelised right turn (CHR(s)) treatment will be required on the north and south approaches to the Kidman Way/McLennons Bore Road intersection.
- A short auxiliary left turn (AUL(s)) treatment will be required on the south approach to the Kidman Way/Cadell Road (south) intersection.
- A short auxiliary left turn (AUL(s)) treatment will be required on the north approach to the new intersection on Kidman Way that will facilitate access to the accommodation facility.

Strategic concept designs for proposed intersection upgrades will be prepared in consultation with Transport for NSW (TfNSW) prior to commencement of construction.

A construction traffic management plan (CTMP) will be prepared in consultation with TfNSW, Murrumbidgee Council and Edward River Council. The CTMP will aim to ensure the safety of all workers and road users within the vicinity of the development footprint. The CTMP provide further detail on the project's construction staging.

A dilapidation report and road maintenance strategy for local roads proposed for use by the project's construction traffic will be developed in consultation with Murrumbidgee Council and Edward River Council.

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1 Introduction

1.1 Overview

Spark Renewables Pty Limited (Spark Renewables) proposes to develop the Dinawan Wind Farm (the project). The project includes the installation, operation, maintenance and decommissioning of up to approximately 200 wind turbine generators (WTGs) and associated infrastructure. The project is on the traditional lands of the Wiradjuri people and several smaller nations of the Murrumbidgee plains, about halfway between the towns of Coleambally and Jerilderie and lies within the Murrumbidgee and Edward River local government areas (LGAs) in New South Wales (NSW). The regional and local contexts of the project are shown in Figure 1.1 and Figure 1.2, respectively.

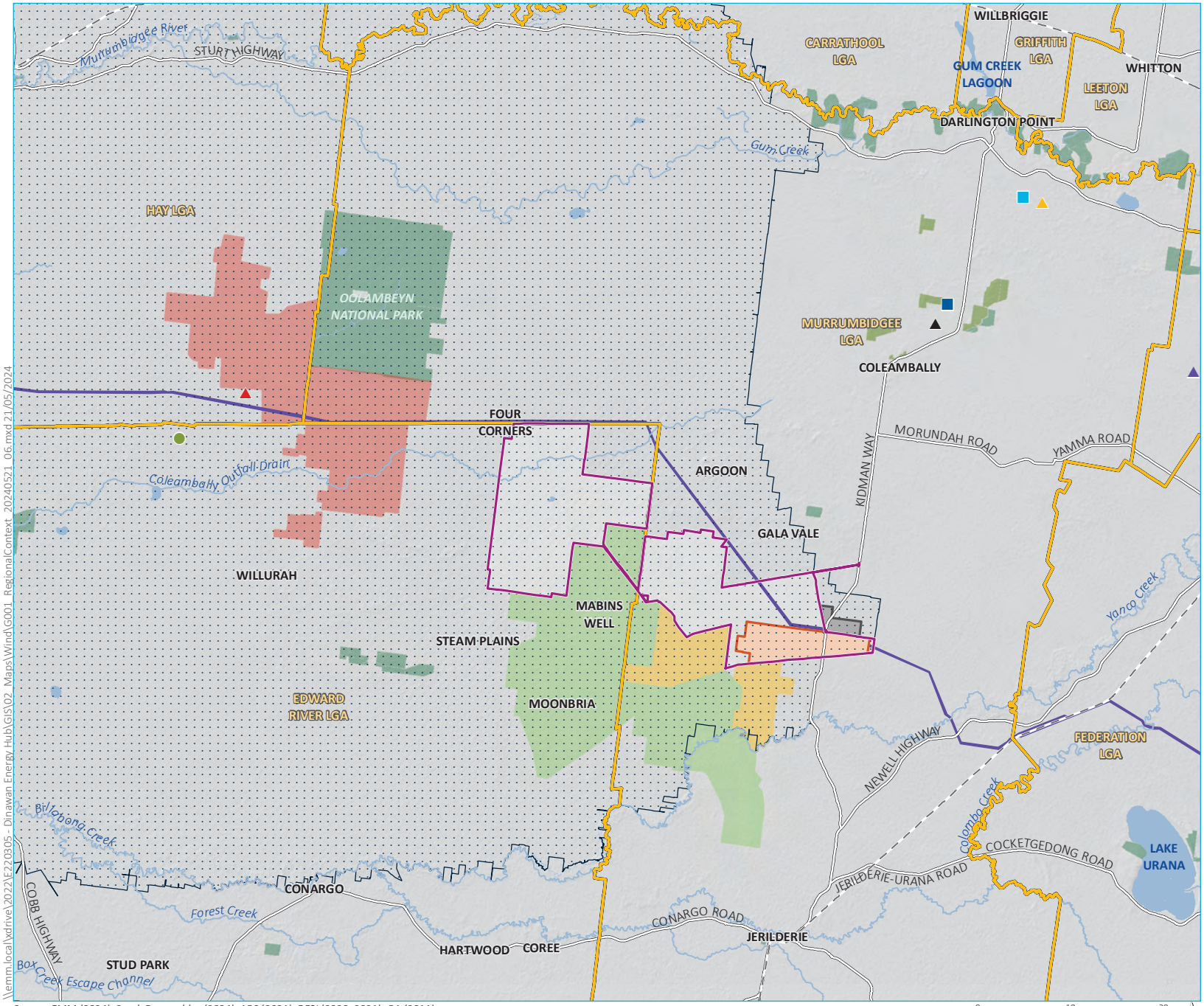
The project is within the South West Renewable Energy Zone (REZ), a region selected by the NSW Government for its significant potential for renewable energy generation and regional development.

The project will connect to the Dinawan Substation, currently under construction as part of the Project EnergyConnect interconnector that will run between Robertstown in South Australia and Wagga Wagga in NSW. The substation and interconnector are a separate approved project that is being built by Transgrid.

The main objective of the project is to generate renewable energy, consistent with NSW Government policy for development of infrastructure for renewable energy generation, and will significantly contribute to the target of 3.98 gigawatts (GW) of generation planned in the South West REZ. The project will have a generation capacity of up to approximately 1,200 megawatts (MW), equivalent to the needs of 700,000 NSW households per year. It will assist in meeting NSW and Australian Government emissions reduction targets and will abate approximately 3.2 million tonnes of greenhouse gases (GHG) annually.

The project is State significant development (SSD) pursuant to schedule 1 of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP). Accordingly, approval for the project is required under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This traffic impact assessment (TIA) forms part of the environmental impact statement (EIS) for the project.



KEY

- Project area
- Dinawan Solar Farm project area
- Renewable Energy Zone

Project EnergyConnect (Transgrid)

- Dinawan Substation
- Transmission line

Neighbouring renewable energy developments

- Coleambally Solar Farm (operating)
- Darlington Point Solar Farm (operating)
- Coleambally BESS (approved)
- Yarrabee Solar Farm (approved)
- Pottinger Solar Farm (proposed)
- Pottinger Wind Farm (proposed)
- Woodland BESS (proposed)
- Yanco Delta Wind Farm (approved)
- Argoon Wind Farm (proposed)
- Bullawah Wind Farm (proposed)

Existing environment

- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- State forest
- Local government area

Source: EMM (2024); Spark Renewables (2024); ABS (2021); DFSI (2020, 2021); GA (2011)

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Regional context

Dinawan Wind Farm
Traffic Impact Assessment
Figure 1.1

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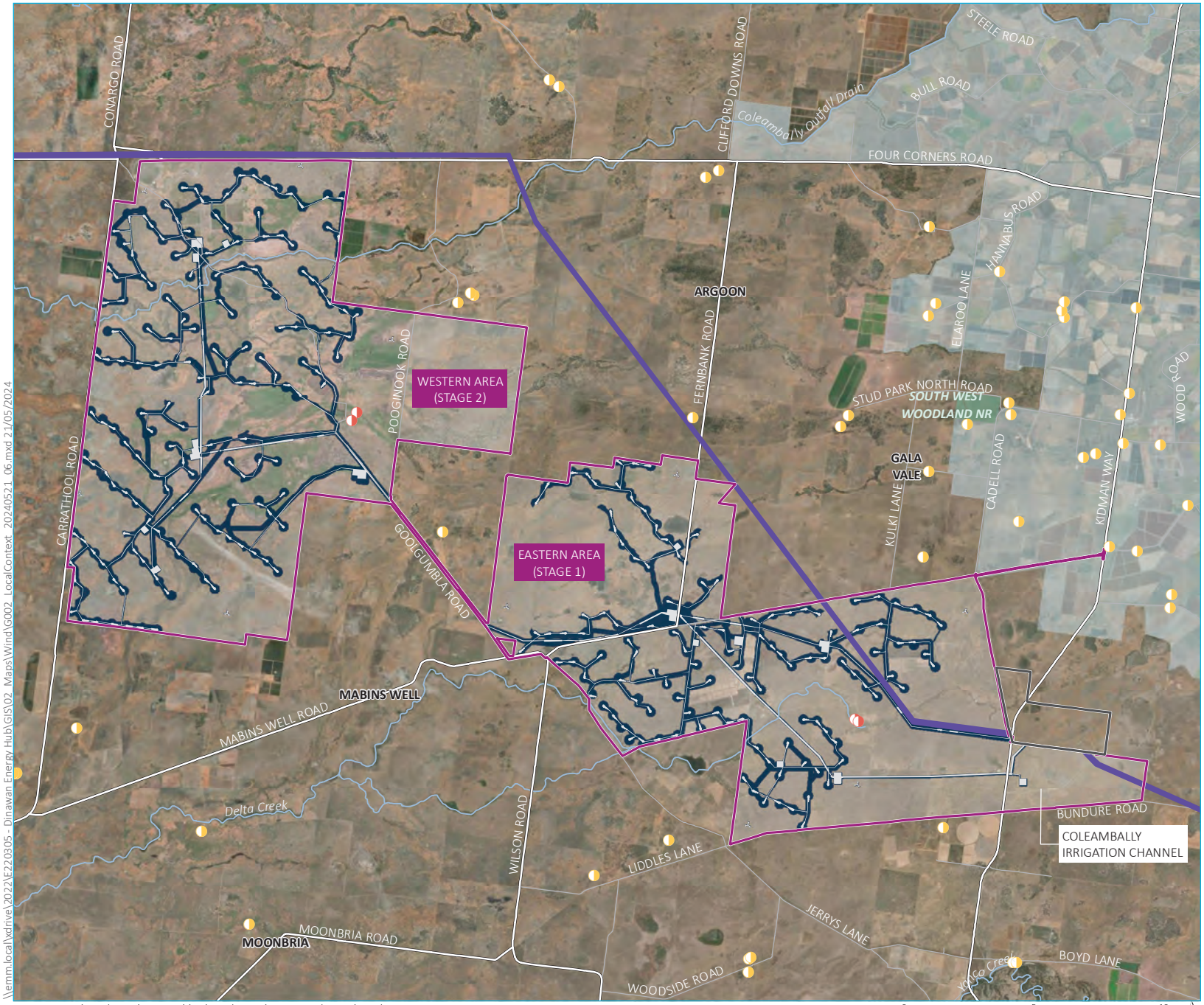

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Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

Local context

Dinawan Wind Farm
Traffic Impact Assessment
Figure 1.2

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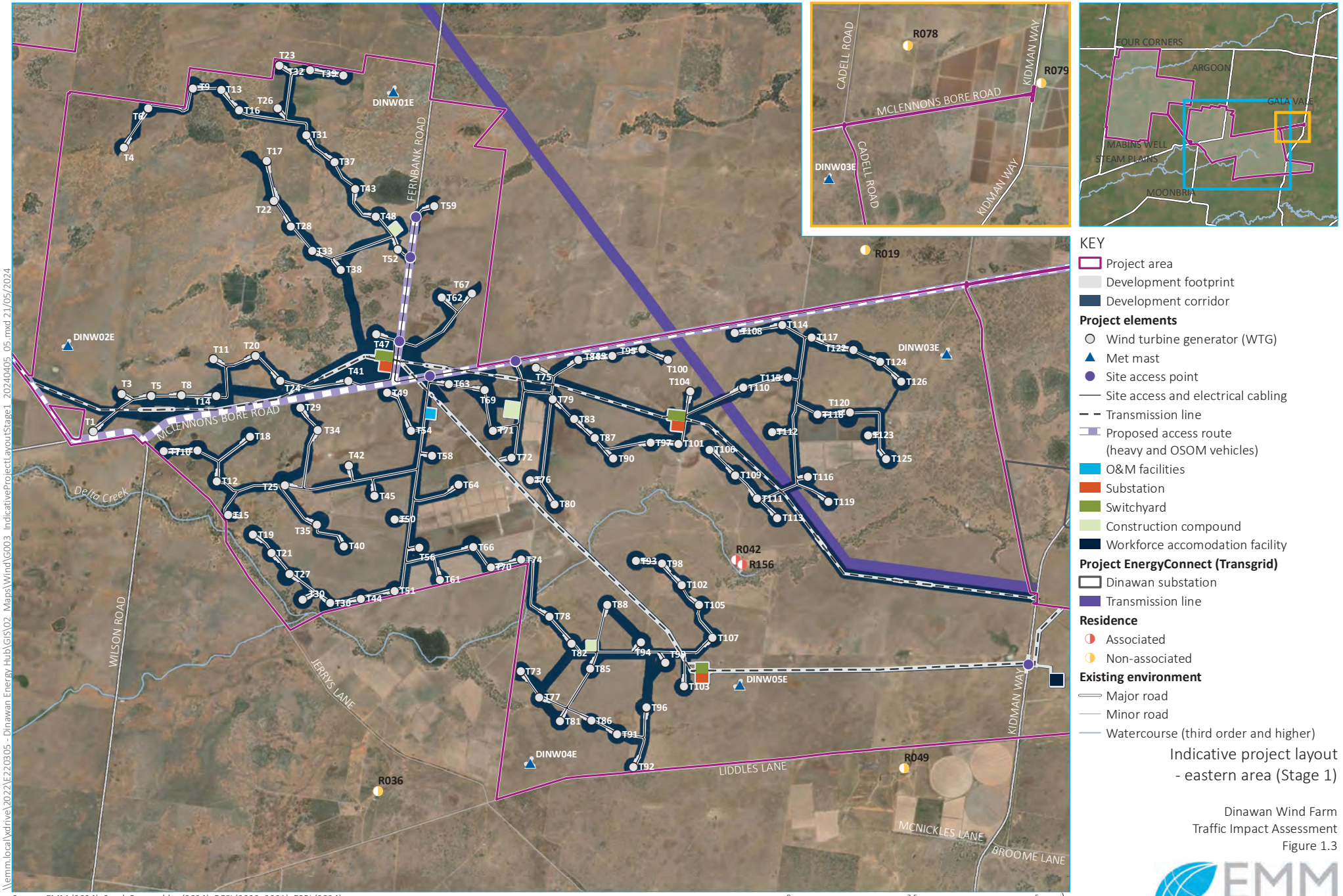
1.2 Project description

A full project description is provided in Chapter 3 of the EIS and an overview of the project layout is shown in Figure 1.3 and Figure 1.4. The project will comprise the following key components:

- a network of approximately 200 (3 blade) WTGs across two areas
- electrical collection system, substations and control rooms
- electricity transmission line infrastructure connecting the project substations to the Dinawan Substation
- operations and maintenance (O&M) infrastructure, including site offices and amenities, buildings, equipment and maintenance sheds and laydown, storage and parking areas
- temporary construction facilities, including worker accommodation facilities, construction compounds, site offices and amenities, concrete batching plants, construction materials storage (including stockpiles), laydown areas, temporary meteorological masts, borrow pits, water tanks and storage and parking areas
- other permanent infrastructure, including hardstands, water tanks, permanent meteorological masts, new access tracks and upgrades to existing access tracks
- access points from the public road network and public road upgrades to facilitate the delivery of WTG components.



KEY

- Project area
- Development footprint
- Development corridor

Project elements

- Wind turbine generator (WTG)
- Met mast
- Site access point
- Site access and electrical cabling
- Transmission line
- Proposed access route (heavy and OSOM vehicles)
- O&M facilities
- Substation
- Switchyard
- Construction compound
- Workforce accomodation facility

Project EnergyConnect (Transgrid)

- Dinawan substation
- Transmission line

Residence

- Associated
- Non-associated

Existing environment

- Major road
- Minor road
- Watercourse (third order and higher)

Indicative project layout - eastern area (Stage 1)

Dinawan Wind Farm
Traffic Impact Assessment
Figure 1.3

creating opportunities

Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

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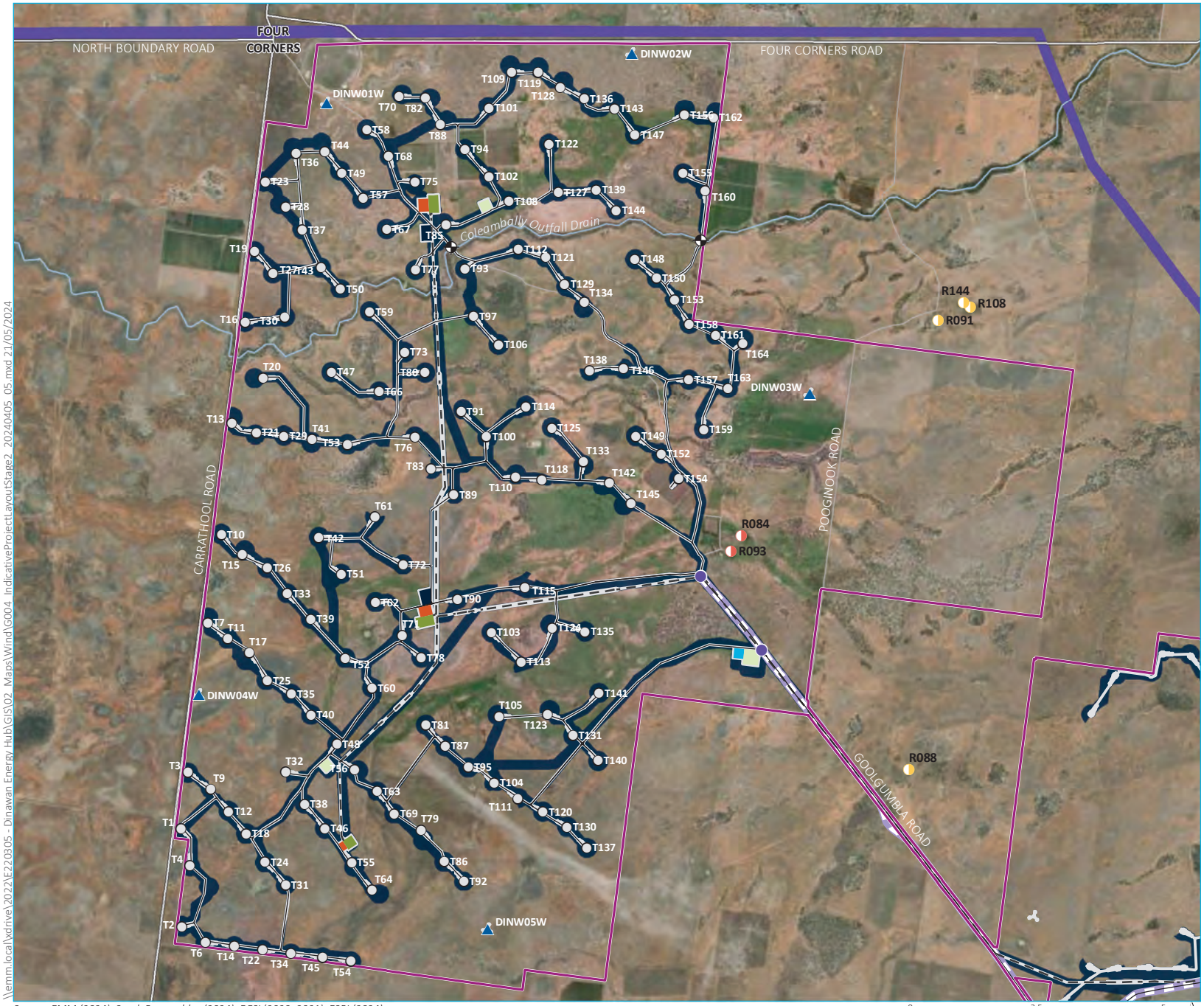

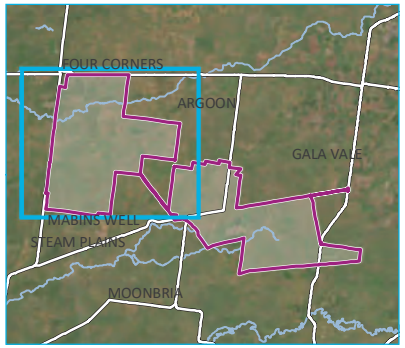

KEY

- Project area
- Development footprint
- Development corridor

Project elements

- Wind turbine generator (WTG)
- Met mast
- Site access point
- Site access and electrical cabling
- Transmission line
- Proposed access route (heavy and OSOM vehicles)
- O&M facilities
- Substation
- Switchyard
- Construction compound
- Workforce accomodation facility

Project EnergyConnect (Transgrid)

- Transmission line

Residence

- Associated
- Non-associated

Existing environment

- Bridge
- Major road
- Minor road
- Watercourse (third order and higher)

Indicative project layout
- western area (Stage 2)

Dinawan Wind Farm
Traffic Impact Assessment
Figure 1.4

Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

0 2.5 5 km

GDA2020 MGA Zone 55

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1.3 Project areas

The project area is approximately 39,061 ha and encompasses 349 land parcels (Figure 1.2). The majority of the land within the project area is privately owned, and can be considered as two distinct areas, the eastern wind area and the western wind area. The land within the project area is predominantly used for sheep and cattle grazing and some irrigated cropping.

Within the project area, the development corridor is approximately 7,256 ha (Figure 1.2). The development corridor is the land within the project area where project components may be placed, providing the necessary flexibility for component placement during detailed design (i.e. micro-siting). The development corridor has been refined based on the results of environmental surveys, including biodiversity, Aboriginal cultural and historical heritage surveys, and with consideration of community and regulatory stakeholder feedback.

A development footprint has also been provided and is approximately 1,339 ha within the development corridor. This assessment assumes that the development footprint will be disturbed. As part of detailed design, the development footprint may move within the development corridor; however, total direct surface disturbance is not anticipated to increase.

Direct impacts for public road upgrade works are required on Kidman Way, McLennons Bore Road, Wilson Road, Fernbank Road and Goolgumbla Road (Figure 1.3) and will facilitate access to the development corridor. From the site access points, private internal roads will be used to traverse the development corridor.

The preferred point of connection to Transgrid's network is via the Dinawan Substation, which forms part of Project EnergyConnect and will be constructed on land adjacent to the project area. An overhead transmission line will connect the project's collector substations to the Dinawan Substation.

1.4 Project staging

It is anticipated that the project will be constructed in two stages:

- **Stage 1** will be the construction of the eastern wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 1 is within the Murrumbidgee LGA.
- **Stage 2** will be the construction of the western wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 2 is predominantly within the Edward River LGA, with the exception of additional public road upgrades and grid connection infrastructure within Murrumbidgee LGA.

The project's generation capacity and connection to the electricity grid is dependent on the outcomes of the South West REZ Access Scheme and the construction of electricity grid infrastructure (including Dinawan Substation). For the purposes of this assessment, it has been assumed that the project will connect to Dinawan Substation and project infrastructure will be housed within the full extent of the development footprint (i.e. this assessment has assessed impacts associated with the construction and operation of both stages 1 and 2).

1.5 Report content and objectives

This TIA has been prepared generally in accordance with the requirements of the NSW Government's *Guide to Traffic Generating Developments* (RTA 2002) and Austroads Guide to Traffic Management, Part 12. This report comprises of the following sections:

- an introduction and description of the project
- a description of the project and local and regional context
- a summary of the assessment requirements
- an overview of the existing environment
- a detailed breakdown of the project's likely traffic impacts
- a summary of initiatives built into the project design to avoid and minimise impacts
- predicted impacts of the project during construction, operation and decommissioning
- an overview of mitigation measures and monitoring requirements for the project.

This TIA also incorporates the following studies and reviews:

- review of background traffic data
- site inspection
- traffic surveys of the local road network
- outcomes of consultation with Transport for New South Wales (TfNSW), Murrumbidgee Council and Edward River Council
- swept path and SIDRA intersection analyses
- identification of impacts to the local road network
- identification of road upgrade requirements and maintenance requirements.

A visual inspection of the primary affected roads has been undertaken to confirm the current general road widths and traffic conditions for these routes and photographs have been taken.

2 Assessment requirements and consultation

2.1 Secretary's Environmental Assessment Requirements

This assessment has been prepared in accordance with requirements of the NSW Department of Planning, Housing and Infrastructure (DPHI) (formally NSW Department of Planning and Environment (DPE)) which were set out in the Planning Secretary's Environmental Assessment Requirements (SEARs) for the project, issued on 14 December 2022 and reissued on 22 August 2023 with additional requirements from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). The SEARs identify matters which must be addressed in the EIS. Table 2.1 lists individual requirements relevant to this TIA and where they have been addressed.

Table 2.1 Traffic related SEARs and where these have been addressed

Item no.	SEARs	Section reference
1	An assessment of the construction, operational and decommissioning traffic impacts of the development on the local and State road network.	Section 4
2	Provide details of the peak and average traffic volumes (including light, heavy and over-mass and over-dimensional vehicles / heavy vehicles requiring escort and construction worker transportation) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel).	Section 4
3	An assessment of the potential traffic impacts of the project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones.	Section 4.7.4
4	An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the project (including over-mass / over-dimensional traffic haulage routes from port) during construction, operation and decommissioning.	Section 4.7.4
5	An assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown Land (including existing Travelling Stock Route network)[1] particularly in relation to the capacity and conditions of the roads and use of rail level crossings (and rail safety assessment if required), and impacts to rail underbridges and overbridges.	Section 4.7.4
6	A cumulative impact assessment of traffic from nearby developments.	Section 4.5
7	Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and / or rail authority.	Section 6

Notes: 1. Parcels of Crown land and travelling stock reserves have been identified along sections of McLennons Bore Road, Fernbank Road and Wilson Road that will be used by project-related traffic and may require upgrades prior to commencement of construction. Consultation with DPHI's Crown Lands (Griffith and Hay District Office) about potential impacts on Crown land and travelling stock reserves is ongoing.

2.2 TfNSW

To inform the preparation of the SEARs, DPHI invited other government agencies to recommend matters to be addressed in the EIS. TfNSW raised matters relevant to this assessment in its letter dated 26 April 2023. TfNSW comments and EMM responses are provided in Table 2.2. These matters have been considered in the preparation of this assessment.

Table 2.2 TfNSW comments and where these have been addressed

Item no.	TfNSW comments	Section reference
1	TfNSW requests that any future application be submitted with an Environmental Impact Assessment (EIA) containing a Traffic Impact Assessment (TIA), prepared by a suitably qualified person/s in accordance with the Austroads Guide to Traffic Management Part 12, Australian Standards and any complementary TfNSW Supplements, and *Roads and Maritime Guide to Traffic Generating Developments*. The TIA should contain information listed in Attachment A: Traffic Impact Assessment (TIA).	This report
2	In addition to the requested TIA, due to the significant scope of the transport logistics for OSOM transit, a concept-level route analysis is required to be provided with the SSD application based on high-level 3D swept path analysis to generally indicate locations where civil works are likely to be required. The route analysis is to include at a minimum the following:	Section 4.7 and Attachment E
3	Identify the OSOM route to be utilised and any indicative pinch points within the network vertically, horizontally and laterally and the potential civil works required to accommodate the OSOM vehicles.	
4	The logistics assessment is to highlight each at-risk road structures that the haulage route crosses including bridges, traffic signals, signage, major culverts, and minor culverts that may not meet the desirable cover to cater for proposed axle loads.	
5	Pull-over bay locations for the design vehicle or identification of any long haulage segments of the route where overtaking cannot be achieved.	
6	The design vehicle templates used with the swept path analysis software are also requested in order for TfNSW to review the performance within the software (e.g. Autodesk Vehicle Tracking or Transoft AutoTURN).	Design vehicle templates can be submitted to TfNSW separately during their review of this TIA.
7	Provide the following measurements parameters of the OSOM components / materials to be moved: • Identify all the types of OSOM vehicles proposed to be used for the project. • Overall combination length, width, height and mass • Maximum component length (e.g. blade length, blade overhang length, etc.) • Maximum component widths (e.g. turbine tower, battery component, pipes, etc.) • Maximum load heights (clearance to overhead obstructions such as structures, utilities and vegetation), • Wheelbase dimensions, • Maximum trailer articulation angle(s), • Minimum overhang heights above the road surface, • Axle loads and axle group loads in terms of both tonnes and Equivalent Standard Axles (refer to Austroads Guide to Pavement Technology). • Identify the route or routes with GPS coordinates for pinch points, traffic management measures and pull over/layby locations.	Section 4.7 and Attachment E

2.3 Consultation

Consultation with TfNSW about Dinawan Solar Farm and Dinawan Wind Farm commenced in May 2023 and is ongoing, including a separate meeting in March 2024.

As part of this engagement, it was noted that a new site access intersection from Kidman Way is proposed for Dinawan Solar Farm. This intersection will also be utilised by construction traffic associated with Dinawan Wind Farm as the Stage 1 accommodation facility is proposed east of Kidman Way and within the development footprint for Dinawan Solar Farm (Figure 1.3).

Creating a new site access intersection directly from Kidman Way negates the need for significant bridge upgrades and/or a new bridge across the Coleambally Irrigation Channel to facilitate OSOM vehicle movements into the eastern part of the development footprint for Dinawan Solar Farm. The proposed new site access intersection is ideally located to support key project infrastructure during construction of the Dinawan Solar Farm (including the battery energy storage system, substation, switchyard, construction compound and accommodation facility), which have been placed in the eastern part of the development footprint to increase the setback distance from the closest non-associated residences.

In response to feedback from TfNSW, the new intersection on Kidman Way will be designed in accordance with *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections Figure 7.1: Right-left staggered T-intersection on a two-lane rural road*. A strategic concept design showing this intersection will be submitted to TfNSW for review.

Transmission lines connecting the project to Dinawan Substation will cross Kidman Way. TfNSW provided in principle support as long as long as poles/towers to support these overhead transmission lines are outside of the road reserve and a 6.5 m height clearance is maintained at the sag point of the line. A conceptual representation of the transmission lines crossing Kidman Way is provided in Figure 3.4 of the EIS.

TfNSW provided the growth rates for background traffic along Kidman Way and local roads, which have been incorporated into the TIA (refer Section 3.4).

Consultation with Murrumbidgee Council, Edward River Council and DPHI's Crown Lands (Griffith and Hay District Office) in relation to impacts on local roads, Crown land and travelling stock reserves is ongoing.

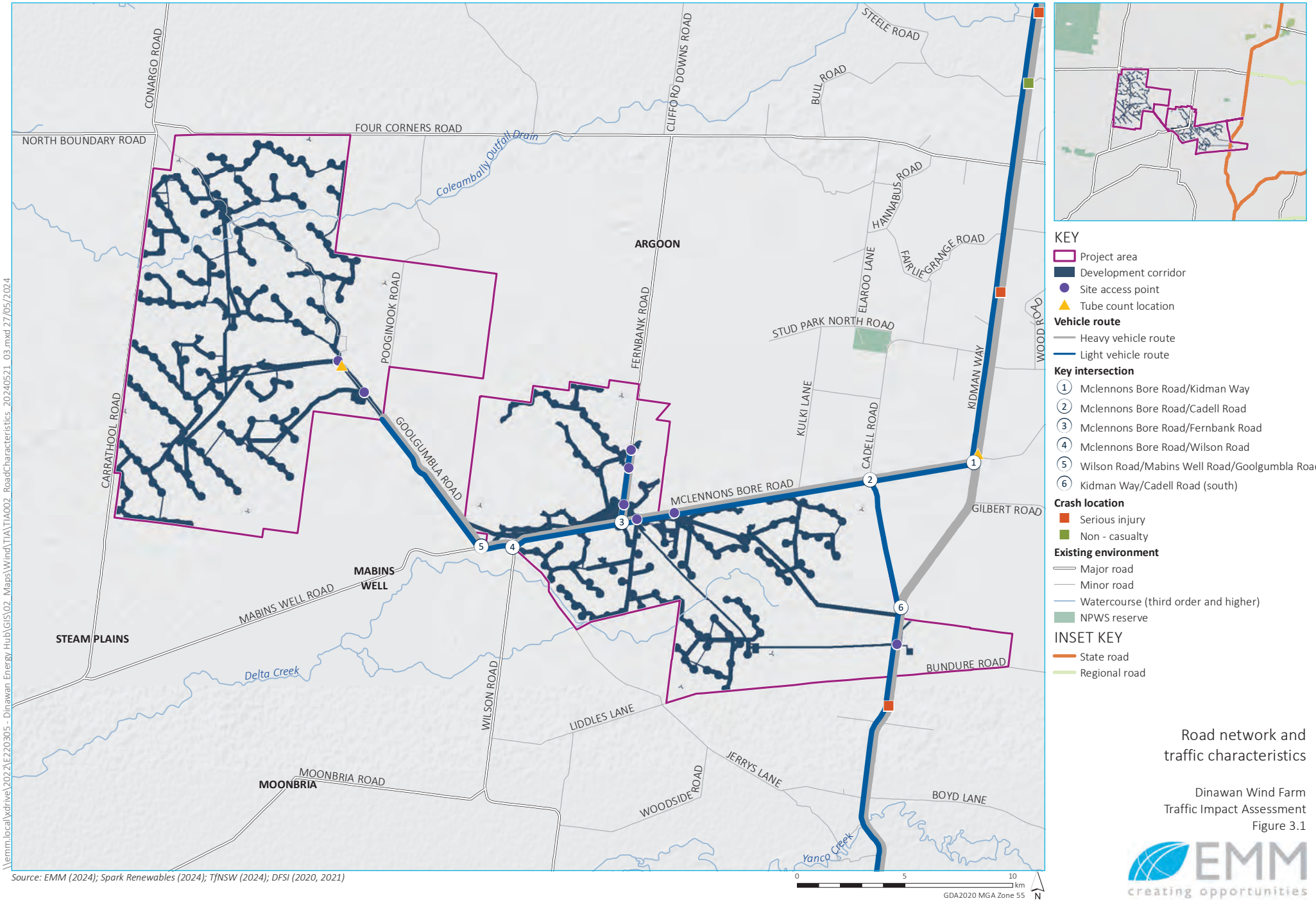
3 Existing conditions

3.1 Road network

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- state roads – freeways and primary arterials (TfNSW managed)
- regional roads – secondary or sub arterials (Council managed and part funded by the State)
- local roads – collector and local access roads (Council managed).

Key roads in the vicinity of the project include Kidman Way, McLennons Bore Road, Fernbank Road, Wilson Road, and Goolgumbla Road, which are shown in Figure 3.1. Road geometry descriptions for each of the roads are provided in the tables below.



KEY

- Project area
- Development corridor
- Site access point
- Tube count location

Vehicle route

- Heavy vehicle route
- Light vehicle route

Key intersection

1. Mclennons Bore Road/Kidman Way
2. Mclennons Bore Road/Cadell Road
3. Mclennons Bore Road/Fernbank Road
4. Mclennons Bore Road/Wilson Road
5. Wilson Road/Mabins Well Road/Goolgumbla Road
6. Kidman Way/Cadell Road (south)

Crash location

- Serious injury
- Non - casualty

Existing environment

- Major road
- Minor road
- Watercourse (third order and higher)
- NPWS reserve

INSET KEY

- State road
- Regional road

Source: EMM (2024); Spark Renewables (2024); TfNSW (2024); DFSI (2020, 2021)

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Road network and traffic characteristics

Dinawan Wind Farm
Traffic Impact Assessment
Figure 3.1

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Table 3.1 Kidman Way

Aspect	Description
Road classification and connectivity	State road stretching between Bourke (north) and Newell Highway near Jerilderie (south)
Alignment	North–south
Number of lanes	One lane each way
Carriageway type	Sealed road
Carriageway width	Approximately 8 m sealed width with 3.5 m travel lane each way and 0.5 m shoulders on both sides
Posted speed limit	100 kilometres per hour (km/h)
Heavy vehicle access	Approved for road trains up to 36.5 m in length and OSOM vehicles
Traffic function	Carries regional and local traffic

Plate 3.1 Kidman Way (looking south)

Table 3.2 Cadell Road

Aspect	Description
Road classification and connectivity	Local road stretching approximately 18 km between Kidman Way, Coleambally (north) and Kidman Way, Bundure (south)
Alignment	Generally north–south
Number of lanes	No marked lanes
Carriageway type	Sealed road
Carriageway width	Approximately 6 m sealed width
Speed limit	100 km/h (NSW default non-built up area speed limit)
Heavy vehicle access	Approved for 19 m vehicles under 50 tonnes (t)
Traffic function	Carries local traffic

Plate 3.2 Cadell Road

Table 3.3 McLennons Bore Road

Aspect	Description
Road classification and connectivity	Local road stretching approximately 22 km west from Kidman Way, Gala Vale to Wilson Road, Jerilderie
Alignment	East–west
Number of lanes	No marked lanes
Carriageway type	Unsealed road, dry weather road only between Cadell Road and Kidman Way
Carriageway width	Approximately 7 m, reduced to approximately 4 m between Cadell Road and Kidman Way
Speed limit	100 km/h (NSW default non-built up area speed limit)
Heavy vehicle access	Approved for 19 m vehicles under 50 t
Traffic function	Carries local traffic

Plate 3.3 McLennons Bore Road

Table 3.4 Fernbank Road

Aspect	Description
Road classification and connectivity	Local road stretching between McLennons Bore Road (south) and Four Corners Road (north)
Alignment	North–south
Number of lanes	No marked lanes
Carriageway type	Unsealed road
Carriageway width	Approximately 5.5 m wide
Speed limit	100 km/h (NSW default non-built up area speed limit)
Heavy vehicle access	Approved for 19 m vehicles under 50 t
Traffic function	Carries local traffic

Plate 3.4 Fernbank Road

Table 3.5 Wilson Road

Aspect	Description
Road classification and connectivity	Local road stretching between Goolgumbla Road (north) and Bolton Street (south)
Alignment	Predominantly north–south
Number of lanes	No marked lanes
Carriageway type	Unsealed road
Carriageway width	Approximately 4.2 m wide
Speed limit	100 km/h (NSW default non-built up area speed limit)
Heavy vehicle access	Approved for 19 m vehicles under 50 t
Traffic function	Carries local traffic

Plate 3.5 Wilson Road

Table 3.6 Goolgumbla Road

Aspect	Description
Road classification and connectivity	Local road between Wilson Road (south) and Goolgumbla Station (north). There is no public access beyond Goolgumbla Station.
Alignment	Predominantly north–south
Number of lanes	No marked lanes
Carriageway type	Unsealed road
Carriageway width	Approximately 4.7 m wide
Speed limit	100 km/h (NSW default non-built up area speed limit)
Heavy vehicle access	Approved for 19 m vehicles under 50 t
Traffic function	Carries local traffic

Plate 3.6 Goolgumbla Road

3.2 Key intersections

The intersection of Kidman Way/McLennons Bore Road has been assessed as it is a key existing intersection for project-related traffic impacts and both Kidman Way and McLennons Bore Road will be used by construction and operational traffic. The location of the intersection is shown in Figure 3.1. Intersection geometry details are presented in Table 3.7 and the intersection is shown in Plate 3.7. Other key intersections are also included below.

Table 3.7 Kidman Way/McLennons Bore Road intersection

Aspect	Description
Location	Approximately 6.7 km east of the closest WTG
Intersection control	Priority controlled (give way)
Major road	Kidman Way
North approach	One arrival lane and one departure lane
South approach	One arrival lane and one departure lane
West approach	No marked lanes
Pedestrian connectivity	None
Traffic function	The intersection carries local traffic movements only
Speed limit	100 km/h on all approaches
Comments	This section of McLennons Bore Road is for dry weather use only as specified on signage installed by Murrumbidgee Council

Source: SIX Maps

Plate 3.7 Kidman Way/McLennons Bore Road intersection

Table 3.8 Kidman Way/Cadell Road (south)

Aspect	Description
Location	Approximately 3.8 km east of the closest WTG
Intersection control	Priority controlled (give way)
Major road	Kidman Way
North approach	One arrival lane and one departure lane
South approach	One arrival lane and one departure lane
West approach	No marked lanes
Pedestrian connectivity	None
Traffic function	The intersection carries local traffic movement only
Speed limit	100 km/h on all approaches

Source: SIX Maps

Plate 3.8 Kidman Way/Cadell Road (south) intersection

Table 3.9 Cadell Road/McLennons Bore Road

Aspect	Description
Location	Approximately 2.3 km east of the closest WTG
Intersection control	Priority controlled (give way)
Major road	Cadell Road
North approach	No marked lanes
East approach	No marked lanes
South approach	No marked lanes
West approach	No marked lanes
Pedestrian connectivity	None
Traffic function	Carries local traffic
Speed limit	100 km/h on all approaches
Comments	The section of McLennons Bore Road east of this intersection is for dry weather use only as specified on signage installed by Murrumbidgee Council

Source: SIX Maps

Plate 3.9 Cadell Road/McLennons Bore Road intersection

Table 3.10 McLennons Bore Road/Fernbank Road intersection

Aspect	Description
Location	Approximately 240 m north of the closest WTG
Intersection control	Priority controlled (give way)
Major road	McLennons Bore Road
North approach	Unsealed with no marked lanes
East approach	Unsealed with no marked lanes
West approach	Unsealed with no marked lanes
Pedestrian connectivity	None
Traffic function	Carries local traffic
Speed limit	100 km/h on all approaches

Source: SIX Maps

Plate 3.10 McLennons Bore Road/Fernbank Road intersection

Table 3.11 McLennons Bore Road/Wilson Road intersection

Aspect	Description
Location	Approximately 460 m north-west of the closest WTG
Intersection control	Priority controlled (give way)
Major road	Wilson Road
North-west approach	Unsealed with no marked lanes
North-east approach	Unsealed with no marked lanes
South-east approach	Unsealed with no marked lanes
Pedestrian connectivity	None
Traffic function	Carries local traffic
Speed limit	100 km/h on all approaches

Source: SIX Maps

Plate 3.11 McLennons Bore Road/Wilson Road intersection

Table 3.12 Wilson Road/Mabins Well Road intersection

Aspect	Description
Location	Approximately 460 m west of the closest WTG
Intersection control	Priority controlled (give way)
Major road	Wilson Road
North-west approach	Unsealed with no marked lanes
South-east approach	Unsealed with no marked lanes
South-west approach	Unsealed with no marked lanes
Pedestrian connectivity	None
Traffic function	Carries local traffic
Speed limit	100 km/h on all approaches

Source: SIX Maps

Plate 3.12 Mabins Well Road/Wilson Road intersection

3.3 Existing traffic volumes

3.3.1 Intersection counts

Intersections affected by project-related traffic were surveyed on Thursday 15 February 2024 during a non-school holiday period. The raw intersection count data is provided in Attachment A. A list of the intersections surveyed is provided in Table 3.13, along with the survey periods and the time periods observed to be AM and PM peak hour windows.

Table 3.13 Intersection surveys performed

Junction	Survey period	AM peak observed	PM peak observed
Kidman Way/Bundure Road/Liddles Lane	12:00 am–12:00 am (24-hour survey)	10:30 am–11:30 am	1:15 pm–2:15 pm
Kidman Way/Cadell Road (south)	12:00 am–12:00 am (24-hour survey)	10:30 am–11:30 am	1:15 pm–2:15 pm
Kidman Way/McLennons Bore Road	12:00 am–12:00 am (24-hour survey)	10:15 am–11:15 am	3:45 pm–4:45 pm
McLennons Bore Road/Cadell Road	6:00 am–9:00 am, 3:00 pm–6:00 pm	7:45 am–8:45 am	3:00 pm–4:00 pm
McLennons Bore Road/Fernbank Road	6:00 am–9:00 am, 3:00 pm–6:00 pm	7:45 am–8:45 am	4:30 pm–5:30 pm
McLennons Bore Road/Wilson Road	6:00 am–9:00 am, 3:00 pm–6:00 pm	7:00 am–8:00 am	3:00 pm–4:00 pm
Wilson Road/Mabins Well Road	6:00 am–9:00 am, 3:00 pm–6:00 pm	7:00 am–8:00 am	4:30 pm–5:30 pm

The above table shows that there is no consistent AM or PM peak hour that could be utilised for the assessment of project-related traffic impacts. Therefore, as a conservative approach, the respective AM and PM traffic volumes for each individual intersection have been used for analysis.

The surveyed intersection traffic volumes for each of these intersections during both the AM and PM peak hours are summarised in Figure 3.2. The 'Dinawan Solar Farm Western Access' and 'Kidman Way Eastern Site Access' do not currently exist and will be constructed as part of the project and Dinawan Solar Farm.

The traffic volumes on Figure 3.2 show that:

- Kidman Way carries approximately 60 to 70 vehicles during the AM and PM peak hours
- over 50% of vehicles on Kidman Way during the peak hour are heavy vehicles, which aligns with the higher order classification of Kidman Way (being suitable for 36.5-m-long A-double trucks)
- for local roads, traffic volumes are generally low.

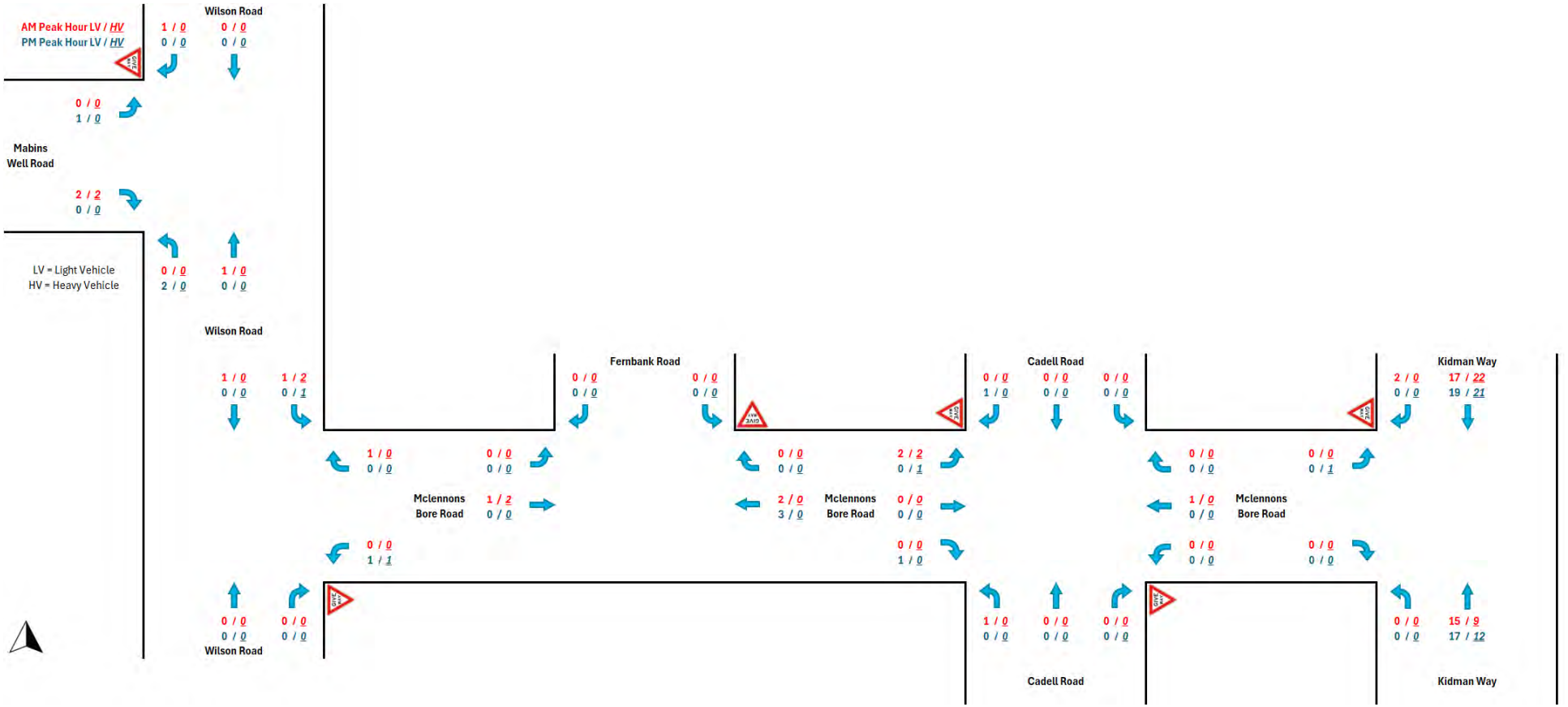

Figure 3.2(a) 2024 survey AM and PM peak hour intersection traffic volumes

Note: Wilson Road becomes Goolgumbla Road approximately 1.7 km north of the Wilson Road and Mabins Well Road intersection

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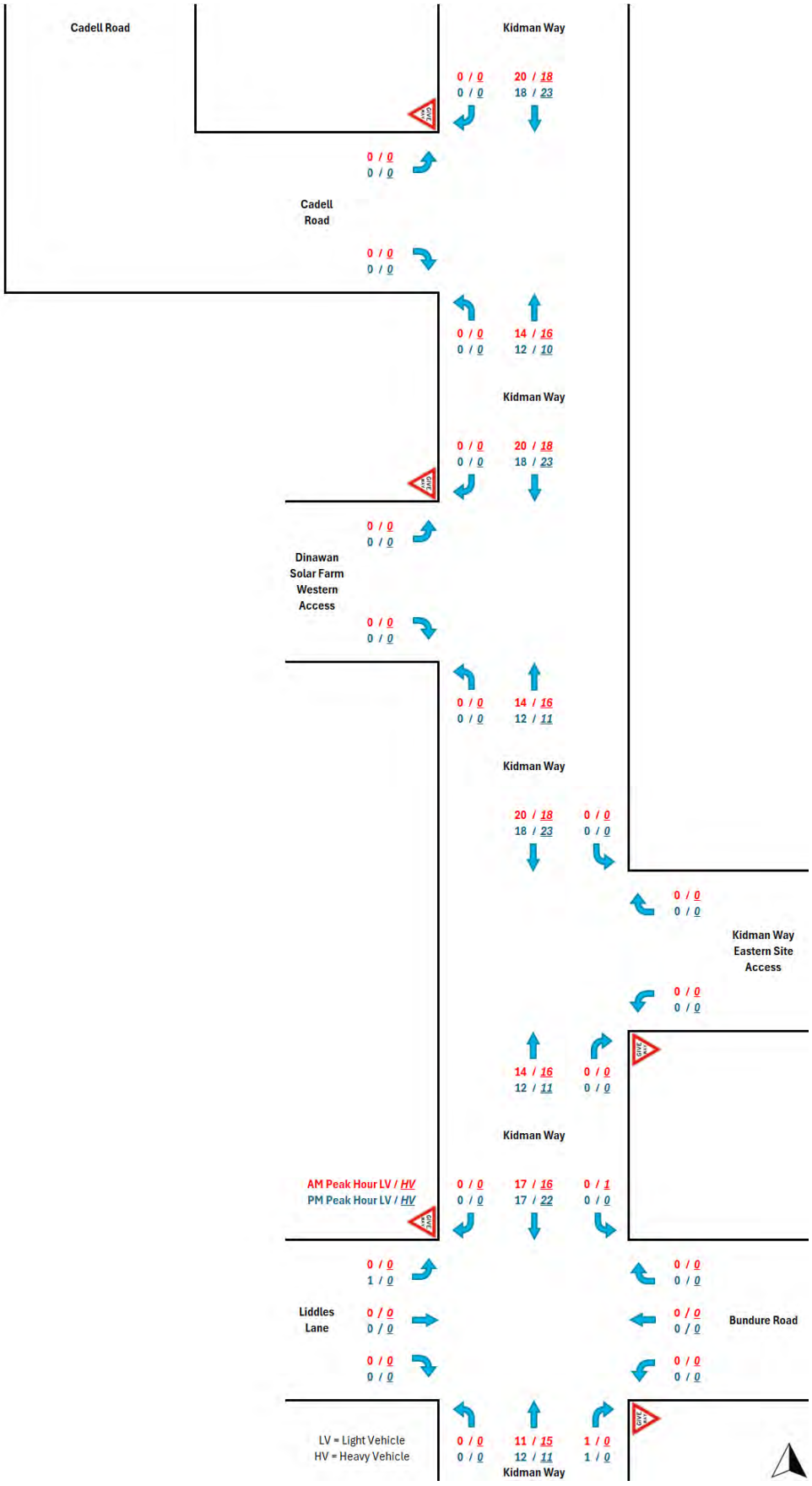


Figure 3.2(b) 2024 survey AM and PM peak hour intersection traffic volumes (continued)

3.3.2 Tube count

i Kidman Way

A tube count survey was undertaken on Kidman Way, north of McLennons Bore Road, for a seven-day period between 14 February 2024 and 21 February 2024. Average daily traffic (ADT), 85th percentile (85%ile) speed, and heavy vehicle percentages were recorded. The tube count location is shown in Figure 3.1. The raw tube count data is shown in Attachment B. A summary of the tube count results is presented below in Table 3.14.

Table 3.14 Kidman Way tube count results summary

Description	Direction	Value
5-day ADT	Bi-directional	860
	Northbound	416
	Southbound	444
85%ile speed (km/h)	Northbound	104.5 km/h
	Southbound	103.4 km/h
Heavy vehicle % (5-day)	Northbound	45.2
	Southbound	43.2

The above table shows that heavy vehicle traffic volumes on Kidman Way are high. Traffic volumes, 85%ile speed and heavy vehicle percentages are observed to be approximately balanced in northbound and southbound directions. The recorded 85%ile traffic speed is slightly higher than the posted speed limit for both directions of traffic but is within approximately 5% of the legal limit.

ii Goolgumbla Road

A tube count survey was also conducted for Goolgumbla Road, north of Pooginook Road, for the seven-day period between 14 February 2024 and 21 February 2024. Figure 3.1 shows the location at which the tube count was performed. ADT, 85%ile speed, and heavy vehicle percentages were recorded. Table 3.15 summarises the results of the survey.

Table 3.15 Goolgumbla Road tube count results summary

Description	Direction	Value
5-day ADT	Bi-directional	9
	Northbound	5
	Southbound	5
85%ile speed (km/h)	Northbound	93.3 km/h
	Southbound	87.8 km/h
Heavy vehicle % (5-day)	Northbound	0
	Southbound	0

Traffic volumes on Goolgumbla Road were found to be light and lacking in heavy vehicles, as shown in the above table, which is to be expected given that it is an unsealed local road with no through traffic for the general public.

3.4 Baseline traffic volumes

The baseline traffic volumes have been calculated from the 2024 survey traffic volumes by applying a linear annual growth rate of 1.6% per annum, as advised by TfNSW.

The construction peaks are expected to occur in:

- Stage 1 – 2027 (based on an assumption that construction commences in 2026) – month 15 in Figure 4.1
- Stage 2 – 2029 (based on an assumption that construction commences in 2026) – month 37 in Figure 4.1.

Hence, baseline traffic volumes have been calculated for 2027 (Figure 3.3) and 2029 (Figure 3.4) based on the 2024 survey traffic volumes.

3.4.1 2027 baseline traffic volumes

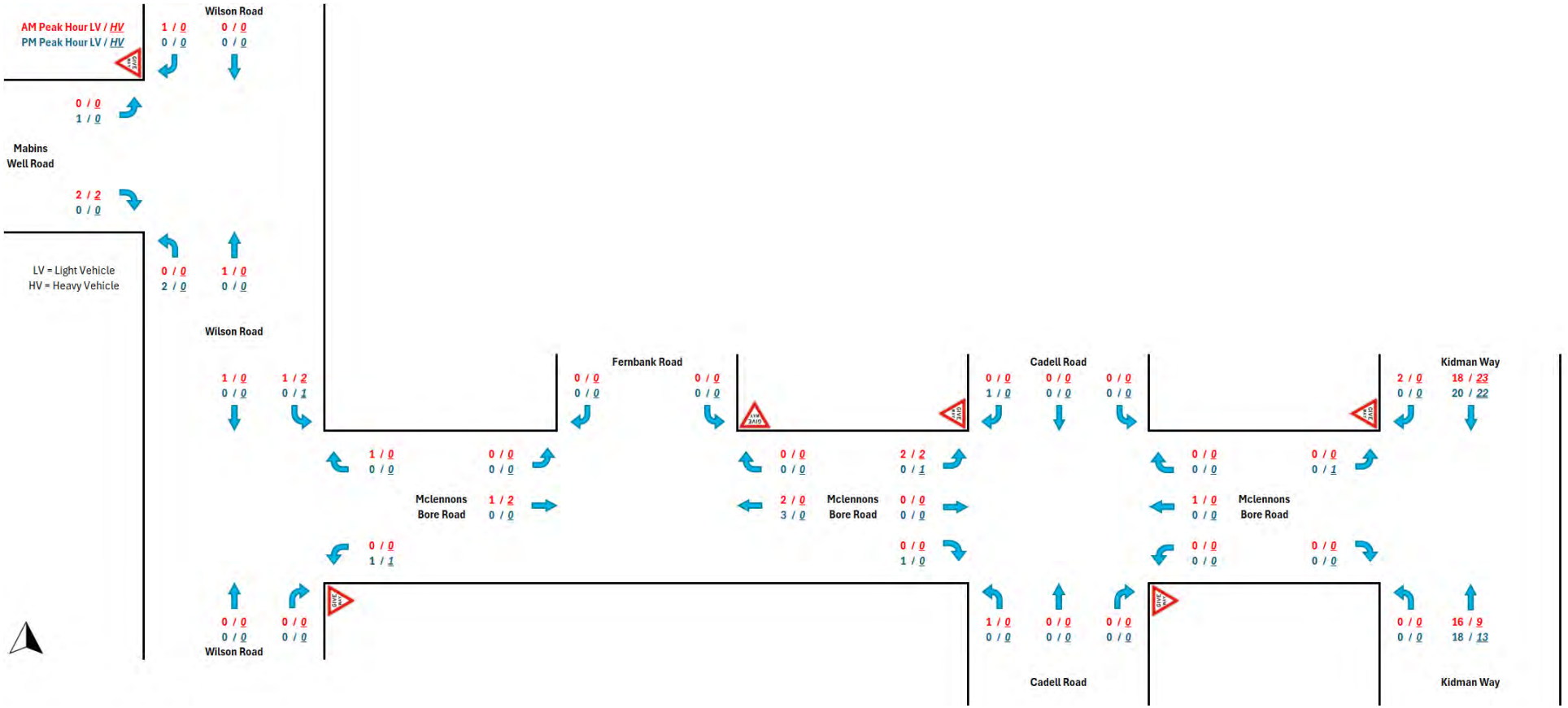


Figure 3.3(a) 2027 baseline AM and PM peak hour traffic volumes

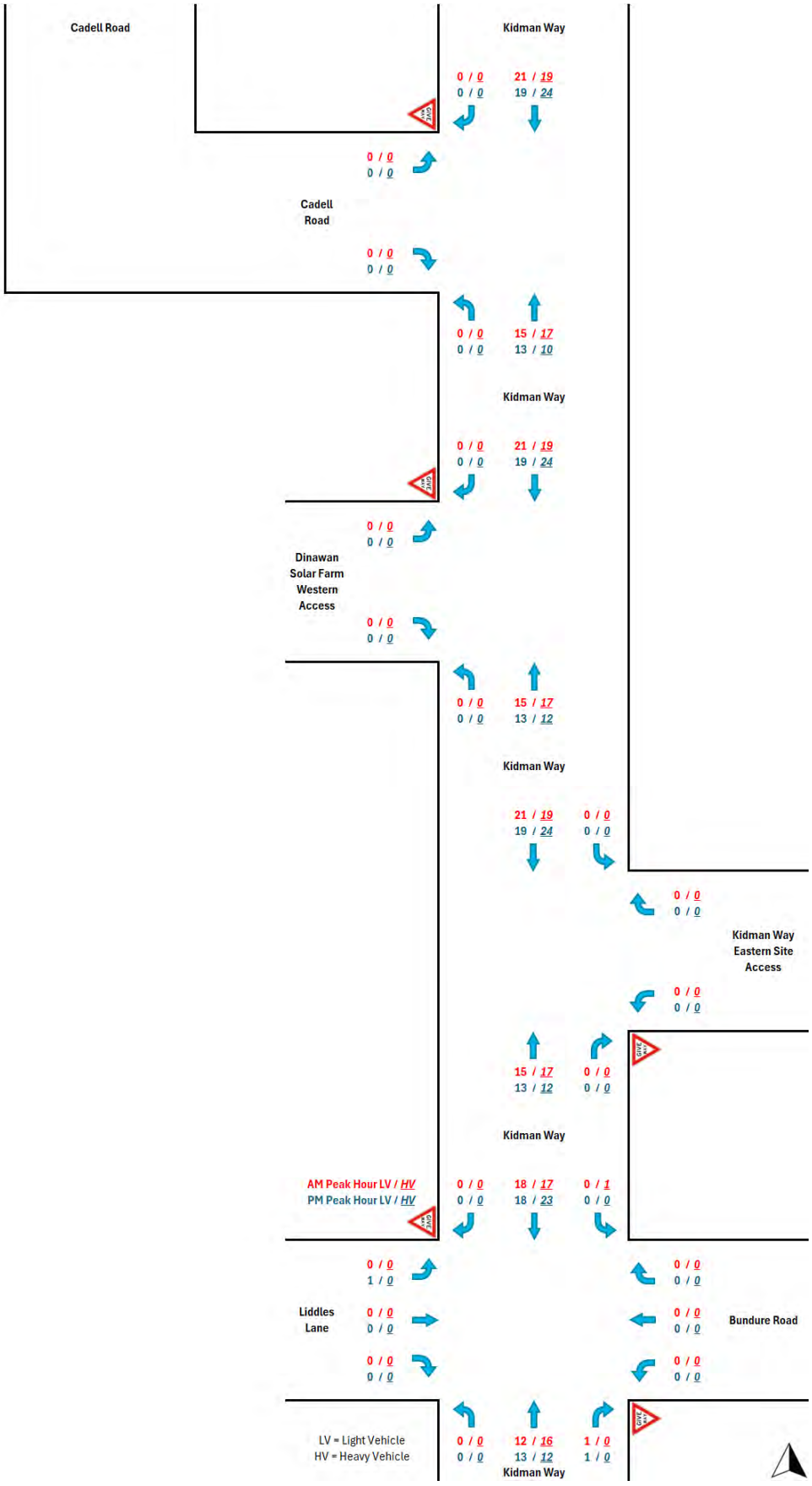


Figure 3.3(b) 2027 baseline AM and PM peak hour traffic volumes (continued)

3.4.2 2029 baseline traffic volumes

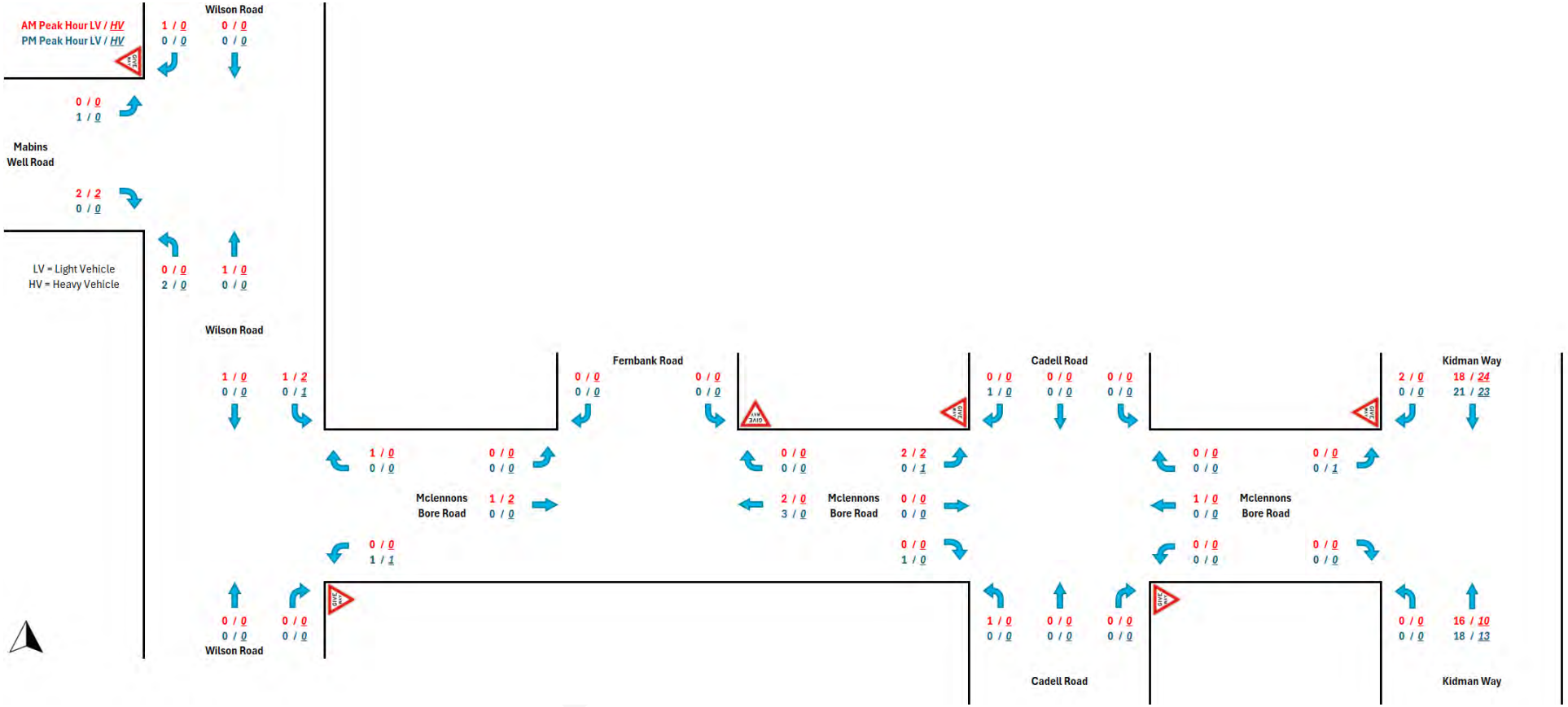


Figure 3.4(a) 2029 baseline AM and PM peak hour traffic volumes

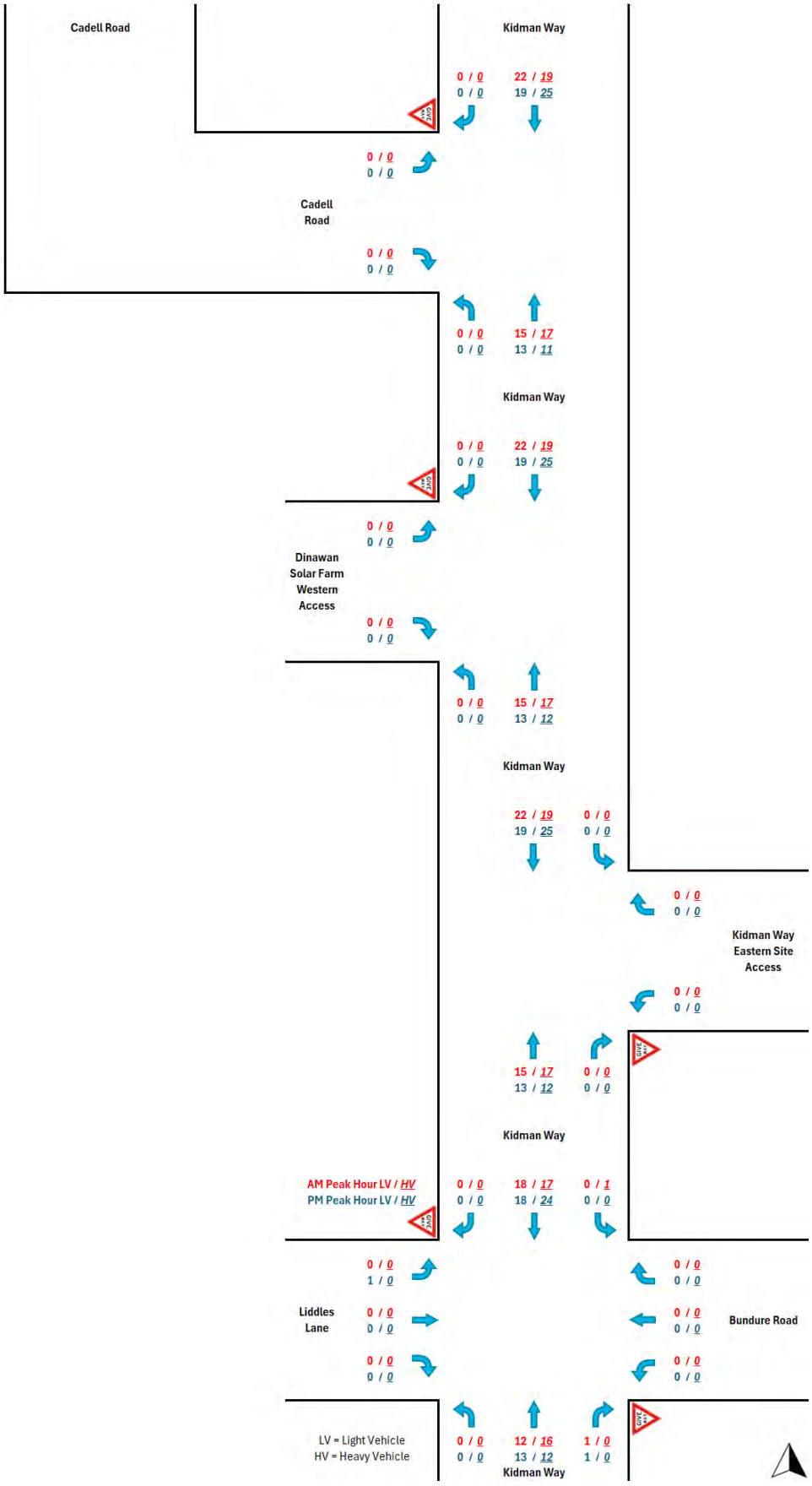


Figure 3.4(b) 2029 baseline AM and PM peak hour traffic volumes (continued)

3.5 Crash analysis

Crash data from TfNSW Centre for Road Safety interactive history database for five available years between 2018 and 2022 (inclusive) has been studied within approximately 30 km of the project area. A total of 5 crashes were found to have occurred – the distribution of where these occurred is presented in Figure 3.1.

The crashes are categorised based on the severity of the crashes as follows:

- fatal
- serious injury
- moderate injury
- minor/other injury.

The five crashes identified resulted in three serious injuries, one moderate injury and one non-casualty. There were no fatalities or minor injuries recorded. All five of these crashes occurred on Kidman Way.

This overall crash rate is considered low over the 5-year period, which indicates that the road network is considered to be safe.

3.6 Public transport

3.6.1 General bus services

A daily V-line bus service travels on Kidman Way in both directions between Jerilderie and Coleambally (PTV 2023). The V-line bus service is part of the Shepparton Line service between Shepparton, Victoria and Griffith, NSW (PTV 2023). The bus services only operate outside of peak hours.

No bus stops have been identified in the vicinity of the project area.

3.6.2 School bus services

C & J Robertson operates dedicated school bus routes S401, S402, S403, S404, S406, S407 and S408 that run along Kidman Way near Coleambally (Moovit 2024). S402 bus route passes south of the Kidman Way/McLennons Bore Road intersection but does not stop to pick-up/drop-off on Kidman Way in the vicinity of the project area. All the remaining school bus services travel on Kidman Way to the north of the key intersections, with some school bus routes making stops on Kidman Way closer to Coleambally. The following two schools are served by these school bus routes on weekdays:

- St Peter's Primary School
- Coleambally Central School.

A weekly school bus service for Yanco Agricultural High School travels through all the key intersections along Kidman Way, but does not make any stops in the vicinity of the key intersections (YAHS 2016).

3.6.3 Trains

There are no train stations, level crossings or other railway facilities within the vicinity of the project area.

3.7 School zones

No school zones have been identified in the vicinity of the project area.

3.8 Active transport

There is no active transport infrastructure in the vicinity of the project due to the rural nature of the area.

3.9 Parking

There are no formal parking facilities in the vicinity of the project due to the rural nature of the area.

4 Project description

4.1 General

4.1.1 Site access

Site access for vehicles will be via Kidman Way and a combination of local roads. Vehicles will approach the project area from a variety of directions, and will take the following routes:

- vehicles approaching from the north will travel south along Kidman Way
- vehicles approaching from the east will travel west along the Sturt Highway before turning onto Kidman Way
- vehicles approaching from the south will travel north along the Newell Highway before turning onto Kidman Way.

From Kidman Way, light vehicles will access the project area via McLennons Bore Road, Cadell Road (south), Fernbank Road, Wilson Road and Goolgumbla Road.

There are eight site access points (Figure 3.1):

- Stage 1 will include traffic from Kidman Way accessing the project via:
  - two site access points on McLennons Bore Road (all vehicle types)
  - three site access points on Fernbank Road (all vehicle types)
  - one site access point on Kidman Way (all vehicle types)
- Stage 2 will include traffic from Kidman Way accessing the project via two site access points on Goolgumbla Road (all vehicle types).

The site access points will be clearly signed and demarcated. On arrival, all vehicles, plant and equipment will be directed to remain within clearly demarcated areas.

As part of Dinawan Solar Farm, a new intersection will be constructed to facilitate access to the project directly from Kidman Way. This intersection is currently being designed in consultation with TfNSW and the strategic concept design will be submitted to TfNSW as part of the Dinawan Solar Farm Submissions Report. The eastern site access will also be utilised by traffic associated with Stage 1 of Dinawan Wind Farm and is referred to as 'Kidman Way Eastern Site Access' throughout this report. Dinawan Solar Farm and Dinawan Wind Farm (Stage 1 only) traffic will both be considered as part of the strategic concept design to determine the geometry of the intersection in accordance with the relevant Austroads guide.

All heavy vehicles will access the project from Kidman Way via McLennons Bore Road, Fernbank Road, Wilson Road and Goolgumbla Road. This route is shown in Figure 3.1. Construction materials and infrastructure will be transported to the development corridor via road. Heavy vehicles up to 36.5 m in length and restricted access vehicles (RAVs) will deliver project components and construction materials.

Imported project components will be delivered to site from the Port of Newcastle. OSOM project components that will be transported from the port include WTG components, substation equipment and O&M facilities. Cranes to erect WTGs and other heavy plant will also be transported to site using RAVs.

All OSOM vehicles will travel to/from the north along Kidman Way and will access the project from Kidman Way via McLennons Bore Road, Fernbank Road, Wilson Road and Goolgumbla Road.

4.1.2 Vehicle type

The maximum size of construction and operation vehicles will be 36.5 m long, excluding OSOM vehicles. Hence, swept path assessments have been undertaken using this type of vehicle. OSOM vehicle types are further described in Section 4.7.

4.1.3 Car parking

Car parking will be provided on-site. No cars will be parked on Kidman Way, McLennons Bore Road or any other public road.

4.1.4 Layout

An internal network of unsealed access tracks will be established consisting of upgraded existing tracks and new tracks. The indicative layout for access tracks is shown in Figure 1.3 and Figure 1.4. Subject to detailed design, internal access tracks will be between 2 m and 6 m wide. Some track sections may be wider to allow RAV and crane movements. The internal tracks will provide access during construction, for maintenance during operations, and for emergency response.

Existing bridges across the Coleambally Outfall Drain and other unnamed watercourses will be utilised for site access. Existing bridges will undergo further assessment and may require upgrades. These existing bridges are on private land.

4.2 Construction

4.2.1 Overview

Chapter 3 of the EIS provides a detailed description of the project's construction, including:

- construction activities
- construction plant and equipment
- delivery of construction material and infrastructure.

4.2.2 Temporary worker accommodation facilities

Temporary worker accommodation facilities for non-local construction employees (where skills cannot be sourced locally) are proposed in the eastern area for Stage 1 and the western area for Stage 2.

Indicative locations are shown on Figure 1.3 and Figure 1.4. Each accommodation facility will be established early in the construction phase for each stage of the project. Each facility will accommodate up to 450 workers.

The indicative location of the accommodation facility in the eastern area is shown in Figure 1.3. This accommodation facility will be co-located with the temporary Dinawan Solar Farm worker accommodation facility, if the Dinawan Solar Farm project (SSD-50725959) is approved.

The indicative locations for the two accommodation facility options in the western area are shown in Figure 1.4. Only one of the two options shown will be used during construction.

The use of on-site worker accommodation facilities will significantly reduce the number of light vehicle movements to and from the project, reducing the project's impact on the local traffic network.

The accommodation facilities will be serviced to ensure staff amenities can be met on-site. This will reduce the need for staff to travel for basic commodities, recreation or health and human services.

Once established, ongoing access for semi-trailer deliveries will not be required until decommissioning of the facilities. Ongoing heavy vehicle access will be required for provisioning the accommodation facilities during construction, including deliveries of consumable goods, water, gas for the kitchen, fuel for generators and access for waste management.

During operation of the accommodation facilities, construction staff will travel to and from the accommodation facilities for their shifts via shuttle buses. It is anticipated that travel between the active work areas and the accommodation facilities will occur between:

- 6:00 am–7:00 am and 6:00 pm–7:00 pm – Monday to Friday
- 7:00 am–8:00 am and 1:00 pm–2:00 pm – Saturday.

Shuttle bus movements during Stage 1 of construction will travel to/from active work areas via Fernbank Road, McLennons Bore Road, Cadell Road (south) and Kidman Way. Shuttle bus movements during Stage 2 of construction will not need to access public roads and will utilise internal access tracks to access active work areas.

Other strategies to minimise the use of private vehicles will be detailed in the construction traffic management plan (CTMP), which will be prepared prior to construction.

The on-site accommodation workers will be shift workers either in a drive-in, drive-out (DIDO) or fly-in, fly-out (FIFO) format. Their trip to/from the accommodation facilities will occur outside the peak traffic hours. Also, any social, medical related trips will occur outside the peak traffic hours, except emergencies. Hence, these trips are not considered in this report.

The construction of the accommodation facilities will occur at the commencement of construction for each stage and workers for camp establishment and pre-construction will need to be accommodated in the local area. The workforce accessing site during these initial stages is expected to be significantly less than peak construction traffic. Furthermore, the timing of the construction of the accommodation facilities will not coincide with the peaks of the project's construction traffic. Heavy vehicles associated with water tank deliveries and waste collection will occur outside of peak hours and are not included in the peak hour traffic volumes.

There will be approximately 10 OSOM movements to the development footprint east of Kidman Way to deliver the infrastructure to build the accommodation facility and this is anticipated to occur in the initial months of construction. These movements will use the Kidman Way Eastern Site Access outside of peak hours. As a result, these movements are unlikely to substantially affect the capacity of the surrounding road network.

4.2.3 Timing

Project construction is expected to commence in 2025, subject to receiving the required approvals. Construction of the project is expected to be completed over approximately 60 months (five years), ending in 2031. It is anticipated that the project will be constructed in two stages (refer Section 1.4). The exact timing of each stage and the duration of the overlap between stages will be determined during detailed design following project approval. Construction hours for the project will be:

- Monday to Friday: 7:00 am to 6:00 pm
- Saturday: 8:00 am to 1:00 pm
- no work on Sunday and public holidays.

Exceptions to these hours may be required for:

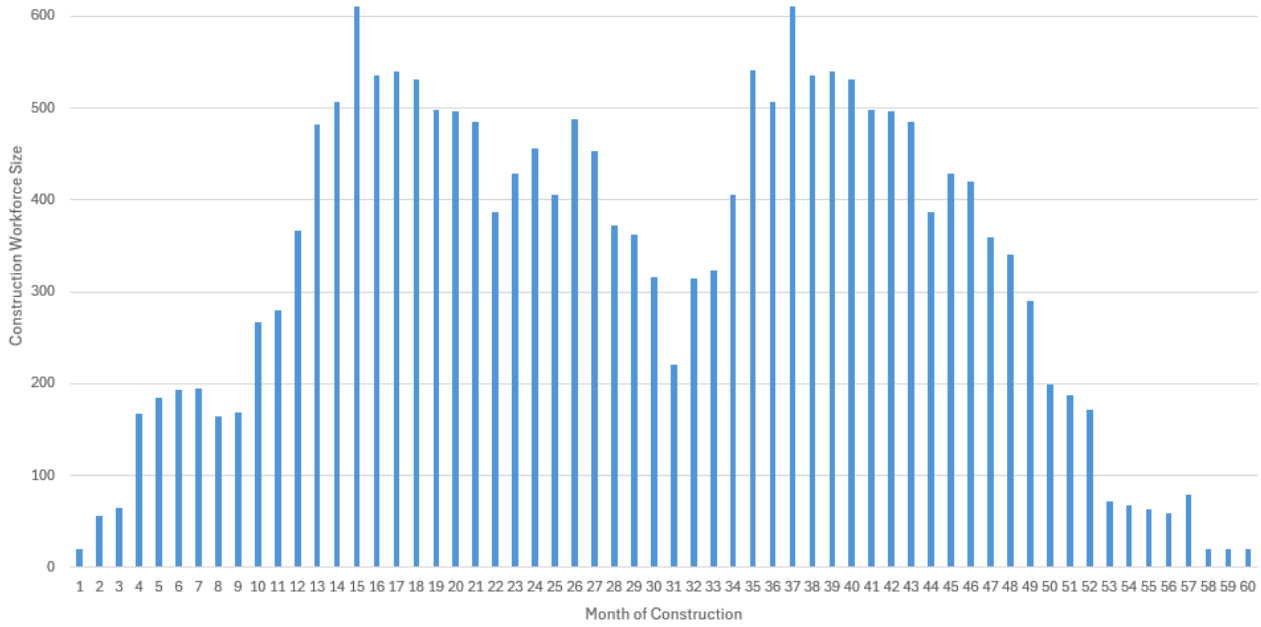
- deliveries by heavy and OSOM vehicles outside of peak traffic times
- concrete batching and pouring

- crane movements between WTG sites
- activities that are inaudible at non-associated residences
- activities for WTG construction hindered by adverse weather conditions.

The relevant council and surrounding landholders will be notified of any work outside of standard construction hours.

4.2.4 Workforce

A workforce of approximately 600 personnel will be required on-site during peak construction. Based on current estimates, this is expected to occur in months 15 (Stage 1 peak) and 37 (Stage 2 peak), as shown in Figure 4.1. The peak construction workforce size in Figure 4.1 is 610 and has been used as the basis of this assessment (i.e. this assessment conservatively considers a peak workforce of 610 rather than the anticipated peak workforce of 600).



Source: Spark Renewables

Figure 4.1 Indicative construction workforce overview

4.2.5 Traffic generation

Based on the indicative construction workforce distribution shown in Figure 4.1, months 15 (Stage 1 peak) and 37 (Stage 2 peak) have been considered the peak construction periods for the project.

It is noted that the construction schedule will be influenced by the outcomes of the South West REZ access scheme and timing of construction of new transmission infrastructure. The assumptions made in this assessment have been used to provide a worst-case scenario for construction vehicle movements over a 60-month period.

i Daily traffic generation

For the purposes of this assessment, it is assumed that 75% of the peak construction workforce of 610 people (i.e. approximately 457 people) will reside in the accommodation facility. Therefore, it is assumed that there will be 153 workers (i.e. the project's local construction workforce) driving to and from the development footprint each day during both months 15 and 37.

Local workers will be assumed to drive to site in light vehicles, with one worker being present in each vehicle. DIDO/FIFO workers being housed within the accommodation facility are anticipated to travel to the active work areas in 12-seater shuttle buses (classified as light vehicles); however, this will only involve travelling on public roads during Stage 1. The shuttle buses are assumed to make the return journey in the same peak hour. The use of 12-seater shuttle buses is considered to be a conservative assumption; however, a larger bus type may also be considered during detailed design. As a larger bus would be classified as a heavy vehicle, any future assessment would need to consider these heavy vehicle shuttle bus movements in place of light vehicle shuttle bus movements. Notwithstanding, the use of larger buses will reduce the overall vehicle volumes. Hence, no further traffic surveys will be required and no changes to the recommendations of this assessment are expected.

The estimated daily heavy vehicles include any delivery, maintenance and waste collection vehicles generated by the accommodation facilities.

a Daily traffic generation - month 15 (Stage 1)

During month 15, the only on-site accommodation facility will be east of Kidman Way.

During month 15, the following is assumed:

- 457 workers within the accommodation facility will access their active work areas via shuttle bus movements along Kidman Way, Cadell Road (south), McLennons Bore Road and Fernbank Road.
- All light vehicle movements will occur during peak hour.
- Heavy vehicle movements will occur evenly across the 10-hour workday.

The daily vehicle movements anticipated in month 15 are shown in Table 4.1.

Table 4.1 Daily traffic generation during month 15

Vehicle type	Inbound movements	Outbound movements	Total movements
Light (excluding shuttle buses)	153	153	306
Shuttle buses (classified as light vehicles)	78	78	156
Heavy	88	88	176

b Daily traffic generation – month 37 (Stage 2)

During month 37, the only on-site accommodation facility will be accessed via Goolgumbla Road.

During month 37, the following is assumed:

- 457 workers living within the accommodation facility will not need to utilise any public roads to access their active work areas.
- All light vehicle movements will occur during peak hour.
- Heavy vehicle movements will occur evenly across the 10-hour workday.

The daily vehicle movements anticipated in month 37 are shown in Table 4.2.

Table 4.2 Daily traffic generation during month 37

Vehicle type	Inbound movements	Outbound movements	Total movements
Light	153	153	306
Heavy	100	100	200

ii Peak hour traffic generation

a Peak hour traffic generation – month 15 (Stage 1)

The peak hour movements anticipated in month 15 are shown in Table 4.3. For the traffic analysis, it is assumed that all light vehicle generation will occur during the AM (inbound) and PM (outbound) peak hours. The light vehicle statistics and assumptions provided are considered highly conservative as it is likely all light vehicles will arrive and depart outside of the AM and PM traffic peaks given the proposed construction hours.

For heavy vehicles, approximately 10% of trips are assumed to occur during the peak hours.

For the shuttle bus movements, the inbound and outbound movements will occur in the same peak hour. Based on the distance between the accommodation facility and the active work areas for Stage 1, one inbound and outbound shuttle bus movement is possible in any particular hour.

Table 4.3 Peak hour traffic generation during month 15

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements
Light (excluding shuttle buses)	153	0	0	153
Shuttle buses (classified as light vehicles)	39	39	39	39
Heavy	9	9	9	9

b Peak hour traffic generation – month 37 (Stage 2)

The peak hour movements anticipated in month 37 are shown in Table 4.4.

Table 4.4 Peak hour traffic generation during month 37

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements
Light	153	0	0	153
Heavy	10	10	10	10

4.2.6 Traffic distribution

i Road network

To determine the traffic distribution for light and heavy vehicles going to/from the development footprint during construction, the following is assumed:

- Traffic from a local workforce not staying in the accommodation facilities may come from Griffith or Coleambally in the north or from Jerilderie or Deniliquin in the south.
- Regional light and heavy vehicle traffic coming from the east via Narrandera or Wagga Wagga will either travel west on Sturt Highway then turning south onto Kidman Way, or travel south-west on Newell Highway before turning north onto Kidman Way. Travel times for both options are similar.

In consideration of these items, a traffic distribution of 50% to/from the north and 50% to/from the south has been assessed for their impacts to the road network.

ii Site access

The expected distribution of light vehicles, heavy vehicles and shuttle buses accessing the project during month 15 of construction is shown in Figure 4.2. While the project's Stage 1 construction traffic can access any of the site access points proposed on McLennons Bore Road and Fernbank Road, it is conservatively assumed that all of the project's Stage 1 construction traffic will turn onto Fernbank Road.

The expected distribution of light and heavy vehicle traffic accessing the project during month 37 of construction is shown in Figure 4.3. It is conservatively assumed that all of the project's Stage 2 construction traffic can access either of the two site access points proposed on Goolgumbla Road.

Source: SIX Maps

Figure 4.2 Road network and site access traffic distribution – month 15

Source: SIX Maps

Note: No shuttle bus route shown as these vehicle movements will not occur on the public road network.

Figure 4.3 Road network and site access traffic distribution – month 37

4.2.7 Network peak vs site peak traffic volumes

As stated in Section 3.3.1, the network peak hour of the background traffic volumes across the intersections vary, but generally occur later in the morning or earlier in the afternoon.

The site peak hour is generated by the project's construction workers travelling to or from the site, and is expected to be 6 am to 7 am and 5 pm to 6 pm. The site peak hour generally does not coincide with the network peak hour.

As per TfNSW's advice, the traffic assessment has been undertaken based on the background traffic volumes during the network peak times while applying the project's traffic volumes during the site peak times. This means this traffic assessment is conservative.

4.2.8 Traffic volumes

Construction traffic volumes have been calculated based on the peak hour traffic generation described in Section 4.2.5, the road network traffic distribution describe in Section 4.2.6i and the site access traffic distribution in Section 4.2.6ii.

The peak hour construction traffic volumes for the construction peaks in both months 15 and 37 are shown in Figure 4.4 and Figure 4.6, respectively.

The baseline and peak hour construction traffic volumes for the construction peaks in both months 15 and 37 are shown in Figure 4.5 and Figure 4.7, respectively.

i Month 15 (Stage 1)

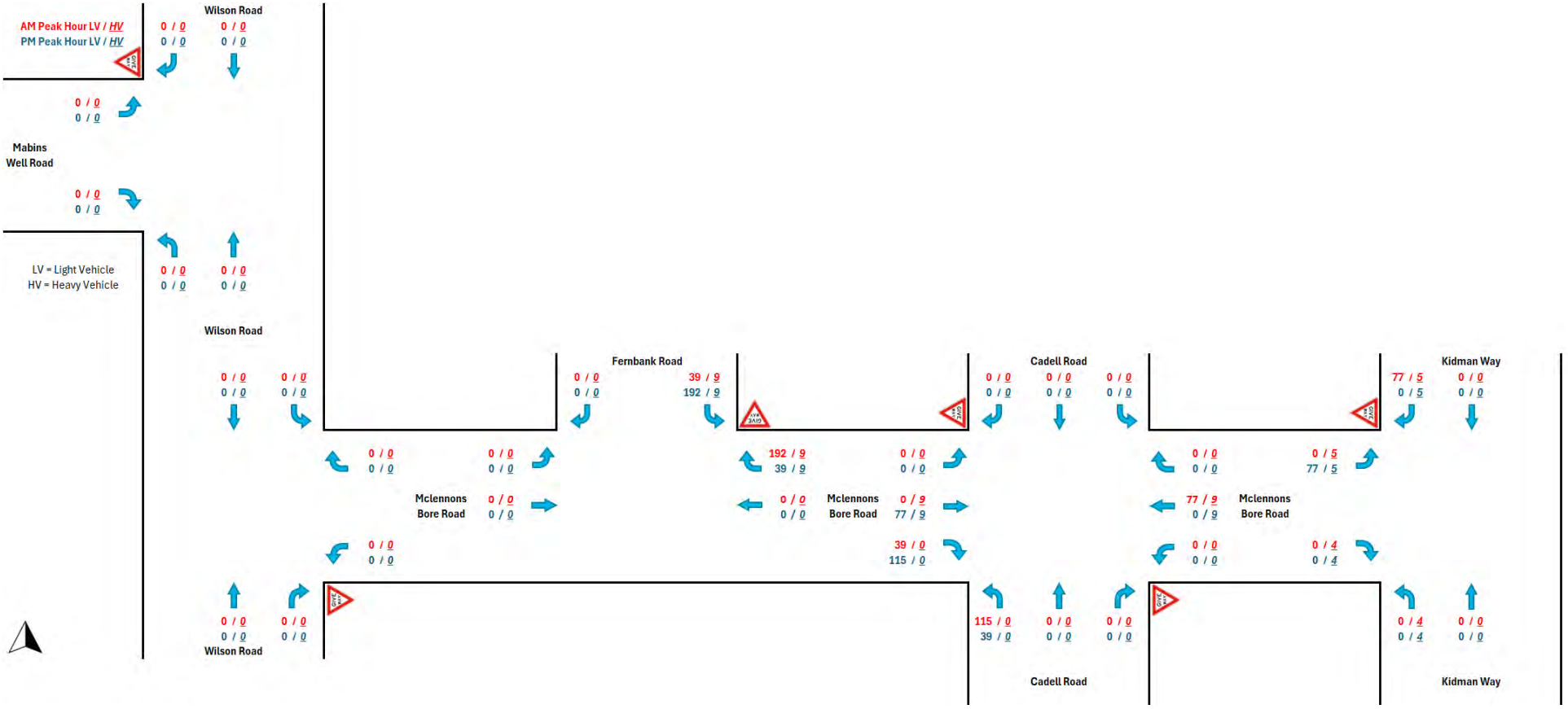


Figure 4.4(a) Month 15 construction AM and PM peak hour traffic volumes

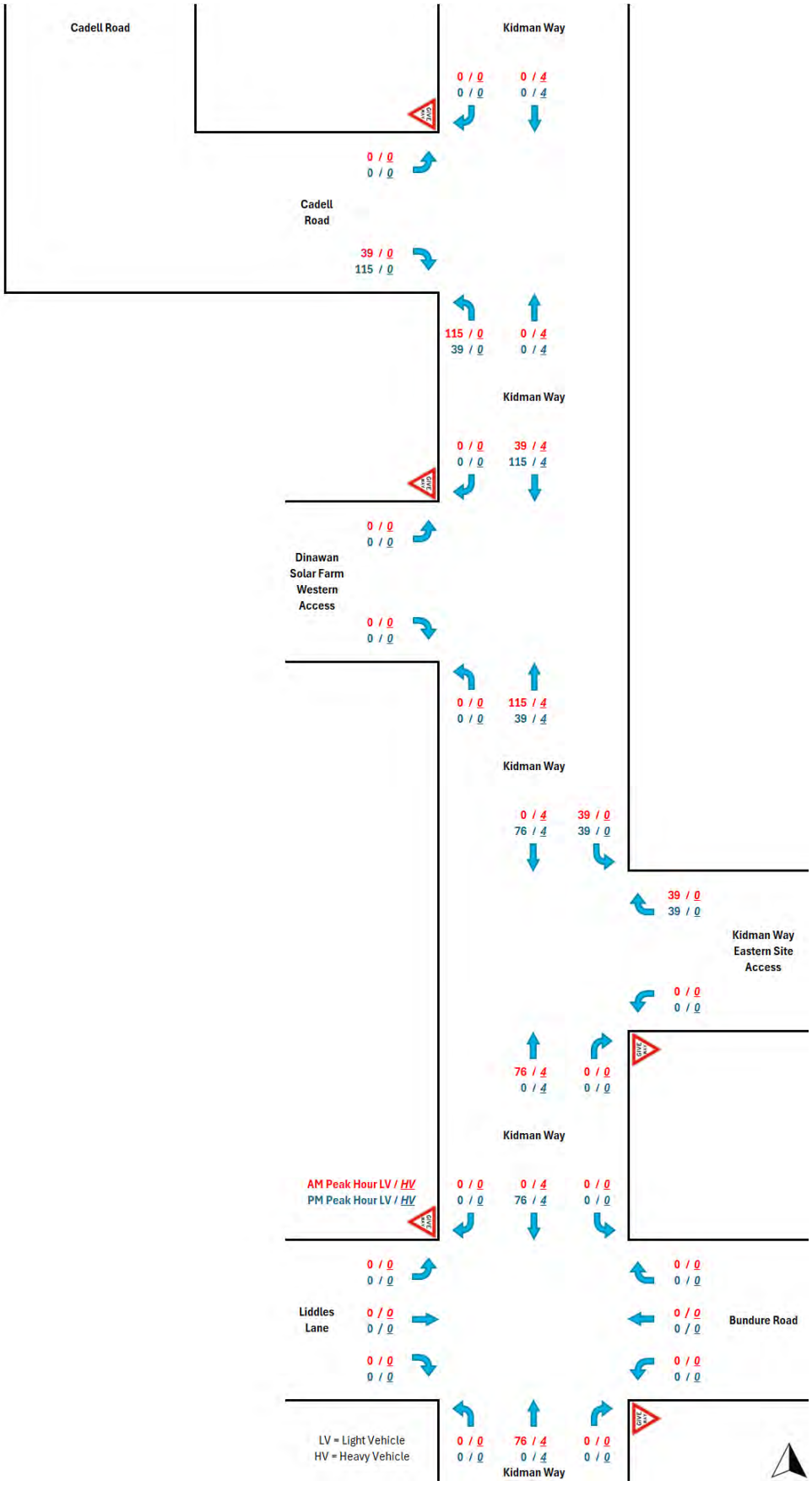


Figure 4.4(b) Month 15 construction AM and PM peak hour traffic volumes (continued)

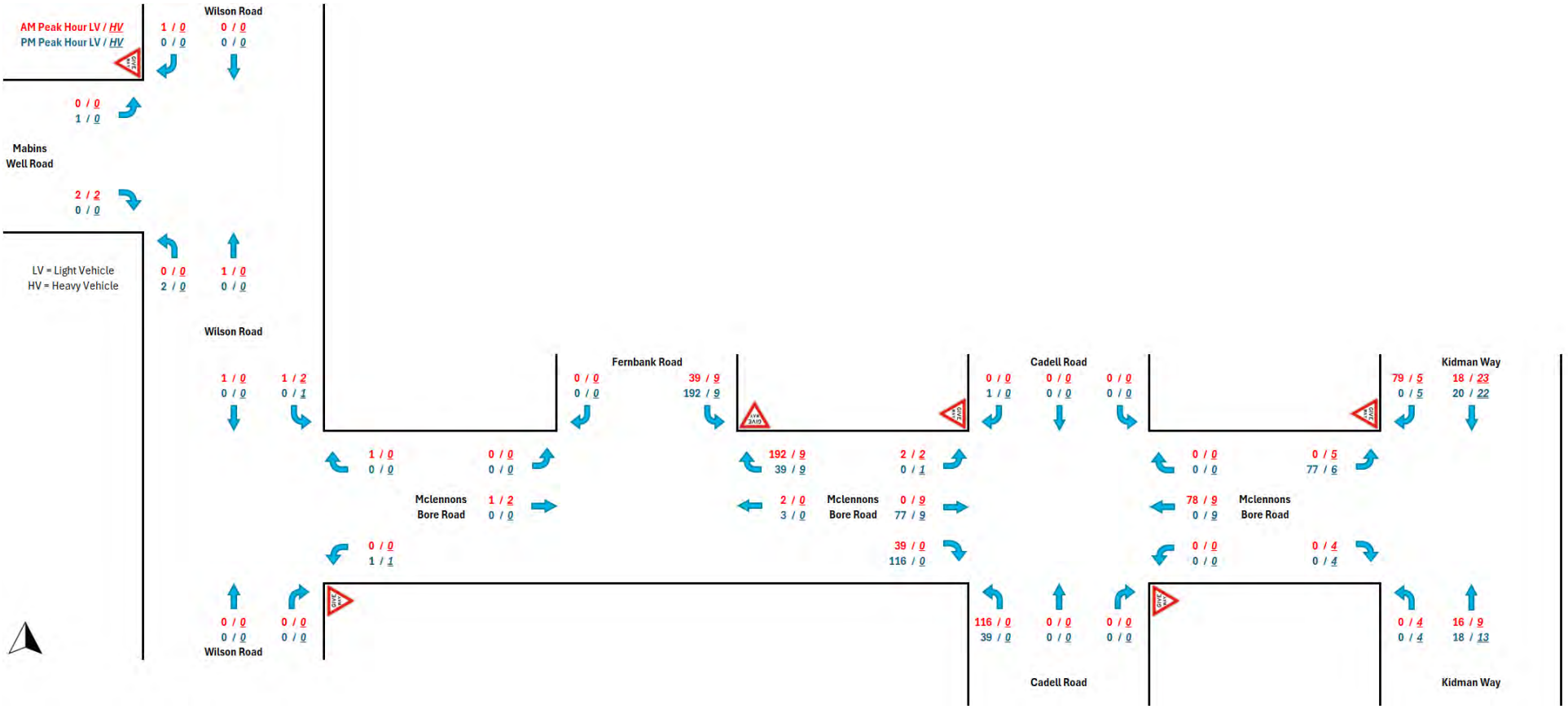


Figure 4.5(a) **2027 baseline + month 15 construction AM and PM peak hour traffic volumes**

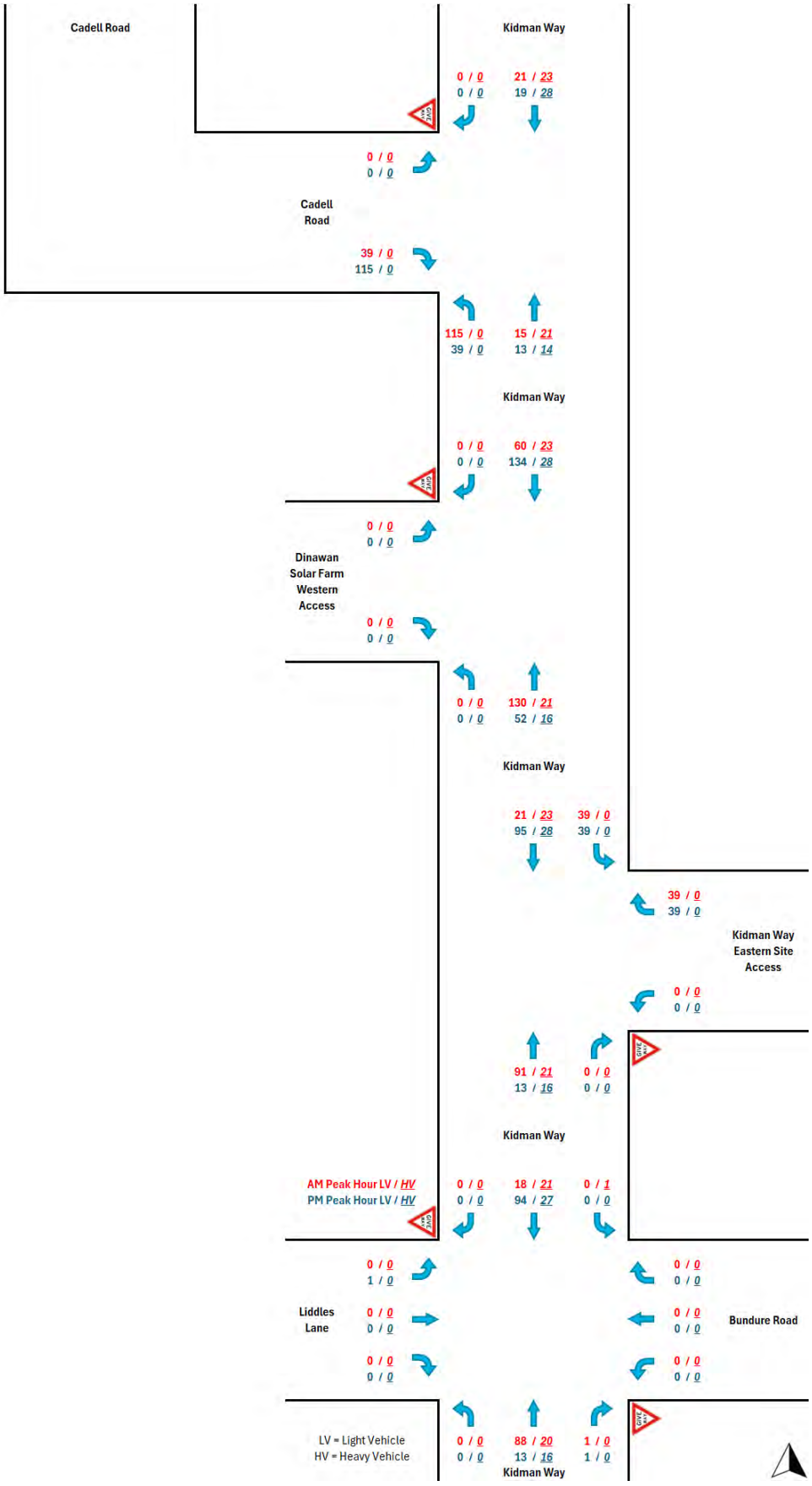


Figure 4.5(b) 2027 baseline + month 15 construction AM and PM peak hour traffic volumes (continued)

ii Month 37 (Stage 2)

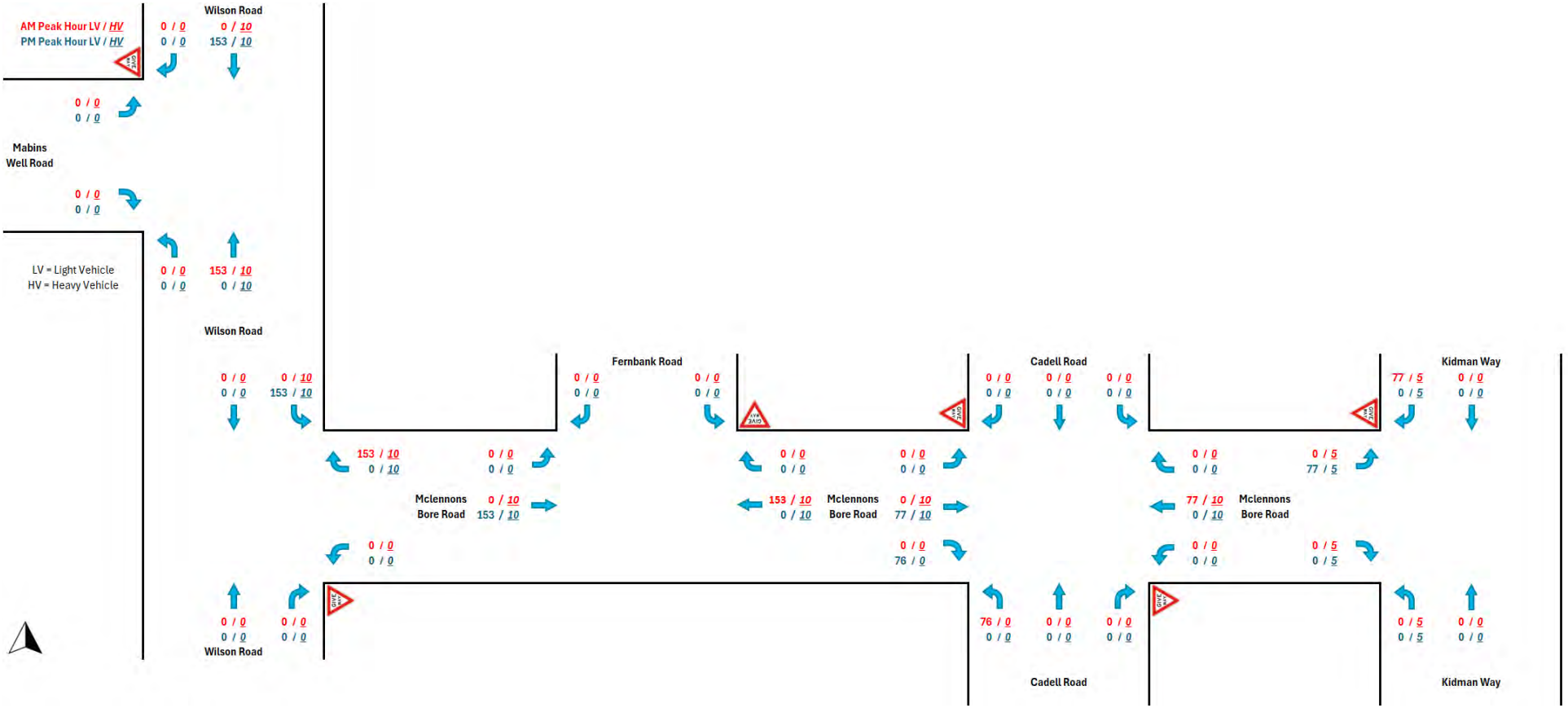


Figure 4.6(a) Month 37 construction AM and PM peak hour traffic volumes

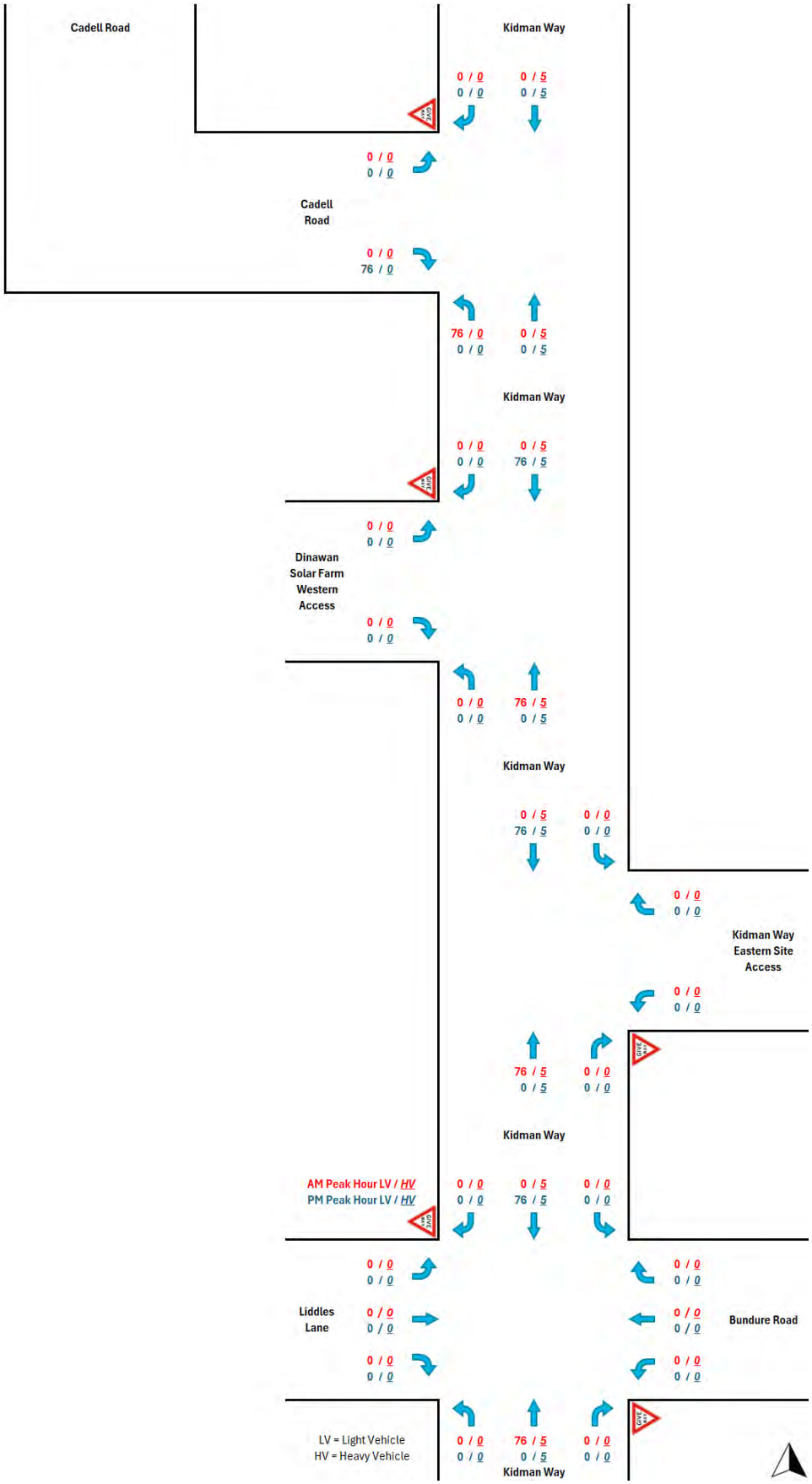


Figure 4.6(b) Month 37 construction AM and PM peak hour traffic volumes (continued)

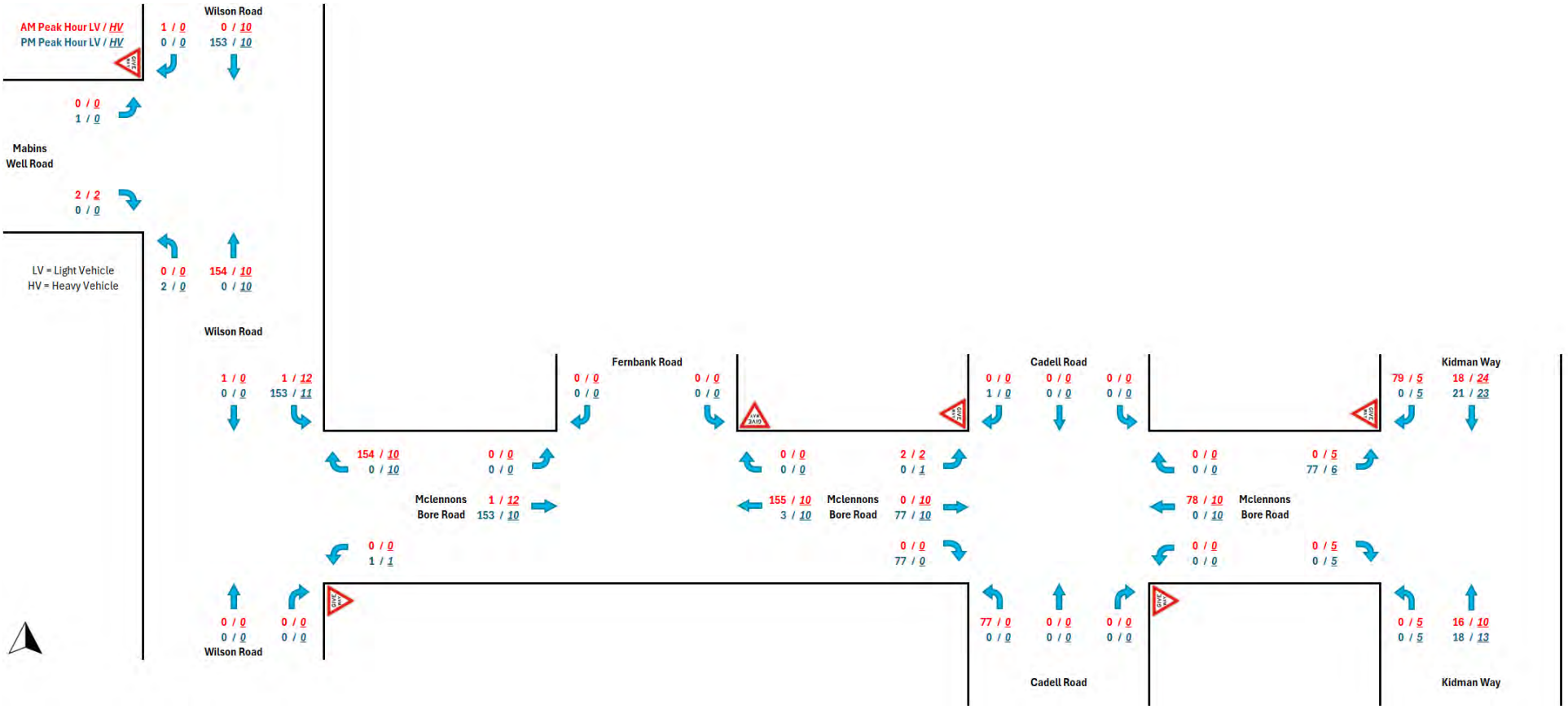


Figure 4.7(a) **2029 baseline + month 37 construction AM and PM peak hour traffic volumes**

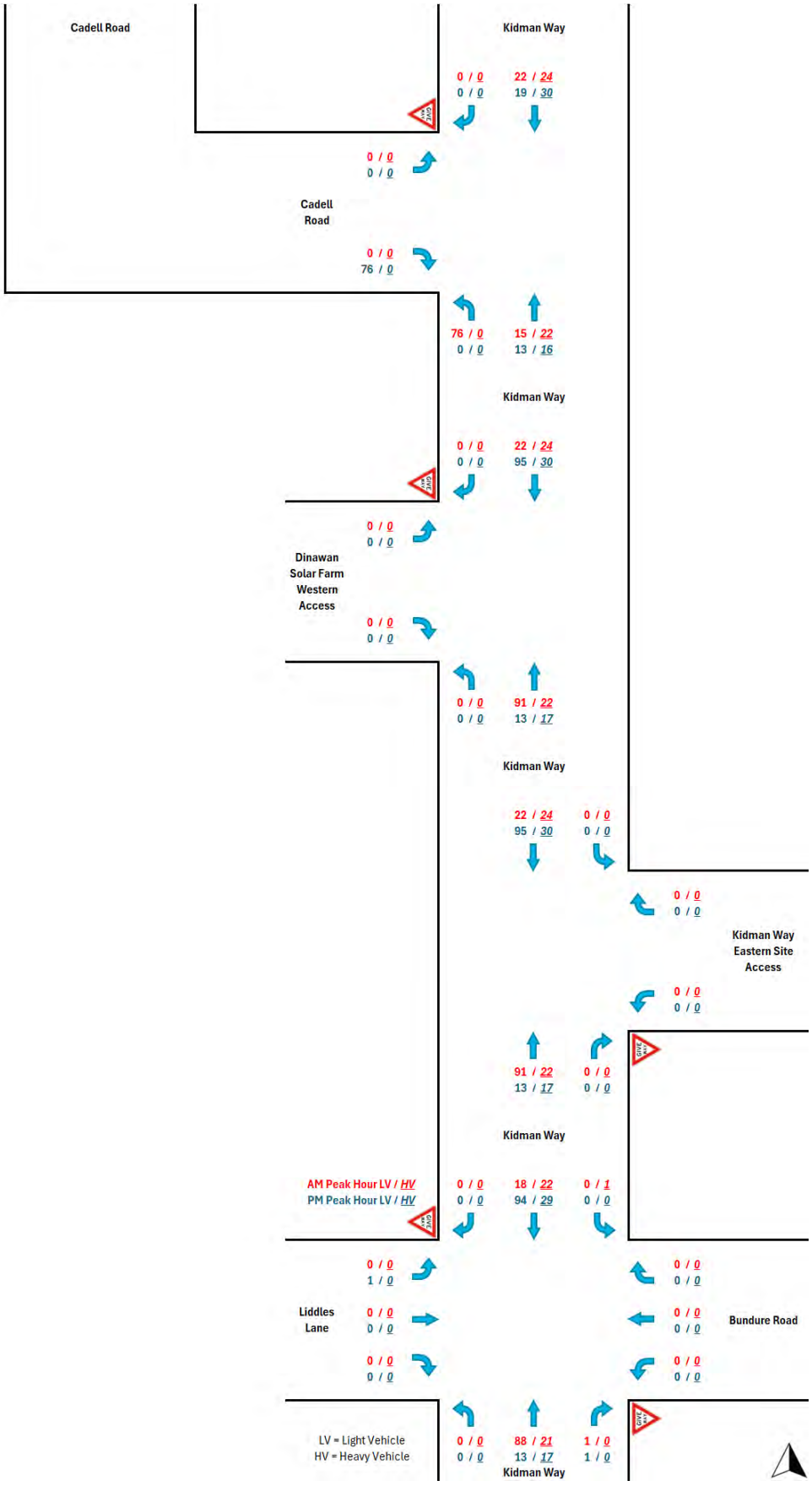


Figure 4.7(b) 2029 baseline + month 37 construction AM and PM peak hour traffic volumes (continued)

4.3 Operations

4.3.1 Operational activities

The WTGs and other project infrastructure will be maintained during operations to ensure ongoing efficient electricity generation and site operations. Maintenance will include:

- servicing WTGs, collector substations, and other infrastructure, with repair or replacement of components where required
- vegetation maintenance
- weed and pest management
- fence and access road management
- internal track management
- drainage and erosion management
- landscaping (if required).

Light vehicle access will be required throughout operations. Heavy vehicles will also be required on occasions for operational and maintenance activities.

Security monitoring will be undertaken by the operational workforce. Security cameras may be utilised to assist with monitoring project infrastructure.

Livestock will graze with the development corridor during operation.

4.3.2 Workforce

Project operations will require up to 50 full-time personnel. Project operations will be supported by contractor roles for vegetation, weed and pest management, cleaning, equipment calibration and internal road maintenance.

4.3.3 Traffic volumes

It is expected that there will be 102 inbound and 102 outbound movements per day, comprising:

- 50 light vehicles per day, each undertaking two inbound and two outbound movements
- two heavy vehicles per day, each undertaking one inbound and one outbound movement, on an as needed basis.

Additional heavy vehicle movements may be required during maintenance activities.

During operations, the majority of traffic will utilise the site access points on McLennons Bore Road, Fernbank Road and Goolgumbla Road; however, access may still be required via Kidman Way for maintenance activities associated with the project's grid connection infrastructure (transmission line shown on Figure 1.3).

Traffic volumes during operations will be significantly less than the project's construction traffic. Therefore, this assessment has focused on construction traffic only.

4.4 Decommissioning

4.4.1 Uses and activities

Once the project reaches the end of its operational life, a decision will be made to either decommission or re-power the facility, subject to approval requirements.

If the project is decommissioned, all aboveground project structures will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. Project infrastructure will be managed in accordance with the waste management hierarchy and contemporary waste management legislation.

If re-powering is proposed, stakeholders will be consulted and the required approvals will be sought in due course.

4.4.2 Traffic volumes

Decommissioning is anticipated to take approximately 1–2 years at the end of the project life and is not expected to occur until at least 2055, assuming a 5-year construction period and 25-year operational life. It is anticipated that decommissioning will require:

- 2,762 light vehicle movements (i.e. approximately 10 daily light vehicle movements if decommissioning occurs in one year)
- 8,962 heavy vehicle movements (i.e. approximately 31 daily heavy vehicle movements if decommissioning occurs in one year)
- 1,416 OSOM movements (i.e. approximately 118 monthly OSOM movements if decommissioning occurs in one year).

As decommissioning traffic volumes are predicted to be significantly less than the project's construction traffic, this assessment has focused on construction traffic only.

4.5 Cumulative traffic

4.5.1 Neighbouring developments

The projects in Table 4.5 have been considered to determine potential cumulative impacts on the local road network. These projects have been selected based on their proposed use of Kidman Way. Project areas for Dinawan Solar Farm, Yanco Delta Wind Farm and Argoon Wind Farm are shown in Figure 1.1.

Table 4.5 Projects with potential for cumulative traffic impacts on Kidman Way

Project	Description	Location	Status
Dinawan Solar Farm	Construction and operation of an 800 MW solar farm, associated infrastructure and battery energy storage system	Adjacent to the project area and part of the Dinawan Energy Hub	Proposed – Response to submissions phase
Yanco Delta Wind Farm	Construction and operation of 1.5 GW wind farm with up to 208 wind turbine generators	South and west of the project area (access via Liddles Lane and Jerrys Lane)	Approved – construction yet to commence

Table 4.5 Projects with potential for cumulative traffic impacts on Kidman Way

Project	Description	Location	Status
Argoon Wind Farm	Construction and operation of 480 MW wind farm with up to 106 wind turbine generators and 477 MW battery energy storage system	South of the project area (access via Liddles Lane and Jerrys Lane)	Proposed – EIS in preparation
Victoria to NSW Interconnector (VNI) West	New overhead transmission line connecting the high voltage electricity grids in NSW and Victoria	Exact location to be confirmed; however, assumed to be adjacent to project area (access unknown)	Pre-SEARs – not in planning portal yet
Project EnergyConnect	New overhead transmission line, substations and accommodation facilities.	An extensive transmission line which passes directly through the development footprint	Approved – under construction

Based on available project information and documentation, the following volumes of cumulative traffic have been considered:

- **Dinawan Solar Farm**: a conservative scenario has been assumed in which the month 15 construction peak of Dinawan Wind Farm overlaps with the month 21 construction peak of Dinawan Solar Farm. No overlap is anticipated during the Stage 2 construction of Dinawan Wind Farm.
- **Yanco Delta Wind Farm**: concurrent construction is anticipated. Stage 1 construction of Dinawan Wind Farm is assumed to overlap with 50% of the peak vehicles generated by Yanco Delta Wind Farm. No overlap is expected during Stage 2 of construction of Dinawan Wind Farm.
- **VNI West**: the same set of assumptions from Yanco Delta Wind Farm have been applied. Whilst not publicly listed in DPHI's Major Projects portal, it is understood that VNI West will be constructed in close proximity to the project and has therefore been considered in this assessment.
- **Project EnergyConnect**: no concurrent construction is anticipated, as Project EnergyConnect is already under construction and is likely to be completed prior to the commencement of construction of the project.
- **Argoon Wind Farm**: minimal information pertaining to Argoon Wind Farm is available; however, its scale is similar to that of one of the project's two stages. Traffic generated by Argoon Wind Farm is assumed to:
  - overlap with the construction period of the project during Stage 2 of construction only
  - be equivalent to 50% of the peak traffic volume generated by Dinawan Wind Farm during Stage 2 of its construction
  - have half of its traffic travelling to/from Kidman Way to the north of its project area, and half travelling to/from Kidman Way to the south of its project area.

The cumulative traffic volumes outlined above are considered to represent highly conservative scenarios.

i Dinawan Solar Farm

Vehicles that travel to Dinawan Solar Farm, part of Dinawan Energy Hub, are expected to primarily use Kidman Way and Bundure Road for site access. Dinawan Solar Farm is subject to a separate SSD application to Dinawan Wind Farm.

During the peak construction month, the **daily** traffic volumes for Dinawan Solar Farm (EMM 2023) are expected to be:

- light vehicles: 94 movements in and 94 movements out, totalling 188 movements
- shuttle buses (considered to be light vehicles): 48 movements in and 48 movements out, totalling 96 movements
- heavy vehicles: 151 movements in and 151 movements out, totalling 302 movements.

During the peak construction month, the **peak hour** traffic volumes for Dinawan Solar Farm (EMM 2023) are expected to be:

- light vehicles: during the AM peak, 94 movements in, and during the PM peak, 94 movements out
- shuttle buses (considered to be light vehicles): during the AM and PM peak, 24 movements in and 24 movements out
- heavy vehicles: during the AM and PM peak, 16 movements in and 16 movements out.

It is assumed that approximately 50% of the traffic will come from the north on Kidman Way and 50% will come from the south on Kidman Way before turning onto Bundure Road or directly into the site access points on Kidman Way.

The daily traffic volumes for Dinawan Solar Farm are shown in Table 4.6.

Table 4.6 Daily traffic generation for Dinawan Solar Farm during peak construction

Vehicle type	Inbound movements	Outbound movements	Total movements
Light (excluding shuttle bus)	94	94	188
Heavy	151	151	302
Shuttle bus*	48	48	96

Note: *Inbound refers to westbound movements crossing Kidman Way, while outbound refers to eastbound movements crossing Kidman Way.

The peak hour traffic volumes for Dinawan Solar Farm are shown in Table 4.7.

Table 4.7 Peak hour traffic generation for Dinawan Solar Farm during peak construction

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements
Light (excluding shuttle bus)	94	0	0	94
Heavy	16	16	16	16
Shuttle bus*	24	24	24	24

Note: *Inbound refers to westbound movements crossing Kidman Way, while outbound refers to eastbound movements crossing Kidman Way.

ii Yanco Delta Wind Farm

Vehicles that travel to Yanco Delta Wind Farm are expected to take Kidman Way (either to/from the north or the south) before turning west onto Liddles Lane or Jerrys Lane to continue to the Yanco Delta Wind Farm project site.

A revised *Traffic and Transport Impact Assessment* from Jacobs[1] (2023) provides the indicative peak construction traffic generation. During the peak construction month, the **daily** traffic volumes for Yanco Delta Wind Farm are indicated to be:

- light vehicles: 305 movements in and 305 movements out, totalling 610 movements
- heavy vehicles: 80 movements in and 80 movements out, totalling 160 movements.

During the peak construction month, the **peak hour** traffic volumes for Yanco Delta Wind Farm are indicated to be:

- light vehicles: during the AM and PM peak, 300 movements in and 300 movements out
- heavy vehicles: during the AM and PM peak, 10 movements in and 10 movements out.

It is not expected that the peak timings of the Yanco Delta Wind Farm will coincide with the project as the construction schedule for the Yanco Delta Wind Farm will be offset from the project. Therefore, it is reasonable to take approximately 50% of the peak movements to determine the cumulative impact.

The estimated daily traffic volumes for Yanco Delta Wind Farm that are expected to coincide with the project are shown in Table 4.8.

Table 4.8 Daily traffic generation for Yanco Delta Wind Farm

Vehicle type	Inbound movements	Outbound movements	Total movements
Light	153	153	306
Heavy	40	40	80

The peak hour traffic volumes for Yanco Delta Wind Farm that are expected to coincide with the project are shown in Table 4.9.

Table 4.9 Peak hour traffic generation for Yanco Delta Wind Farm

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements
Light	150	0	0	150
Heavy	5	0	0	5

[1] Report dated 26 July 2023, retrieved from https://www.planningportal.nsw.gov.au/major-projects/projects/yanco-delta-wind-farm

The available assessment from Jacobs (2023) indicates approximately 38% of light vehicles and 30% of heavy vehicles will travel along Liddles Lane and pass through Kidman Way/Bundure Road/Liddles Lane intersection (Jacobs 2023). Out of the light vehicles at the Kidman Way/Bundure Road/Liddles Lane intersection, Jacobs (2023) indicate that approximately 78% of light vehicles will travel to/from the north along Kidman Way and 22% of light vehicles will travel to/from the south along Kidman Way. Jacobs (2023) indicate that all heavy vehicles at the Kidman Way/Bundure Road/Liddles Lane intersection will travel to/from the north along Kidman Way.

iii Victoria to NSW Interconnector (VNI) West

Vehicles that travel to VNI West are expected to originate from the Dinawan Accommodation Village approved as part of Project EnergyConnect, which is within the footprint of Dinawan Substation and north of the project area.

During the AM peak, light and heavy vehicles are expected to originate from Kidman Way and travel southbound. During the PM peak, this movement is expected to be reversed.

Currently, there is no information available on the Major Projects website regarding VNI West. Light vehicle traffic assumptions for VNI West have been informed by Project EnergyConnect. WSP[2] (2021) prepared the *Traffic and Transport Impact Assessment* for Project EnergyConnect, which provides indicative peak construction traffic generation.

During the peak construction period, the daily light vehicle traffic volumes to and from Project EnergyConnect's Dinawan Accommodation Village are indicated to be a total of 250 movements (WSP 2021). During the peak construction period, the peak hour light vehicle traffic volumes to and from Project EnergyConnect's Dinawan Accommodation Camp are indicated to be 50 movements in the AM and PM peak (WSP 2021).

It is not expected that the peak timings of VNI West will coincide with the project. The use of Project EnergyConnect's Dinawan Accommodation Village for VNI West will also be influenced by the proximity of the construction activity along the transmission line corridor. Therefore, it is reasonable to take approximately 50% of the peak movements to determine the potential for cumulative impacts.

The **daily** light vehicle traffic volumes for VNI West that coincide with the project are estimated to be a total of 125 movements.

The **peak hour** light vehicle traffic volumes for VNI West that coincide with the project are estimated to be:

- AM peak: 25 movements in the southbound direction
- PM peak: 25 movements in the northbound direction.

During the AM peak, it is assumed that all the VNI West light vehicle traffic travels southbound from Project EnergyConnect's Dinawan Accommodation Village before turning right onto Liddles Lane at the Kidman Way/Bundure Road/Liddles Lane intersection. This traffic is expected to be reversed in the PM peak.

[2] Report dated December 2021, retrieved from https://www.planningportal.nsw.gov.au/major-projects/projects/project-energyconnect-nsw-eastern-section

iv Argoon Wind Farm

Argoon Wind Farm is south of the project area (Figure 1.1). As stated in Section 4.5.1iv, concurrent construction of the project and Argoon Wind Farm is anticipated to occur during Stage 2 only. In the absence of detailed vehicle volumes for Argoon Wind Farm, it is assumed that 50% of Dinawan Wind Farm's peak Stage 2 traffic will be generated by Argoon Wind Farm. This traffic is assumed to be evenly split between the northern and southern approach on Kidman Way. As Argoon Wind Farm's site is proposed to be accessed via Liddles Lane and Jerrys Lane, only vehicles approaching Argoon Wind Farm from the north or leaving the site and heading north will pass the intersections assessed in this report.

The daily and peak hour traffic figures assumed to be generated by Argoon Wind Farm are listed in Table 4.10 and Table 4.11, respectively.

Table 4.10 Daily traffic generation for Argoon Wind Farm

Vehicle type	Inbound movements	Outbound movements	Total movements
Light	77	77	154
Heavy	50	50	100

Table 4.11 Peak hour traffic generation for Argoon Wind Farm

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements
Light (assuming no shuttle bus usage)	77	0	0	77
Heavy	5	5	5	5

4.5.2 Traffic volumes

i Month 15 (Stage 1)

The cumulative traffic volumes for the following neighbouring developments are shown in the following figures:

- Dinawan Solar Farm (Figure 4.8)
- Yanco Delta Wind Farm (Figure 4.9)
- VNI West (Figure 4.10).

The cumulative traffic volumes from the above neighbouring developments have been added to the baseline + month 15 construction volumes in Figure 4.11.

Along Kidman Way, the cumulative traffic volumes are higher for month 15 than for month 37. As a result, the assessments in Section 4.7.4 will be performed for month 15.

ii Month 37 (Stage 2)

The cumulative traffic volumes for Argoon Wind Farm are shown in Figure 4.12. The cumulative traffic volumes for Argoon Wind Farm have been added to the baseline + month 37 construction volumes in Figure 4.13.

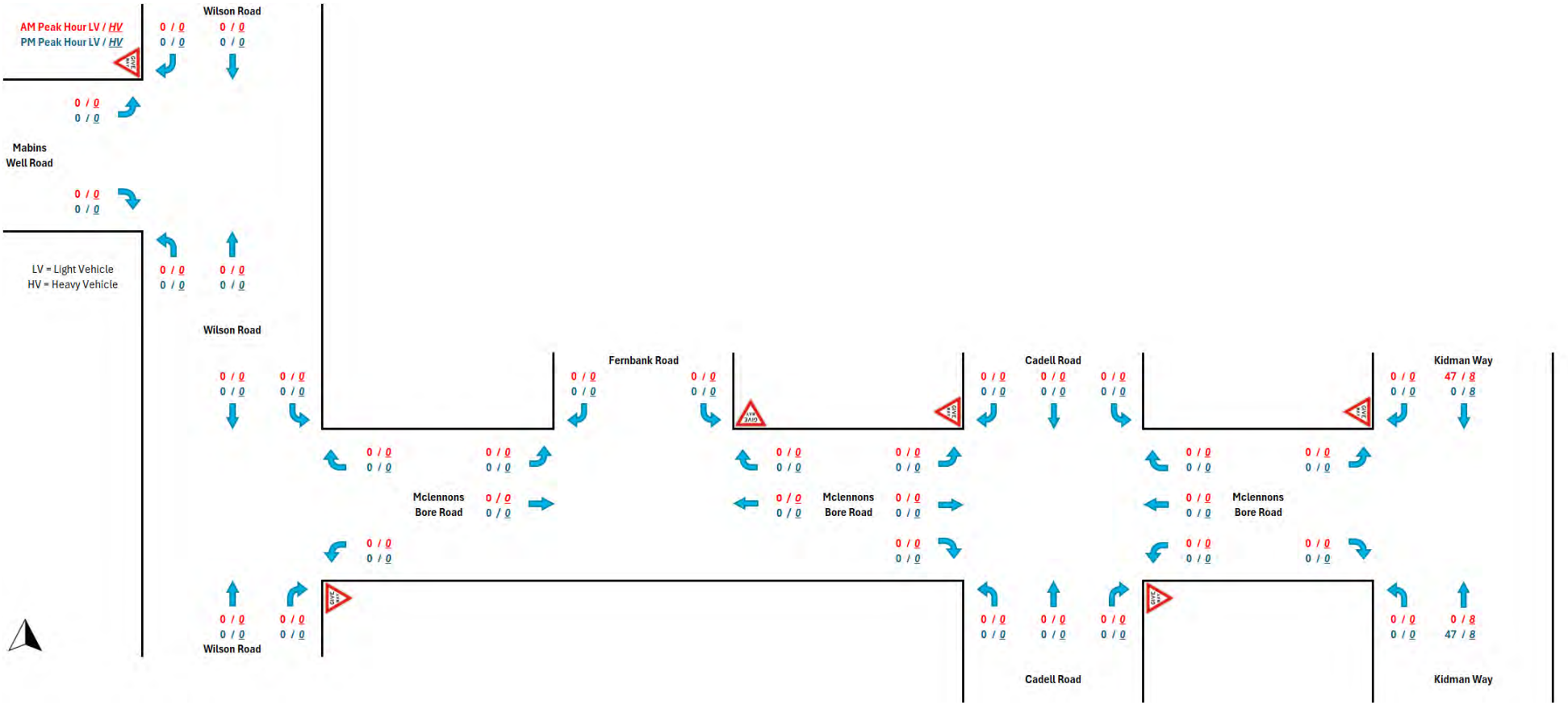


Figure 4.8(a) Dinawan Solar Farm AM and PM peak hour traffic volumes

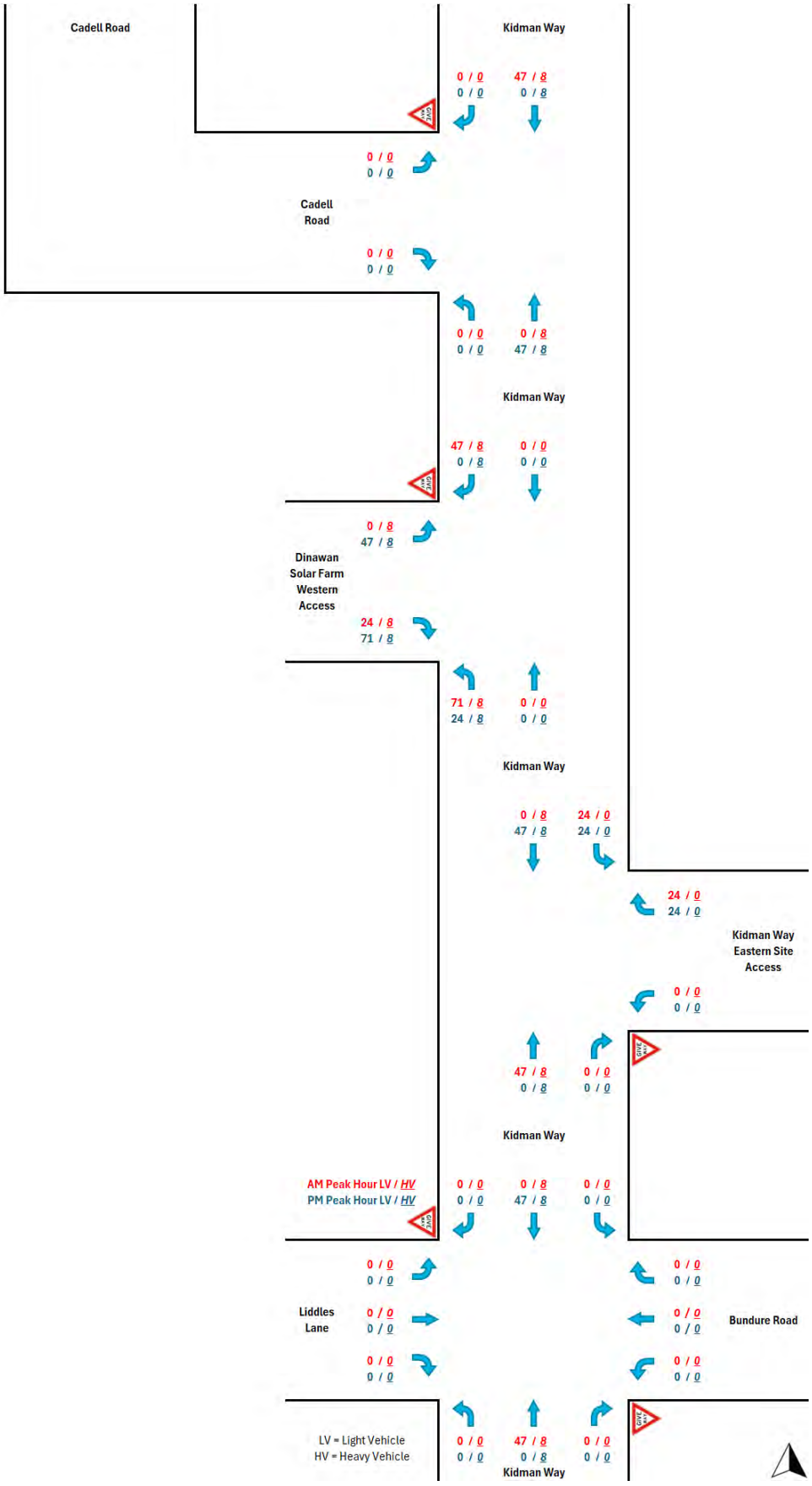


Figure 4.8(b) Dinawan Solar Farm AM and PM peak hour traffic volumes (continued)

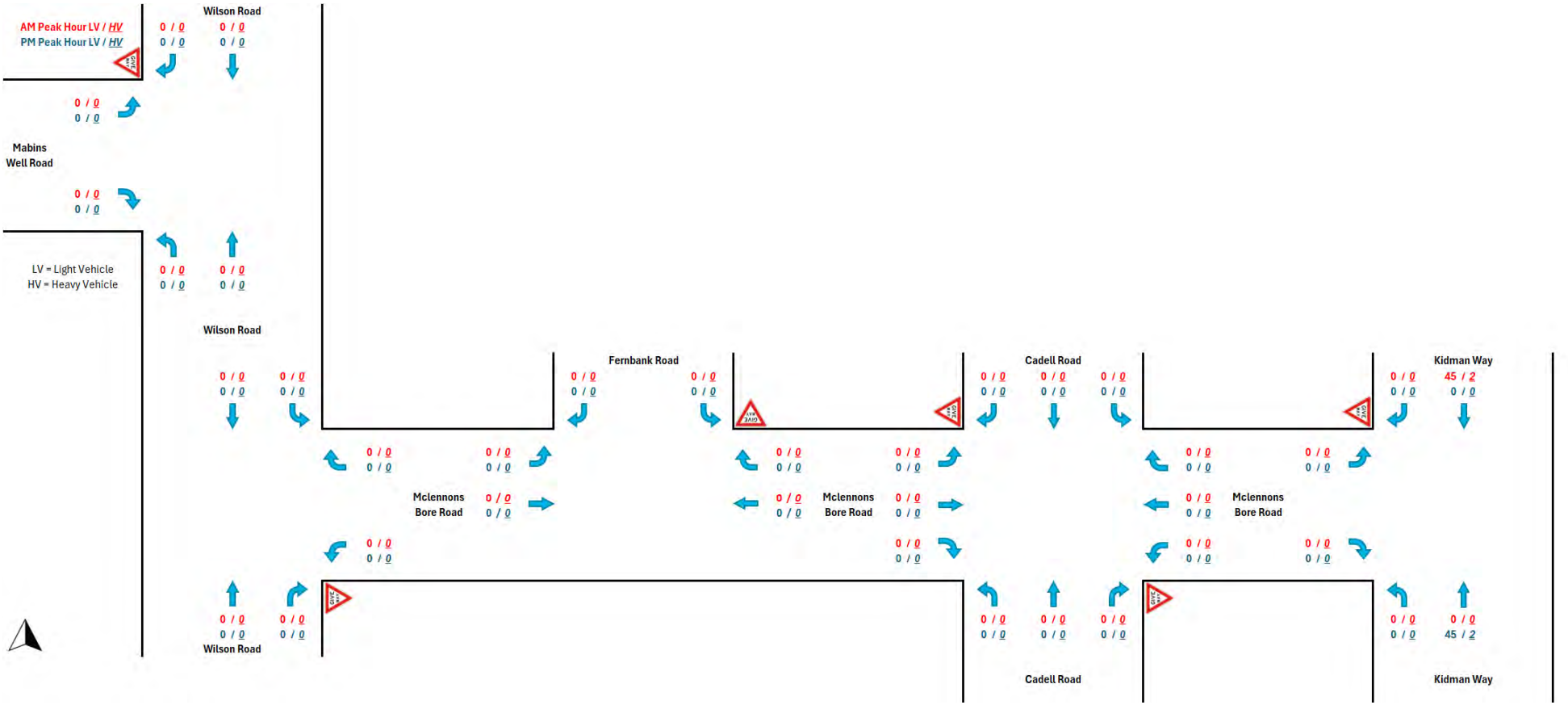


Figure 4.9(a) Yanco Delta Wind Farm AM and PM peak hour traffic volumes

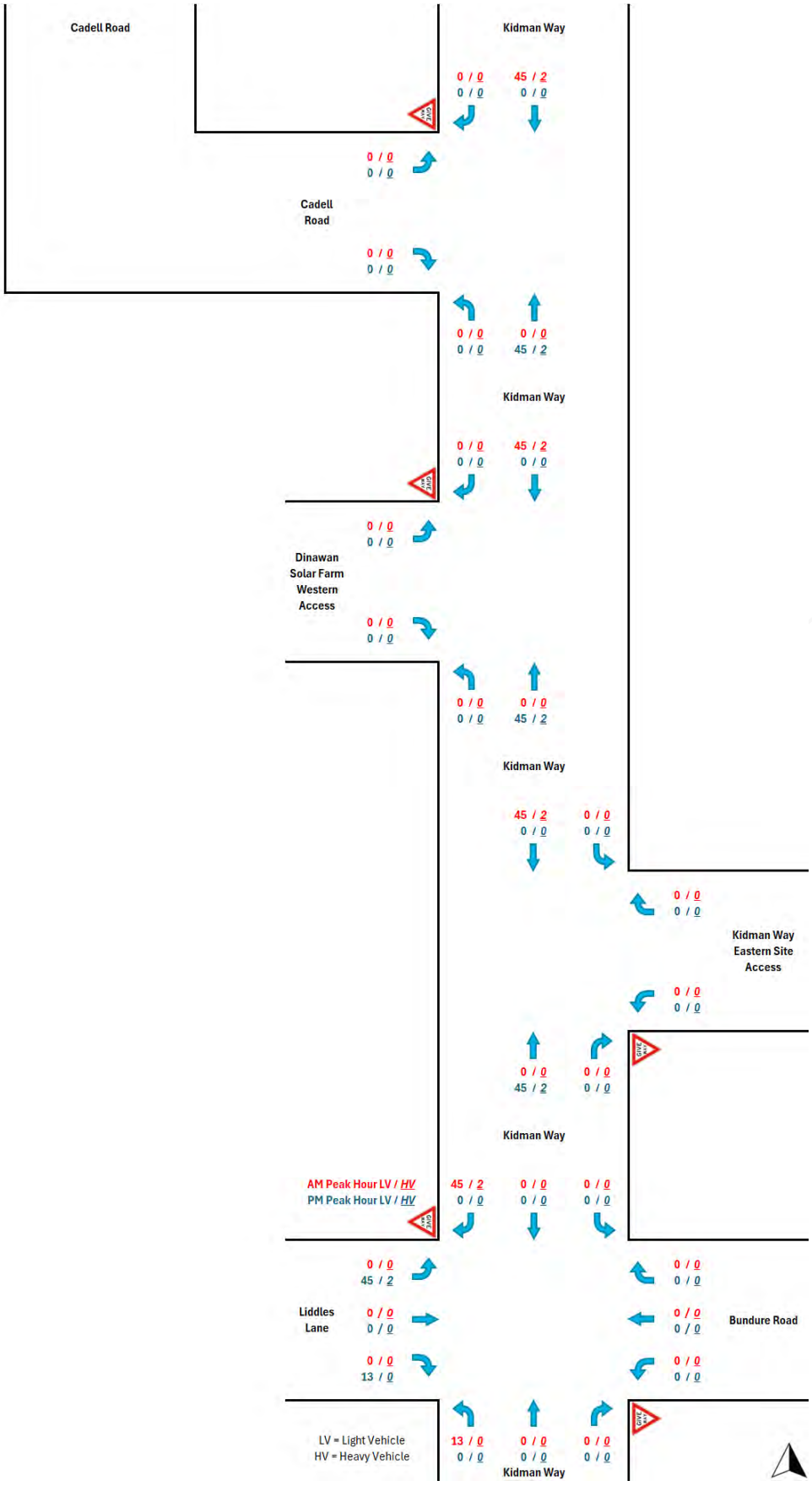


Figure 4.9(b) Yanco Delta Wind Farm AM and PM peak hour traffic volumes (continued)

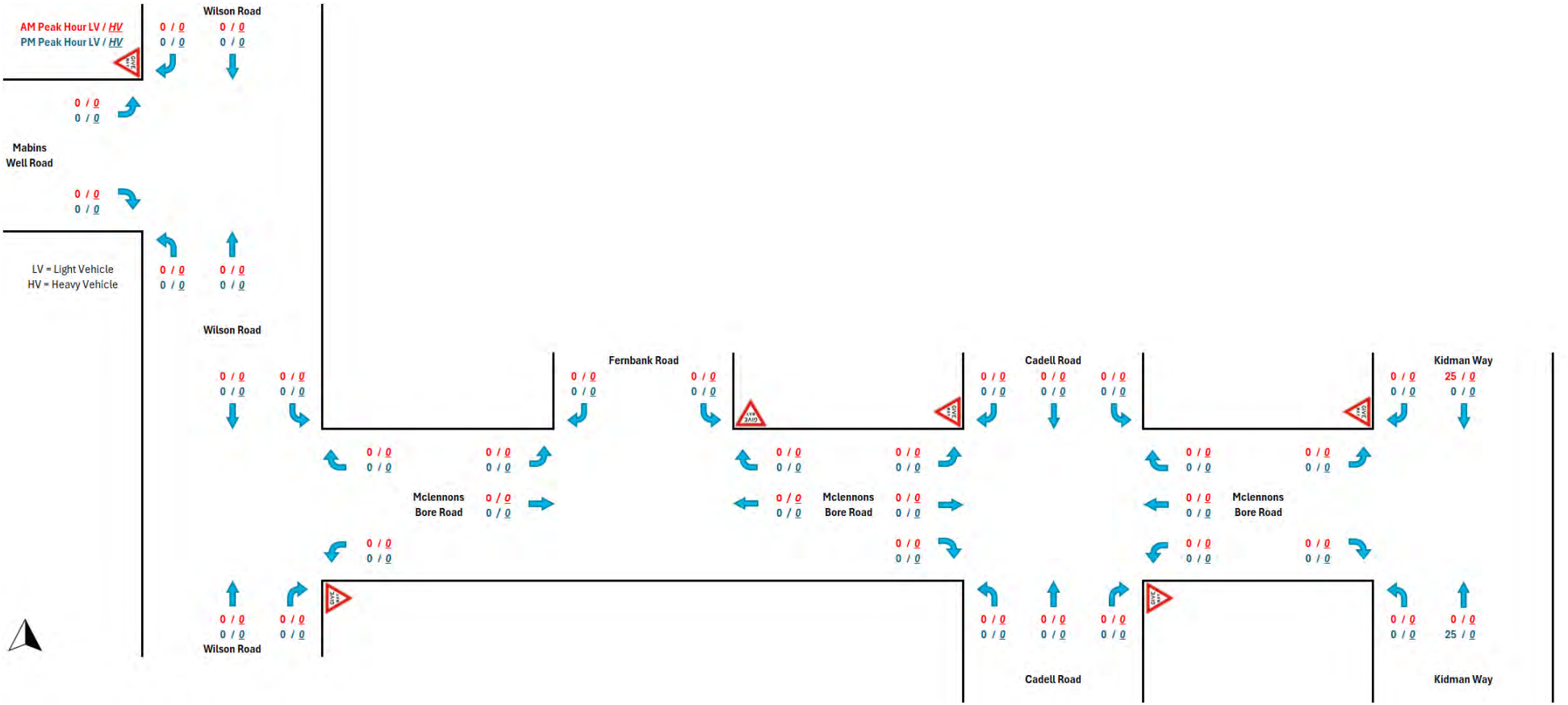


Figure 4.10(a) Victoria to NSW Interconnector West AM and PM peak hour traffic volumes

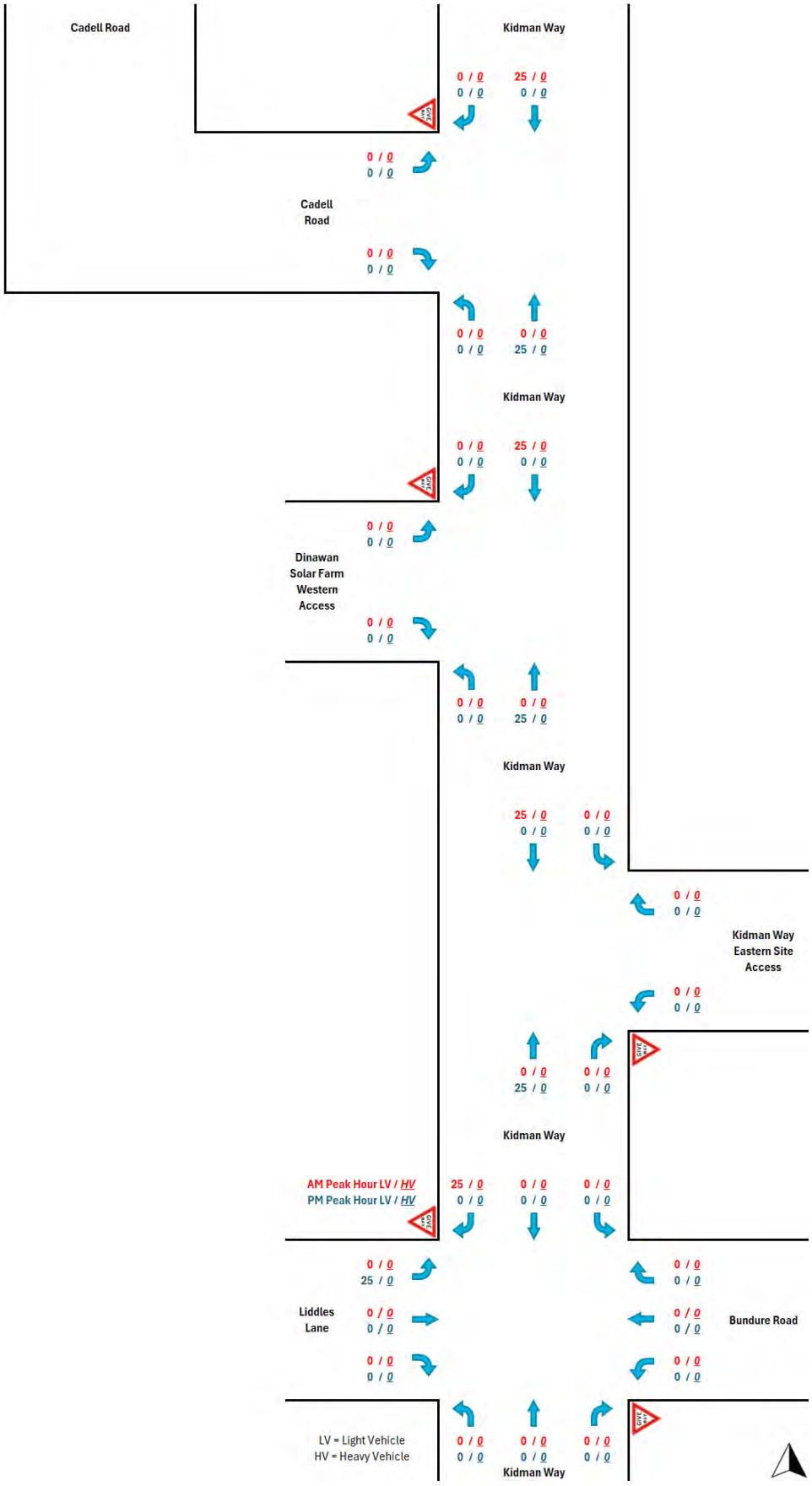


Figure 4.10(b) Victoria to NSW Interconnector West AM and PM peak hour traffic volumes (continued)

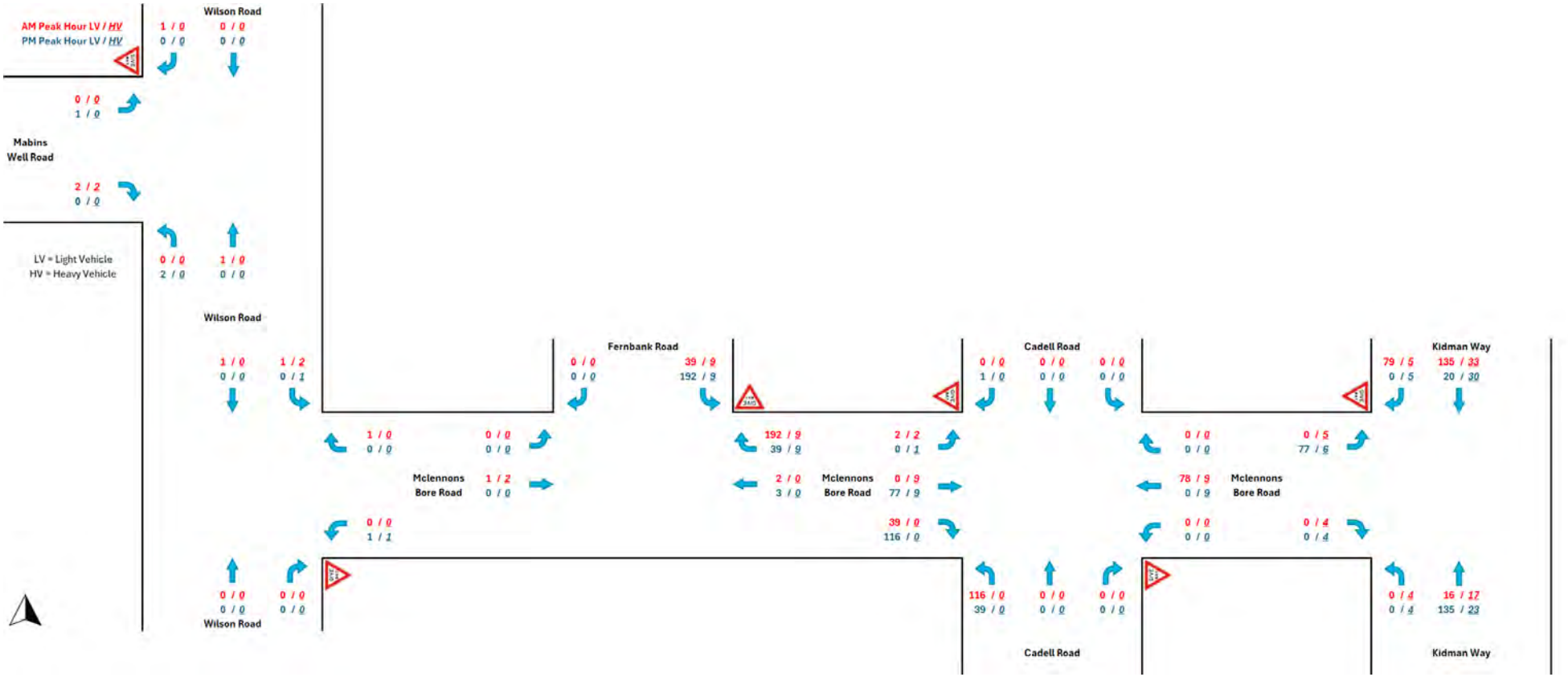


Figure 4.11(a) 2027 baseline + month 15 (Stage 1) + cumulative (Dinawan Solar Farm + Yanco Delta Wind Farm + Victoria to NSW Interconnector West) traffic volumes

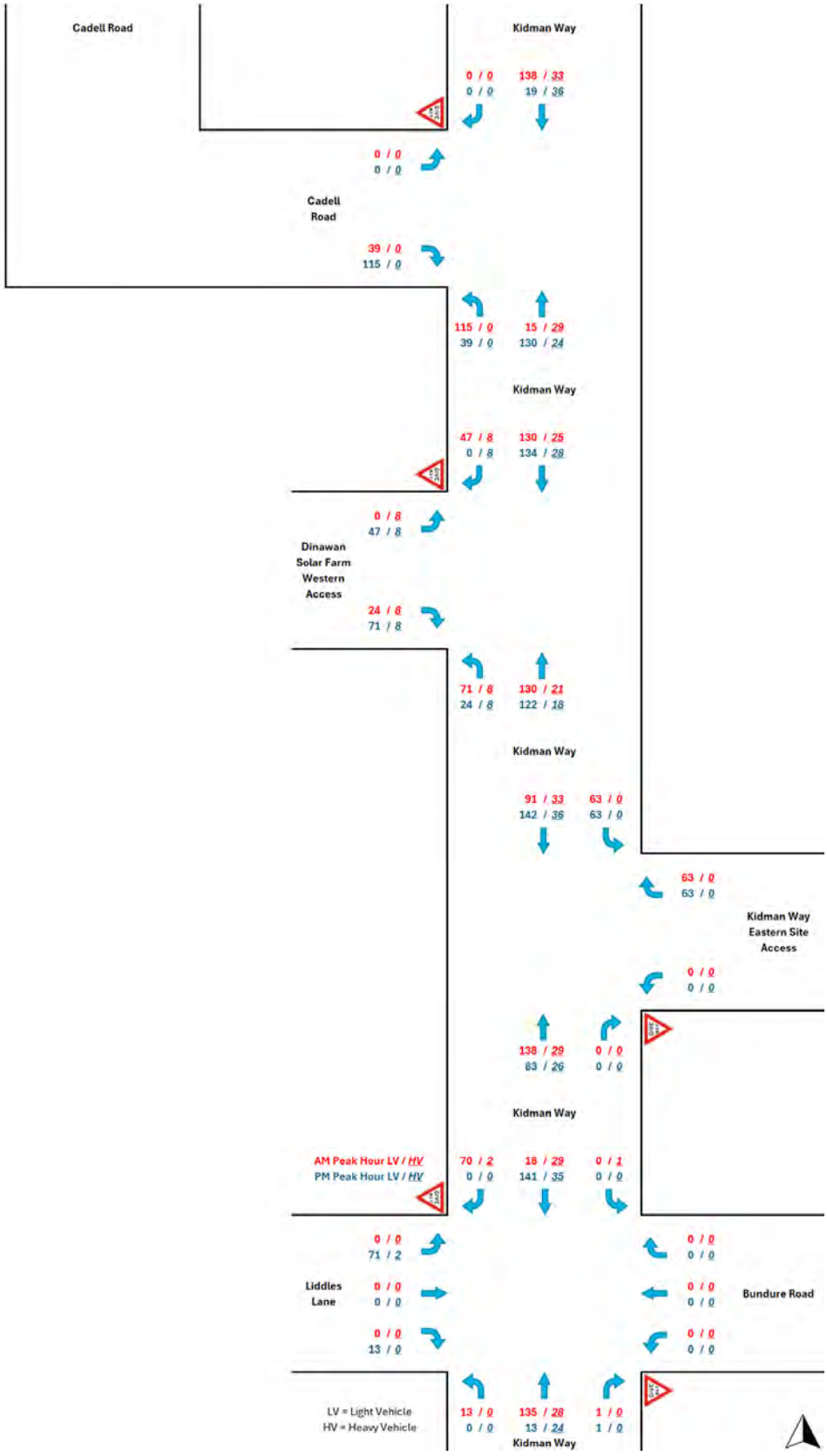


Figure 4.11(b) 2027 baseline + month 15 (Stage 1) + cumulative (Dinawan Solar Farm + Yanco Delta Wind Farm + Victoria to NSW Interconnector West) traffic volumes (continued)

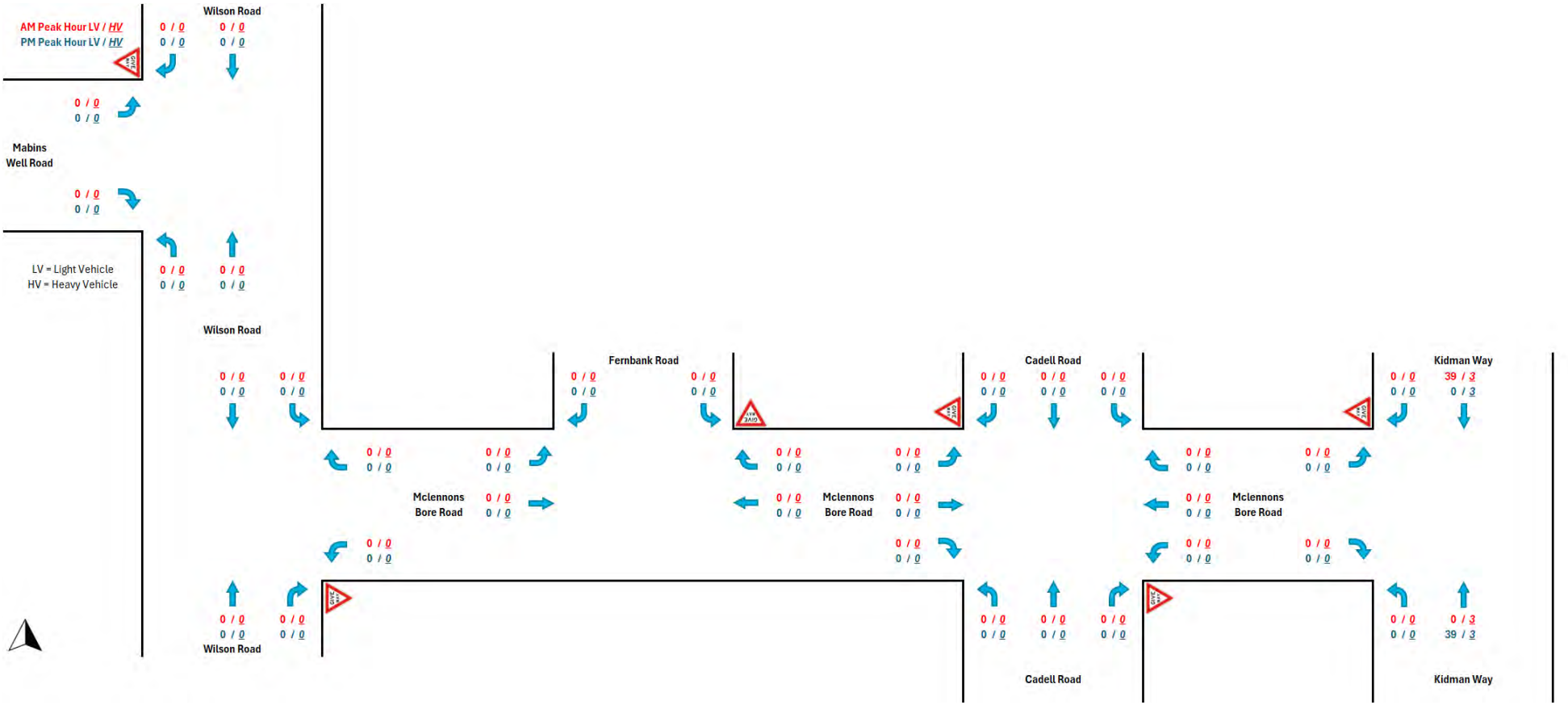


Figure 4.12(a) Argoon Wind Farm AM and PM peak hour traffic volumes

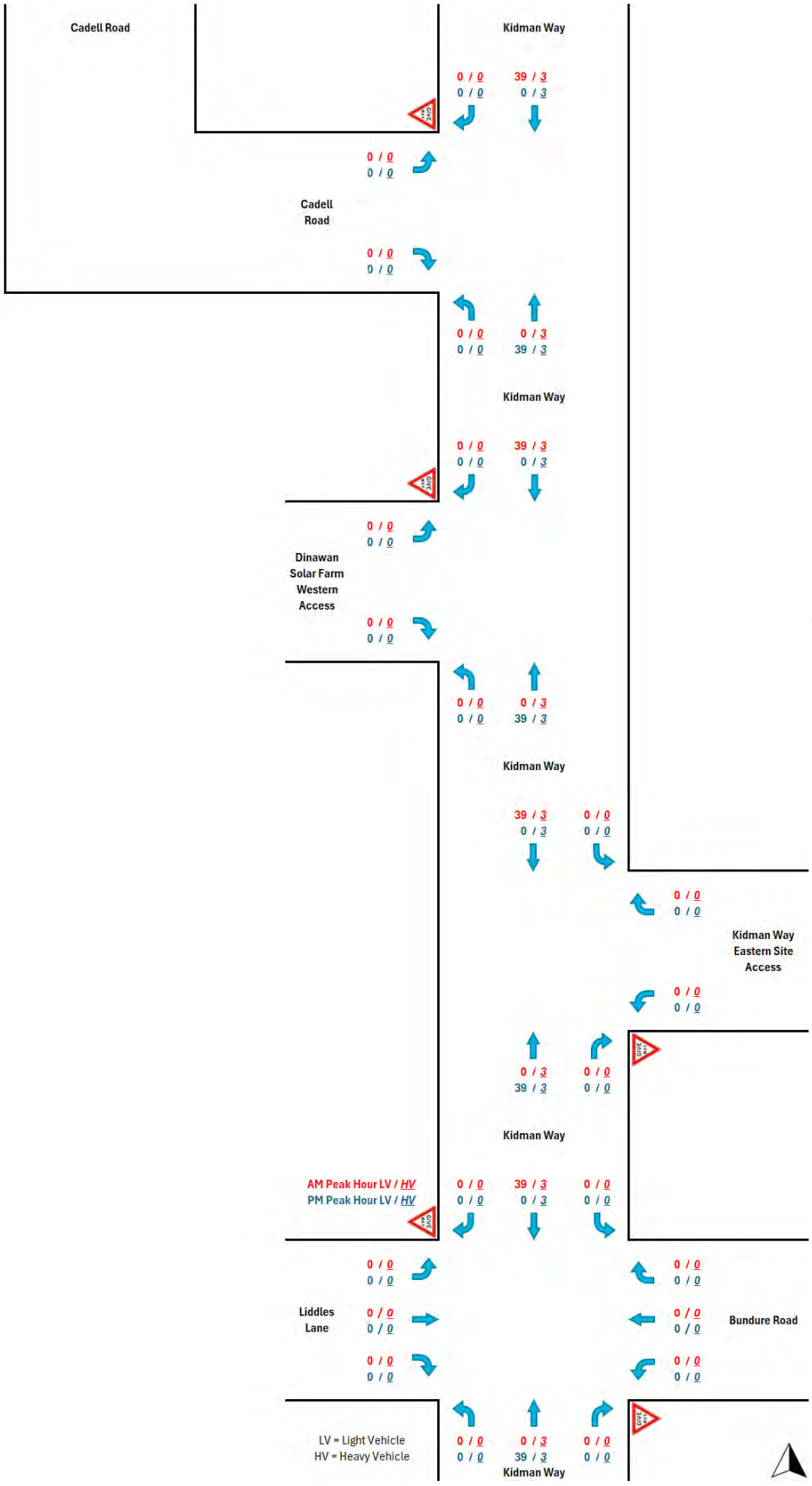


Figure 4.12(b) Argoon Wind Farm AM and PM peak hour traffic volumes (continued)

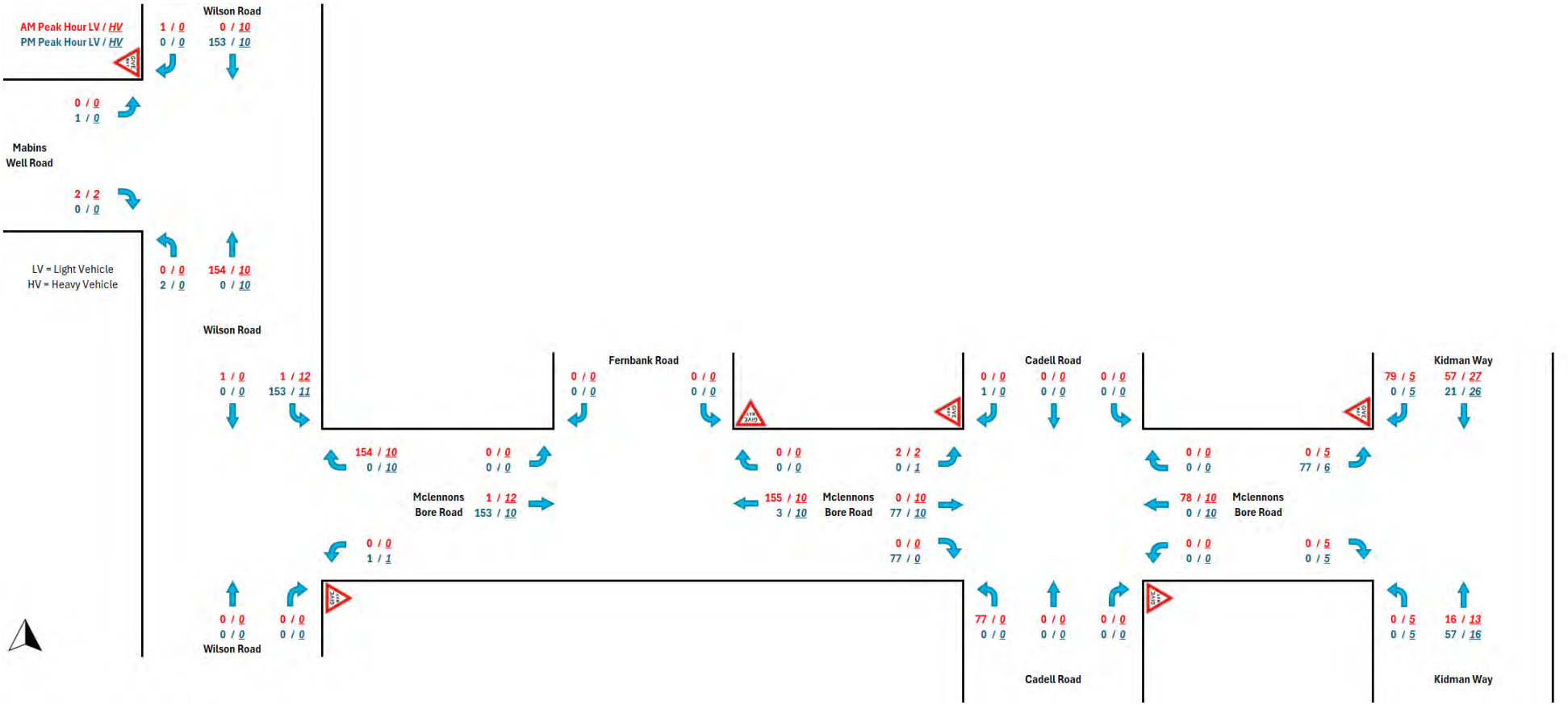


Figure 4.13(a) 2029 baseline + month 37 (Stage 2) + cumulative (Argoon Wind Farm) traffic volumes

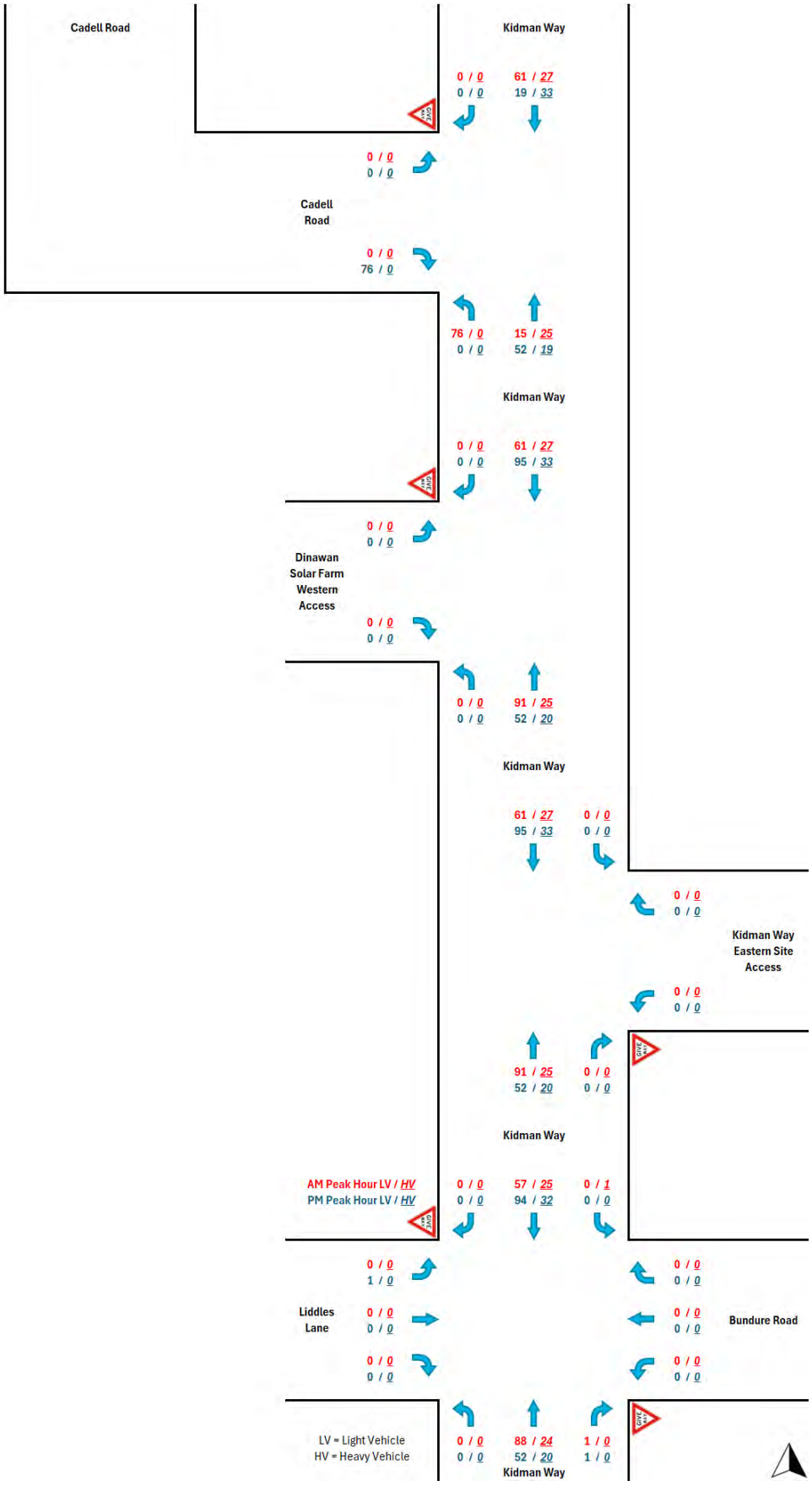


Figure 4.13(b) 2029 baseline + month 37 (Stage 2) + cumulative (Argoon Wind Farm) traffic volumes (continued)

4.6 Road upgrades

Road upgrades will be required to cater for the project's construction traffic. The actual upgrades required will be dependent on the assessments performed in Section 5 and have been further described in the relevant subsections.

4.7 Oversize overmass vehicles (OSOM)

4.7.1 Overview

OSOM vehicles will be required for the delivery of multiple pieces of infrastructure, including:

- various WTG components
- substation transformers
- switching equipment
- WTG erection cranes
- on-site buildings
- machinery and civil equipment
- accommodation facility components.

As the longest piece of infrastructure will be the WTG power trains, the OSOM assessment has considered the transport of the power trains on the OSOM vehicle to be the governing factor for road infrastructure upgrades required along the haulage route.

4.7.2 Traffic volumes

There are expected to be a total of 2,884 OSOM loads over the two stages of the project. During the construction peaks in month 15 and month 37, there are expected to be 104 monthly OSOM movements. Most OSOM vehicles will need to be escorted.

4.7.3 Dimensions

There will be a variety of OSOM vehicles that deliver various components to the site.

The longest OSOM vehicle is expected to be carrying a 100-m-long wind turbine blade on a prime mover, dolly and 3x4 jinker combination.

The tallest and widest OSOM vehicle is expected to be carrying a 6-m-wide base tower on a prime mover and two 5x8 platform trailers in a bookend configuration, followed by a push truck.

The heaviest OSOM vehicle is expected to carry a substation transformer on a prime mover, two 10x8 platform trailers with a beamset, with extra prime movers in a push/pull configuration.

Further details of transport configurations for OSOM vehicles can be found in Attachment E.

4.7.4 Routes

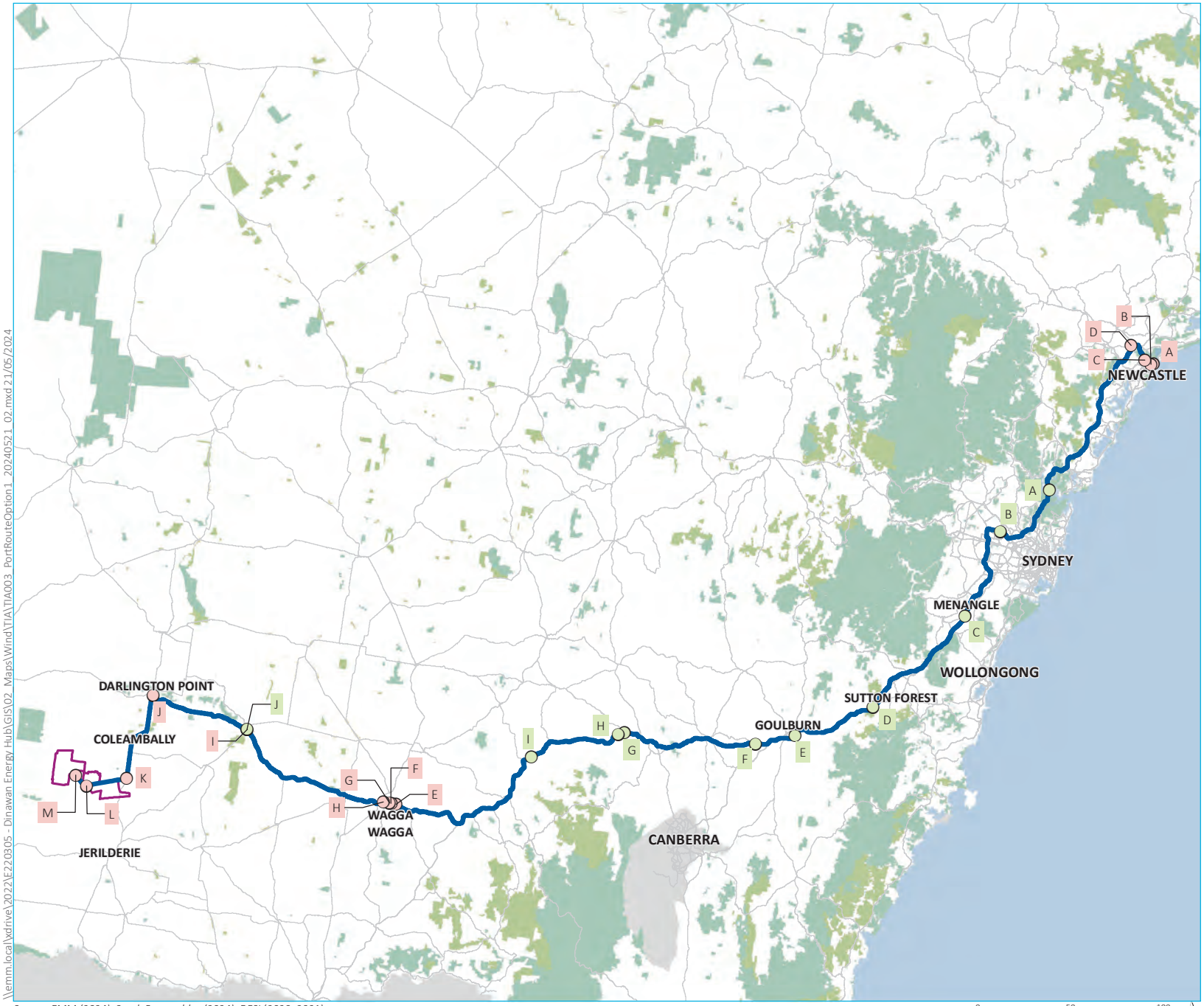
Two potential OSOM vehicle routes from Port of Newcastle to the project area have been assessed:

- Option 1 – suitable for OSOM vehicles with a loaded height of up to 5 m and load length of up to 100 m (Figure 4.14)
- Option 2 – suitable for OSOM vehicles with a loaded height of up to 5.9 m and load length of up to 55 m (Figure 4.15).

Parking areas that can accommodate OSOM vehicles have been identified along the assessed routes and are summarised in Table 4.12 (Option 1) and Table 4.13 (Option 2) and labelled on Figure 4.14 (Option 1) and Figure 4.15 (Option 2).

Table 4.12 OSOM route – Option 1 - parking areas

Label (refer to Figure 4.14)	Distance to port (km)	Location	Section of road	Current clearance
A	122.0	Hawkesbury River	M1 Motorway	100-m-long x 6-m-wide
B	167.0	Kings Park	M7 Motorway	100-m-long x 6-m-wide
C	229.0	Menangle	Hume Highway	200-m-long x 8-m-wide
D	303.0	Sutton Forest	Hume Highway	150-m-long x 10-m-wide
E	352.0	Goulburn	Hume Highway	180-m-long x 15-m-wide
F	380.0	Breadalbane	Hume Highway	140-m-long x 14-m-wide
G	453.0	Bowning	Hume Highway	200-m-long x 8-m-wide
H	456.0	Bowning	Hume Highway	80-m-long x 25-m-wide
I	510.0	Jugiong	Hume Highway	140-m-long x 14-m-wide
J	711.1	Gillenbah	Sturt Highway	100-m-long x 5-m-wide



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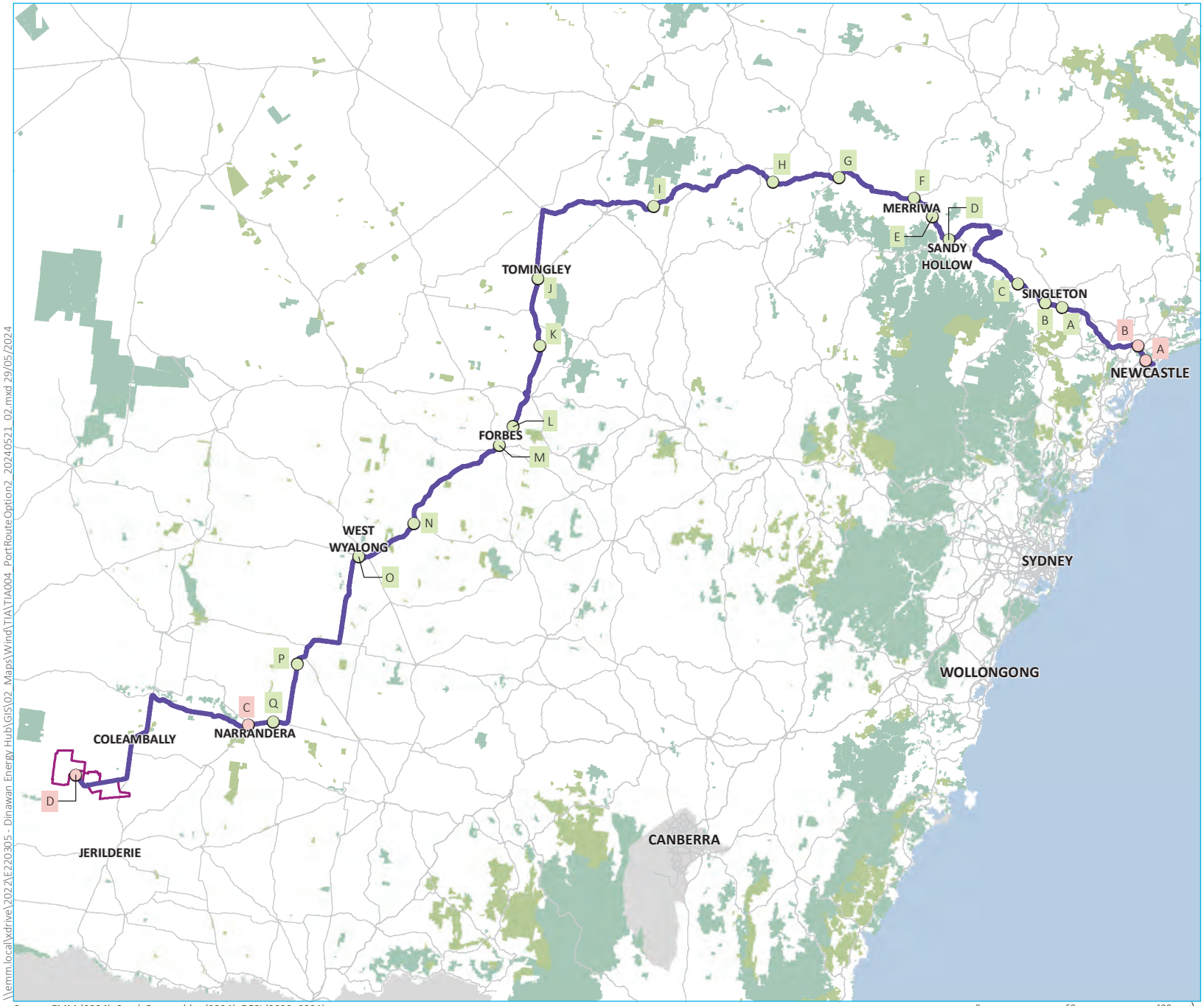
Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021)

OSOM route from Port of Newcastle to the project area - Option 1

Dinawan Wind Farm
Traffic Impact Assessment
Figure 4.14

EMM
creating opportunities



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Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021)

OSOM route from Port of Newcastle to the project area - Option 2

Dinawan Wind Farm
Traffic Impact Assessment
Figure 4.15

EMM creating opportunities

Table 4.13 OSOM route – Option 2 - parking areas

Label (refer to Figure 4.15)	Distance to port (km)	Location	Section of road	Current clearance
A	67.4	Whittingham	Golden Highway	115-m-long x 9-m-wide
B	77.5	Mount Thorley	Golden Highway	100-m-long x 10-m-wide
C	98.0	Warkworth	Golden Highway	100-m-long x 8-m-wide
D[1]	190.1	Sandy Hollow	Golden Highway	50-m-long x 4-m-wide
E	201.0	Gungai	Golden Highway	70-m-long x 6-m-wide
F	224.0	Merriwa	Golden Highway	100-m-long x 5-m-wide
G	274.0	Cassilis	Golden Highway	200-m-long x 8-m-wide
H	305.0	Leadville	Golden Highway	200-m-long x 8-m-wide
I	384.0	Ballimore	Golden Highway	150-m-long x 8-m-wide
J	488.0	Tomingley	Newell Highway	200-m-long x 15-m-wide
K	526.0	Alectown	Newell Highway	90-m-long x 7-m-wide
L	576.0	Daroobalgie rest area	Newell Highway	200-m-long x 7-m-wide
M	590.2	Forbes	Newell Highway	100-m-long x 6.5-m-wide
N	659.0	Marsden rest area	Newell Highway	200-m-long x 7-m-wide
O	702.5	West Wyalong	Showground Road	200-m-long x 7-m-wide
P	784.0	Ardlethan rest area	Newell Highway	200-m-long x 7-m-wide
Q	823.0	Grong Grong rest area	Newell Highway	200-m-long x 7-m-wide

Notes: 1. Suitable for vehicles up to 50-m-long.

The OSOM route assessment (Attachment E) has identified deficiencies in the existing road network that would need to be addressed prior to being used by the project's OSOM vehicles. These deficiencies are summarised in Table 4.14 (Option 1) and Table 4.15 (Option 2) and labelled on Figure 4.14 (Option 1) and Figure 4.15 (Option 2).

Works required to facilitate the project's OSOM vehicles from Port of Newcastle to the project area are listed in Table 4.14 (Option 1) and Table 4.15 (Option 2) and figures showing the outcomes of swept path assessments and indicative work areas for each of these deficiencies are provided in Attachment E. Works in the immediate vicinity of the project that are proposed to be completed as part of the project are identified in Table 4.14 (Option 1) and Table 4.15 (Option 2). Other works will be subject to further consultation with DPHI, EnergyCo and TfNSW.

A decision on the project's OSOM route is subject to further consultation with relevant road authorities (including TfNSW and local councils) and EnergyCo prior to an NHVR application. The selection of a WTG model for construction will determine the exact dimensions of components requiring transport and subsequent road upgrades needed between the site access points and Port of Newcastle to facilitate deliveries.

Table 4.14 OSOM route – Option 1 – potential road network deficiencies

Label (refer to Figure 4.14)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
A	0	Mayfield	Mayfield #4 berth onto Selwyn Street	Length: 70 m Width: 8 m	Moderate right hand turn	The turn may be constrained by the existing dimensions of the intersection and culvert as well as the presence of signage and fencing.	Additional hardstand on left entry and exit of corner. Extension of existing culvert. Relocation or removal of signage. Relocation of gate and fencing.	No	Possible installation of hardstand and relocation of fencing adjacent to road pavement.
B	1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street	Length: 70 m Width: 8 m	Right hand turn	The turn may be constrained by the existing dimensions of the intersection and the presence of signage, light poles and traffic lights.	Relocation or removal of signage and light poles. Additional hardstand on inside corner and south side of intersection. Traffic lights in centre median relocated or made to fold down.	No	Installation of hardstand adjacent to road adjacent to road pavement.
C	5.5	Mayfield West	Industrial Drive onto Maitland Road	Length: 70 m Width: 8 m	Right hand turn	The turn may be constrained by two signs adjacent to the intersection.	Two signs to be made removable or relocated.	No	Minor works within existing road pavement area.
D	18.4	Beresfield	John Renshaw Drive onto the M1	Length: 80 m Width: 8 m	Left hand bend	The outside corner of the tail swing may impact on two light poles.	Two light poles to be made removable or relocated.	No	Minor works within road corridor.

Table 4.14 OSOM route – Option 1 – potential road network deficiencies

Label (refer to Figure 4.14)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
E	614.6	Wagga Wagga	Sturt Highway	Length: 80 m	Second exit on roundabout	Some modifications to existing roundabout required for vehicle to pass safely.	Sign to be removed from middle of roundabout. Roundabout to be made trafficable.	No	Minor works within existing road pavement area and roundabout.
F	617.3	Wagga Wagga	Sturt Highway	Length: 80 m	Second exit on roundabout	Some modifications to existing roundabout required for vehicle to pass safely.	Sign to be removed from middle of roundabout. Hardstand to be installed on roundabout. Roundabout to be made trafficable.	No	All works within existing road pavement area and roundabout.
G	618.4	Wagga Wagga	Sturt Highway	Length: 80 m	Second exit on roundabout	The truck will need to cut across the centre of the roundabout. The existing pavement is ok to drive on without any extra work.	Two signs to be removed in the middle of the roundabout.	No	All works within existing road pavement area and roundabout.
H	621.5	Wagga Wagga	Sturt Highway	Length: 80 m	Second exit on roundabout	Some modifications to existing roundabout required for vehicle to pass safely.	Signs to be removed from middle of roundabout. Roundabout to be made trafficable.		All works within existing road pavement area and roundabout.

Table 4.14 OSOM route – Option 1 – potential road network deficiencies

Label (refer to Figure 4.14)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
I	711	Gillenbah	Sturt Highway	Length: 80 m	Left hand Turn	The turn may be constrained by the presence of signage, a power pole, vegetation and a traffic island.	Signs to be relocated or made removable. Power pole to be relocated out of swept path. Vegetation to be trimmed for blade oversail. Traffic island to be removed.	No	Relocation of signage, power pole and traffic island all entirely within existing road pavement. Some minor vegetation trimming within the road corridor.
J	768	Darlington Point	Sturt Highway onto Kidman Way	Length: 45 m	Left hand turn	The turn may be constrained by the intersection dimensions and the presence of signage.	Hardstand to be installed on the inside corner. Sign to be relocated or removed.	No	Hardstand may impact roadside area entirely within road corridor.
K	819	Coleambally	Kidman Way onto Mclennons Bore Road	Length: 30 m	Right hand turn	The turn may be constrained by the intersection dimensions and the presence of signage.	Hardstand to be installed on inside and outside of corner. Signs to be relocated or made removable.	Yes	Potential impacts included in the development footprint or development corridor.
L	841	Jerilderie	Mclennons Bore Road onto Wilson Road	Length: 40 m	Right hand turn	The turn may be constrained by the intersection dimensions. Clearance to an overhead conductor also requires confirmation.	Hardstand to be installed on inside and outside of corner. Overhead conductor clearance to be confirmed.	Yes	Potential impacts included in the development footprint or development corridor.

Table 4.14 OSOM route – Option 1 – potential road network deficiencies

Label (refer to Figure 4.14)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
M	849	Argoon	Wilson Road Stock Grid	Width: 5.8 m	Travel straight ahead	Existing stock grids may not support the weight of some project deliveries.	All stock grids to be upgraded to accommodate all proposed loads.	Yes	Potential impacts included in the development footprint or development corridor.

Table 4.15 OSOM route – Option 2 – potential road network deficiencies

Label (refer to Figure 4.15)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
A	4.9	Mayfield	Industrial Drive under traffic signals	Height: 5.4 m	Travel directly ahead in the far-right lane.	The lowest traffic signal on route is at the intersection of Steel River Boulevard. Vehicles that exceed 5.3 m will need to travel in the right-hand lane. Clearance in the right end lane is 6 m. Base towers (6.1 m) will need to be lowered for travel through this intersection.	No works required. Issues to be addressed through delivery planning and management.	No	No impacts predicted.

Table 4.15 OSOM route – Option 2 – potential road network deficiencies

Label (refer to Figure 4.15)	Distance from port (km)	Location	Section of road	Current clearance	Procedure	Potential issues	Summary of works required	Works proposed as part of project	Summary of impacts
B	13.9	Hexham	New England Highway under gantry	Height: 5.9 m	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.9 m should not be exceeded. Base towers (6.1 m) will need to be lowered before travelling under this structure.	No works required. Issues to be addressed through delivery planning and management.	No	No impacts predicted.
C	837.0 to 838.0	Narrandera	Newell Highway (Cadell St)	Length: 50 m Width: 7.5 m	Travel directly ahead	Trees to be trimmed.	Vegetation trimming above existing formed road.	No	No physical works beyond formed road.
D	970.9	Argoon	Wilsons Rd Stock Grid	Width: 5.8 m	Travel directly ahead	Existing stock grids may not support the weight of some project deliveries.	Upgrades to stock grids.	Yes	Potential impacts included in the development footprint or development corridor.

5 Impact assessment

5.1 Intersection impact assessment

The intersections along Kidman Way have been modelled with the SIDRA Intersection 9.1 software, a micro-analytical tool for individual intersections and linked intersection-network modelling. The modelling is based on the baseline traffic volumes detailed in Section 3.4, construction traffic volumes in Section 4.2.7 and cumulative traffic volumes in Section 4.5.2. SIDRA provides the following performance indicators:

- Degree of saturation (DOS) – the total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation (e.g. 0.8 = 80% saturation).

  In practice, the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to. These are usually called 'practical degrees of saturation'.

- Average delay (DEL) – for a signalised or roundabout intersection, this is the average delay in seconds encountered by all vehicles passing through the intersection. For a priority-controlled intersection, this is the average delay experienced by the worst approach and turning movement. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.

- Level of service (LOS) – this is a categorisation of average delay, intended for simple reference. For a priority-controlled intersection, this is the categorisation of the average delay experienced by the worst approach and turning movement.

- 95% queue lengths (Q95) – is defined to be the queue length in metres that has only a 5% probability of being exceeded during the analysed time period. It transforms the average delay into measurable distance units.

The LOS is a good indicator of overall performance for individual intersections, with each level summarised in Table 5.1.

Table 5.1 Intersection LOS standards

Level of service	Average delay (seconds per vehicle)	Traffic signals, roundabout	Priority intersection ('Stop' and 'Give Way')
A	<14	Good operation	Good operations
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At traffic signals, incidents will cause extensive delays. Roundabouts require other control mode.	At capacity, required other control mode
F	>71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; required other control mode

Source: *RTA Guide to Traffic Generating Developments* (RTA 2002)

SIDRA intersection modelling has been conducted for the following scenarios:

- Baseline 2027 – based on Figure 3.3
- Baseline 2027 + construction during month 15 (i.e. Stage 1) – based on Figure 4.5
- Baseline 2027 + construction during month 15 + cumulative (i.e. Stage 1) – based on Figure 4.11.

SIDRA intersection modelling has not been performed for month 37 in 2029 (i.e. Stage 2) because:

- overall vehicle volumes on Kidman Way are similar or have reduced compared to month 15 in 2027
- similar turning movements to/from Kidman Way via the Kidman Way/McLennons Bore Road intersection will occur when compared to month 15 in 2027
- there are fewer turning movements to/from Kidman Way via the Kidman Way/Cadell Road (south) intersection when compared to month 15 in 2027
- no turning movements are proposed to/from Kidman Way at the Kidman Way Eastern Site Access intersection during Stage 2 of construction.

The following abbreviations are used for the turn movements:

- TH: through
- LT: left turn
- RT: right turn.

The SIDRA results for the intersections along Kidman Way are presented in the following tables. As the traffic volumes at the intersections that are exclusively on the local road network are lower than the intersections along Kidman Way, it is assumed that those intersections will perform at LOS A and do not need to be assessed.

Detailed SIDRA results can be found in Attachment C.

5.1.1 Kidman Way/McLennons Bore Road intersection

Table 5.2 SIDRA modelling results for Kidman Way/McLennons Bore Road intersection

Control: Priority controlled (Give way)	AM peak						PM peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**
a) Baseline 2027	75	7.9	A	0.031	0.1	TH and RT from Kidman Way (north)	81	10.7	A	0.031	0.1	TH and RT from Kidman Way (north) and LT and RT from McLennons Bore Road (west)
b) Baseline 2027 + month 15 construction	172	12.4	A	0.052	1.8	RT from Kidman Way (north)	178	11.5	A	0.063	2.0	LT and RT from McLennons Bore Road (west)
c) Baseline 2027 + month 15 construction + cumulative	314	14.9	B	0.102	1.8	RT from Kidman Way (north)	320	13.9	A	0.097	2.3	LT and RT from McLennons Bore Road (west)

Key findings for Kidman Way/McLennons Bore Road intersection:

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A (good operation) or B (good with acceptable delays and spare capacity) and DOS <0.2 for all scenarios.
- Right turning traffic from Kidman Way onto McLennons Bore Road will not impede through traffic on Kidman Way when the intersection is upgraded to accommodate project construction and cumulative traffic volumes.
- The intersection has capacity to accommodate the additional project construction and cumulative traffic volumes.

5.1.2 Kidman Way/Cadell Road (south) intersection

Table 5.3 SIDRA modelling result for Kidman Way/Cadell Road (south) intersection

Control: Priority controlled (Give way)	AM Peak						PM Peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**
a) Baseline 2027	80	7.9	A	0.029	0.1	TH and RT from Kidman Way (north)	74	7.9	A	0.032	0.1	TH and RT from Kidman Way (north)
b) Baseline 2027 + month 15 construction	248	8.5	A	0.065	1.1	LT and RT from Cadell Road (west)	242	8.3	A	0.116	3.4	LT and RT from Cadell Road (west)
c) Baseline 2027 + month 15 construction + cumulative	391	9.5	A	0.105	1.3	LT and RT from Cadell Road (west)	384	9.4	A	0.138	4.0	LT and RT from Cadell Road (west)

Key findings for Kidman Way/Cadell Road intersection:

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DOS <0.2 for all scenarios.
- The intersection has capacity to accommodate the additional project construction and cumulative traffic volumes.

5.1.3 Kidman Way/Dinawan Solar Farm Western Access intersection

Table 5.4 SIDRA modelling results for Kidman Way/Dinawan Solar Farm Western Access intersection

Control: Priority controlled (Give way)	AM peak						PM peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**
a) Baseline 2027	80	7.9	A	0.029	0.1	TH and RT from Kidman Way (north)	76	7.9	A	0.032	0.1	TH and RT from Kidman Way (north)
b) Baseline 2027 + month 15 construction	251	9.5	A	0.089	0.1	LT and RT from Dinawan Solar Farm Western Access	246	9.5	A	0.097	0.1	LT and RT from Dinawan Solar Farm Western Access
c) Baseline 2027 + month 15 construction + cumulative	505	13.5	A	0.092	2.8	LT and RT from Dinawan Solar Farm Western Access	501	11.8	A	0.189	5.9	LT and RT from Dinawan Solar Farm Western Access

Key findings for Kidman Way/Dinawan Solar Farm Western Access intersection:

- No project-related vehicles will turn in or out of this intersection.
- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DOS <0.2 for all scenarios.
- The intersection has capacity to accommodate the project's and other developments' through traffic volumes on Kidman Way.

5.1.4 Kidman Way/Kidman Way Eastern Site Access intersection

Table 5.5 SIDRA modelling results for Kidman Way/Kidman Way Eastern Site Access intersection

Control: Priority controlled (Give way)	AM peak						PM peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**
a) Baseline 2027	80	8.0	A	0.029	0.1	TH and RT from Kidman Way (south)	76	8.0	A	0.032	0.1	TH and RT from Kidman Way (south)
b) Baseline 2027 + month 15 construction	249	9.2	A	0.068	1.3	LT and RT from Accommodation Facility Access	245	9.1	A	0.076	1.3	LT and RT from Accommodation Facility Access
c) Baseline 2027 + month 15 construction + cumulative	441	10.7	A	0.100	2.7	LT and RT from Accommodation Facility Access	437	10.7	A	0.109	2.6	LT and RT from Accommodation Facility Access

Key findings for Kidman Way/Kidman Way Eastern Site Access intersection:

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DOS <0.2 for all scenarios.
- The intersection has capacity to accommodate the additional project construction and cumulative traffic volumes.

5.1.5 Kidman Way/Bundure Road/Liddles Lane intersection

Table 5.6 SIDRA modelling results for Kidman Way/Bundure Road/Liddles Lane intersection

Control: Priority controlled (Give way)	AM peak						PM peak					
Scenarios	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Q95 (m)**	**Q95 approach and direction**
a) Baseline 2027	65	7.9	A	0.022	0.1	All approaches and directions	85	7.9	A	0.034	0.1	All approaches and directions
b) Baseline 2027 + month 15 construction	165	10.4	A	0.066	0.1	LT, TH and RT from Bundure Road (east) and Liddles Lane (west)	168	9.0	A	0.075	0.1	LT, TH and RT from Bundure Road (east) and Liddles Lane (west)
c) Baseline 2027 + month 15 construction + cumulative	319	10.5	A	0.105	1.6	RT from Kidman Way (north)	323	2.2	A	0.108	2.2	LT, TH and RT from Liddles Lane (west)

Key findings for Kidman Way/Bundure Road/Liddles Lane intersection:

- No project-related vehicles will turn in or out of this intersection.
- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DOS <0.2 for all scenarios.
- The intersection has capacity to accommodate the project's and other developments' through traffic volumes on Kidman Way.

5.1.6 Summary of intersection impacts

All intersections perform satisfactorily, with LOS A or B for all scenarios including when the project and cumulative traffic volumes are added. Any queues from right turning traffic from Kidman Way will not impede through traffic on Kidman Way. Overall, all the intersections will have significant spare capacity to accommodate the additional traffic volumes from the project and cumulative projects.

5.2 Mid-block capacity analysis

The mid-block level of service on rural and urban roads is assessed based on a vehicle's average travel speed. At low traffic volumes and under ideal conditions, drivers are able to travel at their desired speed without interference. As traffic volumes increase, and as roadway, terrain and traffic conditions become less than ideal, drivers are affected by the presence of other vehicles on the road and bunches form in the traffic stream.

The mid-block capacity of Kidman Way has been assessed as part of the major road network, as this is the main haulage route for all vehicles travelling to and from the development footprint. The posted speed limit along the relevant section of Kidman Way is 100 km/h.

Table 4.5 of the *Guide to Traffic Generating Developments* (RTA 2002) provides the two-way hourly traffic capacities (i.e. number of vehicles per hour) for two-lane roads for different LOS with a design speed of 100 km/h based on different terrain types. The capacities assume 60% of traffic is travelling in one direction and 40% is travelling in the other direction.

The capacities for each LOS transition (i.e. the combined number of vehicles travelling in both directions at which the LOS decreases) are provided in Table 5.7. The capacity of the road is also dependent on the percentage of heavy vehicles.

Table 5.7 Roadway hourly capacity for a two-lane, two-way rural road with level terrain

Terrain	Level of service transition	Effect of percentage of heavy vehicles (in traffic flow)						
		0%	5%	10%	15%	20%	25%	30%
Level	A to B*	315	295	280	265	250	235	220
	B to C	630	590	560	530	500	470	440
	C to D	1,030	970	920	870	820	770	730
	D to E	1,630	1,550	1,480	1,410	1,340	1,270	1,210
	E to F	2,630	2,500	2,390	2,290	2,190	2,100	2,010

Notes:

1. *Assumed to be 50% of upper limit of B to C LOS transition.
2. Columns 20% to 30% have been extrapolated from the preceding columns.
3. Assumes 100 km/h speed limit.

Source: RTA (2002)

The mid-block capacity has only been performed for Stage 1 construction traffic in 2027. The mid-block capacity for Stage 2 construction traffic in 2029 does not need to be assessed on Kidman Way and McLennons Bore Road as the overall vehicle volumes will be similar or lower than in 2027 (i.e. Stage 1 represents a worst case scenario).

The existing and forecast traffic volumes on Wilson Road and Goolgumbla Road are significantly less than Kidman Way as these roads are used for local traffic only. Hence, the mid-block LOS has not been assessed and these roads are assumed to be LOS A.

The LOS for scenarios with heavy vehicle proportions higher than 30% have been obtained from further extrapolations of Table 5.7.

5.2.1 Kidman Way

The mid-block capacity of Kidman Way during different scenarios is provided in Table 5.8. The assessment was undertaken at the Kidman Way Eastern Site Access intersection.

Table 5.8 Kidman Way mid-block capacity

Scenario	Peak hour volume		Proportion of heavy vehicles		Level of service	
	AM	PM	AM	PM	AM	PM
Baseline 2027	72	74	50%	49%	A	A
Baseline 2027 + month 15 construction	234	230	19%	19%	A	A
Baseline 2027 + month 15 construction + cumulative	417	413	15%	15%	B	B

In the baseline and baseline + project construction scenarios, Kidman Way is expected to operate at LOS A during the AM and PM peaks. Overall, as part of the major road network, Kidman Way will still be able to efficiently cater for the additional vehicular traffic generated by the project.

In the baseline + project construction + cumulative scenarios, Kidman Way is expected to operate at LOS B during the AM and PM peaks. Even with the additional cumulative traffic volumes, Kidman Way will be able to perform at an acceptable level.

5.2.2 McLennons Bore Road

The mid-block capacity of McLennons Bore Road during different scenarios at the busiest location between Fernbank Road and Cadell Road is provided in Table 5.9.

Table 5.9 McLennons Bore Road mid-block capacity

Scenario	Peak hour volume		Proportion of heavy vehicles		Level of service	
	AM	PM	AM	PM	AM	PM
Baseline 2027	6	3	33%	33%	A	A
Baseline 2027 + month 15 construction	255	252	8%	8%	A	A

In the baseline and baseline + project construction scenarios, McLennons Bore Road is expected to operate at LOS A during the AM and PM peaks. None of the other projects discussed in Section 4.5 will use McLennons Bore Road during construction and therefore a cumulative assessment scenario is not required. McLennons Bore Road will still be able to efficiently cater for the additional vehicular traffic generated by the project.

5.3 Road design standards

Road width design standards for low volume roads are defined by the:

- *Guide to Road Design Part 3: Geometric Design* (Austroads 2021) for sealed roads
- *Unsealed Roads Best Practice Guide* (ARRB 2020) for unsealed roads.

These standards are based on daily traffic volumes.

5.3.1 Baseline traffic

The existing road width measurements, traffic volumes and compliance for each road portion along the proposed access route are shown in Table 5.10. An annual growth factor of 1.6% has also been applied to the existing traffic volumes to give the baseline traffic for the year 2029, which is the most conservative baseline scenario.

Table 5.10 Baseline daily traffic volumes and design standards compliance

Road	Description of road	Approximate baseline daily movements	Approximate existing road width	Design standard[1]	Currently meets relevant standard?
Kidman Way	State road stretching between Bourke (north) and Newell Highway near Jerilderie (south)	1,059	8 m sealed with 1 m unsealed shoulder on both sides, totalling 10 m-wide carriageway	9 m sealed with 1 m unsealed shoulder on both sides, totalling 11-m-wide carriageway	No
Cadell Road	Local, unsealed road extending predominantly north-south. It connects to the western side of Kidman Way at both ends.	6	6 m sealed with approximately 1.5 m unsealed shoulder on both sides, totalling 9-m-wide carriageway	Minimum 3.7 m sealed with 2.5 m unsealed shoulder on both sides, totalling 8.7-m-wide carriageway	Yes
McLennons Bore Road	Local, unsealed road extending east-west between Kidman Way (east) and Wilson Road (west).	21	Approximately 7 m, reduced to 4 m between Cadell Road and Kidman Way	Minimum 4 m unsealed	Yes
Fernbank Road	Local, unsealed road extending north-south between McLennons Bore Road (south) and Four Corners Road (north).	0[2]	5.5 m	Minimum 3 m unsealed	Yes
Wilson Road	Local, unsealed road extending predominantly north-south between Jerilderie (south) and Goolgumbla Road (north).	54	4.2 m	Minimum 5.5 m unsealed	No
Goolgumbla Road	Local, unsealed road extending predominantly north-south between Wilson Road (south) and Goolgumbla Station (north).	8	4.7 m	Minimum 3 m unsealed	Yes

Notes:

1. As the above roads (other than Kidman Way and Cadell Road) are unsealed roads in a rural area, the *ARRB Unsealed Roads Best Practice Guide* (Edition 2) has been used to guide the appropriate road widths in this table. Kidman Way and Cadell Road uses the Austroads standard.
2. No vehicles were recorded on Fernbank Road during the traffic surveys.

As shown in Table 5.10, Kidman Way does not comply with the relevant Austroads standard. The majority of the local roads (with the exception of Wilson Road) comply with the relevant design standards.

5.3.2 Baseline + project traffic

The future road width measurements, future traffic volumes (baseline + project) and compliance for each road portion along the proposed access route are shown in Table 5.11. The tables below represent the peak traffic load that each road will take – these will occur in either month 15 (Stage 1) or month 37 (Stage 2).

Table 5.11 Future (baseline + project) daily traffic volumes and design standards compliance

Road	Description of road	Approximate future daily movements	Approximate existing road width	Relevant design standard (including project traffic)[1]	Currently meets relevant standard?
Kidman Way	State road stretching between Bourke (north) and Newell Highway near Jerilderie (south)	Month 15 1,059 + 397 = 1,456	8 m sealed with 1 m unsealed shoulder on both sides, totalling 10 m-wide carriageway	9 m sealed with 1 m unsealed shoulder on both sides, totalling 11-m-wide carriageway	No
Cadell Road	Local, unsealed road extending predominantly north-south. It connects to the western side of Kidman Way at both ends.	Month 15 6 + 231 = 237	6 m sealed with approximately 1.5 m unsealed shoulder on both sides, totalling 9-m-wide carriageway	7.2 m sealed with 1 m unsealed shoulder on both sides, totalling 9.2-m-wide carriageway	No
McLennons Bore Road	Local, unsealed road extending east-west between Kidman Way (east) and Wilson Road (west).	Month 15 21 + 638 = 659	Approximately 7 m, reduced to 4 m between Cadell Road and Kidman Way	8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway	No
Fernbank Road	Local, unsealed road extending north-south between McLennons Bore Road (south) and Four Corners Road (north)	Month 15 0^2 + 638 = 638	5.5 m	8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway	No
Wilson Road	Local, unsealed road extending predominantly north-south between Jerilderie (south) and Goolgumbla Road (north)	Month 37 54 + 506 = 560	4.2 m	8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway	No
Goolgumbla Road	Local, unsealed road extending predominantly north-south between Wilson Road (south) and Goolgumbla Station (north).	Month 37 8 + 506 = 514	4.7 m	8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway	No

Notes:

1. As the above roads (other than Kidman Way and Cadell Road) are unsealed roads in a rural area, the *ARRB Unsealed Roads Best Practice Guide* (Edition 2) has been used to guide the appropriate road widths in this table. Kidman Way and Cadell Road uses the Austroads standard.

2. No vehicles were recorded on Fernbank Road during the traffic surveys.

5.3.3 Baseline + project + cumulative traffic

The future road width measurements, future traffic volumes (baseline + project + cumulative) and compliance for Kidman Way is shown in Table 5.12. Kidman Way is the only road that is anticipated to be subject to traffic from both the project and cumulative traffic from neighbouring projects.

Table 5.12 Future (baseline + project + cumulative) daily traffic volumes and design standards compliance

Road	Description of road	Approximate future daily movements	Approximate existing road width	Relevant design standard (including project + cumulative traffic)[1]	Currently meets relevant standard?
Kidman Way	State road stretching between Bourke (north) and Newell Highway near Jerilderie (south)	Month 15 1,059 + 397 + 785[2] = 2,241	8 m sealed with 1 m unsealed shoulder on both sides, totalling 10-m-wide carriageway	9 m sealed with 1 m unsealed shoulder on both sides, totalling 11-m-wide carriageway	No

Notes: 1. As the above roads (other than Kidman Way and Cadell Road) are unsealed roads in a rural area, the *ARRB Unsealed Roads Best Practice Guide* (Edition 2) has been used to guide the appropriate road widths in this table. Kidman Way and Cadell Road uses the Austroads standard.

2. Cumulative traffic volumes on Kidman Way consist of 341 daily movements from Dinawan Solar Farm, 319 daily movements from Yanco Delta Wind Farm and 125 daily movements from VNI West.

5.3.4 Summary

As presented in Table 5.10, Table 5.11, and Table 5.12, parts of the proposed access route do not meet the minimum compliance criteria from Austroads and ARRB guidelines for the existing or proposed traffic volumes.

Based on existing traffic volumes, Kidman Way already requires upgrades to a 9 m wide sealed road with a 1 m wide unsealed shoulder on both sides, with a total width of 11 m. This is an existing deficiency as the vehicle volumes do not comply based on existing traffic volumes.

Given the project's construction activity is temporary, the current 8 m sealed road with 1 m unsealed shoulder on both sides is considered to be satisfactory for Kidman Way. However, where the intersections are proposed to be upgraded along Kidman Way, adequate road width will be provided in accordance with relevant Austroads standard. A driver's code of conduct will also be prepared as part of the CTMP and will identify the existing road width deficiency on Kidman Way so that motorists can take due care while travelling on this road.

For Cadell Road, light vehicles (including shuttle buses) will use the southern portion of this road (i.e. south of McLennons Bore Road). No heavy vehicle movements are proposed on Cadell Road. Hence, combined with the temporary nature of the project's construction activity, the current road width is considered satisfactory.

Sections of McLennons Bore Road, Fernbank Road, Wilson Road and Goolgumbla Road that will be used by project-related traffic will be upgraded to meet the unsealed road width requirements identified in Table 5.11. These upgrades will be subject to discussions with, and satisfaction of, the relevant road authorities (i.e. Murrumbidgee Council and Edward River Council).

5.4 Turn treatment warrants

Intersection operations are assessed from a combination of the peak hourly through and turning traffic movements that occur at each intersection. This determines the need for additional intersection turning lanes (e.g. basic, auxiliary lane and channelised) in accordance with the current intersection design standards (Austroads 2023) *Guide to Road Design Part 4A, Unsignalised and Signalised Intersections* (Figure 5.1), where:

- Curve 1 (red line) represents the boundary between a basic right turn (BAR) and a channelised short right turn (CHR(s)) turn treatment and between a basic left turn (BAL) and an auxiliary short left turn (AUL(s)) turn treatment.
- Curve 2 (blue line) represents the boundary between a CHR(s) and a full length CHR treatment and between an AUL(s) and a full length AUL or CHL treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

Figure 5.1 contains two graphs for the selection of turn treatments on roads with a design speed greater than or equal to 100 km/h.

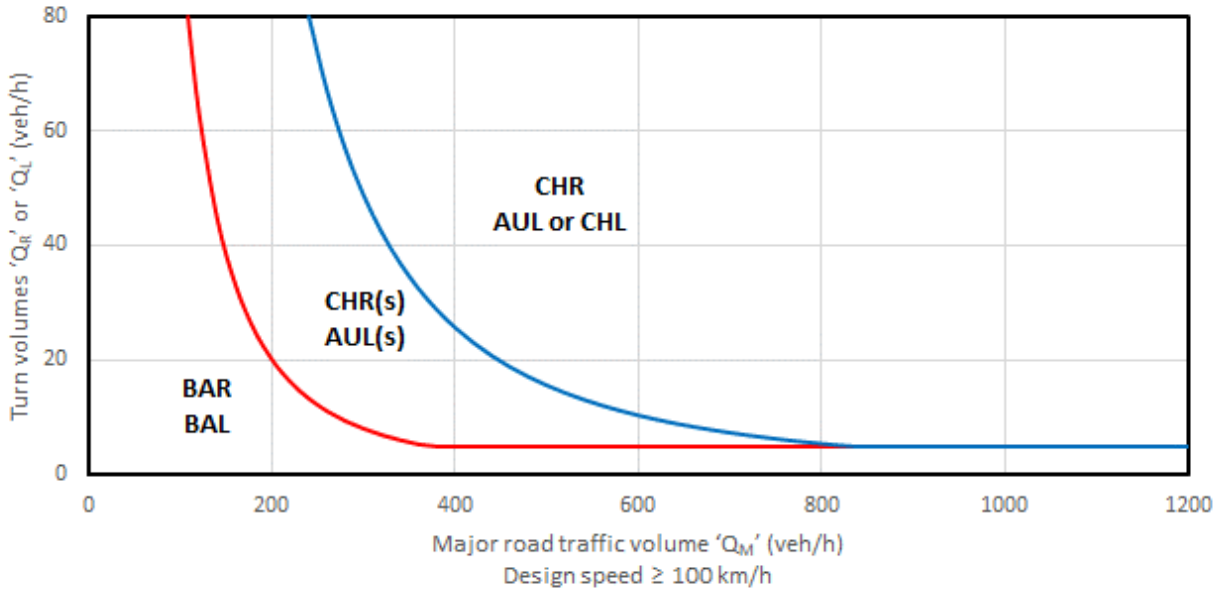


Figure 5.1 Austroads warrant design charts for rural intersection turning lanes

TfNSW recommends intersections should be designed for a travel speed 10 km/h greater than the posted speed limit. As Kidman Way has a posted speed limit of 100 km/h, intersections with Kidman Way (including any requirements for turning bays at the Kidman Way Eastern Site Access) should be designed for 110 km/h, which is 10 km/h above the posted speed limit. Hence, Figure 5.1 is appropriate for determining the turn treatment.

To provide conservative results, the warrant for turn treatments has been assessed based on the combination of baseline, project construction and cumulative traffic. Turn treatment warrant assessments have been performed for Stage 1 (i.e. month 15 in 2027) only.

Turn treatment warrant assessments have not been performed for Stage 2 (i.e. month 37 in 2029) because:

- vehicle volumes on Kidman Way are similar or have reduced compared to Stage 1 (i.e. month 15 in 2027)
- there are similar turning movements to and from Kidman Way at the Kidman Way/McLennons Bore Road intersection compared to Stage 1 (i.e. month 15 in 2027)
- there are fewer turning movements to and from Kidman Way at the Kidman Way/Cadell Road (south) intersection compared to Stage 1 (i.e. month 15 in 2027)
- no turning movements are proposed to/from Kidman Way at the Kidman Way Eastern Site Access intersection during Stage 2 of construction.

5.4.1 Kidman Way/McLennons Bore Road intersection

Project-related vehicles are assumed to be coming from both directions on Kidman Way and turning onto McLennons Bore Road. Hence, assessments are required for a possible left or right turn bay from Kidman Way. The left and right turn treatment warrant design charts for Kidman Way/McLennons Bore Road intersection during month 15 (i.e. Stage 1) are shown in Figure 5.2.

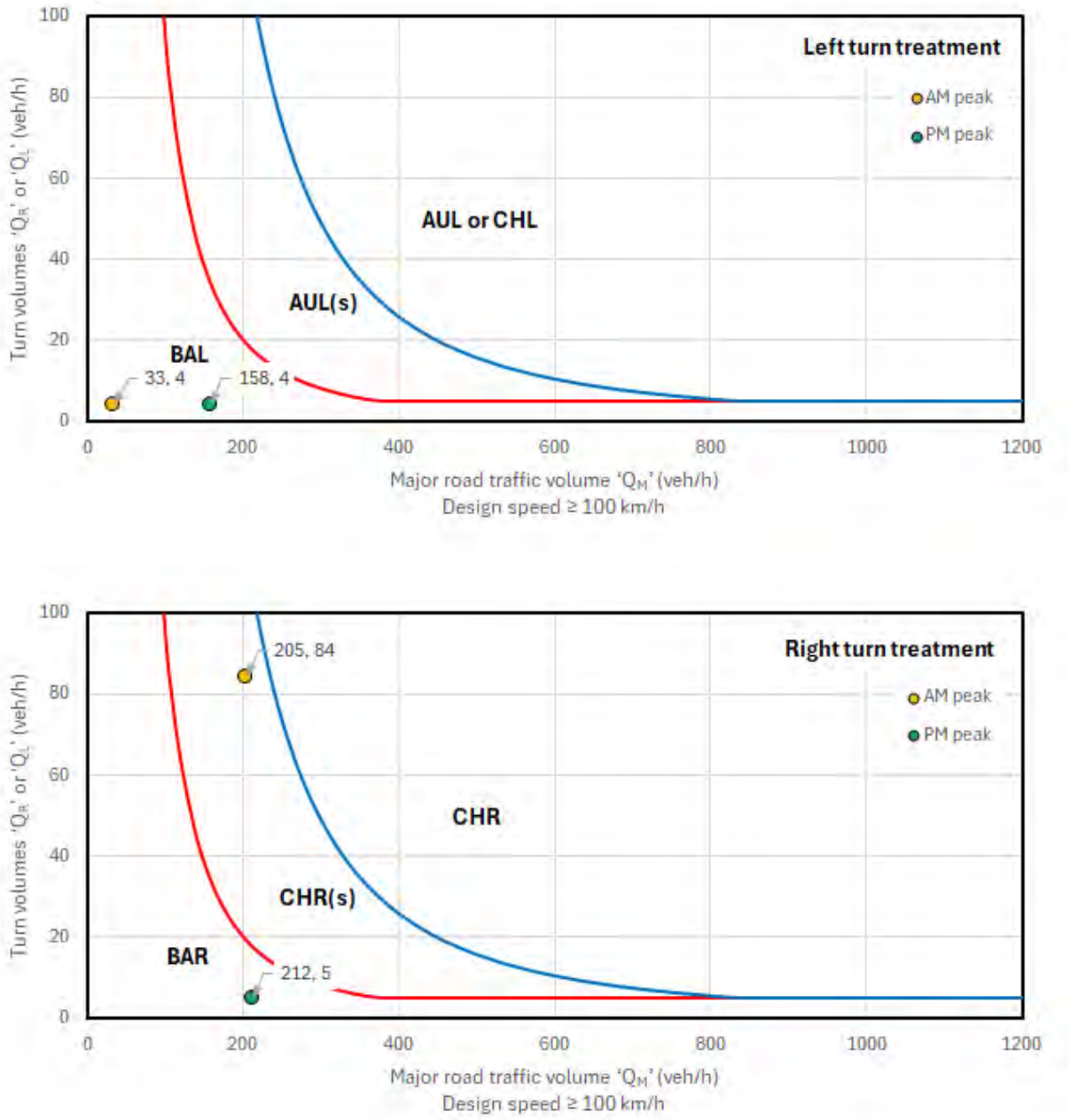
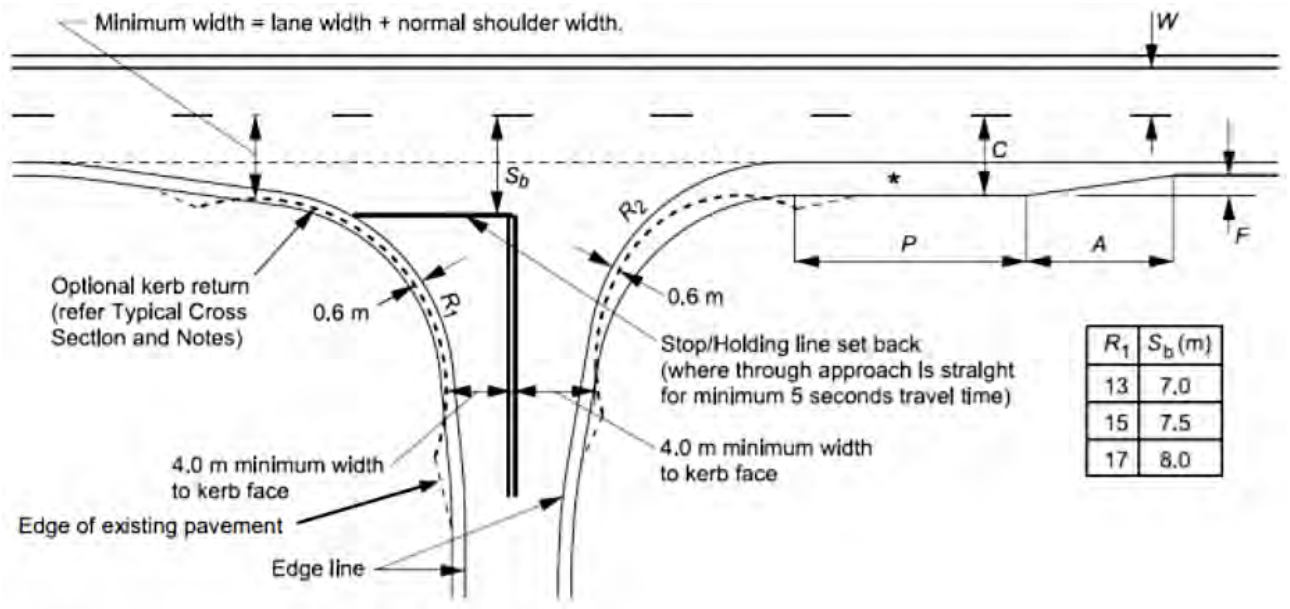


Figure 5.2 **Austroads warrant design charts for rural intersection turning lanes at the intersection of Kidman Way/McLennons Bore Road**

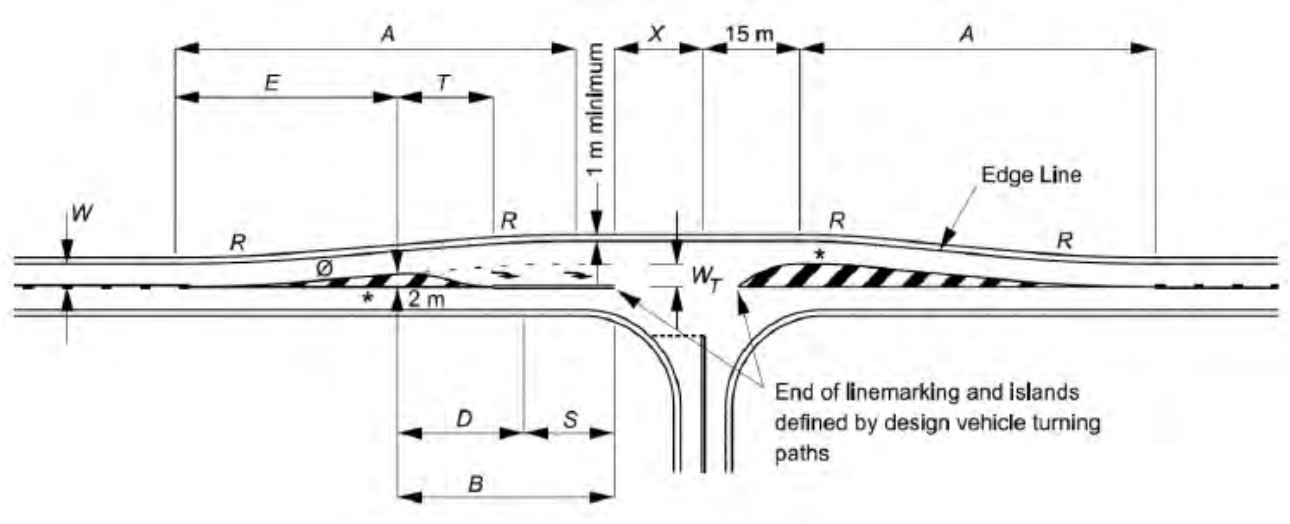
For 4 left turning vehicles and 158 southbound vehicles on Kidman Way, a basic left turn (BAL) treatment will be required. In accordance with Figure 8.2 of Austroads (2023) *Guide to Road Design (Part 4A)*, a widened shoulder will be required (see Figure 5.3). This widened shoulder will be 35-m-long plus an additional length for tapering.



Source: Austroads

Figure 5.3 BAL turn treatment

For 84 right turning vehicles and 205 major road vehicles on Kidman Way, a short channelised right turn (CHR(s)) treatment will be required. In accordance with Figure 7.2 of Austroads (2023) *Guide to Road Design (Part 4A)*, a right turn bay will be required (see Figure 5.4). This right turn bay will be 90-m-long plus an additional length for tapering.



Source: Austroads

Figure 5.4 CHR(s) turn treatment

A concept design for the intersection of Kidman Way/McLennons Bore Road showing the required turn treatments will be provided to TfNSW and Murrumbidgee Council for review and comment.

5.4.2 Kidman Way/Cadell Road intersection

Project-related light vehicles (including shuttle buses) are assumed to be coming from the south on Kidman Way and turning left onto Cadell Road (south). There are no other turning movements from Kidman Way to Cadell Road (south). Hence, an assessment is only required for a possible left turn bay from Kidman Way. Despite the lack of project-related light and heavy vehicles from the north, a BAR treatment will still be required on Kidman Way at the north approach. As there are no background traffic movements or project-related light and heavy vehicles from the Kidman Way north approach turning onto Cadell Road (south), and McLennons Bore Road is proposed to be upgraded to provide suitable access west of Kidman Way, it is recommended that right turns are restricted from Kidman Way north approach into Cadell Road (south), subject to consultation with TfNSW and Murrumbidgee Council.

The left turn treatment warrant design chart for the Kidman Way/Cadell Road (south) intersection during month 15 (i.e. Stage 1) is shown in Figure 5.5.

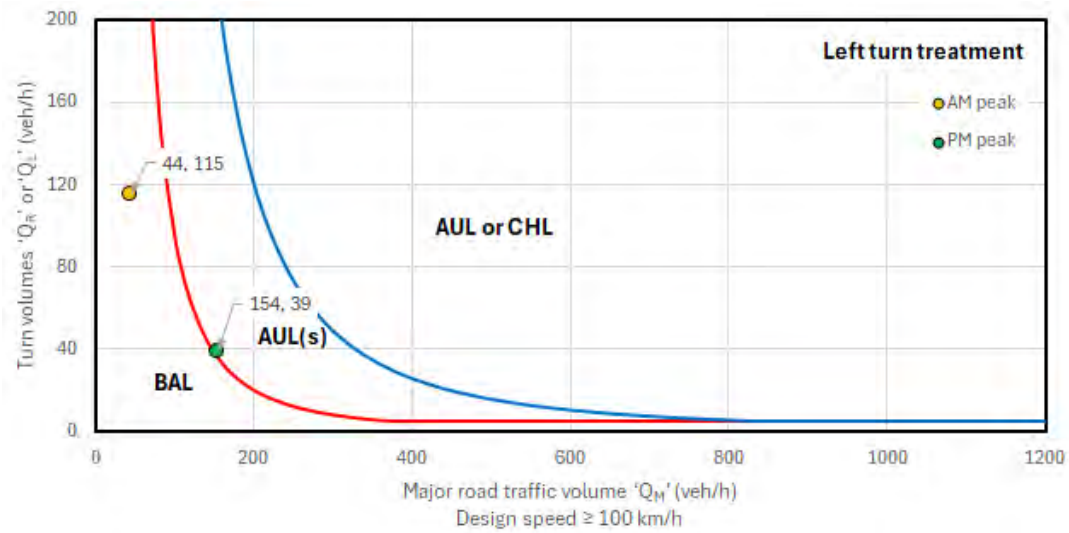
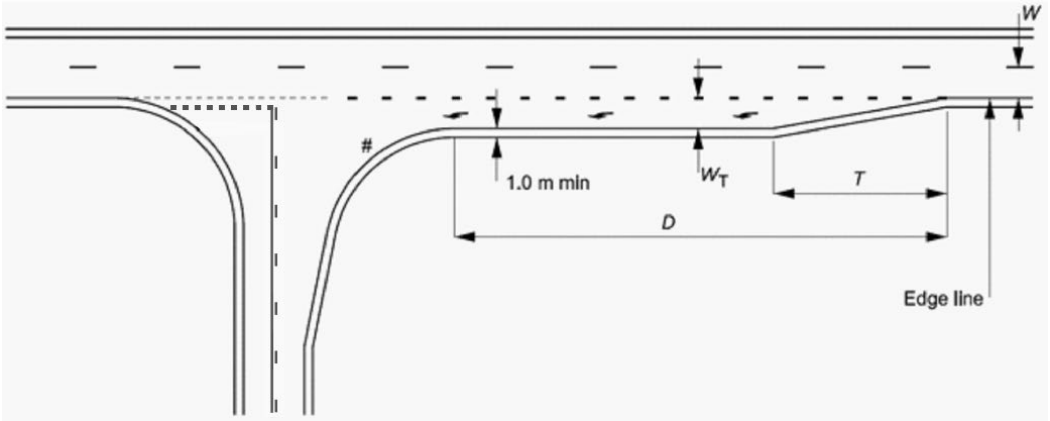


Figure 5.5 Austroads warrant design chart for a rural intersection turning lane at the intersection of Kidman Way/Cadell Road (south)

For 39 left turning vehicles and 154 northbound vehicles on Kidman Way, a shortened auxiliary left turn (AUL(s)) treatment will be required. In accordance with Figure 8.3 of Austroads (2023) *Guide to Road Design (Part 4A)*, a left turn bay will be required (see Figure 5.6). This left turn bay will be 55-m-long plus an additional length for tapering.



Source: Austroads

Figure 5.6 AUL(s) turn treatment

A concept design for the intersection of Kidman Way/Cadell Road (south) showing the required turn treatments will be provided to TfNSW and Murrumbidgee Council for review and comment.

5.4.3 Kidman Way/Kidman Way Eastern Site Access intersection

Project-related vehicles (including shuttle buses) are assumed to be coming from the north on Kidman Way and turning left into the accommodation facility east of Kidman Way. No project-related vehicles are expected to turn right from Kidman Way at the Kidman Way Eastern Site Access intersection. Hence, an assessment is only required for a possible left turn bay from Kidman Way. The left turn treatment warrant design chart for the intersection of Kidman Way/Kidman Way Eastern Site Access during month 15 (i.e. Stage 1) is shown in Figure 5.7.

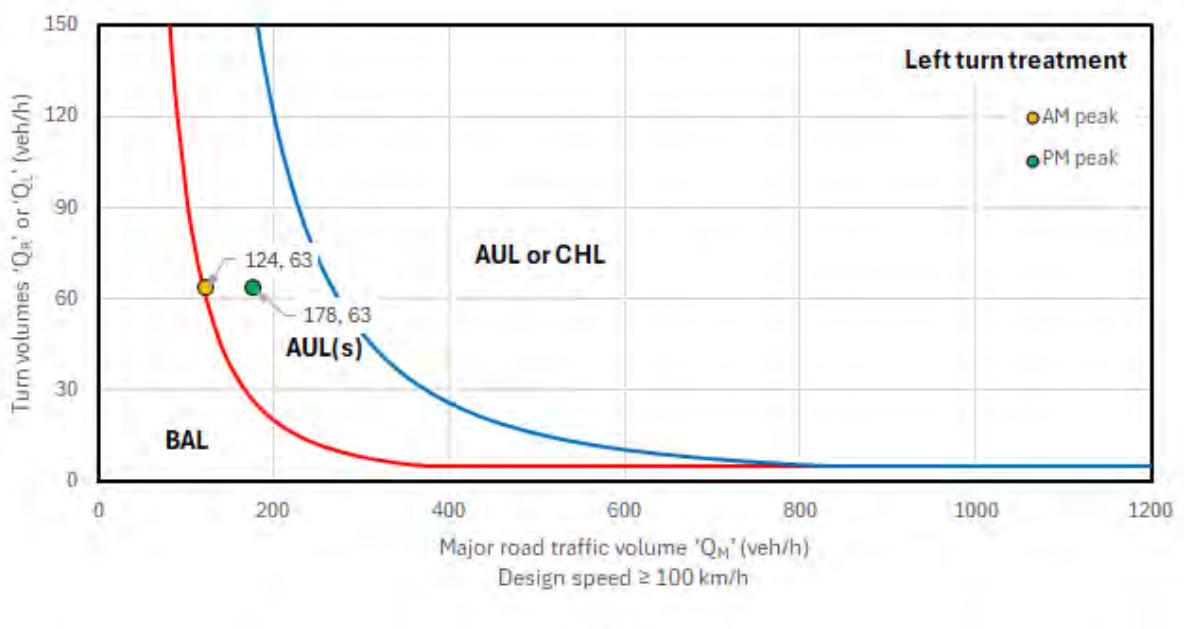


Figure 5.7 Austroads warrant design chart for a rural intersection turning lane at the intersection of Kidman Way/Kidman Way Eastern Site Access

For 63 left turning vehicles and 178 northbound vehicles on Kidman Way during month 15, a shortened auxiliary left turn (AUL(s)) treatment will be required. In accordance with Figure 8.3 of Austroads (2023) *Guide to Road Design (Part 4A)*, a left turn bay will be required (see Figure 5.6). This left turn bay will be 55-m-long plus an additional length for tapering.

In response to feedback from TfNSW, the new intersection on Kidman Way will be designed in accordance with *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections Figure 7.1: Right-left staggered T-intersection on a two-lane rural road*. A strategic concept design showing this intersection will be submitted to TfNSW for review.

5.5 Road safety assessment

In the vicinity of the site access points, the roads and intersections have a flat geometry. The site access points on Kidman Way, McLennons Bore Road, Fernbank Road and Goolgumbla Road are located on a straight section, hence there are no sight distance or safety issues for entering or exiting vehicles to/from the development footprint. As all the roads have a posted or default speed limit of 100 km/h, the road safety assessment should be assessed at a 110 km/h design speed, which is 10 km/h above the posted speed limit. In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads 2023), for a road with a 110 km/h design speed, the minimum safe intersection sight distance (SISD) required for a general 2.5 second driver reaction time is 300 m.

5.5.1 Kidman Way/McLennons Bore Road intersection

The sight distances on Kidman Way at McLennons Bore Road have been estimated based on the line of sight and observations at this intersection (see Figure 5.8). Based on the sight distance analysis, the sight distances to the left and right meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design*.

Sight distance to the left (>1 km)

Sight distance to the right (>1 km)

Source: MetroMap

Figure 5.8 Sight distance to the left and right of McLennons Bore Road

5.5.2 Kidman Way/Cadell Road (south) intersection

The sight distances on Kidman Way at Cadell Road (south) have been estimated based on the line of sight and observations at this intersection (see Figure 5.9). Based on the sight distance analysis, the sight distances to the left and right meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design*.

Sight distance to the left (380 m)

Sight distance to the right (>1 km)

Source: MetroMap

Figure 5.9 Sight distance to the left and right of Cadell Road (south)

5.5.3 Kidman Way/Kidman Way Eastern Site Access intersection

The sight distances on Kidman Way at the Kidman Way Eastern Site Access intersection have been estimated based on the line of sight and observations at the proposed intersection location (see Figure 5.10). Based on the sight distance analysis, the sight distances to the left and right meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design*.

Sight distance to the left (>1 km)

Sight distance to the right (>1 km)

Source: MetroMap

Figure 5.10 Sight distance to the left and right of the Kidman Way/Kidman Way Eastern Site Access intersection

5.5.4 Cadell Road/McLennons Bore Road intersection

i East approach

The sight distances for vehicles approaching the Cadell Road/McLennons Bore Road intersection from the east have been estimated based on the line of sight and observations at this intersection (see Figure 5.11). Based on the sight distance analysis, the sight distances to the left and right do not meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design* due to the geometry of Cadell Road and density of roadside vegetation. The sight distance to the left and right could be improved by trimming vegetation that is obscuring the sight lines.

Sight distance to the left (i.e. south) from McLennons Bore Road east approach (up to approximately 280 m)

Sight distance to the right (i.e. north) from McLennons Bore Road east approach (up to approximately 250 m)

Source: MetroMap

Figure 5.11 Sight distance to the left and right of the Cadell Road/McLennons Bore Road intersection (east approach)

Alternatively, McLennons Bore Road could be either temporarily converted to the main road during the project's construction period, with Cadell Road traffic being required to give way to vehicles on McLennons Bore Road, or truck warning signage could be installed on Cadell Road on both approaches to the intersection. These options will remove the requirement for vegetation trimming along Cadell Road. McLennons Bore Road has a straight and flat alignment, so there are not anticipated to be any sight distance issues for vehicles waiting to turn left or right onto McLennons Bore Road or continue straight through the intersection on Cadell Road.

Changing the main road to McLennons Bore Road will also reduce wear and tear from heavy vehicles, as the heavy vehicles will not be required to accelerate/decelerate in the vicinity of this intersection. As heavy vehicles take longer to stop, it would be better if project-related light vehicles on Cadell Road (south) gave way to heavy vehicles travelling along McLennons Bore Road.

Spark Renewables will continue to liaise with Murrumbidgee Council about the process to modify the 'give way' treatment and/or the installation of truck warning signage at the intersection of Cadell Road/McLennons Bore Road.

ii West approach

The sight distances for vehicles approaching the Cadell Road/McLennons Bore Road intersection from the west have been estimated based on the line of sight and observations at this intersection (see Figure 5.12). Based on the sight distance analysis, the sight distances to the left and right meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design*.

Sight distance to the left from McLennons Bore Road west approach (330 m)

Sight distance to the right from McLennons Bore Road west approach (720 m)

Source: MetroMap

Figure 5.12 Sight distance to the left and right of the Cadell Road/McLennons Bore Road intersection (west approach)

5.5.5 McLennons Bore Road/Fernbank Road intersection

The sight distances on McLennons Bore Road at the intersection with Fernbank Road have been estimated based on the line of sight and observations at this intersection (see Figure 5.13). Based on the sight distance analysis, the sight distances to the left and right meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design*.

Sight distance to the left (>1 km)

Sight distance to the right (>1 km)

Source: MetroMap

Figure 5.13 Sight distance at the McLennons Bore Road/Fernbank Road intersection

5.5.6 Wilson Road/McLennons Bore Road intersection

The sight distances on Wilson Road at the intersection with McLennons Bore Road have been estimated based on the line of sight and observations at this intersection (see Figure 5.14). Based on the sight distance analysis, the sight distances to the left and right do not meet the minimum requirement (300 m) as stipulated in the *Austroads Guide to Road Design* due to the geometry of Wilson Road and density of roadside vegetation.

Sight distance to the left (190 m)

Sight distance to the right (290 m)

Source: MetroMap

Figure 5.14 Sight distance to the left and right of Wilson Road/McLennons Bore Road intersection

Typical truck entry warning signage (W5-22), as shown in Figure 5.15, will need to be provided on Wilson Road in both directions at typical distances of 150 m and 350 m from Wilson Road/McLennons Bore Road intersection. The truck warning signage will be removed when all construction and commissioning works at the site are completed.

Figure 5.15 Truck warning signage

5.6 Impact on public transport, pedestrians and cyclists

There are public bus routes passing along Kidman Way. Potential impacts on public buses associated with construction of the project will be limited to heavy vehicles only as construction staff travelling in light vehicles will be arriving and departing from the development footprint outside of public bus operating hours. Potential impacts from heavy vehicles will be limited as the heavy vehicle movements will be spread throughout the day.

As the bus services only operate outside of peak hours:

- there are negligible impacts to the public bus service from the project's construction traffic
- the public bus service would not be used as a mode of transport for workers travelling to and from the site.

As discussed in Section 3.8, there are no pedestrian or bicycle facilities within proximity of the project due to its rural location. No impacts on pedestrians and cyclists have been identified.

5.7 Impacts on school bus services and school zones

School buses travel along Kidman Way. It is anticipated that only the project's heavy vehicle construction traffic may interact with the school buses. This is because construction workers in light vehicles will arrive and depart outside of school bus operating hours. Additionally, the impact of heavy vehicles will be reduced because their movements will be spread throughout the day.

There are no school bus stops on Kidman Way within proximity of the intersections with Cadell Road (south) or McLennons Bore Road or on any other local road that forms part of the haulage route from Kidman Way to the site access points. Therefore, it is considered that there will be negligible impacts to the school bus service from the project's construction traffic.

No impacts to school zones are predicted.

5.8 Transportation of dangerous goods

A dangerous goods assessment is beyond the scope of this report; however, it is acknowledged that liquified petroleum gas, gasoline and diesel will be transported to the development footprint during construction. For any transportation of dangerous goods, necessary approval will be sought from National Heavy Vehicle Regulator (NHVR).

5.9 Access to properties

Impacts to existing property access points (i.e. driveways) are not anticipated; however, if any impacts occur, these will be upgraded in accordance with Murrumbidgee Council and/or Edward River Council's rural property access standards.

5.10 Level crossing assessment

There are no nearby level crossings that will be affected by construction traffic. Hence, a level crossing assessment is not required.

5.11 Dilapidation survey

The requirements for and timing of dilapidation surveys on the affected local roads (i.e. McLennons Bore Road, Cadell Road (south), Fernbank Road, Wilson Road and Goolgumbla Road) will be discussed with Murrumbidgee Council and Edward River Council as part of the preparation of the CTMP.

5.12 Swept path assessments

Swept path assessments using the longest heavy vehicle and OSOM vehicle accessing the site accesses along McLennons Bore Road, Fernbank Road and Goolgumbla Road have been undertaken (Attachment D).

Swept paths of light vehicle turning movements have been performed at Cadell Road/McLennons Bore Road intersection, as only light vehicles are proposed to travel on Cadell Road (south) (Attachment D).

As part of the OSOM route assessments (Attachment E), swept path assessments have also been undertaken for OSOM vehicles travelling through the intersections of McLennons Bore Road/Fernbank Road and McLennons Bore Road/Wilson Road. All light, heavy and OSOM vehicles will be able to forward-in/forward-out to/from public roads and the development footprint.

Swept path assessments for vehicles travelling via the intersections on Kidman Way will be undertaken as part of the preparation of the strategic concept designs for these intersections.

6 Road upgrades and mitigation measures

6.1 Schedule of road upgrades

The proposed schedule of road upgrades for the project is provided in Table 6.1. Road upgrades will be completed prior to construction of the relevant stage.

Table 6.1 Schedule of road upgrades

Road	Proposed upgrade	Relevant stage(s)	Description
Kidman Way/Kidman Way Eastern Site Access	New intersection	Stage 1	• Intersection upgrades to accommodate a 26-m-long truck and to allow the passage of the largest OSOM vehicle. • Upgrade sealed road lanes and shoulders in the vicinity of the Kidman Way/Kidman Way Eastern Site Access intersection to Austroads standards. • Addition of a dedicated turning bay for left turning vehicles from Kidman Way north approach to Kidman Way Eastern Site Access. The shortened auxiliary left turn bay will be 55-m-long plus an additional length for tapering.
Kidman Way/McLennons Bore Road	Upgrade of existing intersection	Stage 1 Stage 2	• Intersection upgrades to accommodate a 36.5-m-long truck and to allow the passage of the largest OSOM vehicle. • Upgrade sealed road lanes and shoulders in vicinity of the Kidman Way/McLennons Bore Road intersection to Austroads standards. • Addition of a widened shoulder for left turning vehicles from Kidman Way south approach to McLennons Bore Road. The widened shoulder will be 35-m-long plus an additional length for tapering. • Addition of a dedicated turning bay for right turning vehicles from Kidman Way north approach to McLennons Bore Road. The shortened channelised right turn bay will be 90-m-long plus an additional length for tapering.
Kidman Way/Cadell Road (south)	Upgrade of existing intersection	Stage 1 Stage 2	• Upgrade sealed road lanes and shoulders in vicinity of the Kidman Way/Cadell Road (south) intersection to Austroads standards. • Addition of a dedicated turning bay for left turning vehicles from Kidman Way south approach to Cadell Road (south). The shortened auxiliary left turn bay will be 55-m-long plus an additional length for tapering. • Addition of a widened shoulder in accordance with the BAR turn treatment on the eastern side of Kidman Way.
McLennons Bore Road/Cadell Road	Upgrade of existing intersection	Stage 1 Stage 2	• Intersection upgrades to accommodate a 36.5-m-long truck and to allow the passage of the largest OSOM vehicle. • Subject to outcomes of engagement with Murrumbidgee Council, the major road priority at this intersection may change from Cadell Road to McLennons Bore Road. Give-way signage would be installed on Cadell Road on both the north and south approaches. Alternatively, truck warning signage would be provided on Cadell Road on both approaches to McLennons Bore Road.

Table 6.1 Schedule of road upgrades

Road	Proposed upgrade	Relevant stage(s)	Description
McLennons Bore Road	Road upgrade and widening	Stage 1 Stage 2	• Upgrade of dry weather road from Cadell Road to Kidman Way to an all-weather road and removal of existing signage relating to the use of this road during dry weather only. • Widening of unsealed road (where necessary) to cater for construction traffic (8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway or as otherwise agreed with Murrumbidgee Council).
McLennons Bore Road/site access intersections	New site access intersections	Stage 1	• Construct intersection to suit 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.
McLennons Bore Road/Fernbank Road	Upgrade of existing intersection	Stage 1	• Intersection upgrades to accommodate a 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.
Fernbank Road	Road widening	Stage 1	• Widening of the unsealed road between McLennons Bore Road and the site access points to cater for construction traffic (8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway or as otherwise agreed with Murrumbidgee Council).
Fernbank Road/site access intersections	New site access intersections	Stage 1	• Construct intersection to suit 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.
McLennons Bore Road/Wilson Road	Upgrade of existing intersection	Stage 2	• Intersection upgrades to accommodate a 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.
Wilson Road	Road widening	Stage 2	• Widening of the unsealed road between McLennons Bore Road and Goolgumbla Road to cater for construction traffic (8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway or as otherwise agreed with Murrumbidgee Council).
Goolgumbla Road	Road widening	Stage 2	• Widening of the unsealed road between Wilson Road and the site access points to cater for construction traffic (8 m trafficable width and 1 m unsealed shoulder on both sides, totalling 10-m-wide unsealed carriageway or as otherwise agreed with Edward River Council).
Goolgumbla Road/site access intersections	New site access intersections	Stage 2	• Construct intersection to suit 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.

6.2 Construction

6.2.1 Construction traffic management plan

Once the project is approved, a Construction Traffic Management Plan (CTMP) will be prepared in consultation with TfNSW, Murrumbidgee Council and Edward River Council. An outline of the CTMP is provided below.

i Objective

The CTMP will address the safety of workers and road users within the vicinity of the development footprint and will aim to:

- minimise the impact of the construction vehicle traffic on the overall operation of the road network
- ensure continuous, safe and efficient movement of traffic for both the general public and construction workers
- provide a description of the construction vehicles and the volume of these construction vehicles accessing the development footprint
- provide a description of the proposed external routes for vehicles including the construction vehicles accessing the development footprint.

ii General requirements

In accordance with TfNSW requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the development footprint. All subcontractors will be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the development footprint. The lead contractors will monitor the roads leading to and from the development footprint and take all necessary steps to clean any load deposits on the road caused by project-related vehicles.

Vehicles operating to, from and within the development footprint, will do so in a manner which does not create unreasonable or unnecessary noise or vibration.

iii Access

Construction vehicle routes will be provided in the CTMP. The development footprint will be accessed directly from Fernbank Road, McLennons Bore Road, Goolgumbla Road and Kidman Way. The access points will be clearly signed and demarcated. On arrival, all vehicles, plant and equipment will be directed to remain within clearly demarcated areas.

iv Traffic control measures

A Traffic Control Plan (TCP) will be developed in accordance with Australian Standards and the *Traffic control at work sites – Technical Manual, version 6.1* (Transport for NSW 2022). The TCP will be lodged separately along with any relevant Section 138 application and submitted to the relevant authorities, prior to the commencement of construction.

Typical truck entry warning signage will need to be provided in both directions at distances of 150 m and 350 m typically from the site access points. Any truck warning signs must be installed at the start of construction and maintained continuously while activities associated with construction are occurring. No signs will be placed when construction activities are not scheduled to occur.

If traffic controllers are engaged on-site, they shall be accredited by TfNSW, and act in accordance with TfNSW Standard Conditions. Any personnel required to undertake works or traffic control within the public domain will be suitably trained and covered by appropriate insurances.

v Pedestrian access

To provide segregation and protection for pedestrians, active work areas will be demarcated. Pedestrian activity in the locality, including along Kidman Way and McLennons Bore Road, is generally minimal due to the long distance from the nearest residences and/or urban areas.

vi Road occupancy licences

If the works required for the pre-construction access road upgrades require any lane or road closures, the proponent shall submit a necessary application to Murrumbidgee Council or Edward River Council for approval, prior to carrying out the associated works.

vii Work site security

All access gates will be securely locked when the site is unoccupied, or construction activities are not in progress.

viii Staff safety and induction briefings

All staff and subcontractors will be required to undergo a site induction prior to the commencement of their work on-site. The site induction will include briefings in relation to permitted transport routes for travel to and from the development footprint for light and heavy vehicles, the Driver's Code of Conduct, as well as standard environmental, occupation health and safety, vehicle safety and emergency safety procedures.

ix Driver's Code of Conduct

The Driver's Code of Conduct will be provided to all relevant personnel prior to their arrival at site. The Driver's Code of Conduct is to be read and signed by all light and heavy vehicle drivers prior to operation of vehicles. This will be in addition to regular safety briefings and updates. The Driver's Code of Conduct will address all relevant site and locality road safety and traffic management measures including:

- compliance with all road rules and regulations
- commuter traffic routes
- vehicle speeds
- driving to local road conditions
- driver behaviour
- courtesy to other road users
- fatigue management
- dangers of mobile phone use while driving
- checking vehicles and covering loads
- the appropriate use of compression braking
- safety procedures for accidents and breakdowns.

x Complaint management

A complaint management system to enable active community consultation and maintain positive communication with local residents will be implemented for the project. The purpose of this system will be to minimise complaints by providing timely responses to community concerns and monitoring the ongoing environmental performance of the site construction activity.

A dedicated Community Complaints phone number will be established that is available 24 hours, seven days a week for community members who have enquiries or who wish to lodge complaints in relation to project construction activities. The Community Complaints phone number allows community members to enquire or lodge complaints about project related vehicles travelling on the public road system.

An initial response will be provided to the complainant generally within 24 hours using the contact details provided (phone and/or email). Preliminary investigations into each complaint will commence within 48 hours of complaint receipt. Complainants will be advised as soon as possible of the result of the investigation.

6.2.2 Summary of mitigation measures

A summary of traffic management and mitigation measures for construction are outlined in Table 6.2. The timing of the implementation of these measures will be agreed with the relevant approval authorities.

Table 6.2 Summary of mitigation measures – construction

ID	Mitigation measure
T1	A detailed CTMP will be developed in consultation with TfNSW, Edward River Council and Murrumbidgee Council prior to the commencement of works.
T2	The Kidman Way/Kidman Way Eastern Site Access intersection will be designed in accordance with Austroads Guide to Road design Part 4A, Figure 7.6, and will form a right-left staggered intersection arrangement with Kidman Way/Dinawan Solar Farm Western Access intersection. The Kidman Way Eastern Site Access intersection will include: • a dedicated turning bay for left turning vehicles from Kidman Way • upgrades to be applied on the north approach • upgrades designed for a 26-m-long truck and to allow the passage of the largest OSOM vehicle.
T3	The Kidman Way/Cadell Road (south) intersection will be upgraded to include: • a dedicated turning bay for left turning vehicles from Kidman Way • a widened shoulder on the eastern side of Kidman Way at the intersection • upgrades on both the north and south approaches • closure of right turn from Kidman Way north approach into Cadell Road (south), subject to consultation with TfNSW and Murrumbidgee Council • upgrades designed for light vehicle access.
T4	The Kidman Way/McLennons Bore Road intersection will be upgraded to include: • a widened shoulder for left turning vehicles and a dedicated turning bay for right turning vehicles from Kidman Way • upgrades on both the north and south approaches • upgrades designed for a 36.5-m-long truck and to allow the passage of the largest OSOM vehicle.
T5	Obtain a permit (from NHVR) to allow up to 36.5-m-long trucks as well as OSOM vehicles to use the road network as part of construction. Conditional approval will be requested from NHVR for 36.5-m-long trucks to access McLennons Bore Road, Fernbank Road, Wilson Road and Goolgumbla Road, as it is currently only approved for 19-m-long heavy vehicles. Relevant councils (Edward River Council and Murrumbidgee Council) will be consulted as part of the approval process.
T6	The following roads will be widened to comply with the relevant ARRB rural roads design guidelines (unless agreed otherwise with the relevant local council): • McLennons Bore Road • Fernbank Road from McLennons Bore Road to the northern site access point • Wilson Road between McLennons Bore Road and Goolgumbla Road • Goolgumbla Road between Wilson Road and the northern site access point.

Table 6.2 Summary of mitigation measures – construction

ID	Mitigation measure
T7	McLennons Bore Road between Cadell Road and Kidman Way will be upgraded from a dry weather road to an all-weather unsealed road and existing signage relating to the use of this road during dry weather only will be removed.
T8	All site access points will be constructed as per council's Rural Property Access standard to the satisfaction of TfNSW, Murrumbidgee Council and Edward River Council.
T9	Subject to outcomes of engagement with Murrumbidgee Council, the major road priority at the intersection of McLennons Bore Road and Cadell Road will change from Cadell Road to McLennons Bore Road. Give way signage will be installed on Cadell Road on both the north and south approaches. Alternatively, if the major road priority cannot be changed, truck warning signage will be installed on Cadell Road on both approaches to the intersection.
T10	At Wilson Road/McLennons Bore Road intersection, truck warning signage will be placed on Wilson Road to warn drivers of trucks turning at Wilson Road/McLennons Bore Road intersection.
T11	The McLennons Bore Road/Fernbank Road and McLennons Bore Road/Wilson Road intersections will be widened based on the recommendations of the swept path assessment to facilitate access by the longest vehicles requiring access via these intersections.
T12	A dilapidation survey will be commissioned prior to the start of construction to assess the existing condition of the sections of McLennons Bore Road, Cadell Road (south), Fernbank Road, Wilson Road and Goolgumbla Road that will be used by vehicles associated with the project.
T13	A road maintenance strategy will be developed in consultation with Murrumbidgee Council and Edward River Council.

6.3 Operations

No material traffic impacts are expected during operations. Accordingly, no mitigation measures are proposed.

6.4 Decommissioning

No material traffic impacts are expected during decommissioning. A decommissioning plan will be prepared prior to decommissioning to address issues at the time of decommissioning and will include consideration of potential traffic management measures.

6.5 Compliance and monitoring

Spark Renewables has committed to monitor for compliance, which will be outlined in further detail in the Construction Environmental Management Plan (CEMP).

7 Conclusion

Dinawan Wind Farm will consist of up to 200 WTGs, supported by associated infrastructure. Traffic generated by the project will be the highest during construction and is expected to be negligible during operations. There are expected to be a maximum of approximately 600 workers during peak construction and 330 workers on average throughout the approximately 60-month construction period.

The associated traffic impacts for the project and potential cumulative traffic impacts as a result of the project have been assessed as follows:

- Daily traffic during peak construction is expected to reach 462 light vehicle movements and 176 heavy vehicle movements across eight site access points, for a total of 638 vehicle movements.
- During both the AM and PM peak hour during peak construction, 231 light vehicle movements and 18 heavy vehicle movements will occur across six site access points, for a total of 249 vehicle movements in each peak hour.
- The intersection of Kidman Way/McLennons Bore Road will remain at LOS A with the project's construction traffic and LOS B when cumulative traffic from other neighbouring developments is added. The project's construction traffic and cumulative traffic will not significantly deteriorate the performance of this intersection. The remaining intersections on Kidman Way will remain at LOS A in all scenarios.
- The mid-block capacity of Kidman Way will remain at LOS A with the project's construction traffic and LOS B when cumulative traffic from other neighbouring developments is added. McLennons Bore Road will remain at LOS A in all scenarios. As a result, no significant impacts to either traffic flow or road safety are expected.
- The sight line distances for traffic entering and exiting via the proposed intersection on Kidman Way are adequate.
- The sight line distances for westbound traffic on McLennons Bore Road do not meet the minimum sight distance requirements at the Cadell Road/McLennons Bore Road intersection for a design speed of 110 km/h. Mitigation measures will be put in place to address this prior to commencement of construction.
- The sight line distances for traffic on McLennons Bore Road at the Wilson Road/McLennons Bore Road intersection do not meet the minimum sight distance requirements for a design speed of 110 km/h. Mitigation measures will be put in place to address this prior to commencement of construction.
- There are not expected to be any impacts to public transport, school bus, pedestrian or cycling routes.
- Car parking and accommodation will be provided on-site during construction. Shuttle buses will transport workers from the accommodation facilities to their active work area during construction and will need to travel on Kidman Way, Cadell Road (south), McLennons Bore Road and Fernbank Road during Stage 1. During stage 2, the accommodation facility will be relocated and any associated shuttle bus movements will be exclusively on-site and will not use the public road network to regularly transport workers.
- A schedule of road upgrades is proposed to facilitate construction traffic movements to and from the development footprint. This includes:
    - McLennons Bore Road between Cadell Road and Kidman Way will be upgraded to an all-weather unsealed road and widened to accommodate the additional construction traffic volumes from the project.

- Fernbank Road, Wilson Road and Goolgumbla Road will be upgraded to 10-m-wide unsealed roads to cater for construction traffic volumes.
- A basic left turn (BAL) and short channelised right turn (CHR(s)) treatment will be required on the north and south approaches of the Kidman Way/McLennons Bore Road intersection.
- A short auxiliary left turn (AUL(s)) treatment will be required on the south approach of the Kidman Way/Cadell Road (south) intersection.
- A short auxiliary left turn (AUL(s)) treatment will be required on the north approach of the Kidman Way/Kidman Way Eastern Site Access intersection.

- A CTMP will be prepared in consultation with TfNSW, Murrumbidgee Council and Edward River Council. The CTMP will aim to ensure the safety of all workers and road users within the vicinity of the development footprint.
- The scope of the road maintenance strategy (including dilapidation survey requirements) will be prepared in consultation with Murrumbidgee Council and Edward River Council.

References

ARRB 2020, *Unsealed Roads Best Practice Guide,* Australian Road Research Board.

Austroads 2023, *Guide to Road Design Part 4A: Unsignalised & Signalised Intersections*.

Austroads 2021, *Guide to Road Design Part 3: Geometric Design*.

EMM 2023, *Dinawan Solar Farm Traffic Impact Assessment*

Jacobs 2023, *Yanco Delta Wind Farm Submissions Report: Appendix D. Revised Traffic and Transport Impact Assessment*

Moovit 2024, *C & J Robertson Pty Ltd - Schedules, Routes and Stops*

PTV 2023, *Shepparton Line*, Public Transport Victoria

RTA 2002, *Guide to Traffic Generating Developments*, Transport for New South Wales

TfNSW 2018, *Traffic Control at Work Sites – Version 6*, Transport for New South Wales

YAHS 2016, *Weekly Transport to & from Yanco*, Yanco Agricultural High School

Abbreviations

AC	alternating current
BESS	battery energy storage system
Council	Murrumbidgee Council
DC	direct current
DP	deposited plan
DPE	NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formally NSW Department of Planning and Environment (DPE))
EIS	environmental impact statement
EMM	EMM Consulting Pty Limited
EnergyCo	Energy Corporation of NSW
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GHG	greenhouse gas
GW	gigawatts
ha	hectares
km	kilometres
kV	kilovolts
LEP	local environmental plan
LGA	local government area
MW	megawatts
MWh	megawatt-hours
NSW	New South Wales
O&M	operations and maintenance
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
PV	photovoltaic
REZ	renewable energy zone
SEARs	Secretary's Environmental Assessment Requirements
SSD	State significant development
SSI	State significant infrastructure
WTG	wind turbine generator

Glossary

- **Associated residence:** A dwelling whose owners have parts of their property included in a land agreement with Spark Renewables for the project (i.e. host landholder dwellings).
- **Development corridor:** The development corridor is the land within the project area where project components may be placed, providing the necessary flexibility for component placement during detailed design (i.e. micro-siting). The development corridor is wholly within the project area.
- **Development footprint:** The indicative extent of the project's ground disturbance area, including earthworks, associated with permanent infrastructure and temporary construction facilities. The development footprint will be within the development corridor; however, its exact location will be confirmed following detailed design.
- **Non-associated residence**: A dwelling whose owners do not have parts of their property included in a land agreement with Spark Renewables for the project.
- **Project area**: The land required for the project. The project area contains the entirety of all 349 lots that overlap with the development corridor and is approximately 39,061 ha. The project area includes parts of Goolgumbla Road, Wilson Road, Fernbank Road, McLennons Bore Road and Kidman Way (including the road easement) and Coleambally Outfall Drain, where site access and/or electrical cabling may be required.
- **Site access point**: The proposed locations where all construction and operation traffic will access the development footprint. Access across the development footprint will be possible via internal tracks.
- **The project**: Dinawan Wind Farm.
- **Vehicle movement**: A vehicle movement is a single, one-way journey from one point to another, excluding the return journey. If a return journey is considered, this will be classified as another vehicle movement.

Attachment A

Traffic survey data – intersection counts

EMM
creating opportunities

A.1 Kidman Way/Bundure Road/Liddles Lane intersection traffic counts

TRANS TRAFFIC SURVEY
TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Bundure Rd and Kidman Way, Gala Vale

GPS	*-35.08586, 145.78668*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Kidman Way
East:	Bundure Rd
South:	Kidman Way
West:	Liddles Ln

Survey Period	AM:	12:00 AM-12:00 PM
	PM:	12:00 PM-12:00 AM
Traffic Peak	AM:	10:30 AM-11:30 AM
	PM:	1:15 PM-2:15 PM

All Vehicles

Time		North Approach Kidman Way				East Approach Bundure Rd				South Approach Kidman Way				West Approach Liddles Ln				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
0:00	0:15	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	7	
0:15	0:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	
0:30	0:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
0:45	1:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
1:00	1:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
1:15	1:30	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	9	
1:30	1:45	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	8	
1:45	2:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
2:00	2:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
2:15	2:30	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
2:30	2:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	
2:45	3:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	
3:00	3:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
3:15	3:30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4	
3:30	3:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
3:45	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:00	4:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:15	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:30	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
4:45	5:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
5:00	5:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
5:15	5:30	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	16	
5:30	5:45	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	18	
5:45	6:00	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	25	
6:00	6:15	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	26	
6:15	6:30	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	29	
6:30	6:45	0	0	4	0	0	0	0	0	0	0	6	0	0	0	0	0	37	
6:45	7:00	0	0	0	0	0	0	0	0	0	1	6	0	0	0	0	0	37	
7:00	7:15	0	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	41	
7:15	7:30	0	0	6	0	0	1	0	0	0	0	6	0	0	0	0	0	50	
7:30	7:45	0	0	6	0	0	0	0	0	0	0	4	0	0	0	0	0	49	
7:45	8:00	0	0	5	0	0	0	0	0	0	0	6	0	0	0	0	0	53	
8:00	8:15	0	0	9	0	0	0	0	0	0	0	7	0	0	0	0	0	60	
8:15	8:30	0	0	6	0	0	0	0	0	0	0	6	0	0	0	0	0	59	
8:30	8:45	0	0	6	0	0	0	0	0	0	0	8	0	0	0	0	0	59	
8:45	9:00	0	1	10	0	0	0	0	0	0	0	7	0	0	0	0	0	54	
9:00	9:15	0	0	8	0	0	0	0	0	0	0	7	0	0	0	0	0	51	
9:15	9:30	1	0	4	0	0	0	0	0	0	0	7	0	0	0	0	0	46	
9:30	9:45	0	0	5	0	0	0	0	0	0	0	4	0	0	0	0	0	47	
9:45	10:00	0	0	10	0	0	0	0	0	0	0	5	0	0	0	0	0	58	
10:00	10:15	0	0	5	0	0	0	0	0	0	0	5	0	0	0	0	0	61	
10:15	10:30	0	0	8	0	0	0	0	0	0	1	4	0	0	0	0	0	66	
10:30	10:45	0	0	7	1	0	0	0	0	0	0	12	0	0	0	0	0	72	Peak
10:45	11:00	0	0	13	0	0	0	0	0	0	0	5	0	0	0	0	0	56	
11:00	11:15	0	0	12	0	0	1	0	0	0	0	2	0	0	0	0	0	56	
11:15	11:30	0	0	11	0	0	0	0	0	0	1	7	0	0	0	0	0	49	
11:30	11:45	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	41	
11:45	12:00	0	0	9	0	0	0	0	0	0	0	9	0	0	0	0	0	58	

Figure A.1(a) Kidman Way/Bundure Road/Liddles Lane intersection traffic counts

12:00	12:15	0	0	5	0	0	0	0	0	0	0	3	0	0	0	0	0	54	
12:15	12:30	0	0	6	0	0	0	0	2	0	0	3	0	0	0	0	0	58	
12:30	12:45	0	0	8	0	0	0	0	0	0	0	13	0	0	0	0	0	63	
12:45	13:00	0	0	7	1	0	0	0	0	0	0	6	0	0	0	0	0	63	
13:00	13:15	0	0	7	0	0	0	0	0	0	0	5	0	0	0	0	0	62	
13:15	13:30	0	0	9	0	0	0	0	0	0	0	7	0	0	0	0	0	64	Peak
13:30	13:45	0	0	14	0	0	0	0	0	0	0	6	0	0	0	0	1	62	
13:45	14:00	0	0	5	0	0	0	0	0	0	1	7	0	0	0	0	0	52	
14:00	14:15	0	0	11	0	0	0	0	0	0	0	3	0	0	0	0	0	59	
14:15	14:30	0	0	5	0	0	0	0	0	0	0	9	0	0	0	0	0	52	
14:30	14:45	0	0	4	0	0	0	0	0	0	0	7	0	0	0	0	0	53	
14:45	15:00	0	0	13	0	0	0	0	0	0	0	7	0	0	0	0	0	50	
15:00	15:15	0	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	47	
15:15	15:30	0	0	8	0	0	0	0	0	0	0	7	0	0	0	0	0	52	
15:30	15:45	0	0	4	0	0	0	0	0	0	0	4	0	0	0	0	0	51	
15:45	16:00	0	0	12	0	0	0	0	0	0	0	4	1	0	0	0	0	60	
16:00	16:15	0	0	6	0	0	0	0	0	0	0	6	0	0	0	0	0	49	
16:15	16:30	0	0	6	1	0	0	0	1	0	0	6	0	0	0	0	0	48	
16:30	16:45	0	0	12	0	0	0	0	0	0	0	5	0	0	0	0	0	45	
16:45	17:00	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	41	
17:00	17:15	0	0	6	0	0	0	0	0	0	0	5	0	0	0	0	0	42	
17:15	17:30	0	0	5	0	0	0	0	0	0	0	5	0	0	1	0	0	45	
17:30	17:45	0	0	5	0	0	0	0	0	0	0	8	0	0	0	0	0	39	
17:45	18:00	0	0	3	0	0	0	0	0	0	0	4	0	0	0	0	0	36	
18:00	18:15	0	0	7	0	0	0	0	0	0	0	7	0	0	0	0	0	35	
18:15	18:30	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	27	
18:30	18:45	0	0	5	0	0	1	0	0	0	0	4	0	0	0	0	0	23	
18:45	19:00	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	17	
19:00	19:15	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	18	
19:15	19:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
19:30	19:45	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	19	
19:45	20:00	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0	0	18	
20:00	20:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	19	
20:15	20:30	0	1	5	0	0	0	0	0	0	0	1	0	0	0	0	0	22	
20:30	20:45	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	20	
20:45	21:00	0	0	4	0	0	0	0	0	0	0	4	0	0	0	0	0	21	
21:00	21:15	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	14	
21:15	21:30	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	13	
21:30	21:45	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	13	
21:45	22:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	15	
22:00	22:15	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	17	
22:15	22:30	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	15	
22:30	22:45	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	11	
22:45	23:00	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	7	
23:00	23:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
23:15	23:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
23:30	23:45	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0		
23:45	0:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0		

Peak Time		North Approach Kidman Way				East Approach Bundure Rd				South Approach Kidman Way				West Approach Liddles Ln				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
10:30	11:30	0	0	43	1	0	1	0	0	0	1	26	0	0	0	0	0	72
13:15	14:15	0	0	39	0	0	0	0	0	0	1	23	0	0	0	0	1	64

Figure A.1(b) Kidman Way/Bundure Road/Liddles Lane intersection traffic counts (continued)

A.2 Kidman Way/Cadell Road intersection traffic counts

TRANS TRAFFIC SURVEY
TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Cadell Rd and Kidman Way, Gala Vale

GPS	*-35.05698, 145.79162*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Kidman Way
East:	N/A
South:	Kidman Way
West:	Cadell Rd

Survey Period	AM:	12:00 AM-12:00 PM
	PM:	12:00 PM-12:00 AM
Traffic Peak	AM:	10:30 AM-11:30 AM
	PM:	1:15 PM-2:15 PM

All Vehicles

Time		orth Approach Kidman Wa			outh Approach Kidman Wa			West Approach Cadell Rd			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
0:00	0:15	0	0	0	0	2	0	0	0	0	6	
0:15	0:30	0	0	0	0	1	0	0	0	0	5	
0:30	0:45	0	0	1	0	0	0	0	0	0	7	
0:45	1:00	0	0	2	0	0	0	0	0	0	10	
1:00	1:15	0	0	1	0	0	0	0	0	0	9	
1:15	1:30	0	0	0	0	3	0	0	0	0	9	
1:30	1:45	0	0	3	0	1	0	0	0	0	8	
1:45	2:00	0	0	1	0	0	0	0	0	0	5	
2:00	2:15	0	0	1	0	0	0	0	0	0	5	
2:15	2:30	0	0	2	0	0	0	0	0	0	5	
2:30	2:45	0	0	0	0	1	0	0	0	0	6	
2:45	3:00	0	0	0	0	1	0	0	0	0	5	
3:00	3:15	0	0	1	0	0	0	0	0	0	5	
3:15	3:30	0	0	2	0	1	0	0	0	0	4	
3:30	3:45	0	0	0	0	0	0	0	0	0	1	
3:45	4:00	0	0	1	0	0	0	0	0	0	1	
4:00	4:15	0	0	0	0	0	0	0	0	0	1	
4:15	4:30	0	0	0	0	0	0	0	0	0	2	
4:30	4:45	0	0	0	0	0	0	0	0	0	5	
4:45	5:00	0	0	1	0	0	0	0	0	0	8	
5:00	5:15	0	0	0	0	1	0	0	0	0	10	
5:15	5:30	0	0	2	0	1	0	0	0	0	15	
5:30	5:45	0	0	2	0	1	0	0	0	0	17	
5:45	6:00	0	0	0	0	3	0	0	0	0	23	
6:00	6:15	0	0	1	0	5	0	0	0	0	27	
6:15	6:30	0	0	2	0	3	0	0	0	0	29	
6:30	6:45	0	0	4	0	5	0	0	0	0	37	
6:45	7:00	0	0	1	0	6	0	0	0	0	37	
7:00	7:15	0	0	3	0	5	0	0	0	0	41	
7:15	7:30	0	0	7	0	6	0	0	0	0	48	
7:30	7:45	0	0	5	0	4	0	0	0	0	49	
7:45	8:00	0	0	5	0	6	0	0	0	0	56	
8:00	8:15	0	0	9	0	6	0	0	0	0	63	
8:15	8:30	0	1	7	0	6	0	0	0	0	63	
8:30	8:45	0	0	9	0	7	0	0	0	0	57	
8:45	9:00	0	0	9	0	9	0	0	0	0	57	
9:00	9:15	0	0	8	0	7	0	0	0	0	49	
9:15	9:30	0	0	4	0	4	0	0	0	0	45	
9:30	9:45	0	0	8	0	8	0	0	0	0	50	
9:45	10:00	0	0	7	0	3	0	0	0	0	61	
10:00	10:15	0	0	5	0	6	0	0	0	0	68	
10:15	10:30	0	0	8	0	5	0	0	0	0	73	
10:30	10:45	0	0	13	0	14	0	0	0	0	75	Peak
10:45	11:00	0	0	12	0	5	0	0	0	0	53	
11:00	11:15	0	0	13	0	3	0	0	0	0	53	
11:15	11:30	0	0	8	0	7	0	0	0	0		
11:30	11:45	0	0	2	0	3	0	0	0	0		
11:45	12:00	0	0	8	0	8	0	0	1	0		

Figure A.2(a) Kidman Way/Cadell Road intersection traffic counts

12:00	12:15	0	0	5	0	3	0	0	0	0	56	
12:15	12:30	0	0	6	0	5	0	0	0	0	59	
12:30	12:45	0	0	8	0	10	0	0	0	0	62	
12:45	13:00	0	1	9	0	9	0	0	0	0	62	
13:00	13:15	0	0	6	0	5	0	0	0	0	60	
13:15	13:30	0	0	10	0	4	0	0	0	0	63	Peak
13:30	13:45	0	0	13	0	5	0	0	0	0	63	Peak
13:45	14:00	0	0	7	0	10	0	0	0	0	55	
14:00	14:15	0	0	11	0	3	0	0	0	0	58	
14:15	14:30	0	0	4	0	10	0	0	0	0	50	
14:30	14:45	0	0	4	0	6	0	0	0	0	51	
14:45	15:00	0	0	13	0	7	0	0	0	0	51	
15:00	15:15	0	0	2	0	3	0	0	1	0	46	
15:15	15:30	0	0	8	0	7	0	0	0	0	51	
15:30	15:45	0	0	4	0	6	0	0	0	0	49	
15:45	16:00	0	0	11	0	4	0	0	0	0	56	
16:00	16:15	0	0	6	0	5	0	0	0	0	47	
16:15	16:30	0	0	7	0	6	0	0	0	0	48	
16:30	16:45	0	0	11	0	5	0	0	1	0	42	
16:45	17:00	0	0	2	0	4	0	0	0	0	40	
17:00	17:15	0	0	7	0	5	0	0	0	0	42	
17:15	17:30	0	0	4	0	3	0	0	0	0	46	
17:30	17:45	0	0	5	0	9	0	0	1	0	45	
17:45	18:00	0	0	3	0	5	0	0	0	0	39	
18:00	18:15	0	0	8	0	8	0	0	0	0	37	
18:15	18:30	0	0	5	0	1	0	0	0	0	26	
18:30	18:45	0	0	4	0	5	0	0	0	0	21	
18:45	19:00	0	0	3	0	3	0	0	0	0	16	
19:00	19:15	0	0	1	0	4	0	0	0	0	17	
19:15	19:30	0	0	1	0	0	0	0	0	0	13	
19:30	19:45	0	0	3	0	1	0	0	0	0	20	
19:45	20:00	0	0	1	0	6	0	0	0	0	18	
20:00	20:15	0	0	0	0	1	0	0	0	0	19	
20:15	20:30	0	0	7	0	1	0	0	0	0	20	
20:30	20:45	0	0	0	0	2	0	0	0	0	20	
20:45	21:00	0	0	4	0	4	0	0	0	0	22	
21:00	21:15	0	0	0	0	2	0	0	0	0	15	
21:15	21:30	0	0	4	0	4	0	0	0	0	16	
21:30	21:45	0	0	2	0	2	0	0	0	0	13	
21:45	22:00	0	0	0	0	1	0	0	0	0	14	
22:00	22:15	0	0	2	0	1	0	0	0	0	16	
22:15	22:30	0	0	3	0	2	0	0	0	0	16	
22:30	22:45	0	0	3	0	2	0	0	0	0	12	
22:45	23:00	0	0	1	0	2	0	0	0	0	9	
23:00	23:15	0	0	2	0	1	0	0	0	0	8	
23:15	23:30	0	0	1	0	0	0	0	0	0		
23:30	23:45	0	0	1	0	1	0	0	0	0		
23:45	0:00	0	0	0	0	2	0	0	0	0		

Peak Time		orth Approach Kidman Wa			outh Approach Kidman Wa			West Approach Cadell Rd			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
10:30	11:30	0	0	46	0	29	0	0	0	0	75
13:15	14:15	0	0	41	0	22	0	0	0	0	63

Figure A.2(b) Kidman Way/Cadell Road intersection traffic counts (continued)

A.3 Kidman Way/McLennons Bore Road intersection traffic counts

TRANS TRAFFIC SURVEY
TURNING MOVEMENT SURVEY
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Intersection of Mclennons Bore Rd and Kidman Way

GPS	*-34.99642, 145.8308*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Kidman Way
East:	N/A
South:	Kidman Way
West:	Mclennons Bore Rd

Survey Period	AM:	12:00 AM-12:00 PM
	PM:	12:00 PM-12:00 AM
Traffic Peak	AM:	10:15 AM-11:15 AM
	PM:	3:45 PM-4:45 PM

All Vehicles

Time		orth Approach Kidman Wa			outh Approach Kidman We			t Approach Mclennons Bor			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
0:00	0:15	0	0	0	0	3	0	0	0	0	7	
0:15	0:30	0	0	0	0	1	0	0	0	0	5	
0:30	0:45	0	0	2	0	0	0	0	0	0	7	
0:45	1:00	0	0	1	0	0	0	0	0	0	9	
1:00	1:15	0	0	1	0	0	0	0	0	0	9	
1:15	1:30	0	0	0	0	3	0	0	0	0	10	
1:30	1:45	0	0	3	0	1	0	0	0	0	8	
1:45	2:00	0	0	1	0	0	0	0	0	0	4	
2:00	2:15	0	0	2	0	0	0	0	0	0	4	
2:15	2:30	0	0	1	0	0	0	0	0	0	4	
2:30	2:45	0	0	0	0	0	0	0	0	0	5	
2:45	3:00	0	0	0	0	1	0	0	0	0	6	
3:00	3:15	0	0	1	0	1	0	0	0	0	6	
3:15	3:30	0	0	2	0	0	0	0	0	0	5	
3:30	3:45	0	0	0	0	1	0	0	0	0	3	
3:45	4:00	0	0	1	0	0	0	0	0	0	3	
4:00	4:15	0	1	0	0	0	0	0	0	0	3	
4:15	4:30	0	0	0	0	0	0	0	0	0	4	
4:30	4:45	0	0	0	0	0	0	0	0	1	8	
4:45	5:00	0	0	1	0	0	0	0	0	0	8	
5:00	5:15	0	0	1	0	1	0	0	0	0	13	
5:15	5:30	0	0	2	0	2	0	0	0	0	23	
5:30	5:45	0	0	1	0	0	0	0	0	0	23	
5:45	6:00	0	0	3	0	3	0	0	0	0	36	
6:00	6:15	0	0	9	0	3	0	0	0	0	40	
6:15	6:30	0	0	3	0	1	0	0	0	0	35	
6:30	6:45	0	0	7	0	7	0	0	0	0	42	
6:45	7:00	0	0	5	0	5	0	0	0	0	36	
7:00	7:15	0	0	3	0	4	0	0	0	0	40	
7:15	7:30	0	0	4	0	7	0	0	0	0	47	
7:30	7:45	0	0	3	0	5	0	0	0	0	48	
7:45	8:00	0	0	9	0	5	0	0	0	0	57	
8:00	8:15	0	0	11	0	3	0	0	0	0	60	
8:15	8:30	0	0	5	0	7	0	0	0	0	60	
8:30	8:45	0	1	10	0	6	0	0	0	0	56	
8:45	9:00	0	1	7	0	9	0	0	0	0	56	
9:00	9:15	0	0	7	0	7	0	0	0	0	47	
9:15	9:30	0	0	3	0	5	0	0	0	0	42	
9:30	9:45	0	0	8	0	9	0	0	0	0	45	
9:45	10:00	0	0	6	0	2	0	0	0	0	48	
10:00	10:15	0	0	6	0	3	0	0	0	0	59	
10:15	10:30	0	0	8	0	3	0	0	0	0	66	Peak
10:30	10:45	0	1	11	0	8	0	0	0	0	64	
10:45	11:00	0	1	10	0	8	0	0	0	0	58	
11:00	11:15	0	0	10	1	5	0	0	0	0	50	
11:15	11:30	0	0	5	0	3	0	0	0	1		
11:30	11:45	0	0	8	0	6	0	0	0	0		
11:45	12:00	0	0	5	0	6	0	0	0	0		

Figure A.3(a) Kidman Way/McLennons Bore Road intersection traffic counts

12:00	12:15	0	0	8	0	3	0	0	0	0	63	
12:15	12:30	0	0	7	0	6	0	0	0	0	64	
12:30	12:45	0	0	11	0	5	0	0	0	1	67	
12:45	13:00	0	0	7	0	15	0	0	0	0	69	
13:00	13:15	0	0	4	0	8	0	0	0	0	70	
13:15	13:30	0	0	11	0	5	0	0	0	0	65	
13:30	13:45	0	0	14	0	4	0	0	0	1	64	
13:45	14:00	0	0	11	0	12	0	0	0	0	57	
14:00	14:15	0	0	4	0	3	0	0	0	0	49	
14:15	14:30	0	0	6	0	9	0	0	0	0	52	
14:30	14:45	0	0	5	0	7	0	0	0	0	47	
14:45	15:00	0	0	7	0	8	0	0	0	0	49	
15:00	15:15	0	0	6	0	4	0	0	0	0	50	
15:15	15:30	0	0	7	0	3	0	0	0	0	67	
15:30	15:45	0	0	9	0	5	0	0	0	0	72	
15:45	16:00	0	0	9	0	7	0	0	0	0	76	Peak
16:00	16:15	0	1	12	0	11	1	0	0	2	70	
16:15	16:30	0	0	6	0	9	0	0	0	0	55	
16:30	16:45	0	0	9	0	9	0	0	0	0	52	
16:45	17:00	0	0	4	0	6	0	0	0	0	47	
17:00	17:15	0	1	5	0	6	0	0	0	0	52	
17:15	17:30	0	1	5	0	6	0	0	0	0	52	
17:30	17:45	0	0	3	0	9	0	0	0	1	49	
17:45	18:00	0	1	7	0	7	0	0	0	0	43	
18:00	18:15	0	0	6	0	6	0	0	0	0	35	
18:15	18:30	0	0	6	0	3	0	0	0	0	26	
18:30	18:45	0	0	4	0	3	0	0	0	0	22	
18:45	19:00	0	0	1	0	6	0	0	0	0	19	
19:00	19:15	0	0	1	0	2	0	0	0	0	17	
19:15	19:30	0	0	2	0	3	0	0	0	0	16	
19:30	19:45	0	0	3	0	1	0	0	0	0	18	
19:45	20:00	0	0	1	0	4	0	0	0	0	18	
20:00	20:15	0	0	1	0	1	0	0	0	0	18	
20:15	20:30	0	0	6	0	1	0	0	0	0	20	
20:30	20:45	0	0	2	0	2	0	0	0	0	20	
20:45	21:00	0	0	2	0	3	0	0	0	0	19	
21:00	21:15	0	0	1	0	3	0	0	0	0	17	
21:15	21:30	0	0	3	0	4	0	0	0	0	18	
21:30	21:45	0	0	2	0	1	0	0	0	0	16	
21:45	22:00	0	0	1	0	2	0	0	0	0	17	
22:00	22:15	0	0	2	0	1	1	0	1	0	18	
22:15	22:30	0	0	2	0	3	0	0	0	0	16	
22:30	22:45	0	0	3	0	1	0	0	0	0	12	
22:45	23:00	0	0	1	0	3	0	0	0	0	10	
23:00	23:15	0	0	2	0	1	0	0	0	0	8	
23:15	23:30	0	0	1	0	0	0	0	0	0		
23:30	23:45	0	0	1	0	1	0	0	0	0		
23:45	0:00	0	0	0	0	2	0	0	0	0		

Peak Time		orth Approach Kidman Wa			outh Approach Kidman Wa			t Approach Mclennons Bor			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
10:15	11:15	0	2	39	1	24	0	0	0	0	66
15:45	16:45	0	1	36	0	36	1	0	0	2	76

Figure A.3(b) Kidman Way/McLennons Bore Road intersection traffic counts (continued)

A.4 Cadell Road/McLennons Bore Road intersection traffic counts

TRANS TRAFFIC SURVEY
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TURNING MOVEMENT SURVEY

Intersection of Mclennons Bore Rd and Cadell Rd, Gala Vale

GPS	*-35.00324, 145.77661*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Cadell Rd
East:	Mclennons Bore Rd
South:	Cadell Rd
West:	Mclennons Bore Rd

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

Time		North Approach Cadell Rd				East Approach Mclennons Bore Rd				South Approach Cadell Rd				West Approach Mclennons Bore Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30	6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
6:45	7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	
7:30	7:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	Peak
8:00	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
8:15	8:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	
8:30	8:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	
8:45	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15:00	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	Peak
15:15	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	
15:30	15:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
15:45	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
16:00	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
16:15	16:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Peak
16:30	16:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
16:45	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
17:00	17:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	Peak
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
17:30	17:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	

Peak Time		North Approach Cadell Rd				East Approach Mclennons Bore Rd				South Approach Cadell Rd				West Approach Mclennons Bore Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	4	6
15:00	16:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3

Figure A.4 Cadell Road/McLennons Bore Road intersection traffic counts

A.5 McLennons Bore Road/Fernbank Road intersection traffic counts

TRANS TRAFFIC SURVEY
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TURNING MOVEMENT SURVEY

Intersection of Mclennons Bore Rd and Fernbank Rd

GPS	*-35.01957, 145.65007*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Fernbank Rd
East:	Mclennons Bore Rd
South:	N/A
West:	Mclennons Bore Rd

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

Time		orth Approach Fernbank R			Approach Mclennons Bore			Approach Mclennons Bor			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:00	6:15	0	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	0	0	0	0	0	0	0	0	0	
6:30	6:45	0	0	0	0	0	0	0	0	0	1	
6:45	7:00	0	0	0	0	0	0	0	0	0	1	
7:00	7:15	0	0	0	0	0	0	0	0	0	4	
7:15	7:30	0	0	0	0	0	0	0	1	0	4	
7:30	7:45	0	0	0	0	0	0	0	0	0	4	
7:45	8:00	0	0	0	0	0	1	0	2	0	5	Peak
8:00	8:15	0	0	0	0	0	0	0	0	0	5	Peak
8:15	8:30	0	0	0	0	0	0	0	1	0	5	Peak
8:30	8:45	0	0	0	0	0	1	0	0	0	4	
8:45	9:00	0	0	0	0	0	3	0	0	0	3	
15:00	15:15	0	0	0	0	0	0	0	0	0	2	
15:15	15:30	0	0	0	0	0	0	0	1	0	2	
15:30	15:45	0	0	0	0	0	0	0	0	0	1	
15:45	16:00	0	0	0	0	0	1	0	0	0	2	
16:00	16:15	0	0	0	0	0	0	0	0	0	2	
16:15	16:30	0	0	0	0	0	0	0	0	0	2	
16:30	16:45	0	0	0	0	0	1	0	0	0	3	Peak
16:45	17:00	0	0	0	0	0	1	0	0	0	2	
17:00	17:15	0	0	0	0	0	0	0	0	0	1	
17:15	17:30	0	0	0	0	0	1	0	0	0	1	
17:30	17:45	0	0	0	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	0	0	0	0	0	0	

Peak Time		orth Approach Fernbank R			Approach Mclennons Bore			Approach Mclennons Bor			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:45	8:45	0	0	0	0	0	2	0	3	0	5
16:30	17:30	0	0	0	0	0	3	0	0	0	3

Figure A.5 McLennons Bore Road/Fernbank Road intersection traffic counts

A.6 Wilson Road/McLennons Bore Road intersection traffic counts

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TURNING MOVEMENT SURVEY

Intersection of Mclennons Bore Rd and Wilson Rd, G

GPS	*-35.02957, 145.5944*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Wilson Rd
East:	Mclennons Bore Rd
South:	Wilson Rd
West:	N/A

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	7:00 AM-8:00 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

Time		North Approach Wilson Rd			Approach Mclennons Bor			South Approach Wilson Rd			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
6:00	6:15	0	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	0	0	0	0	0	0	0	0	1	
6:30	6:45	0	0	0	0	0	0	0	0	0	1	
6:45	7:00	0	0	0	0	0	0	0	0	0	3	
7:00	7:15	0	0	1	0	0	0	0	0	0	5	Peak
7:15	7:30	0	0	0	0	0	0	0	0	0	4	
7:30	7:45	0	0	2	0	0	0	0	0	0	5	Peak
7:45	8:00	0	1	0	0	1	0	0	0	0	4	
8:00	8:15	0	0	0	0	0	0	0	0	0	5	Peak
8:15	8:30	0	1	0	0	0	0	0	0	0	5	Peak
8:30	8:45	0	0	0	0	1	0	0	0	0	4	
8:45	9:00	0	0	0	0	1	1	0	0	1	3	
15:00	15:15	0	0	1	0	0	1	0	0	0	3	Peak
15:15	15:30	0	0	0	0	0	0	0	0	0	1	
15:30	15:45	0	0	0	0	0	0	0	0	0	1	
15:45	16:00	0	0	0	0	0	1	0	0	0	2	
16:00	16:15	0	0	0	0	0	0	0	0	0	2	
16:15	16:30	0	0	0	0	0	0	0	0	0	2	
16:30	16:45	0	0	0	0	1	0	0	0	0	3	Peak
16:45	17:00	0	0	0	0	0	1	0	0	0	2	
17:00	17:15	0	0	0	0	0	0	0	0	0	1	
17:15	17:30	0	0	0	0	1	0	0	0	0	1	
17:30	17:45	0	0	0	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	0	0	0	0	0	0	

Peak Time		North Approach Wilson Rd			Approach Mclennons Bor			South Approach Wilson Rd			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:00	8:00	0	1	3	0	1	0	0	0	0	5
15:00	16:00	0	0	1	0	0	2	0	0	0	3

Figure A.6 Wilson Road/McLennons Bore Road intersection traffic counts

A.7 Wilson Road/Mabins Well Road intersection traffic counts

TRANS TRAFFIC SURVEY
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TURNING MOVEMENT SURVEY

Intersection of Mabins Well Rd and Wilson Rd, Gala V

GPS	*-35.02906, 145.57851*
Date:	Thu 15/02/24
Weather:	Overcast
Suburban:	Gala Vale
Customer:	EMM

North:	Wilson Rd
East:	N/A
South:	Wilson Rd
West:	Mabins Well Rd

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	7:00 AM-8:00 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

Time		North Approach Wilson Rd			South Approach Wilson Rd			West Approach Mabins Well			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
6:00	6:15	0	0	0	0	0	0	0	0	0	0	
6:15	6:30	0	0	0	0	0	0	0	0	0	1	
6:30	6:45	0	0	0	0	0	0	0	0	0	1	
6:45	7:00	0	0	0	0	0	0	0	0	0	3	
7:00	7:15	0	0	0	0	0	0	0	1	0	6	Peak
7:15	7:30	0	0	0	0	0	0	0	0	0	5	
7:30	7:45	0	0	0	0	0	0	0	2	0	6	Peak
7:45	8:00	0	1	0	0	1	0	0	1	0	5	
8:00	8:15	0	0	0	0	0	0	0	0	0	4	
8:15	8:30	0	0	0	0	0	0	0	1	0	4	
8:30	8:45	0	0	0	0	0	1	0	0	0	3	
8:45	9:00	0	0	0	0	1	1	0	0	0	2	
15:00	15:15	0	0	0	0	0	0	0	1	0	1	
15:15	15:30	0	0	0	0	0	0	0	0	0	0	
15:30	15:45	0	0	0	0	0	0	0	0	0	0	
15:45	16:00	0	0	0	0	0	0	0	0	0	1	
16:00	16:15	0	0	0	0	0	0	0	0	0	2	
16:15	16:30	0	0	0	0	0	0	0	0	0	2	
16:30	16:45	0	0	0	0	0	1	0	0	0	3	Peak
16:45	17:00	0	0	0	0	0	0	0	0	1	2	
17:00	17:15	0	0	0	0	0	0	0	0	0	1	
17:15	17:30	0	0	0	0	0	1	0	0	0	1	
17:30	17:45	0	0	0	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	0	0	0	0	0	0	

Peak Time		North Approach Wilson Rd			South Approach Wilson Rd			West Approach Mabins Well			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:00	8:00	0	1	0	0	1	0	0	4	0	6
16:30	17:30	0	0	0	0	0	2	0	0	1	3

Figure A.7 Wilson Road/Mabins Well Road intersection traffic counts

Attachment B

Traffic survey data – tube counts

EMM
creating opportunities

B.1 Kidman Way tube counts

TRANS TRAFFIC SURVEY
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AUTOMATIC COUNT SUMMARY

Street Name :	Kidman Way	**Location :**	North of Mclennons Bore Rd
Suburb :	Coleambally	**Start Date :**	00:00 Wed 14/February/2024
Machine ID:	YA656F7E	**Finish Date :**	00:00 Wed 21/February/2024
Site ID:	2957	**Speed Zone :**	100 km/h
Prepared By :	Vo Son Binh	**Email:**	binh@trafficsurvey.com.au

			Direction of Travel		
GPS information		Lat 34° 59' 43.53 South Long 145° 49' 51.20 East	Both directions	Northbound	Southbound
Traffic Volume :		Weekdays Average	862	416	446
(Vehicles/Day)		7 Day Average	787	390	397
Weekday	**AM**	09:00	69	30	39
Peak hour starts	**PM**	12:00	66	34	32
Speeds :		85th Percentile	104.5	105.3	103.7
(Km/Hr)		Average	98.0	98.7	97.2
Classification % :		Light Vehicles up to 5.5m	60.0%	59.6%	60.5%

Location

GPS Information	Load Google Map (internet required)
(Latitude, Longitude)	-34.995425, 145.830889

Speed Data | Speed Graph | Speed Bin
Volume Data | Volume Graph | Classification

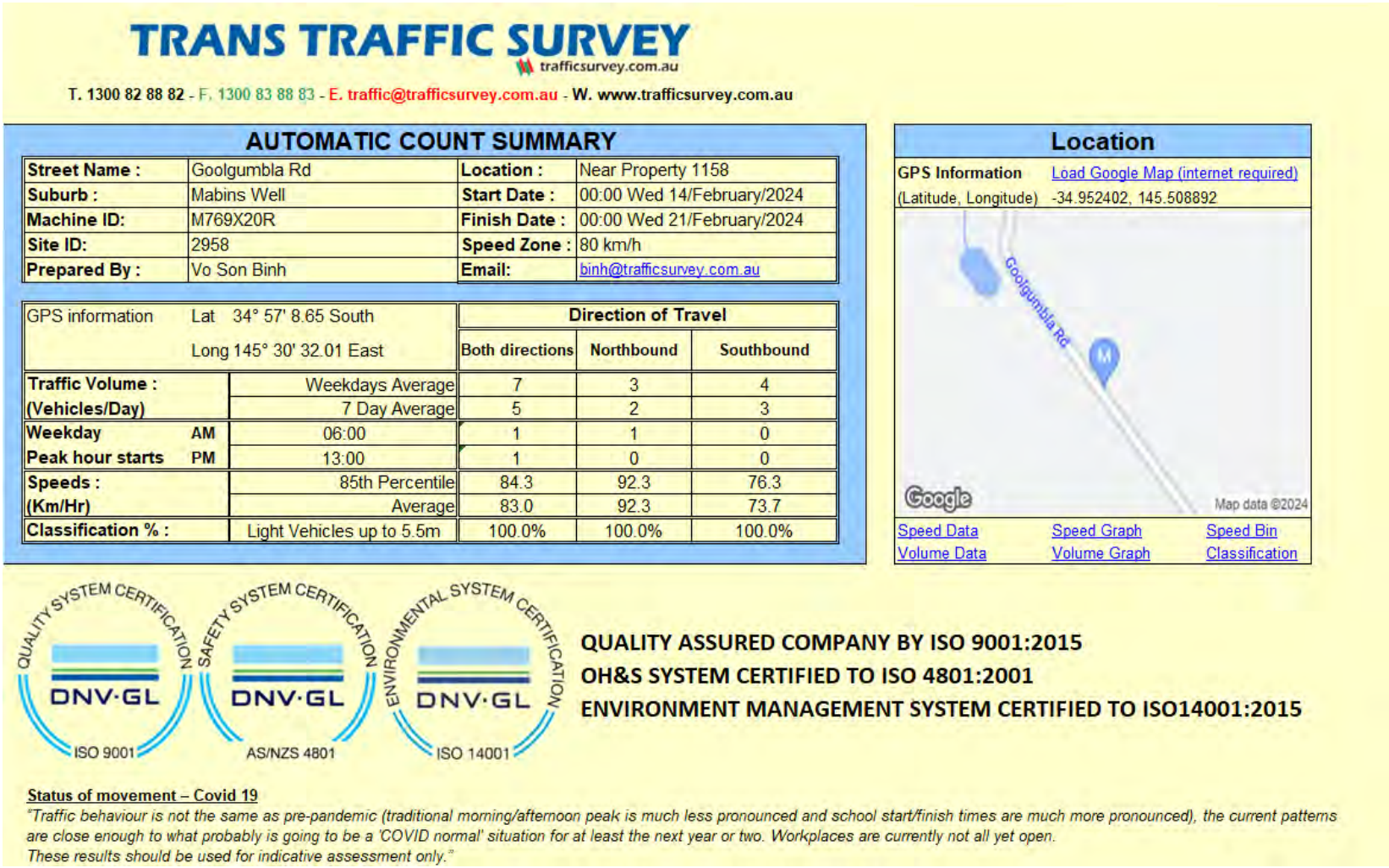
QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001
SAFETY SYSTEM CERTIFICATION DNV·GL AS/NZS 4801
ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

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."

Figure B.1 Kidman Way tube counts

B.2 Goolgumbla Road tube counts



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AUTOMATIC COUNT SUMMARY

Street Name :	Goolgumbla Rd	**Location :**	Near Property 1158
Suburb :	Mabins Well	**Start Date :**	00:00 Wed 14/February/2024
Machine ID:	M769X20R	**Finish Date :**	00:00 Wed 21/February/2024
Site ID:	2958	**Speed Zone :**	80 km/h
Prepared By :	Vo Son Binh	**Email:**	binh@trafficsurvey.com.au

GPS information	Lat 34° 57' 8.65 South Long 145° 30' 32.01 East		Direction of Travel		
			Both directions	Northbound	Southbound
Traffic Volume :		Weekdays Average	7	3	4
(Vehicles/Day)		7 Day Average	5	2	3
Weekday	**AM**	06:00	1	1	0
Peak hour starts	**PM**	13:00	1	0	0
Speeds :		85th Percentile	84.3	92.3	76.3
(Km/Hr)		Average	83.0	92.3	73.7
Classification % :		Light Vehicles up to 5.5m	100.0%	100.0%	100.0%

Location

GPS Information	Load Google Map (internet required)
(Latitude, Longitude)	-34.952402, 145.508892

Speed Data | Speed Graph | Speed Bin
Volume Data | Volume Graph | Classification

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001
SAFETY SYSTEM CERTIFICATION DNV·GL AS/NZS 4801
ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

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."

Figure B.2 Goolgumbla Road tube counts

Attachment C

SIDRA results

EMM
creating opportunities

MOVEMENT SUMMARY

Site: 101 [Base 2027 AM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.017	7.8	LOS A	0.0	0.0	0.00	0.03	0.00	86.5
2	T1	All MCs	26	36.0	26	36.0	0.017	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	98.7
Approach			27	34.6	27	34.6	0.017	0.3	NA	0.0	0.0	0.00	0.03	0.00	98.2
North: Kidman Way															
8	T1	All MCs	43	56.1	43	56.1	0.031	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	97.9
9	R2	All MCs	2	0.0	2	0.0	0.031	7.4	LOS A	0.0	0.1	0.01	0.03	0.01	85.7
Approach			45	53.5	45	53.5	0.031	0.3	NA	0.0	0.1	0.01	0.03	0.01	97.2
West: Mclennons Bore Road															
10	L2	All MCs	1	0.0	1	0.0	0.002	7.9	LOS A	0.0	0.0	0.11	0.61	0.11	74.1
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.11	0.61	0.11	73.9
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.11	0.61	0.11	74.0
All Vehicles			75	45.1	75	45.1	0.031	0.5	NA	0.0	0.1	0.01	0.05	0.01	96.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Base 2027 PM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.022	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.5
2	T1	All MCs	33	41.9	33	41.9	0.022	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.9
Approach			34	40.6	34	40.6	0.022	0.2	NA	0.0	0.0	0.00	0.02	0.00	98.4
North: Kidman Way															
8	T1	All MCs	44	52.4	44	52.4	0.031	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	99.0
9	R2	All MCs	1	0.0	1	0.0	0.031	7.4	LOS A	0.0	0.1	0.01	0.02	0.01	86.6
Approach			45	51.2	45	51.2	0.031	0.2	NA	0.0	0.1	0.01	0.02	0.01	98.6
West: Mclennons Bore Road															
10	L2	All MCs	1	100.0	1	100.0	0.002	10.7	LOS A	0.0	0.1	0.14	0.61	0.14	47.8
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.1	0.14	0.61	0.14	71.1
Approach			2	50.0	2	50.0	0.002	9.2	LOS A	0.0	0.1	0.14	0.61	0.14	57.2
All Vehicles			81	46.8	81	46.8	0.031	0.4	NA	0.0	0.1	0.01	0.03	0.01	96.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Base 2027 AM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.024	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.4
2	T1	All MCs	34	53.1	34	53.1	0.024	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.7
Approach			35	51.5	35	51.5	0.024	0.2	NA	0.0	0.0	0.00	0.02	0.00	98.2
North: Kidman Way															
8	T1	All MCs	42	47.5	42	47.5	0.029	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	99.0
9	R2	All MCs	1	0.0	1	0.0	0.029	7.4	LOS A	0.0	0.1	0.01	0.02	0.01	86.6
Approach			43	46.3	43	46.3	0.029	0.2	NA	0.0	0.1	0.01	0.02	0.01	98.7
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.002	7.9	LOS A	0.0	0.0	0.13	0.61	0.13	74.0
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.13	0.61	0.13	73.8
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.13	0.61	0.13	73.9
All Vehicles			80	47.4	80	47.4	0.029	0.4	NA	0.0	0.1	0.01	0.03	0.01	97.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Base 2027 PM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.016	7.8	LOS A	0.0	0.0	0.00	0.03	0.00	86.2
2	T1	All MCs	24	43.5	24	43.5	0.016	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	98.5
Approach			25	41.7	25	41.7	0.016	0.3	NA	0.0	0.0	0.00	0.03	0.00	97.9
North: Kidman Way															
8	T1	All MCs	45	55.8	45	55.8	0.032	0.0	LOS A	0.0	0.1	0.00	0.02	0.00	98.9
9	R2	All MCs	1	0.0	1	0.0	0.032	7.4	LOS A	0.0	0.1	0.00	0.02	0.00	86.5
Approach			46	54.5	46	54.5	0.032	0.2	NA	0.0	0.1	0.00	0.02	0.00	98.6
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.002	7.9	LOS A	0.0	0.0	0.11	0.62	0.11	74.1
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.11	0.62	0.11	73.9
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.11	0.62	0.11	74.0
All Vehicles			74	48.6	74	48.6	0.032	0.4	NA	0.0	0.1	0.01	0.04	0.01	97.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Base 2027 AM Kidman Way/DSF Western Access (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Base 2027 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.024	3.0	LOS A	0.0	0.0	0.00	0.02	0.00	78.2
2	T1	All MCs	34	53.1	34	53.1	0.024	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	99.0
Approach			35	51.5	35	51.5	0.024	0.1	NA	0.0	0.0	0.00	0.02	0.00	98.2
North: Kidman Way															
8	T1	All MCs	42	47.5	42	47.5	0.029	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	98.0
9	R2	All MCs	1	0.0	1	0.0	0.029	7.4	LOS A	0.0	0.1	0.01	0.02	0.01	86.6
Approach			43	46.3	43	46.3	0.029	0.2	NA	0.0	0.1	0.01	0.02	0.01	97.4
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	7.9	LOS A	0.0	0.0	0.13	0.61	0.13	74.0
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.13	0.61	0.13	69.5
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.13	0.61	0.13	72.4
All Vehicles			80	47.4	80	47.4	0.029	0.3	NA	0.0	0.1	0.01	0.03	0.01	96.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Base 2027 PM Kidman Way/DSF Western Access (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Base 2027 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.018	3.0	LOS A	0.0	0.0	0.00	0.02	0.00	78.1
2	T1	All MCs	26	48.0	26	48.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.9
Approach			27	46.2	27	46.2	0.018	0.1	NA	0.0	0.0	0.00	0.02	0.00	97.9
North: Kidman Way															
8	T1	All MCs	45	55.8	45	55.8	0.032	0.0	LOS A	0.0	0.1	0.00	0.02	0.00	97.9
9	R2	All MCs	1	0.0	1	0.0	0.032	7.4	LOS A	0.0	0.1	0.00	0.02	0.00	86.5
Approach			46	54.5	46	54.5	0.032	0.2	NA	0.0	0.1	0.00	0.02	0.00	97.3
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	7.9	LOS A	0.0	0.0	0.11	0.61	0.11	74.1
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.11	0.61	0.11	69.6
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.11	0.61	0.11	72.5
All Vehicles			76	50.0	76	50.0	0.032	0.4	NA	0.0	0.1	0.01	0.04	0.01	96.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Base 2027 AM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Base 2027 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	34	53.1	34	53.1	0.024	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	97.3
9	R2	All MCs	1	0.0	1	0.0	0.024	7.4	LOS A	0.0	0.1	0.01	0.02	0.01	86.3
Approach			35	51.5	35	51.5	0.024	0.2	NA	0.0	0.1	0.01	0.02	0.01	96.6
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	8.0	LOS A	0.0	0.0	0.14	0.61	0.14	73.9
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.14	0.61	0.14	69.4
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.14	0.61	0.14	72.3
North: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.029	3.0	LOS A	0.0	0.0	0.00	0.01	0.00	78.4
2	T1	All MCs	42	47.5	42	47.5	0.029	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.3
Approach			43	46.3	43	46.3	0.029	0.1	NA	0.0	0.0	0.00	0.01	0.00	98.7
All Vehicles			80	47.4	80	47.4	0.029	0.3	NA	0.0	0.1	0.01	0.03	0.01	96.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Base 2027 PM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Base 2027 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	26	48.0	26	48.0	0.018	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	96.9
9	R2	All MCs	1	0.0	1	0.0	0.018	7.4	LOS A	0.0	0.1	0.01	0.03	0.01	86.1
Approach			27	46.2	27	46.2	0.018	0.3	NA	0.0	0.1	0.01	0.03	0.01	96.0
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	8.0	LOS A	0.0	0.0	0.14	0.61	0.14	73.9
12	R2	All MCs	1	0.0	1	0.0	0.002	7.7	LOS A	0.0	0.0	0.14	0.61	0.14	69.3
Approach			2	0.0	2	0.0	0.002	7.8	LOS A	0.0	0.0	0.14	0.61	0.14	72.3
North: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.032	3.0	LOS A	0.0	0.0	0.00	0.01	0.00	78.3
2	T1	All MCs	45	55.8	45	55.8	0.032	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.2
Approach			46	54.5	46	54.5	0.032	0.1	NA	0.0	0.0	0.00	0.01	0.00	98.6
All Vehicles			76	50.0	76	50.0	0.032	0.4	NA	0.0	0.1	0.01	0.04	0.01	96.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Base 2027 AM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.015	7.9	LOS A	0.0	0.1	0.02	0.09	0.02	83.4
2	T1	All MCs	20	52.6	20	52.6	0.015	0.0	LOS A	0.0	0.1	0.02	0.09	0.02	94.8
3	R2	All MCs	2	0.0	2	0.0	0.015	7.4	LOS A	0.0	0.1	0.02	0.09	0.02	75.2
Approach			23	45.5	23	45.5	0.015	1.0	NA	0.0	0.1	0.02	0.09	0.02	92.6
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.003	7.3	LOS A	0.0	0.1	0.13	0.60	0.13	68.5
5	T1	All MCs	1	0.0	1	0.0	0.003	6.2	LOS A	0.0	0.1	0.13	0.60	0.13	68.9
6	R2	All MCs	1	0.0	1	0.0	0.003	7.0	LOS A	0.0	0.1	0.13	0.60	0.13	68.2
Approach			3	0.0	3	0.0	0.003	6.8	LOS A	0.0	0.1	0.13	0.60	0.13	68.5
North: Kidman Way															
7	L2	All MCs	1	0.0	1	0.0	0.022	7.8	LOS A	0.0	0.1	0.01	0.04	0.01	50.7
8	T1	All MCs	33	35.5	33	35.5	0.022	0.0	LOS A	0.0	0.1	0.01	0.04	0.01	98.0
9	R2	All MCs	1	0.0	1	0.0	0.022	7.4	LOS A	0.0	0.1	0.01	0.04	0.01	85.9
Approach			35	33.3	35	33.3	0.022	0.5	NA	0.0	0.1	0.01	0.04	0.01	95.7
West: Liddles Lane															
10	L2	All MCs	2	0.0	2	0.0	0.003	7.9	LOS A	0.0	0.1	0.10	0.61	0.10	74.4
11	T1	All MCs	1	0.0	1	0.0	0.003	6.9	LOS A	0.0	0.1	0.10	0.61	0.10	54.8
12	R2	All MCs	1	0.0	1	0.0	0.003	7.7	LOS A	0.0	0.1	0.10	0.61	0.10	74.2
Approach			4	0.0	4	0.0	0.003	7.6	LOS A	0.0	0.1	0.10	0.61	0.10	69.6
All Vehicles			65	33.9	65	33.9	0.022	1.4	NA	0.0	0.1	0.02	0.12	0.02	91.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Base 2027 PM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.019	7.9	LOS A	0.0	0.1	0.01	0.05	0.01	85.8
2	T1	All MCs	29	32.1	29	32.1	0.019	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	97.9
3	R2	All MCs	1	0.0	1	0.0	0.019	7.4	LOS A	0.0	0.1	0.01	0.05	0.01	78.0
Approach			32	30.0	32	30.0	0.019	0.5	NA	0.0	0.1	0.01	0.05	0.01	96.8
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.003	7.3	LOS A	0.0	0.1	0.16	0.59	0.16	68.3
5	T1	All MCs	1	0.0	1	0.0	0.003	6.3	LOS A	0.0	0.1	0.16	0.59	0.16	68.7
6	R2	All MCs	1	0.0	1	0.0	0.003	7.1	LOS A	0.0	0.1	0.16	0.59	0.16	68.0
Approach			3	0.0	3	0.0	0.003	6.9	LOS A	0.0	0.1	0.16	0.59	0.16	68.3
North: Kidman Way															
7	L2	All MCs	1	0.0	1	0.0	0.034	7.8	LOS A	0.0	0.1	0.01	0.03	0.01	50.4
8	T1	All MCs	45	67.4	45	67.4	0.034	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	97.4
9	R2	All MCs	1	0.0	1	0.0	0.034	7.4	LOS A	0.0	0.1	0.01	0.03	0.01	85.4
Approach			47	64.4	47	64.4	0.034	0.3	NA	0.0	0.1	0.01	0.03	0.01	95.7
West: Liddles Lane															
10	L2	All MCs	1	0.0	1	0.0	0.003	7.9	LOS A	0.0	0.1	0.14	0.60	0.14	74.4
11	T1	All MCs	1	0.0	1	0.0	0.003	7.0	LOS A	0.0	0.1	0.14	0.60	0.14	54.8
12	R2	All MCs	1	0.0	1	0.0	0.003	7.8	LOS A	0.0	0.1	0.14	0.60	0.14	74.2
Approach			3	0.0	3	0.0	0.003	7.6	LOS A	0.0	0.1	0.14	0.60	0.14	68.0
All Vehicles			85	46.9	85	46.9	0.034	0.9	NA	0.0	0.1	0.02	0.08	0.02	93.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Mth 15 AM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	4	100.0	4	100.0	0.021	10.4	LOS A	0.0	0.0	0.00	0.09	0.00	45.9
2	T1	All MCs	26	36.0	26	36.0	0.021	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	94.6
Approach			31	44.8	31	44.8	0.021	1.4	NA	0.0	0.0	0.00	0.09	0.00	82.5
North: Kidman Way															
8	T1	All MCs	43	56.1	43	56.1	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	88	6.0	88	6.0	0.052	7.7	LOS A	0.2	1.8	0.12	0.63	0.12	71.3
Approach			132	22.4	132	22.4	0.052	5.2	NA	0.2	1.8	0.08	0.42	0.08	78.7
West: Mclennons Bore Road															
10	L2	All MCs	5	100.0	5	100.0	0.012	10.6	LOS A	0.0	0.6	0.18	0.61	0.18	51.6
12	R2	All MCs	4	100.0	4	100.0	0.012	12.4	LOS A	0.0	0.6	0.18	0.61	0.18	50.8
Approach			9	100.0	9	100.0	0.012	11.4	LOS A	0.0	0.6	0.18	0.61	0.18	51.2
All Vehicles			172	30.7	172	30.7	0.052	4.8	NA	0.2	1.8	0.07	0.37	0.07	77.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Mth 15 PM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	4	100.0	4	100.0	0.025	10.4	LOS A	0.0	0.0	0.00	0.08	0.00	46.0
2	T1	All MCs	33	41.9	33	41.9	0.025	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	95.0
Approach			37	48.6	37	48.6	0.025	1.2	NA	0.0	0.0	0.00	0.08	0.00	84.7
North: Kidman Way															
8	T1	All MCs	44	52.4	44	52.4	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	5	100.0	5	100.0	0.005	10.4	LOS A	0.0	0.3	0.16	0.63	0.16	50.7
Approach			49	57.4	49	57.4	0.030	1.1	NA	0.0	0.3	0.02	0.07	0.02	90.6
West: Mclennons Bore Road															
10	L2	All MCs	87	7.2	87	7.2	0.063	8.1	LOS A	0.3	2.0	0.12	0.62	0.12	70.2
12	R2	All MCs	4	100.0	4	100.0	0.063	11.5	LOS A	0.3	2.0	0.12	0.62	0.12	53.0
Approach			92	11.5	92	11.5	0.063	8.3	LOS A	0.3	2.0	0.12	0.62	0.12	69.2
All Vehicles			178	32.0	178	32.0	0.063	4.8	NA	0.3	2.0	0.07	0.35	0.07	77.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Mth 15 AM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	121	0.0	121	0.0	0.065	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	74.4
2	T1	All MCs	38	58.3	38	58.3	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			159	13.9	159	13.9	0.065	6.0	NA	0.0	0.0	0.00	0.50	0.00	79.2
North: Kidman Way															
8	T1	All MCs	46	52.3	46	52.3	0.033	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	98.9
9	R2	All MCs	1	0.0	1	0.0	0.033	7.6	LOS A	0.0	0.1	0.01	0.02	0.01	86.5
Approach			47	51.1	47	51.1	0.033	0.2	NA	0.0	0.1	0.01	0.02	0.01	98.6
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.042	8.0	LOS A	0.2	1.1	0.28	0.62	0.28	73.0
12	R2	All MCs	41	0.0	41	0.0	0.042	8.5	LOS A	0.2	1.1	0.28	0.62	0.28	72.9
Approach			42	0.0	42	0.0	0.042	8.5	LOS A	0.2	1.1	0.28	0.62	0.28	73.0
All Vehicles			248	18.6	248	18.6	0.065	5.3	NA	0.2	1.1	0.05	0.43	0.05	81.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Mth 15 PM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	41	0.0	41	0.0	0.022	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	74.4
2	T1	All MCs	28	51.9	28	51.9	0.019	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			69	21.2	69	21.2	0.022	4.6	NA	0.0	0.0	0.00	0.39	0.00	83.1
North: Kidman Way															
8	T1	All MCs	49	59.6	49	59.6	0.036	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	98.9
9	R2	All MCs	1	0.0	1	0.0	0.036	7.4	LOS A	0.0	0.1	0.01	0.01	0.01	86.5
Approach			51	58.3	51	58.3	0.036	0.2	NA	0.0	0.1	0.01	0.01	0.01	98.6
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.116	7.9	LOS A	0.5	3.4	0.26	0.63	0.26	73.2
12	R2	All MCs	121	0.0	121	0.0	0.116	8.3	LOS A	0.5	3.4	0.26	0.63	0.26	73.1
Approach			122	0.0	122	0.0	0.116	8.3	LOS A	0.5	3.4	0.26	0.63	0.26	73.1
All Vehicles			242	18.3	242	18.3	0.116	5.6	NA	0.5	3.4	0.13	0.43	0.13	80.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Dev Mth 15 AM Kidman Way/DSF Western Access (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Dev 2027 Mth 15 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.001	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	159	13.9	159	13.9	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			160	13.8	160	13.8	0.089	0.0	NA	0.0	0.0	0.00	0.00	0.00	99.7
North: Kidman Way															
8	T1	All MCs	87	27.7	87	27.7	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	8.0	LOS A	0.0	0.0	0.27	0.59	0.27	73.4
Approach			88	27.4	88	27.4	0.053	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.1
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	8.4	LOS A	0.0	0.1	0.32	0.59	0.32	72.5
12	R2	All MCs	1	0.0	1	0.0	0.002	9.5	LOS A	0.0	0.1	0.32	0.59	0.32	67.1
Approach			2	0.0	2	0.0	0.002	9.0	LOS A	0.0	0.1	0.32	0.59	0.32	70.6
All Vehicles			251	18.5	251	18.5	0.089	0.1	NA	0.0	0.1	0.00	0.01	0.00	99.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Dev Mth 15 PM Kidman Way/DSF Western Access (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Dev 2027 Mth 15 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.001	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	72	23.5	72	23.5	0.042	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			73	23.2	73	23.2	0.042	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.4
North: Kidman Way															
8	T1	All MCs	171	17.3	171	17.3	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	7.7	LOS A	0.0	0.0	0.17	0.60	0.17	73.9
Approach			172	17.2	172	17.2	0.097	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.5
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	1	0.0	1	0.0	0.002	8.1	LOS A	0.0	0.1	0.25	0.58	0.25	73.0
12	R2	All MCs	1	0.0	1	0.0	0.002	9.5	LOS A	0.0	0.1	0.25	0.58	0.25	67.8
Approach			2	0.0	2	0.0	0.002	8.8	LOS A	0.0	0.1	0.25	0.58	0.25	71.1
All Vehicles			246	18.8	246	18.8	0.097	0.1	NA	0.0	0.1	0.00	0.01	0.00	99.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Dev Mth 15 AM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Dev 2027 Mth 15 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	119	18.6	119	18.6	0.068	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	7.7	LOS A	0.0	0.0	0.19	0.60	0.19	73.7
Approach			120	18.4	120	18.4	0.068	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.4
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.049	8.0	LOS A	0.2	1.3	0.34	0.64	0.34	72.5
12	R2	All MCs	41	0.0	41	0.0	0.049	9.2	LOS A	0.2	1.3	0.34	0.64	0.34	66.9
Approach			42	0.0	42	0.0	0.049	9.1	LOS A	0.2	1.3	0.34	0.64	0.34	67.2
North: Kidman Way															
1	L2	All MCs	41	0.0	41	0.0	0.022	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	46	52.3	46	52.3	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			87	27.7	87	27.7	0.032	2.2	NA	0.0	0.0	0.00	0.31	0.00	83.3
All Vehicles			249	18.6	249	18.6	0.068	2.4	NA	0.2	1.3	0.06	0.22	0.06	86.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Dev Mth 15 PM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Dev 2027 Mth 15 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	32	53.3	32	53.3	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	8.0	LOS A	0.0	0.0	0.28	0.58	0.28	73.3
Approach			33	51.6	33	51.6	0.022	0.3	NA	0.0	0.0	0.01	0.02	0.01	97.8
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.049	8.4	LOS A	0.2	1.3	0.34	0.64	0.34	72.5
12	R2	All MCs	41	0.0	41	0.0	0.049	9.1	LOS A	0.2	1.3	0.34	0.64	0.34	66.9
Approach			42	0.0	42	0.0	0.049	9.1	LOS A	0.2	1.3	0.34	0.64	0.34	67.2
North: Kidman Way															
1	L2	All MCs	41	0.0	41	0.0	0.022	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	129	22.8	129	22.8	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			171	17.3	171	17.3	0.076	1.1	NA	0.0	0.0	0.00	0.16	0.00	90.6
All Vehicles			245	18.9	245	18.9	0.076	2.4	NA	0.2	1.3	0.06	0.22	0.06	86.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Dev Mth 15 AM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.066	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	87.2
2	T1	All MCs	114	18.5	114	18.5	0.066	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.7
3	R2	All MCs	1	0.0	1	0.0	0.001	7.5	LOS A	0.0	0.0	0.14	0.61	0.14	64.8
Approach			116	18.2	116	18.2	0.066	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.3
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.003	7.3	LOS A	0.0	0.1	0.23	0.58	0.23	67.4
5	T1	All MCs	1	0.0	1	0.0	0.003	7.5	LOS A	0.0	0.1	0.23	0.58	0.23	67.8
6	R2	All MCs	1	0.0	1	0.0	0.003	8.3	LOS A	0.0	0.1	0.23	0.58	0.23	67.3
Approach			3	0.0	3	0.0	0.003	7.7	LOS A	0.0	0.1	0.23	0.58	0.23	67.5
North: Kidman Way															
7	L2	All MCs	1	100.0	1	100.0	0.029	10.4	LOS A	0.0	0.0	0.00	0.02	0.00	43.5
8	T1	All MCs	41	53.8	41	53.8	0.029	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.5
9	R2	All MCs	1	0.0	1	0.0	0.001	7.7	LOS A	0.0	0.0	0.22	0.58	0.22	73.6
Approach			43	53.7	43	53.7	0.029	0.4	NA	0.0	0.0	0.01	0.03	0.01	95.6
West: Liddles Lane															
10	L2	All MCs	1	0.0	1	0.0	0.003	8.3	LOS A	0.0	0.1	0.29	0.59	0.29	73.2
11	T1	All MCs	1	0.0	1	0.0	0.003	8.1	LOS A	0.0	0.1	0.29	0.59	0.29	53.8
12	R2	All MCs	1	0.0	1	0.0	0.003	9.0	LOS A	0.0	0.1	0.29	0.59	0.29	73.1
Approach			3	0.0	3	0.0	0.003	8.5	LOS A	0.0	0.1	0.29	0.59	0.29	66.9
All Vehicles			165	26.8	165	26.8	0.066	0.5	NA	0.0	0.1	0.01	0.04	0.01	96.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Dev Mth 15 PM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027 + Construction Month 15)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.022	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.2
2	T1	All MCs	31	55.2	31	55.2	0.022	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.5
3	R2	All MCs	1	0.0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.24	0.58	0.24	64.2
Approach			33	51.6	33	51.6	0.022	0.5	NA	0.0	0.0	0.01	0.04	0.01	96.8
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.003	7.6	LOS A	0.0	0.1	0.30	0.58	0.30	67.0
5	T1	All MCs	1	0.0	1	0.0	0.003	7.5	LOS A	0.0	0.1	0.30	0.58	0.30	67.4
6	R2	All MCs	1	0.0	1	0.0	0.003	8.4	LOS A	0.0	0.1	0.30	0.58	0.30	66.9
Approach			3	0.0	3	0.0	0.003	7.8	LOS A	0.0	0.1	0.30	0.58	0.30	67.1
North: Kidman Way															
7	L2	All MCs	1	0.0	1	0.0	0.075	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	51.3
8	T1	All MCs	127	22.3	127	22.3	0.075	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.7
9	R2	All MCs	1	0.0	1	0.0	0.001	7.5	LOS A	0.0	0.0	0.11	0.62	0.11	74.2
Approach			129	22.0	129	22.0	0.075	0.1	NA	0.0	0.0	0.00	0.01	0.00	98.9
West: Liddles Lane															
10	L2	All MCs	1	0.0	1	0.0	0.003	8.0	LOS A	0.0	0.1	0.21	0.58	0.21	73.6
11	T1	All MCs	1	0.0	1	0.0	0.003	8.2	LOS A	0.0	0.1	0.21	0.58	0.21	54.1
12	R2	All MCs	1	0.0	1	0.0	0.003	9.0	LOS A	0.0	0.1	0.21	0.58	0.21	73.5
Approach			3	0.0	3	0.0	0.003	8.4	LOS A	0.0	0.1	0.21	0.58	0.21	67.2
All Vehicles			168	26.9	168	26.9	0.075	0.5	NA	0.0	0.1	0.01	0.04	0.01	97.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Cumu Mth 15 AM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	4	100.0	4	100.0	0.028	10.4	LOS A	0.0	0.0	0.00	0.07	0.00	45.9
2	T1	All MCs	35	51.5	35	51.5	0.028	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	94.6
Approach			39	56.8	39	56.8	0.028	1.1	NA	0.0	0.0	0.00	0.07	0.00	84.8
North: Kidman Way															
8	T1	All MCs	177	19.6	177	19.6	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	88	6.0	88	6.0	0.053	7.7	LOS A	0.2	1.8	0.14	0.62	0.14	71.2
Approach			265	15.1	265	15.1	0.102	2.6	NA	0.2	1.8	0.05	0.21	0.05	88.1
West: Mclennons Bore Road															
10	L2	All MCs	5	100.0	5	100.0	0.014	10.7	LOS A	0.1	0.7	0.25	0.60	0.25	50.8
12	R2	All MCs	4	100.0	4	100.0	0.014	14.9	LOS B	0.1	0.7	0.25	0.60	0.25	50.0
Approach			9	100.0	9	100.0	0.014	12.6	LOS A	0.1	0.7	0.25	0.60	0.25	50.4
All Vehicles			314	22.8	314	22.8	0.102	2.7	NA	0.2	1.8	0.05	0.20	0.05	85.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Cumu Mth 15 PM Kidman Way/Mclennons Bore Rd (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	4	100.0	4	100.0	0.097	10.4	LOS A	0.0	0.0	0.00	0.02	0.00	46.9
2	T1	All MCs	166	14.6	166	14.6	0.097	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	99.1
Approach			171	16.7	171	16.7	0.097	0.3	NA	0.0	0.0	0.00	0.02	0.00	96.5
North: Kidman Way															
8	T1	All MCs	53	60.0	53	60.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	5	100.0	5	100.0	0.006	11.4	LOS A	0.0	0.3	0.35	0.62	0.35	50.1
Approach			58	63.6	58	63.6	0.038	1.0	NA	0.0	0.3	0.03	0.06	0.03	91.7
West: Mclennons Bore Road															
10	L2	All MCs	87	7.2	87	7.2	0.073	8.6	LOS A	0.3	2.3	0.29	0.63	0.29	69.3
12	R2	All MCs	4	100.0	4	100.0	0.073	13.9	LOS A	0.3	2.3	0.29	0.63	0.29	52.5
Approach			92	11.5	92	11.5	0.073	8.9	LOS A	0.3	2.3	0.29	0.63	0.29	68.3
All Vehicles			320	23.7	320	23.7	0.097	2.9	NA	0.3	2.3	0.09	0.20	0.09	85.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Cumu Mth 15 AM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	121	0.0	121	0.0	0.065	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	74.4
2	T1	All MCs	46	65.9	46	65.9	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			167	18.2	167	18.2	0.065	5.7	NA	0.0	0.0	0.00	0.48	0.00	80.1
North: Kidman Way															
8	T1	All MCs	180	19.3	180	19.3	0.105	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	99.8
9	R2	All MCs	1	0.0	1	0.0	0.105	7.5	LOS A	0.0	0.1	0.00	0.00	0.00	87.2
Approach			181	19.2	181	19.2	0.105	0.0	NA	0.0	0.1	0.00	0.00	0.00	99.7
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.050	8.0	LOS A	0.2	1.3	0.40	0.67	0.40	72.0
12	R2	All MCs	41	0.0	41	0.0	0.050	9.5	LOS A	0.2	1.3	0.40	0.67	0.40	71.9
Approach			42	0.0	42	0.0	0.050	9.5	LOS A	0.2	1.3	0.40	0.67	0.40	71.9
All Vehicles			391	16.7	391	16.7	0.105	3.5	NA	0.2	1.3	0.05	0.28	0.05	86.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Cumu Mth 15 PM Kidman Way/Cadell Road (south) (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Existing intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	41	0.0	41	0.0	0.022	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	74.4
2	T1	All MCs	162	15.6	162	15.6	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			203	12.4	203	12.4	0.092	1.6	NA	0.0	0.0	0.00	0.13	0.00	93.5
North: Kidman Way															
8	T1	All MCs	58	65.5	58	65.5	0.043	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	98.8
9	R2	All MCs	1	0.0	1	0.0	0.043	7.7	LOS A	0.0	0.1	0.01	0.01	0.01	86.5
Approach			59	64.3	59	64.3	0.043	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.6
West: Cadell Road															
10	L2	All MCs	1	0.0	1	0.0	0.138	8.4	LOS A	0.6	4.0	0.41	0.69	0.41	72.2
12	R2	All MCs	121	0.0	121	0.0	0.138	9.4	LOS A	0.6	4.0	0.41	0.69	0.41	72.1
Approach			122	0.0	122	0.0	0.138	9.4	LOS A	0.6	4.0	0.41	0.69	0.41	72.1
All Vehicles			384	16.4	384	16.4	0.138	3.8	NA	0.6	4.0	0.13	0.29	0.13	86.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Cumu Mth 15 AM Kidman Way/DSF Western Access (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Cumu 2027 Mth 15 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	83	10.1	83	10.1	0.048	4.7	LOS A	0.0	0.0	0.00	0.65	0.00	64.0
2	T1	All MCs	159	13.9	159	13.9	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			242	12.6	242	12.6	0.089	1.6	NA	0.0	0.0	0.00	0.22	0.00	83.7
North: Kidman Way															
8	T1	All MCs	163	16.1	163	16.1	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	58	14.5	58	14.5	0.057	9.1	LOS A	0.2	1.8	0.36	0.66	0.36	67.1
Approach			221	15.7	221	15.7	0.092	2.4	NA	0.2	1.8	0.09	0.17	0.09	83.1
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	8	100.0	8	100.0	0.081	12.0	LOS A	0.3	2.8	0.50	0.74	0.50	50.6
12	R2	All MCs	34	25.0	34	25.0	0.081	13.5	LOS A	0.3	2.8	0.50	0.74	0.50	59.1
Approach			42	40.0	42	40.0	0.081	13.2	LOS A	0.3	2.8	0.50	0.74	0.50	56.0
All Vehicles			505	16.3	505	16.3	0.092	2.9	NA	0.3	2.8	0.08	0.24	0.08	80.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 103 [Cumu Mth 15 PM Kidman Way/DSF Western Access (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Cumu 2027 Mth 15 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	34	25.0	34	25.0	0.021	4.8	LOS A	0.0	0.0	0.00	0.64	0.00	57.8
2	T1	All MCs	147	12.9	147	12.9	0.082	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			181	15.1	181	15.1	0.082	0.9	NA	0.0	0.0	0.00	0.12	0.00	87.9
North: Kidman Way															
8	T1	All MCs	171	17.3	171	17.3	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	8	100.0	8	100.0	0.012	11.8	LOS A	0.0	0.6	0.36	0.65	0.36	50.0
Approach			179	21.2	179	21.2	0.097	0.6	NA	0.0	0.6	0.02	0.03	0.02	91.8
West: Dinawan Solar Farm Western Access															
10	L2	All MCs	58	14.5	58	14.5	0.189	9.0	LOS A	0.8	5.9	0.43	0.68	0.43	65.5
12	R2	All MCs	83	10.1	83	10.1	0.189	11.8	LOS A	0.8	5.9	0.43	0.68	0.43	64.2
Approach			141	11.9	141	11.9	0.189	10.7	LOS A	0.8	5.9	0.43	0.68	0.43	64.9
All Vehicles			501	16.4	501	16.4	0.189	3.5	NA	0.8	5.9	0.13	0.25	0.13	79.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Cumu Mth 15 AM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Cumu 2027 Mth 15 AM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	176	17.4	176	17.4	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	8.1	LOS A	0.0	0.0	0.30	0.58	0.30	73.2
Approach			177	17.3	177	17.3	0.100	0.1	NA	0.0	0.0	0.00	0.00	0.00	99.5
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.098	8.4	LOS A	0.4	2.7	0.47	0.73	0.47	70.4
12	R2	All MCs	66	0.0	66	0.0	0.098	10.7	LOS A	0.4	2.7	0.47	0.73	0.47	63.5
Approach			67	0.0	67	0.0	0.098	10.7	LOS A	0.4	2.7	0.47	0.73	0.47	63.7
North: Kidman Way															
1	L2	All MCs	66	0.0	66	0.0	0.036	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	131	26.6	131	26.6	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			197	17.6	197	17.6	0.079	1.6	NA	0.0	0.0	0.00	0.22	0.00	87.4
All Vehicles			441	14.8	441	14.8	0.100	2.4	NA	0.4	2.7	0.07	0.21	0.07	86.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 104 [Cumu Mth 15 PM Kidman Way/Eastern Site Access (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [Cumu 2027 Mth 15 PM Staggered Right-Left (Network Folder: Staggered Right-Left priority-controlled)]

New right-left staggered intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
8	T1	All MCs	115	23.9	115	23.9	0.068	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	1	0.0	1	0.0	0.001	8.4	LOS A	0.0	0.0	0.35	0.59	0.35	72.9
Approach			116	23.6	116	23.6	0.068	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.3
East: Kidman Way Eastern Site Access															
10	L2	All MCs	1	0.0	1	0.0	0.098	8.7	LOS A	0.4	2.6	0.47	0.73	0.47	70.4
12	R2	All MCs	66	0.0	66	0.0	0.098	10.7	LOS A	0.4	2.6	0.47	0.73	0.47	63.6
Approach			67	0.0	67	0.0	0.098	10.6	LOS A	0.4	2.6	0.47	0.73	0.47	63.8
North: Kidman Way															
1	L2	All MCs	66	0.0	66	0.0	0.036	4.7	LOS A	0.0	0.0	0.00	0.66	0.00	70.2
2	T1	All MCs	187	20.2	187	20.2	0.109	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
Approach			254	14.9	254	14.9	0.109	1.2	NA	0.0	0.0	0.00	0.17	0.00	89.9
All Vehicles			437	14.9	437	14.9	0.109	2.4	NA	0.4	2.6	0.07	0.21	0.07	86.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Cumu Mth 15 AM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	14	0.0	14	0.0	0.105	7.8	LOS A	0.0	0.0	0.00	0.05	0.00	86.0
2	T1	All MCs	172	17.2	172	17.2	0.105	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	98.1
3	R2	All MCs	1	0.0	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.15	0.60	0.15	64.7
Approach			186	15.8	186	15.8	0.105	0.6	NA	0.0	0.0	0.00	0.05	0.00	96.9
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.004	7.4	LOS A	0.0	0.1	0.31	0.57	0.31	65.8
5	T1	All MCs	1	0.0	1	0.0	0.004	8.8	LOS A	0.0	0.1	0.31	0.57	0.31	66.1
6	R2	All MCs	1	0.0	1	0.0	0.004	9.8	LOS A	0.0	0.1	0.31	0.57	0.31	65.7
Approach			3	0.0	3	0.0	0.004	8.7	LOS A	0.0	0.1	0.31	0.57	0.31	65.9
North: Kidman Way															
7	L2	All MCs	1	100.0	1	100.0	0.037	10.4	LOS A	0.0	0.0	0.00	0.01	0.00	43.5
8	T1	All MCs	49	61.7	49	61.7	0.037	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	98.5
9	R2	All MCs	76	2.8	76	2.8	0.051	8.1	LOS A	0.2	1.6	0.31	0.63	0.31	71.5
Approach			126	26.7	126	26.7	0.051	5.0	NA	0.2	1.6	0.18	0.38	0.18	79.8
West: Liddles Lane															
10	L2	All MCs	1	0.0	1	0.0	0.004	8.5	LOS A	0.0	0.1	0.40	0.60	0.40	72.0
11	T1	All MCs	1	0.0	1	0.0	0.004	9.4	LOS A	0.0	0.1	0.40	0.60	0.40	52.9
12	R2	All MCs	1	0.0	1	0.0	0.004	10.5	LOS A	0.0	0.1	0.40	0.60	0.40	71.9
Approach			3	0.0	3	0.0	0.004	9.5	LOS A	0.0	0.1	0.40	0.60	0.40	65.8
All Vehicles			319	19.8	319	19.8	0.105	2.5	NA	0.2	1.6	0.08	0.19	0.08	88.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 105 [Cumu Mth 15 PM Kidman Way/Bundure Rd/Liddles Ln (Site Folder: Baseline 2027 + Construction Month 15 + Cumulative)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Upgraded intersection
Site Category: (None)
Give-Way (Two-Way)

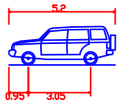
Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kidman Way															
1	L2	All MCs	1	0.0	1	0.0	0.029	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.2
2	T1	All MCs	39	64.9	39	64.9	0.029	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.5
3	R2	All MCs	1	0.0	1	0.0	0.001	8.0	LOS A	0.0	0.0	0.30	0.57	0.30	63.9
Approach			41	61.5	41	61.5	0.029	0.4	NA	0.0	0.0	0.01	0.03	0.01	97.2
East: Bundure Road															
4	L2	All MCs	1	0.0	1	0.0	0.004	7.9	LOS A	0.0	0.1	0.39	0.60	0.39	65.8
5	T1	All MCs	1	0.0	1	0.0	0.004	8.1	LOS A	0.0	0.1	0.39	0.60	0.39	66.2
6	R2	All MCs	1	0.0	1	0.0	0.004	9.9	LOS A	0.0	0.1	0.39	0.60	0.39	65.7
Approach			3	0.0	3	0.0	0.004	8.6	LOS A	0.0	0.1	0.39	0.60	0.39	65.9
North: Kidman Way															
7	L2	All MCs	1	0.0	1	0.0	0.108	7.8	LOS A	0.0	0.0	0.00	0.00	0.00	51.3
8	T1	All MCs	185	19.9	185	19.9	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
9	R2	All MCs	1	0.0	1	0.0	0.001	7.5	LOS A	0.0	0.0	0.13	0.61	0.13	74.1
Approach			187	19.7	187	19.7	0.108	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.2
West: Liddles Lane															
10	L2	All MCs	77	2.7	77	2.7	0.083	8.1	LOS A	0.3	2.2	0.16	0.61	0.16	71.8
11	T1	All MCs	1	0.0	1	0.0	0.083	9.0	LOS A	0.3	2.2	0.16	0.61	0.16	54.4
12	R2	All MCs	14	0.0	14	0.0	0.083	10.1	LOS A	0.3	2.2	0.16	0.61	0.16	72.7
Approach			92	2.3	92	2.3	0.083	8.4	LOS A	0.3	2.2	0.16	0.61	0.16	71.7
All Vehicles			323	19.9	323	19.9	0.108	2.6	NA	0.3	2.2	0.05	0.19	0.05	89.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

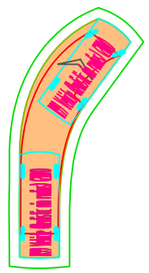
Attachment D
Swept path drawings

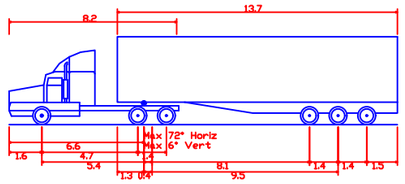
EMM
creating opportunities



B99 Vehicle (Realistic min radius) (2004)

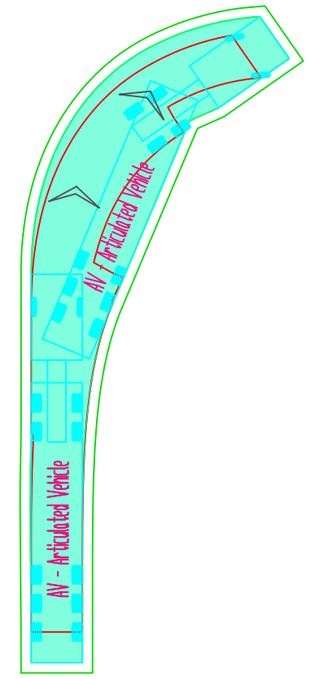
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

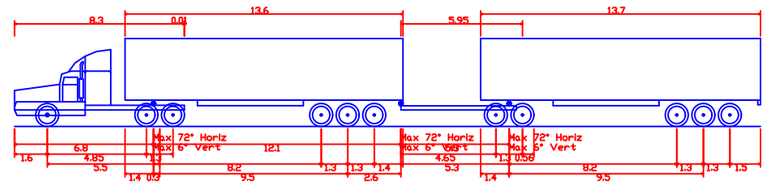




AV - Articulated Vehicle

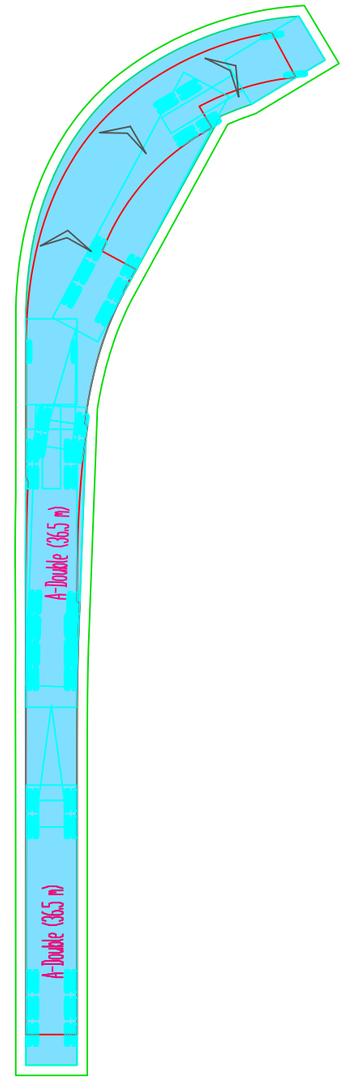
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

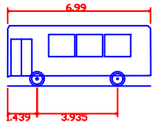




A-Double (36.5 m)

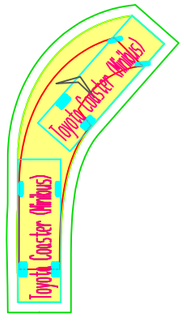
Overall Length	36.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

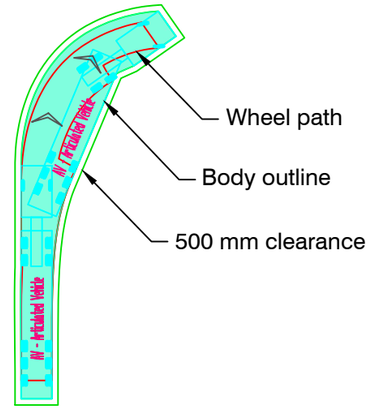




Toyota Coaster (Minibus)

Overall Length	6.990m
Overall Width	2.095m
Overall Body Height	2.945m
Min Body Ground Clearance	0.437m
Track Width	1.990m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	7.200m





COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

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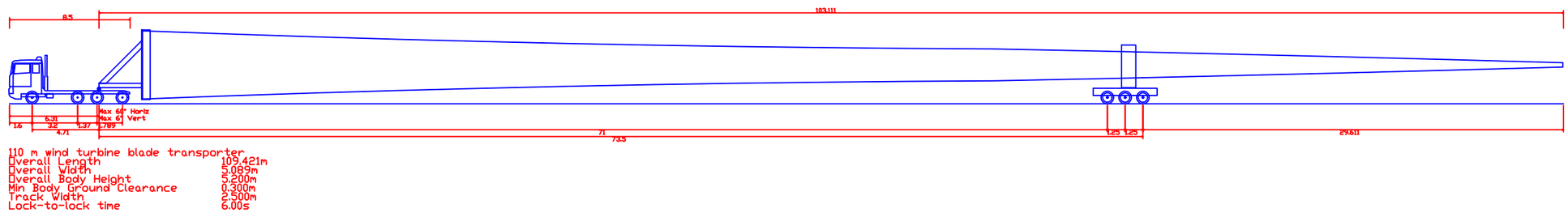
4	21/05/24	FOR INFORMATION	JM	AU
3	17/05/24	FOR INFORMATION	JM	AU
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Vehicle specifications
Light vehicles: B99 and minibus
Heavy vehicles: 19 m semi-trailer and 36.5 m A-double

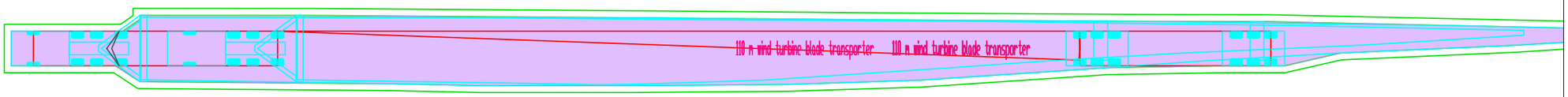
CLIENT:	Spark Renewables
DRG. #:	EMM-SP1
PROJECT #:	E220305
SCALE:	1:300

REV: 4



110 m wind turbine blade transporter

Overall Length	109.421m
Overall Width	5.089m
Overall Body Height	5.200m
Min Body Ground Clearance	0.300m
Track Width	2.500m
Lock-to-lock time	6.00s



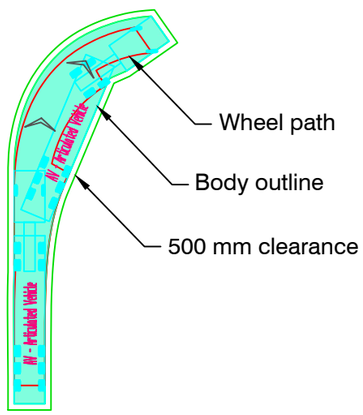
COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary



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4	21/05/24	FOR INFORMATION	JM	AU					
3	17/05/24	FOR INFORMATION	JM	AU					
2	16/05/24	FOR INFORMATION	JM	AU					
1	15/05/24	FOR INFORMATION	JM	AU					

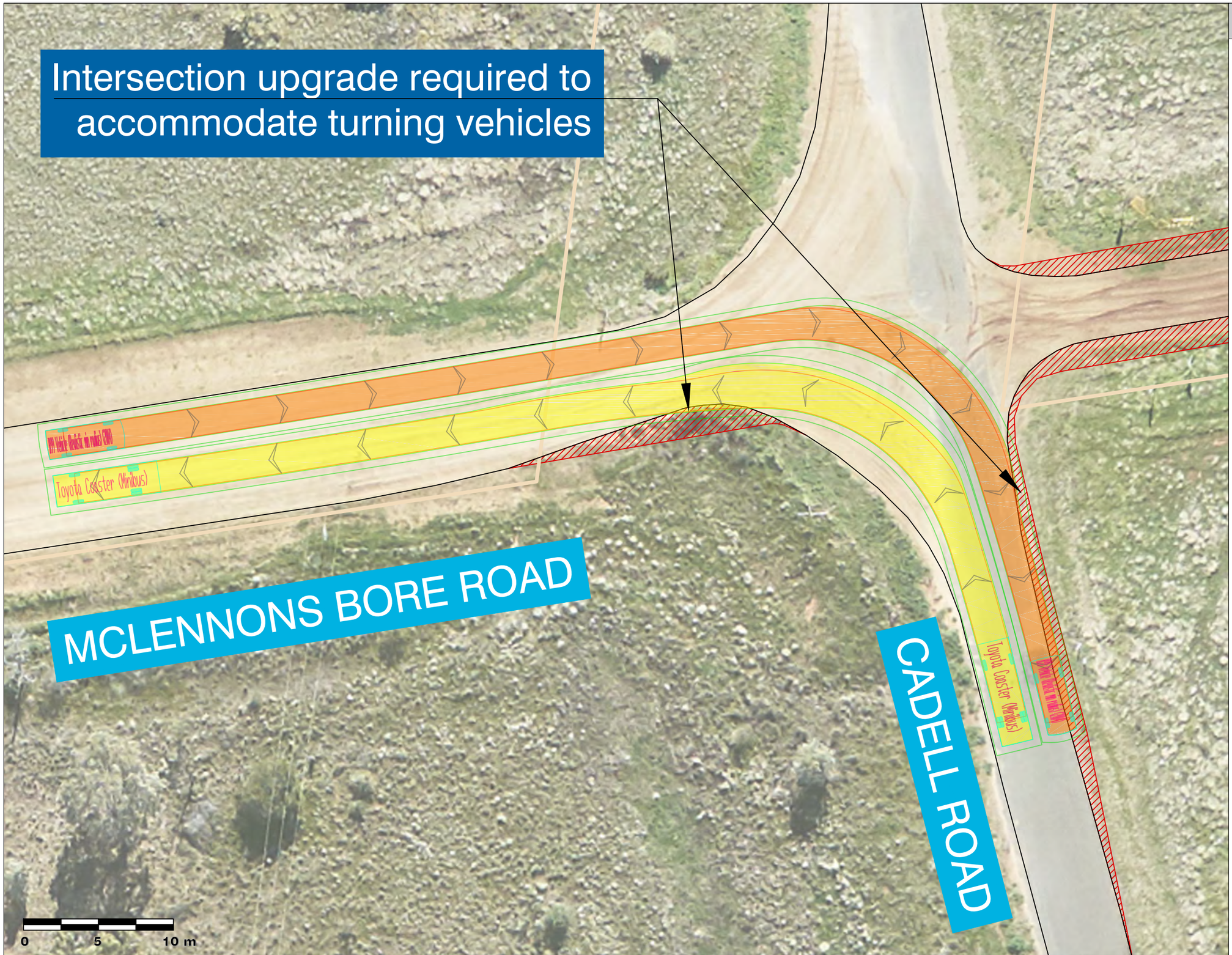
PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Vehicle specifications
110 m long OSOM vehicle carrying
100 m long wind turbine blade

CLIENT:	Spark Renewables
DRG. #:	EMM-SP2
PROJECT #:	E220305
SCALE:	1:350

REV: 4

Intersection upgrade required to accommodate turning vehicles



COMMENTS | A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for LV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°00'11.8"S 145°46'35.9"E
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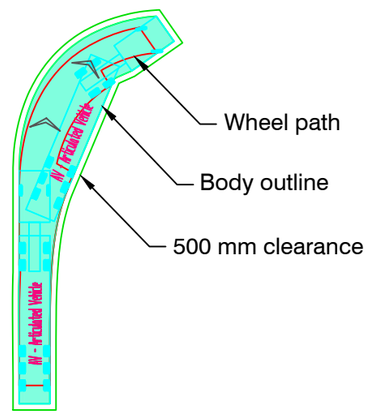

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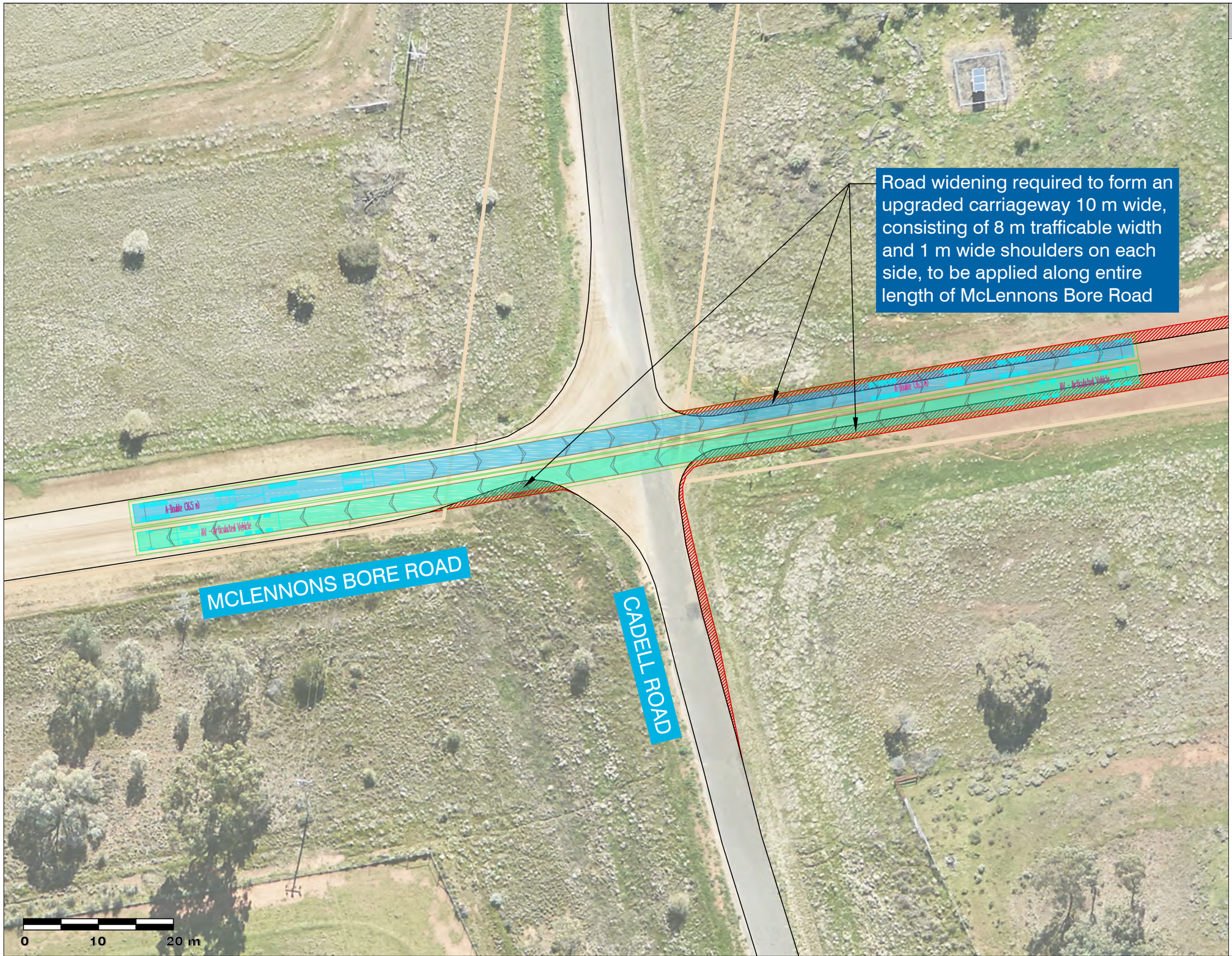
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Light vehicle turning swept path Cadell Road/Mclennons Bore Road, Gala Vale, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-001
PROJECT #:	E220305
SCALE:	1:250

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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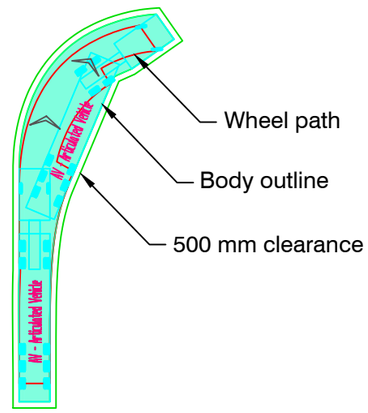

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4	21/05/24	FOR INFORMATION	JM	AU					
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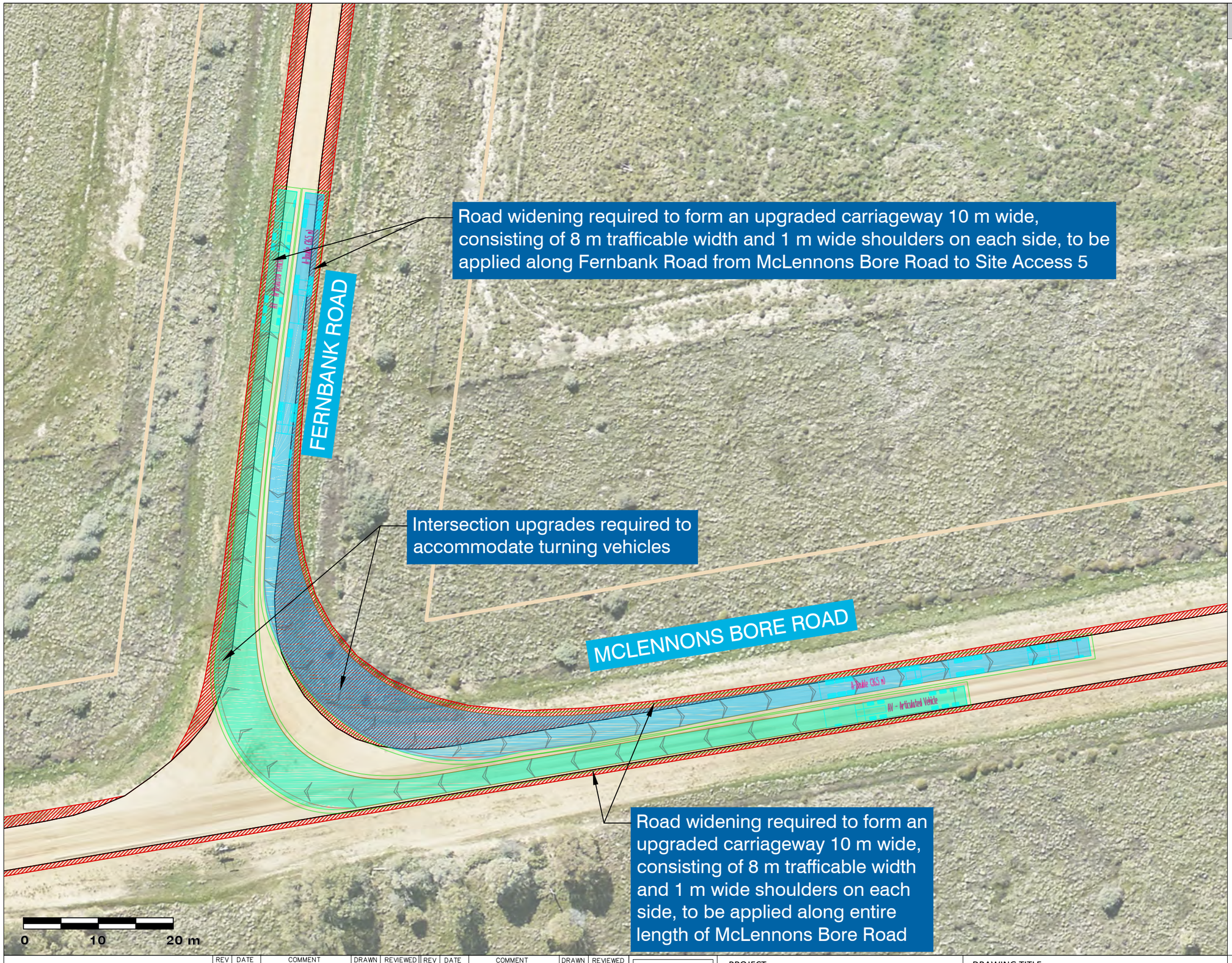
2	16/05/24	FOR INFORMATION	JM	AU					
1	15/05/24	FOR INFORMATION	JM	AU					

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle through swept path
Cadell Road/Mclennons Bore Road,
Gala Vale, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-002
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

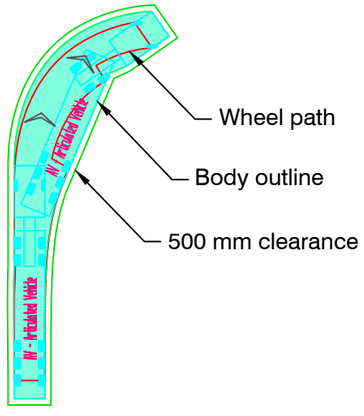
A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°01'10.7"S 145°39'00.3"E
maps.app.goo.gl/tGESPp91aWh6P7ZZ7



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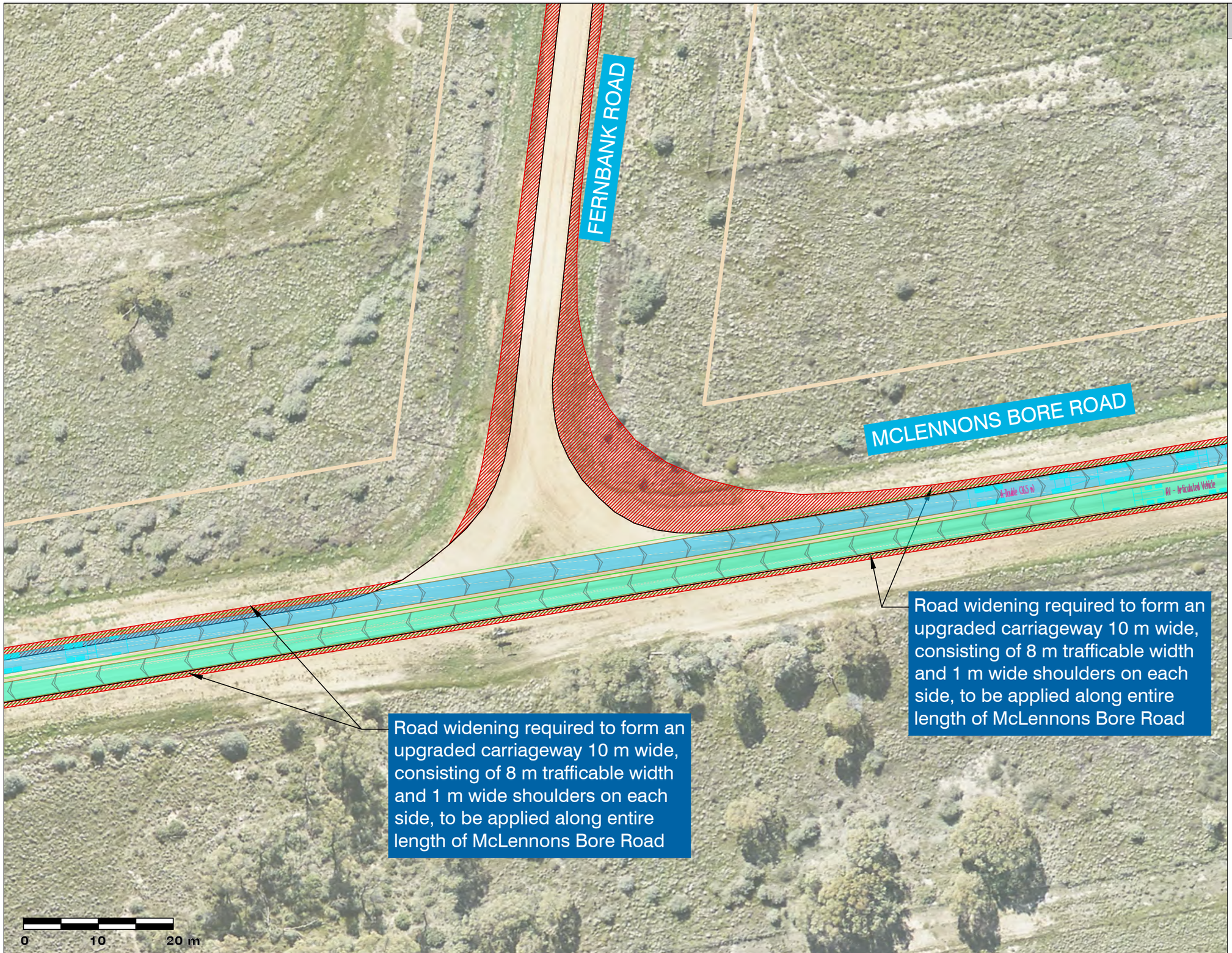
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path
Mclennons Bore Road/Fernbank Road,
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-003
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS | A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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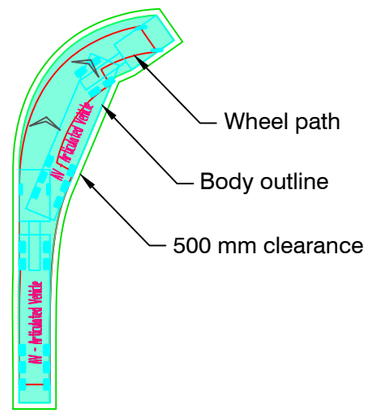

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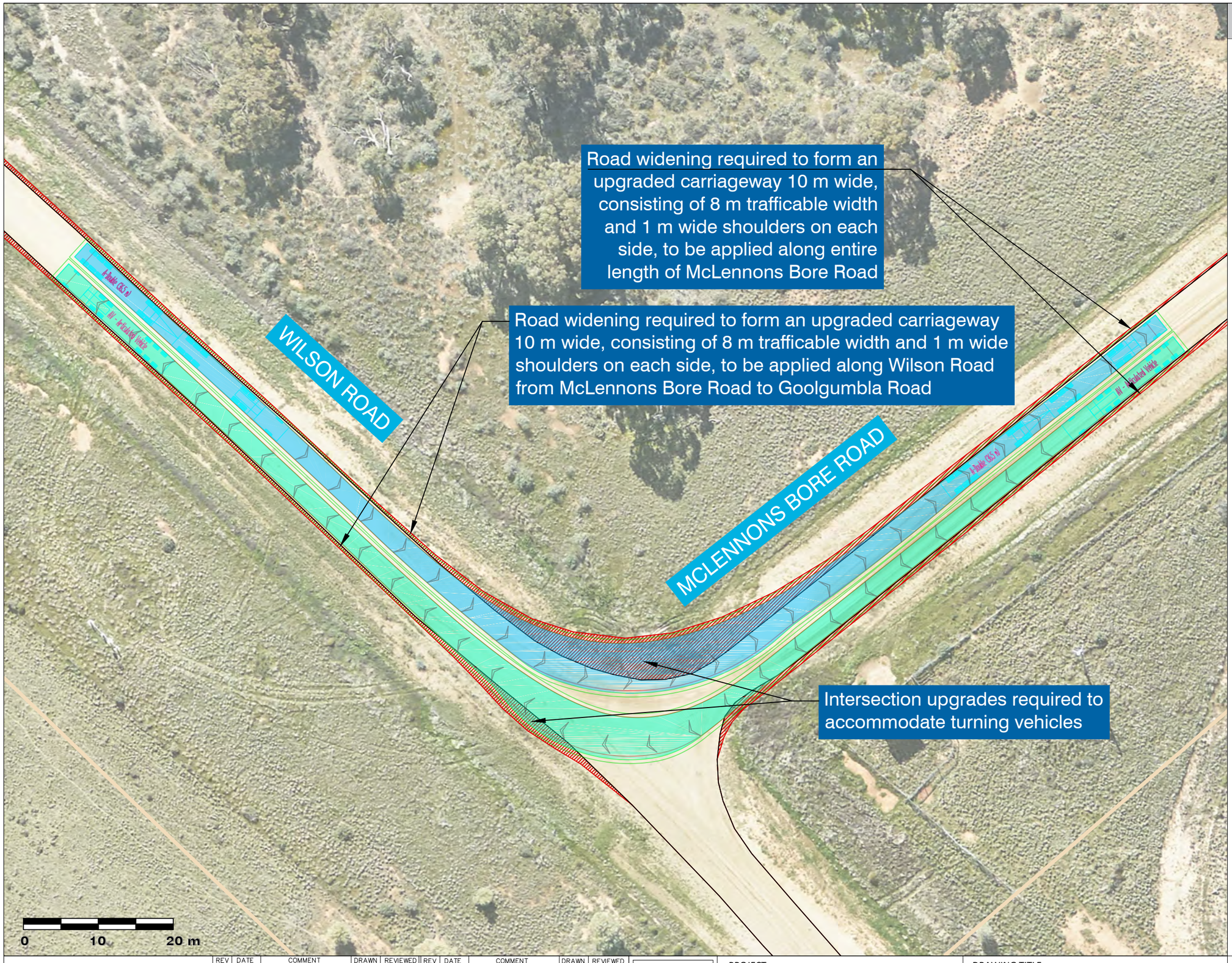
3	17/05/24	FOR INFORMATION	JM	AU
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle through swept path Mclennons Bore Road/Fernbank Road, Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-004
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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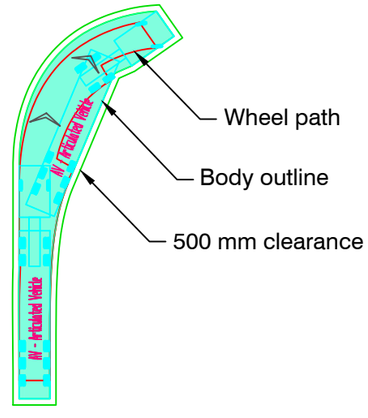

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3	17/05/24	FOR INFORMATION	JM	AU
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path
Wilson Road/Mclennons Bore Road,
Jerilderie, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-005
PROJECT #:	E220305
SCALE:	1:500

REV: 4

Road widening required to form an upgraded carriageway 10 m wide, consisting of 8 m trafficable width and 1 m wide shoulders on each side, to be applied along Wilson Road from McLennons Bore Road to Goolgumbla Road

WILSON ROAD

MABINS WELL ROAD

0 10 20 m

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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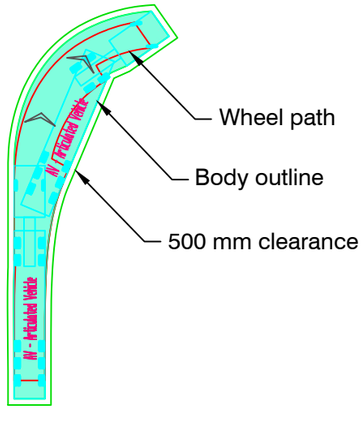

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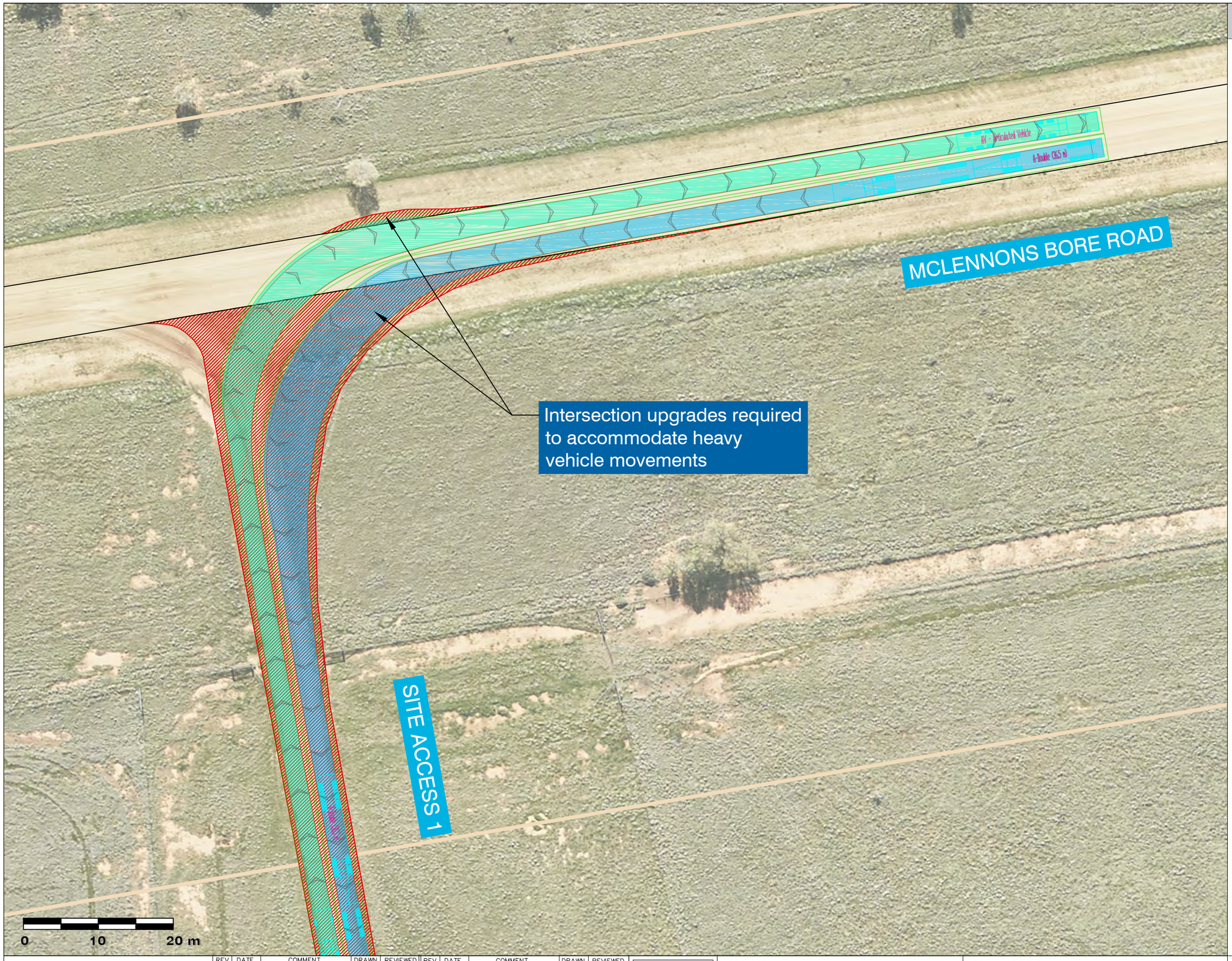
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle through swept path Wilson Road/Mabins Well Road, Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-006
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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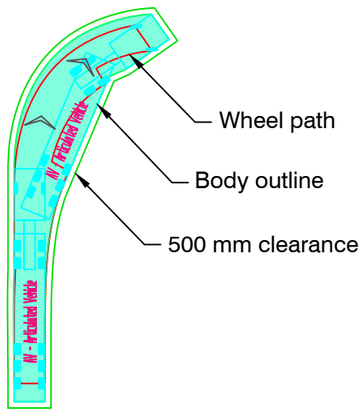

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2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path
Mclennons Bore Road/Site Access 1,
Gala Vale, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-011
PROJECT #:	E220305
SCALE:	1:500

REV: 4

MCLENNONS BORE ROAD

Intersection upgrades required to accommodate heavy vehicle movements

Additional hardstand required for OSOM movements

SITE ACCESS 1

0 10 20 m

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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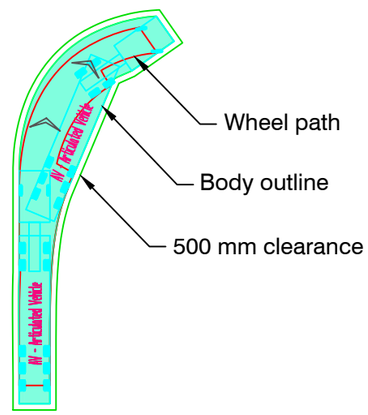

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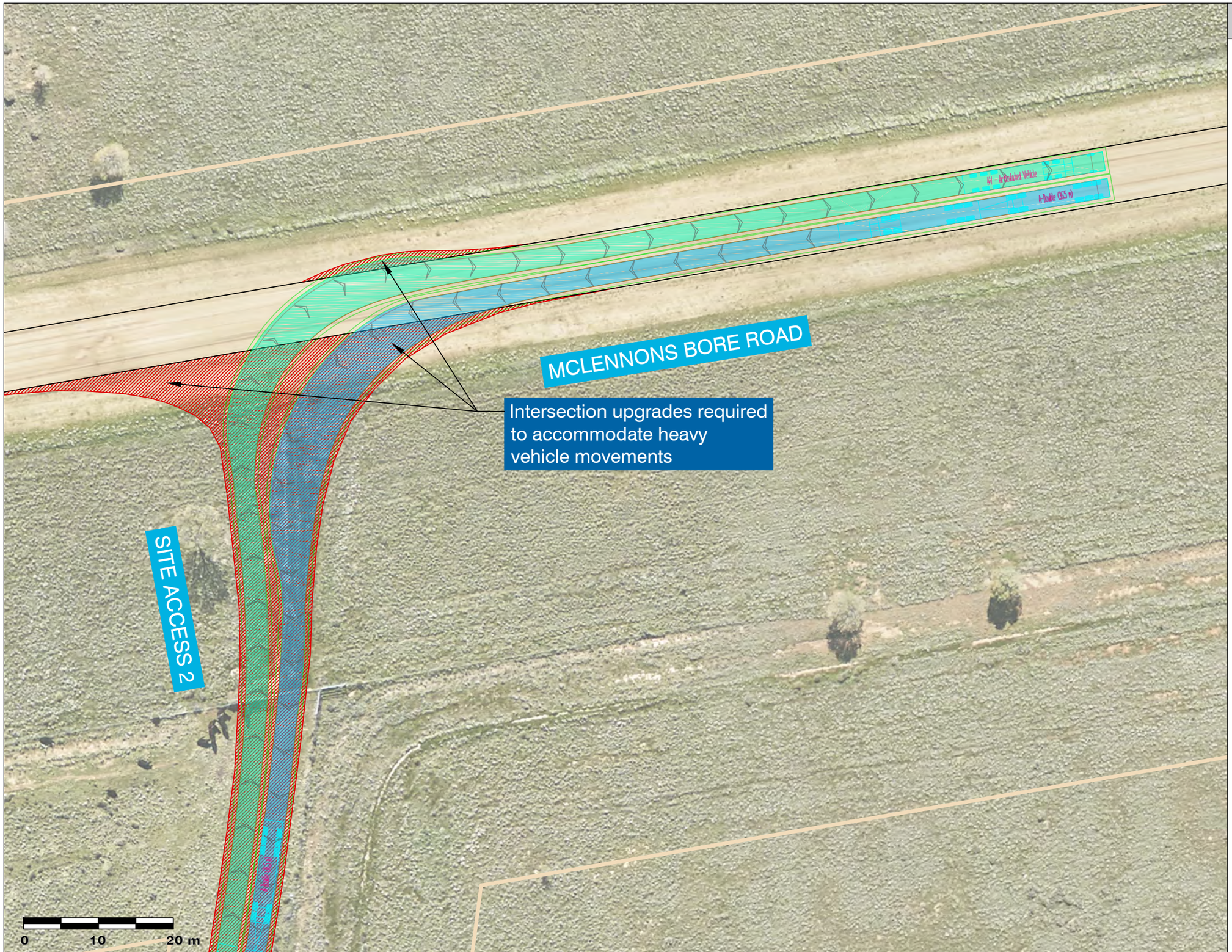
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Mclennons Bore Road/Site Access 1,
Gala Vale, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-111
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS | A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°01'06.9"S 145°39'28.5"E
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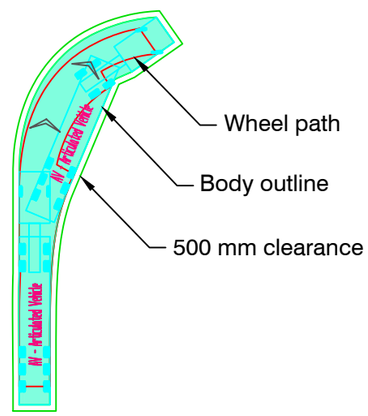

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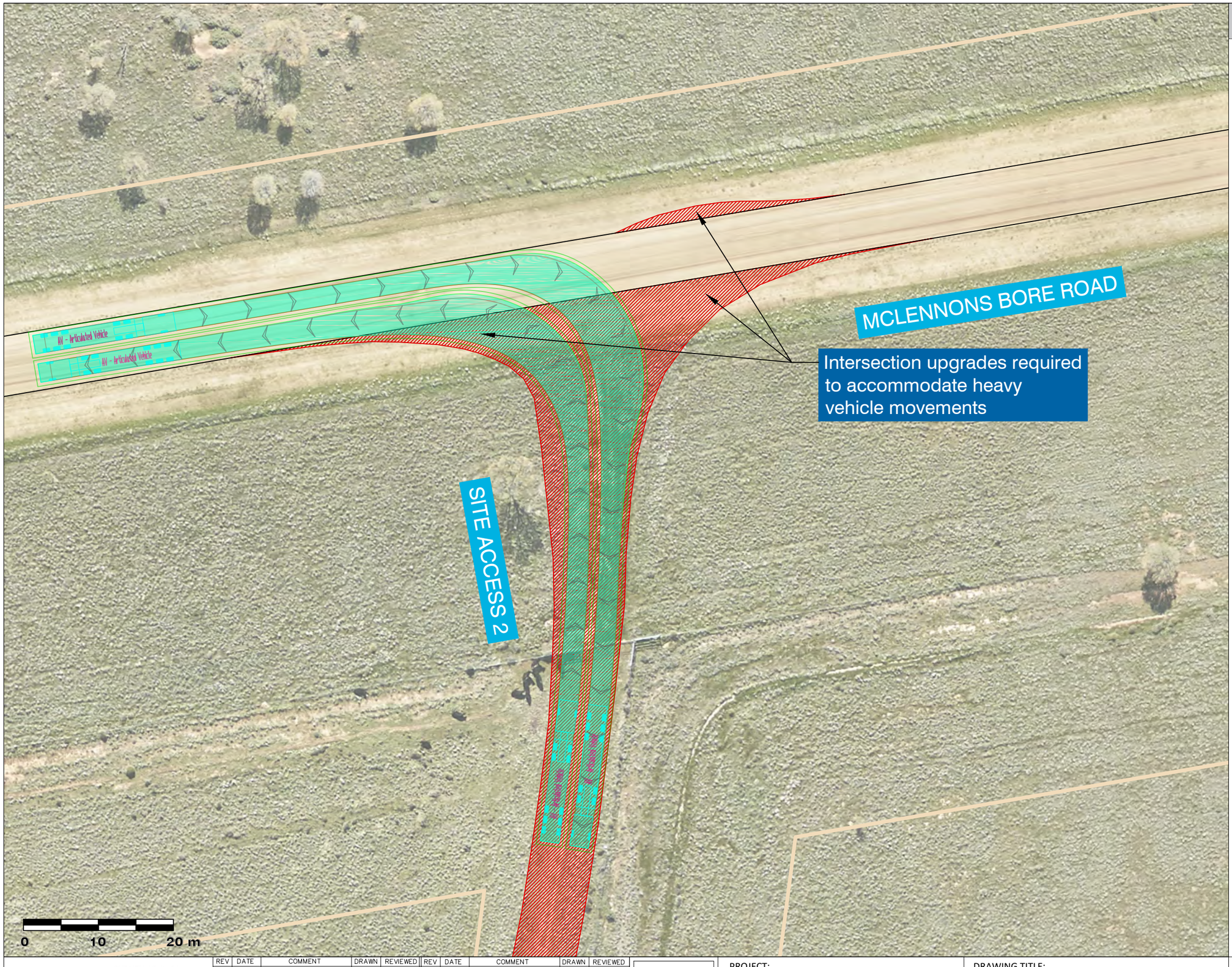
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle turning swept path external movements
Mclennons Bore Road/Site Access 2, Argoon, NSW

CLIENT: Spark Renewables
DRG. #: EMM-021
PROJECT #: E220305
SCALE: 1:500

REV: 4



COMMENTS A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°01'06.9"S 145°39'28.5"E
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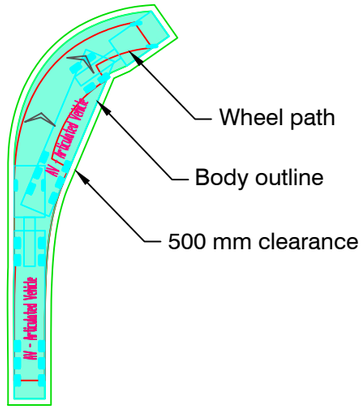

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3	17/05/24	FOR INFORMATION	JM	AU
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle turning swept path internal movements
Mclennons Bore Road/Site Access 2, Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-022
PROJECT #:	E220305
SCALE:	1:500

REV: 4

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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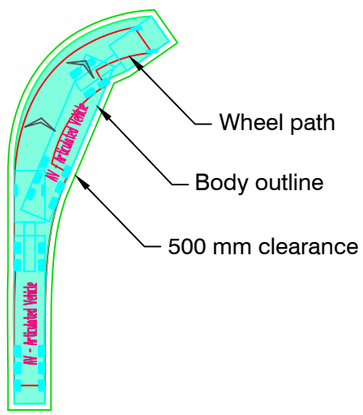

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2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Mclennons Bore Road/Site Access 2,
Argoon, NSW

CLIENT: Spark Renewables
DRG. #: EMM-121
PROJECT #: E220305
SCALE: 1:500

REV: 4

Give way signs to be installed facing east and west approaches

SITE ACCESS 3

Trees to be potentially removed or trimmed

Intersection upgrades required to accommodate heavy vehicle movements

Road widening required to form an upgraded carriageway 10 m wide, consisting of 8 m trafficable width and 1 m wide shoulders on each side, to be applied along Fernbank Road from McLennons Bore Road to Site Access 5

FERNBANK ROAD

0 10 20 m

COMMENTS A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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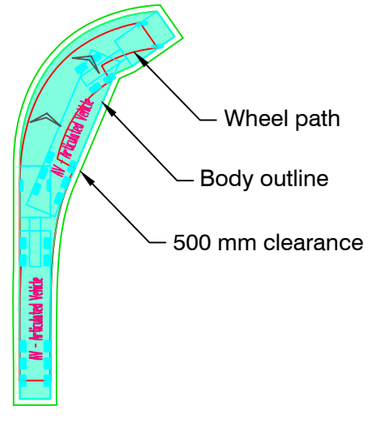
maps.app.goo.gl/1H3yewYRwiKBx9qD9



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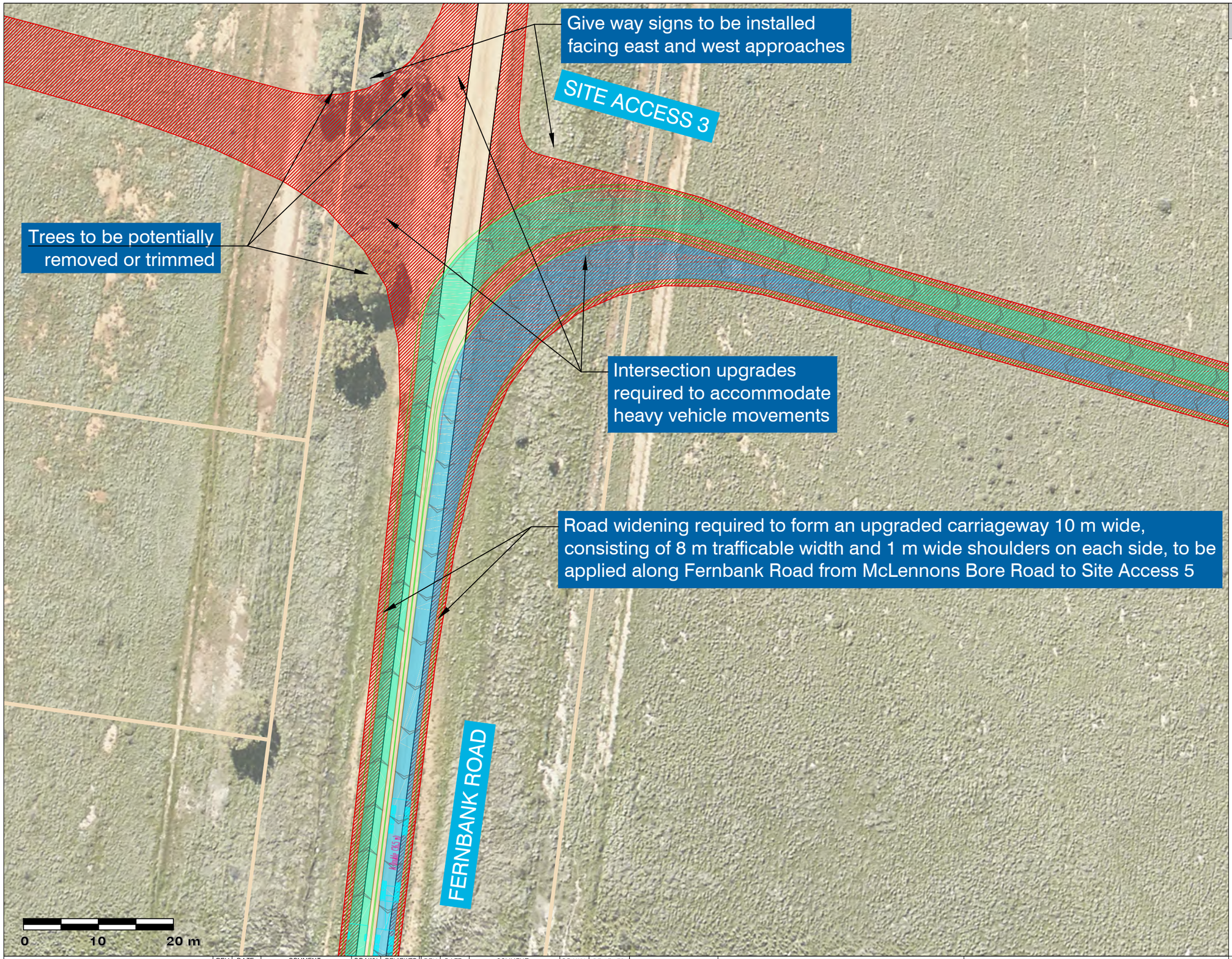
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle turning swept path external movements
Fernbank Road/Site Access 3 (west), Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-031
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°00'44.2"S 145°39'04.7"E
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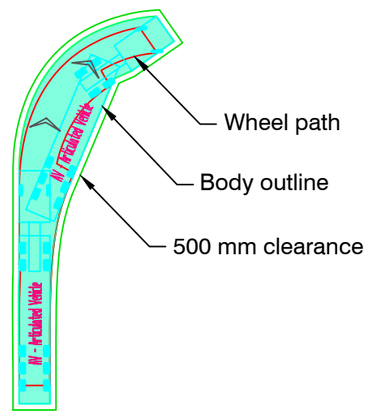

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2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT: Dinawan Energy Hub - Wind Farm

DRAWING TITLE: Heavy vehicle turning swept path external movements
Fernbank Road/Site Access 3 (east), Argoon, NSW

CLIENT: Spark Renewables
DRG. #: EMM-032
PROJECT #: E220305
SCALE: 1:500

REV: 4

Road widening required to form an upgraded carriageway 10 m wide, consisting of 8 m trafficable width and 1 m wide shoulders on each side, to be applied along Fernbank Road from McLennons Bore Road to Site Access 5

FERNBANK ROAD

Give way signs to be installed facing east and west approaches

SITE ACCESS 3

Trees to be potentially removed or trimmed

Intersection upgrades required to accommodate heavy vehicle movements

0 10 20 m

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
35°00'44.2"S 145°39'04.7"E
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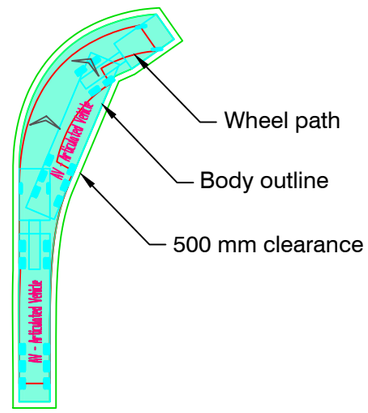

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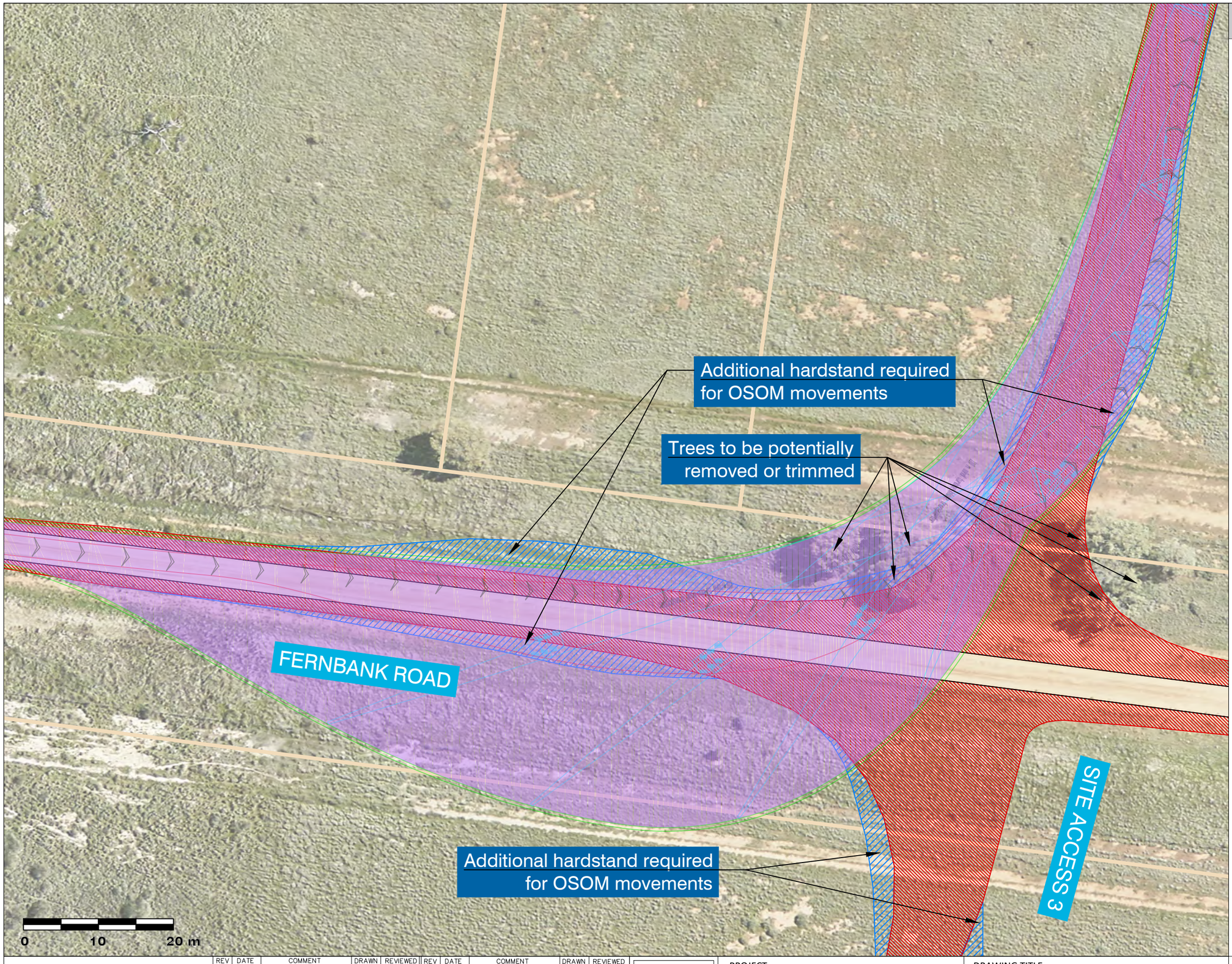
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path internal movements
Fernbank Road/Site Access 3 (west), Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-033
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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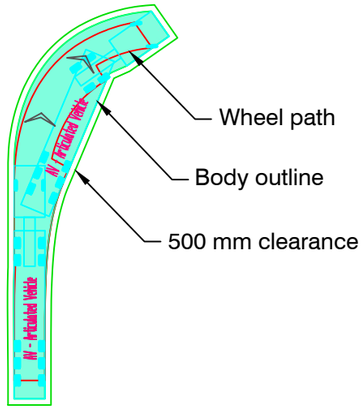

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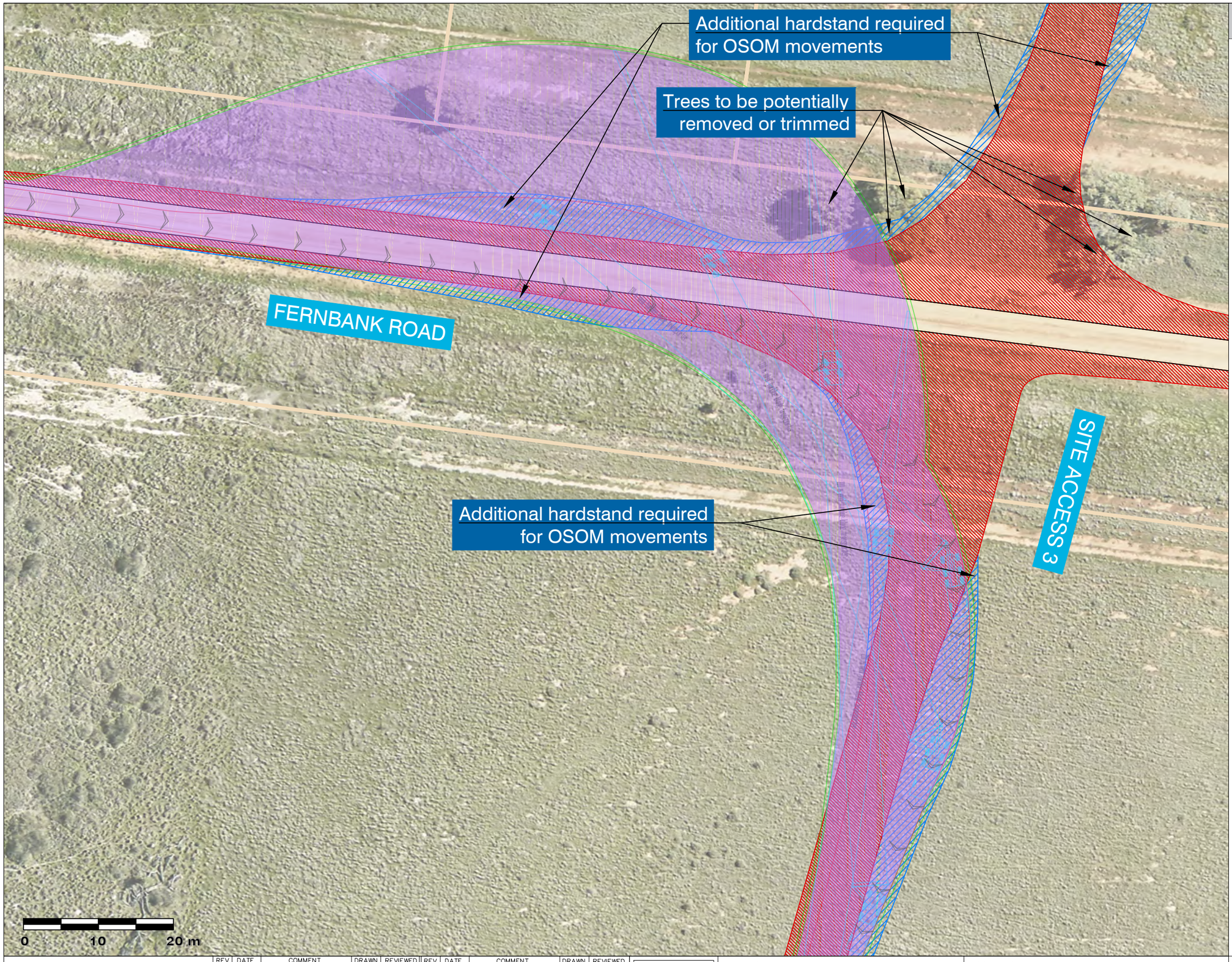
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Fernbank Road/Site Access 3 (west),
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-131
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS | A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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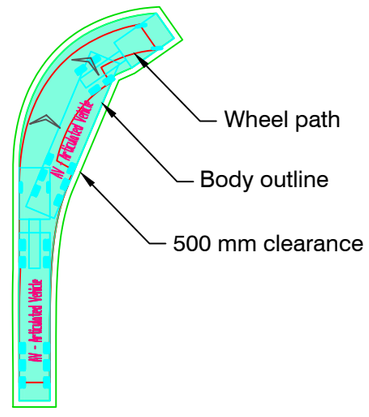

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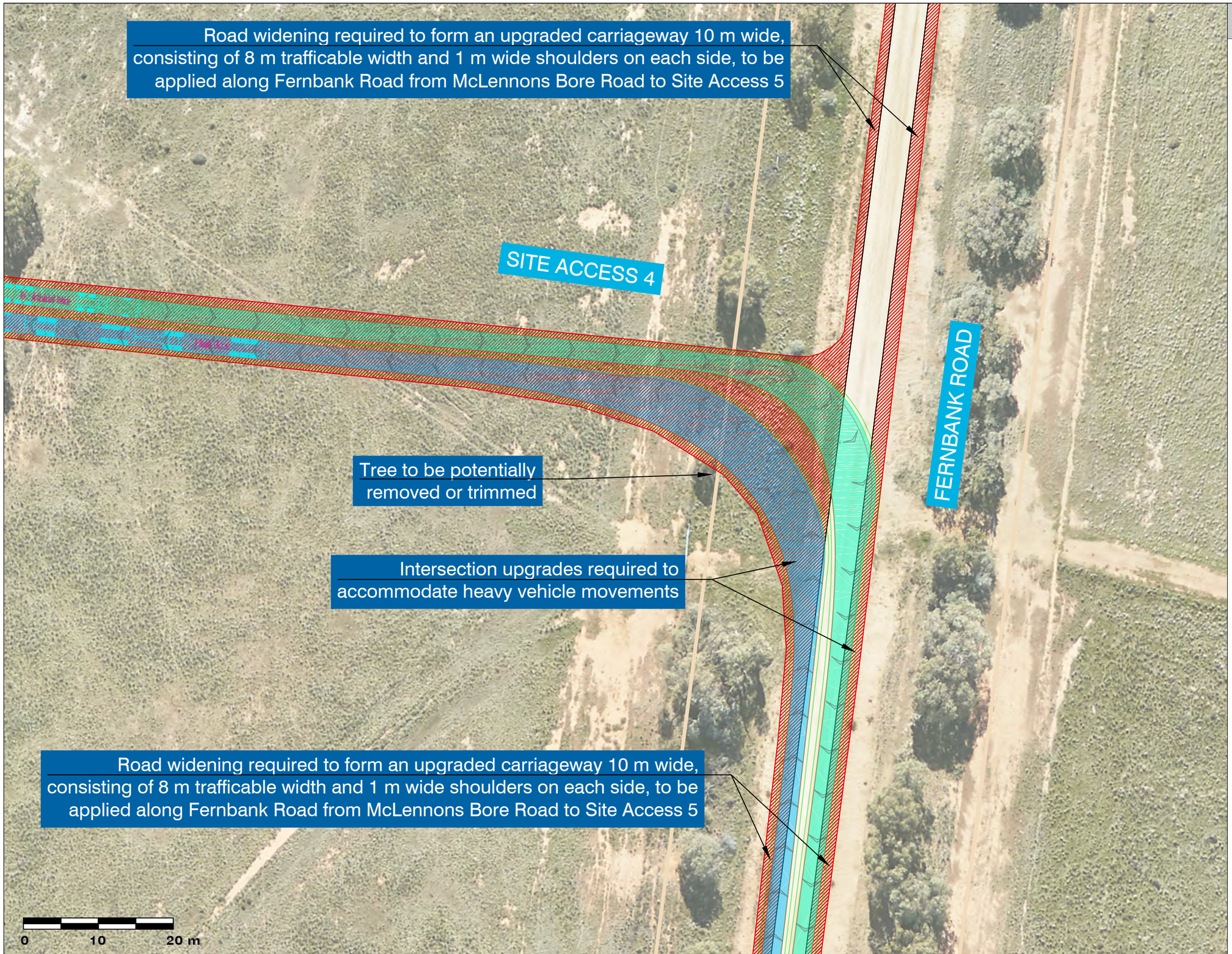
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Fernbank Road/Site Access 3 (east),
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-132
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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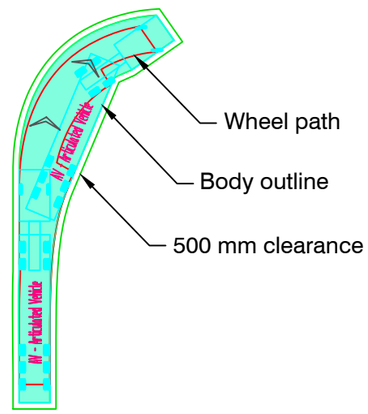

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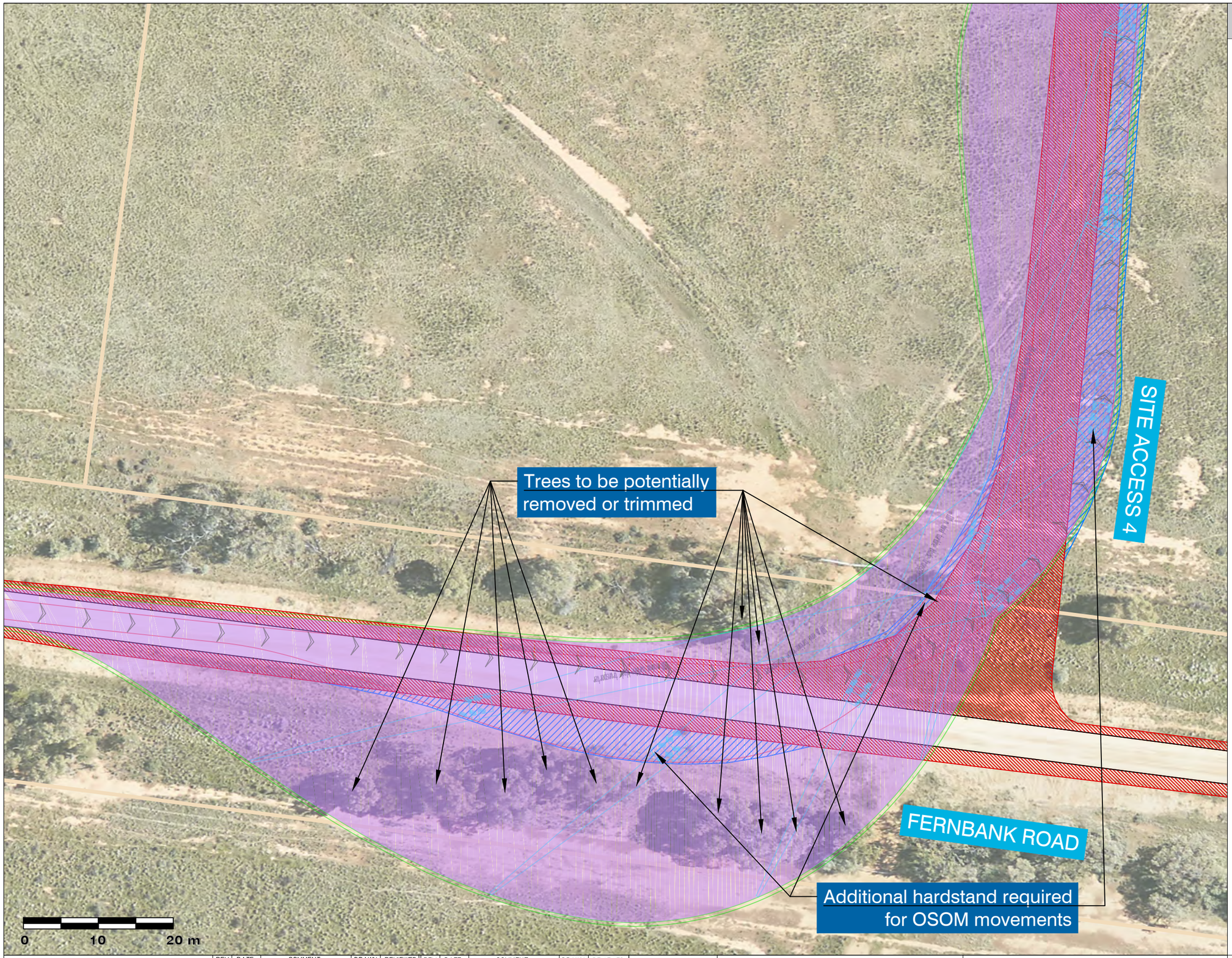
2	16/05/24	FOR INFORMATION	JM	AU					
1	15/05/24	FOR INFORMATION	JM	AU					

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path
Fernbank Road/Site Access 4,
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-041
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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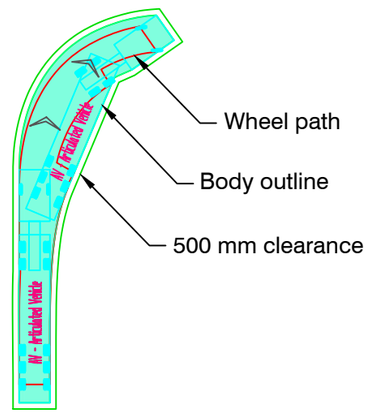

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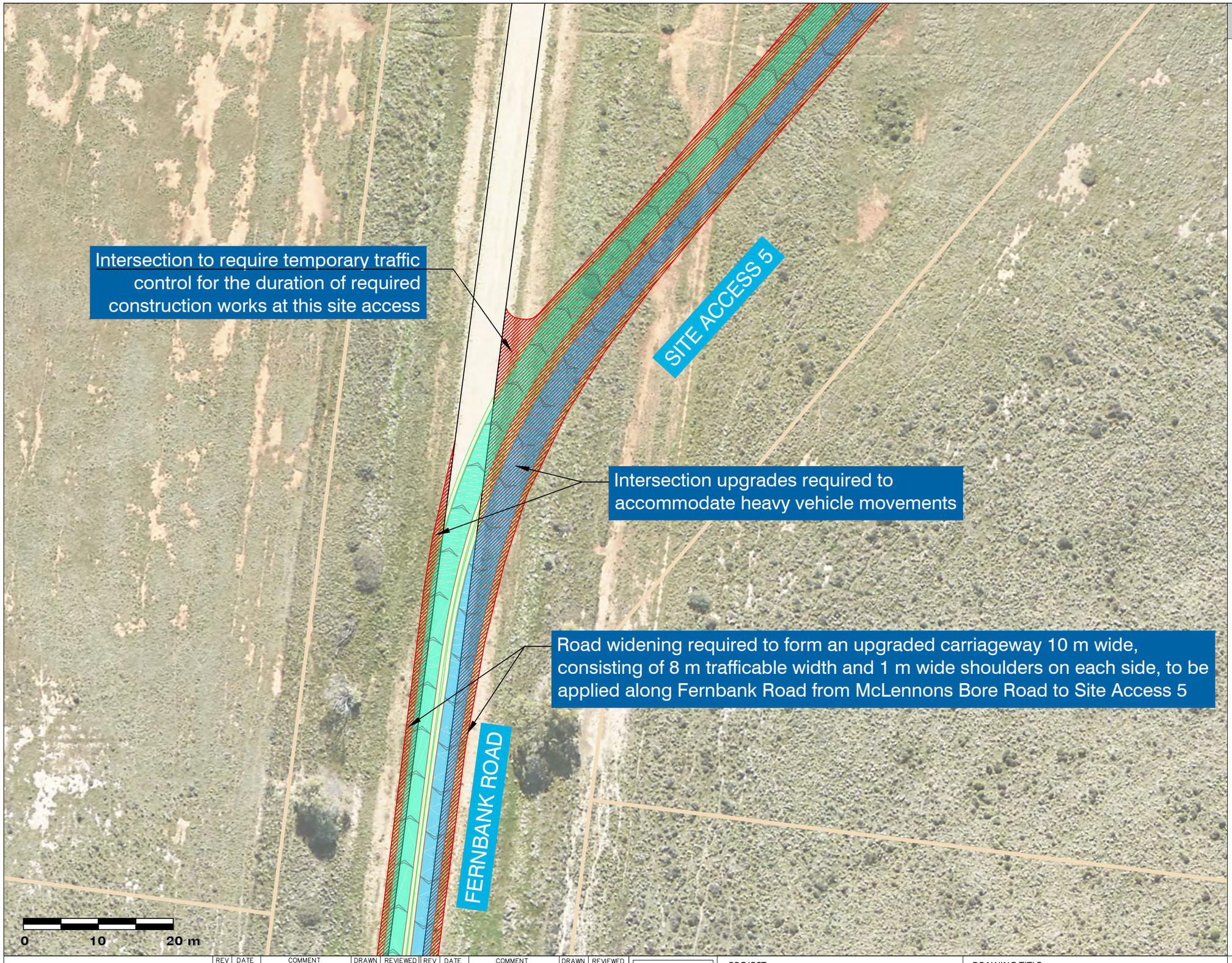
2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Fernbank Road/Site Access 4,
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-141
PROJECT #:	E220305
SCALE:	1:500

REV: 4



COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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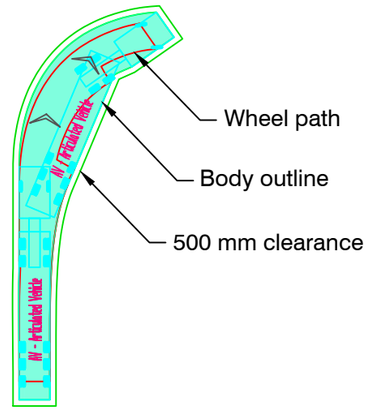

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2	16/05/24	FOR INFORMATION	JM	AU
1	15/05/24	FOR INFORMATION	JM	AU

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Heavy vehicle turning swept path
Fernbank Road/Site Access 5,
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-051
PROJECT #:	E220305
SCALE:	1:500

REV: 4

FERNBANK ROAD

SITE ACCESS 5

0 10 20 m

COMMENTS

A3

Swept paths
- Wheel path
- Body outline
- 500 mm clearance

Roads
- Existing road boundary
- Road upgrades for HV
- Road upgrades for OSOM

Boundaries
- Cadastral boundary

Location
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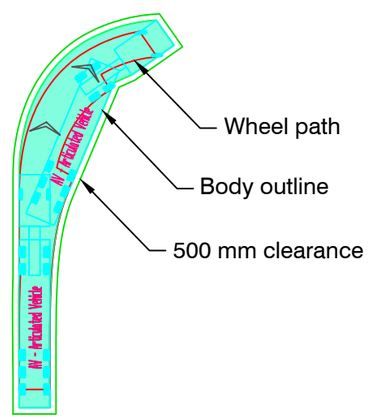

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1	15/05/24	FOR INFORMATION	JM	AU					

PROJECT:
Dinawan Energy Hub - Wind Farm

DRAWING TITLE:
Wind OSOM swept path
Fernbank Road/Site Access 5,
Argoon, NSW

CLIENT:	Spark Renewables
DRG. #:	EMM-151
PROJECT #:	E220305
SCALE:	1:500

REV: 4

Attachment E

OSOM route assessment

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REX J ANDREWS
ENGINEERED TRANSPORTATION

ROUTE STUDY:

PROJECT: DINAWAN ENERGY HUB WINDFARM
EX PORT OF NEWCASTLE
BLADE SIZE: 100 METRE

05/10/2023 REV 00

Rev.	Date	Change	Responsible	Checked
00	07/08/23	Route Assessed	W Andrews	✓
00	11/09/23	Report Compiled	E Novak	✓
00	05/10/23	Report Completed	W Andrews	✓

Index:

1.0 Introduction

Spark Renewables are in the early stages of investigating a potential windfarm as part of the Dinawan Energy Hub in the Southwest Renewable Energy Zone in Southwestern NSW.
This study is to understand the transport route constraints for the components listed in this report and assist in planning of the windfarm layout.
This document describes observations and previous experience on sections of the route and explains the Transport of Wind turbine equipment from Port of Newcastle to Dinawan Windfarm by Rex J Andrews.
This study is based on a proposed 100 Metre blade with a hub height of up to 200 metres.

The Route survey was conducted on 07/08/2023.

2.0 Evaluation

1	No Cost
2	Some Work
3	Moderate Amount of Work
4	Extreme Amount of Work

(Mark below boxes with an X)

		1	2	3	4
A	Harbour		X		
B	Road Modification				X
C	Road Furnishings				X
D	Trees				X
E	Site Entrance				X
F	Bridge Calculations			X	
G	Traffic Control			X	

3.0 Project data

Date of latest Route Assessment: 07/08/2023
Survey undertaken by: (Rex J Andrews P/L)
Project Name: Dinawan Energy Hub Windfarm
Location: Port of Newcastle (NSW) to Dinawan (NSW)
Turbine types:
Up to 250 wind turbine generators with blades up to 100 metres in length and a maximum overall height of 280 metres.

4.0 Transport Combinations (Examples)

TURBINE EXAMPLES:

Blades (100.0 x 4.5w x 4.0h x 30.0T)
Configuration. Prime mover with 2x4 dolly 3x4 Jinker
Overall dimension: 110.0l x 4.5w x 4.9h x 227.0T

Nacelles (15.1l x 4.2w x 4.2h x 130T)
Configuration. Prime mover with 12x8 Platform trailer + Backup truck.
Overall dimensions: 46.0l x 4.3w x 5.2h x 204.5T + Backup truck.

Drive train/Power train/Generator (8.0l x 5.5w x 4.0h x 110T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck.
Overall dimensions: 39.9l x 5.5w x 5.0h x 199.5T + Backup truck.

Hubs (5.5l x 5.0w x 4.2h x 70.0T)
Configuration. Prime mover with 2x8 dolly and 5x8 Low loader.
Overall dimensions: 26.0l x 5.0w x 5.2h x 106.5T.

149 METRE TOWER EXAMPLE:

Base Towers (10.1l x 6.0 x 5.5 x 91T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 42.0l x 5.85w x 6.1h x 164.5T (+ Push truck)

Section 2 Towers (14.1l x 5.5 x 5.5 x 89T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 44.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 3 Towers (16.5l x 5.5 x 4.95 x 89T)
Configuration. Prime mover with 5x8-5x8 Bookend.
Overall dimension: 46.0l x 5.5w x 5.7h x 164.5T (+ Push truck)

Section 4 Towers (17.2l x 4.95 x 4.65 x 86T)
Configuration. Prime mover with 8x8 low platform.
Overall dimension: 35.0l x 5.0w x 5.9h x 154.5T (+ Push truck)

Section 5 Towers (20.5l x 4.65 x 4.65 x 84T)
Configuration. Prime mover with 10x8 platform trailer.
Overall dimension: 38.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Section 6 Towers (29.9l x 4.65w x 4.65 x 87T)
Configuration. Prime mover with 5x8-5x8 Extending platform trailer.
Overall dimension: 45.0l x 4.7w x 5.7h x 164.5T (+ Push truck)

Top Towers (35.5l x 4.65w x 3.97h x 74T)
Configuration. Prime mover with 4x8-4x8 Extending platform trailer.
Overall dimension: 54.0l x 5.1w x 5.7h x 152.5T (+ Push truck)

ERECTION CRANES:

LG1750 carrier (19.2l x 3.0 x 4.0 x 96T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck
Overall dimensions: 36.0l x 4.2w x 5.2h x 174.5T + Backup truck

LTM1500 carrier (21.0l x 3.0 x 4.0 x 96T)
Configuration. Prime mover with 10x8 Platform trailer + Backup truck
Overall dimensions: 36.0l x 5.0w x 5.2h x 174.5T + Backup truck

TRANSFORMER:

Possible Transformer size (9.2l x 4.0 x 4.35 x 175T)
Configuration. Prime mover with 10x8-10x8 Beamset + 4 x Backup trucks
Overall dimensions: 120.0l x 6.5w x 5.4h x 324.5T + 4 x Backup trucks

Possible Transformer size (9.2l x 4.0 x 4.35 x 130T)
Configuration. Prime mover with 12x8 Platform trailer + 1 x Backup trucks
Overall dimensions: 45.0l x 4.3w x 5.4h x 222.5T

SWITCHROOM:

The largest switchroom size that is recommended for this site would be as follows.
Switchroom dimensions: 30.0l x 6.0w x 4.4h x 90.0T

5.0 Transport Drawing Examples (Possible Combinations)

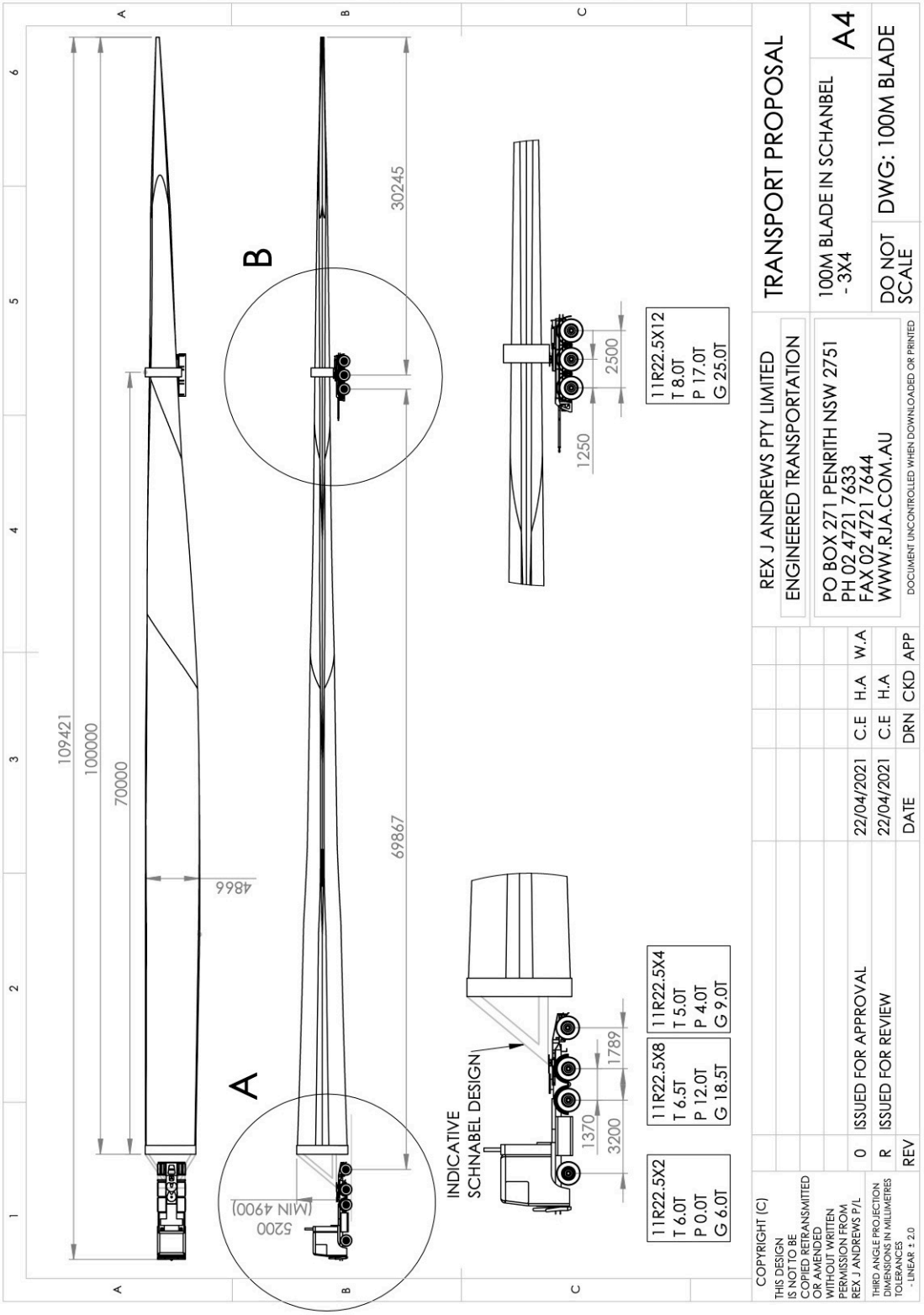


Figure 1 - Blade Diagram (100 Metre blade case study).

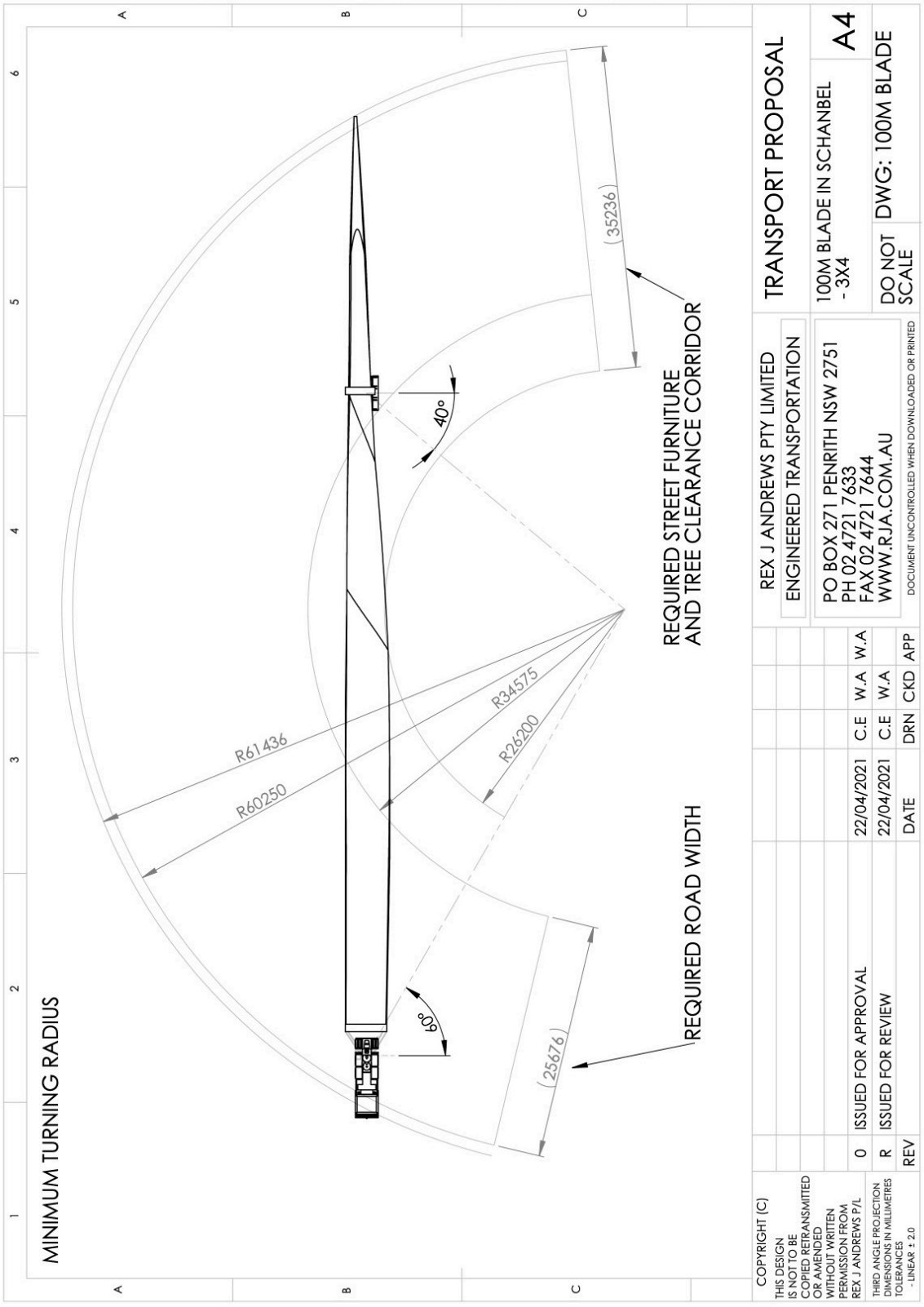


Figure 2 - Blade Diagram Swept Path (100 Metre blade case study)

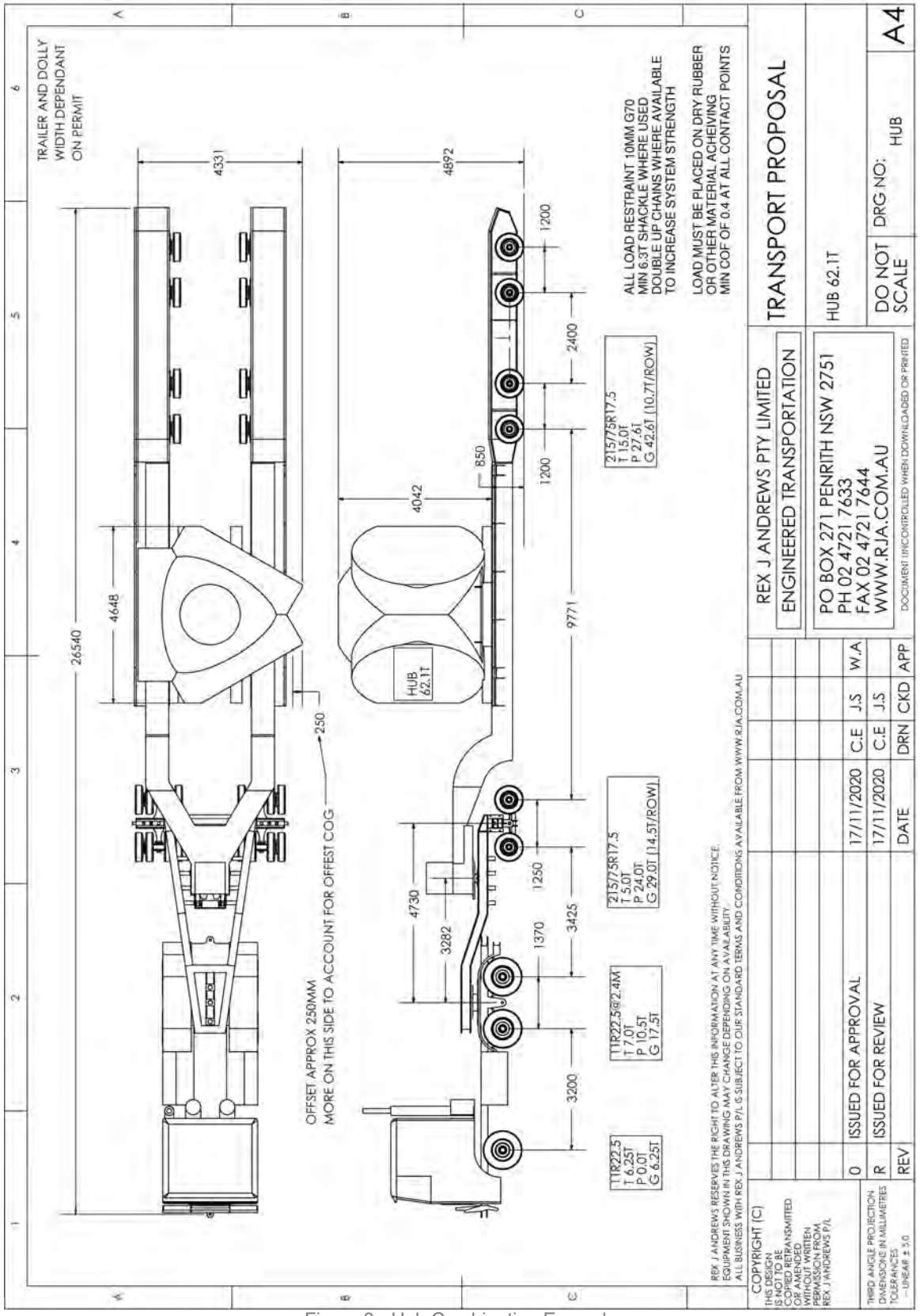


Figure 3 - Hub Combination Example

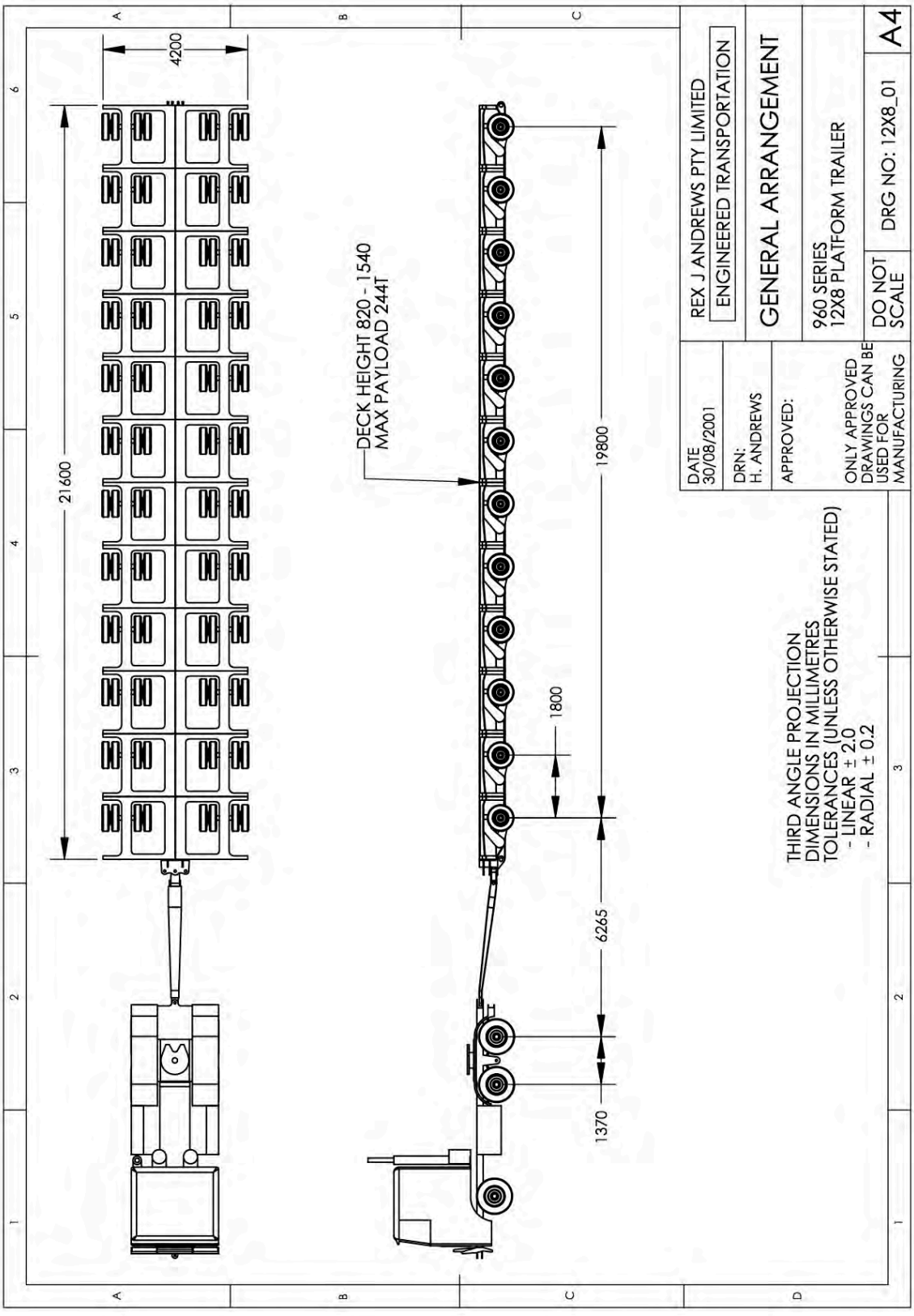


Figure 4 - Nacelle Combination Example

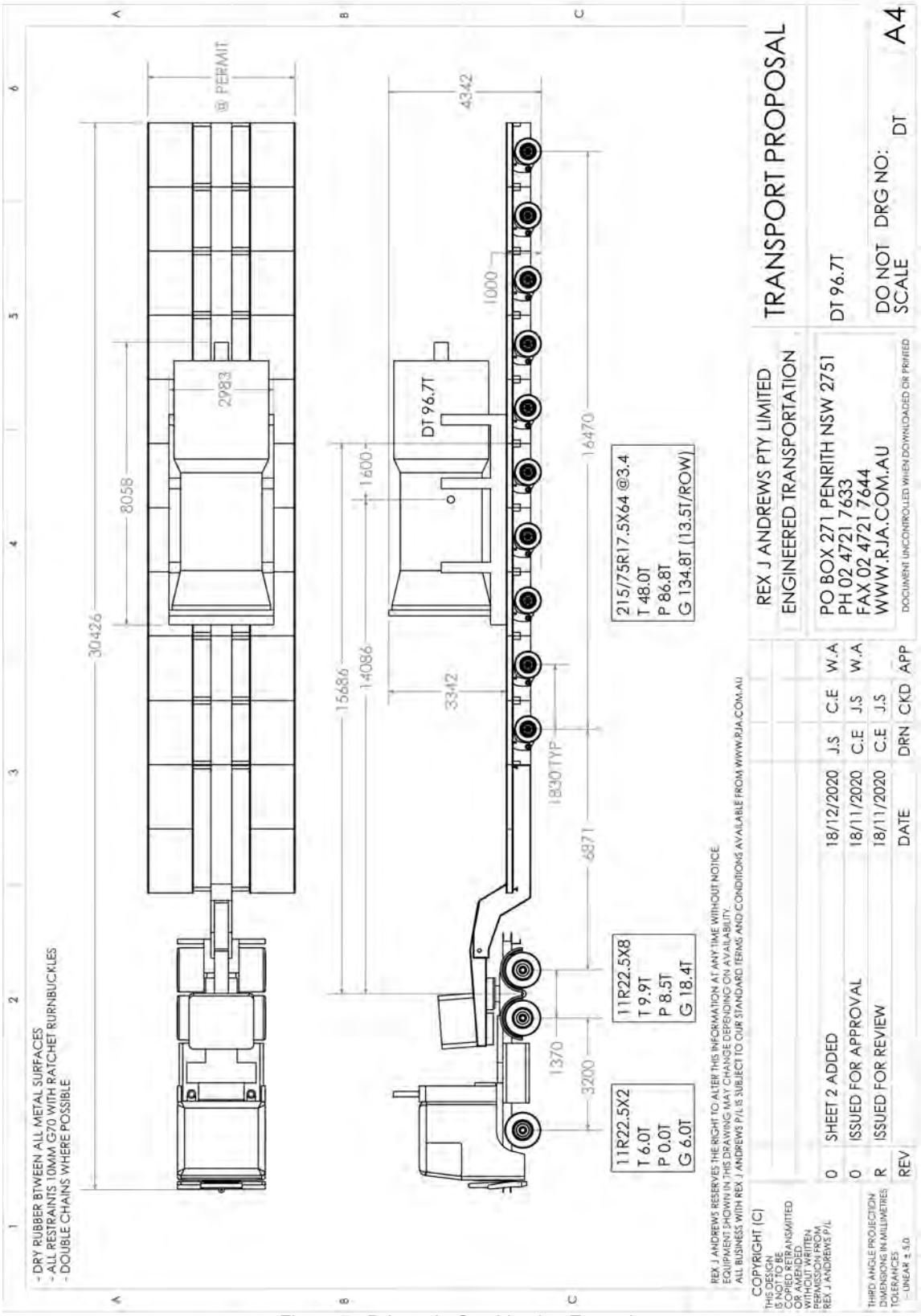


Figure 5 - Drivetrain Combination Example

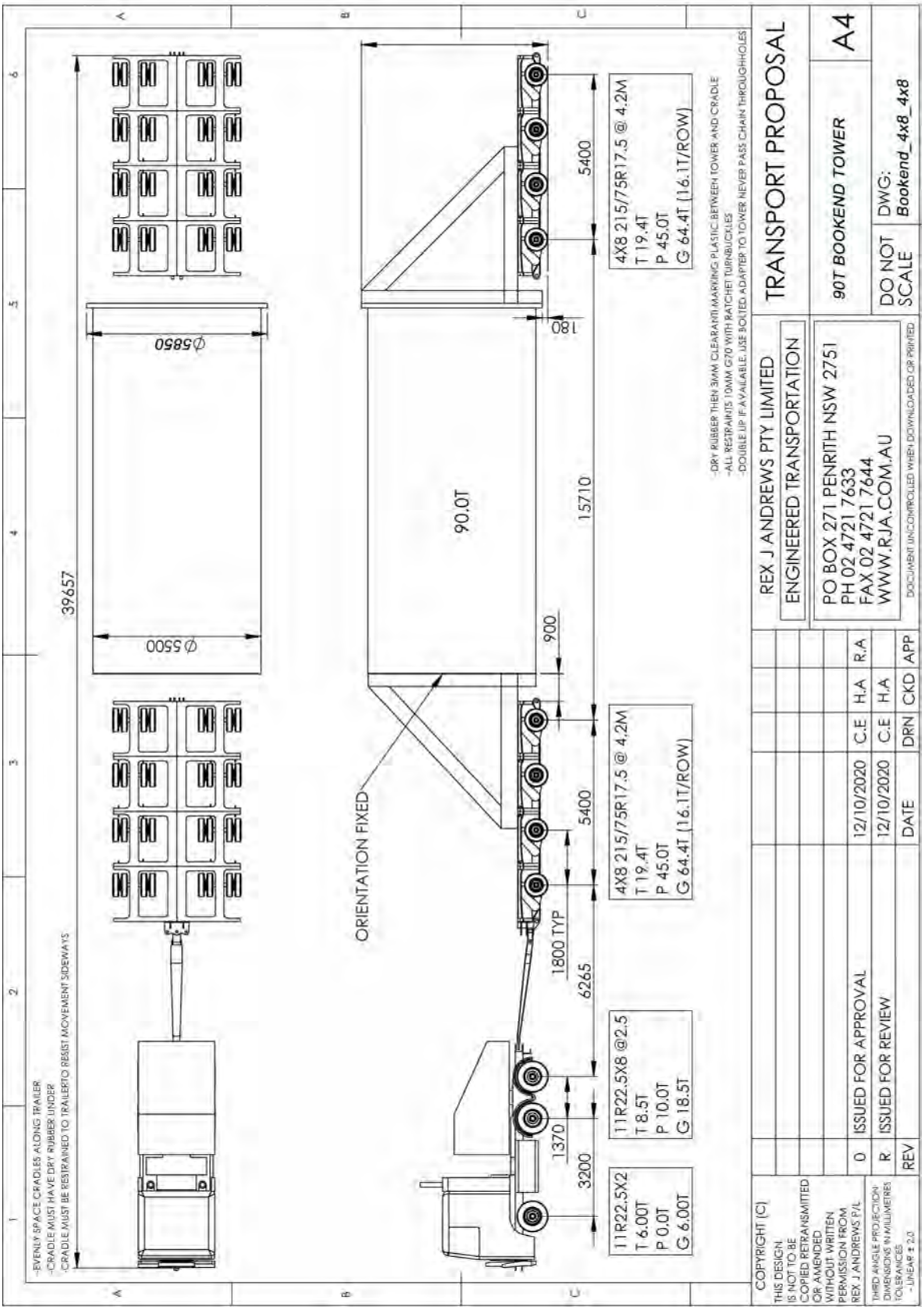


Figure 6 - Tower Trailer Bookend

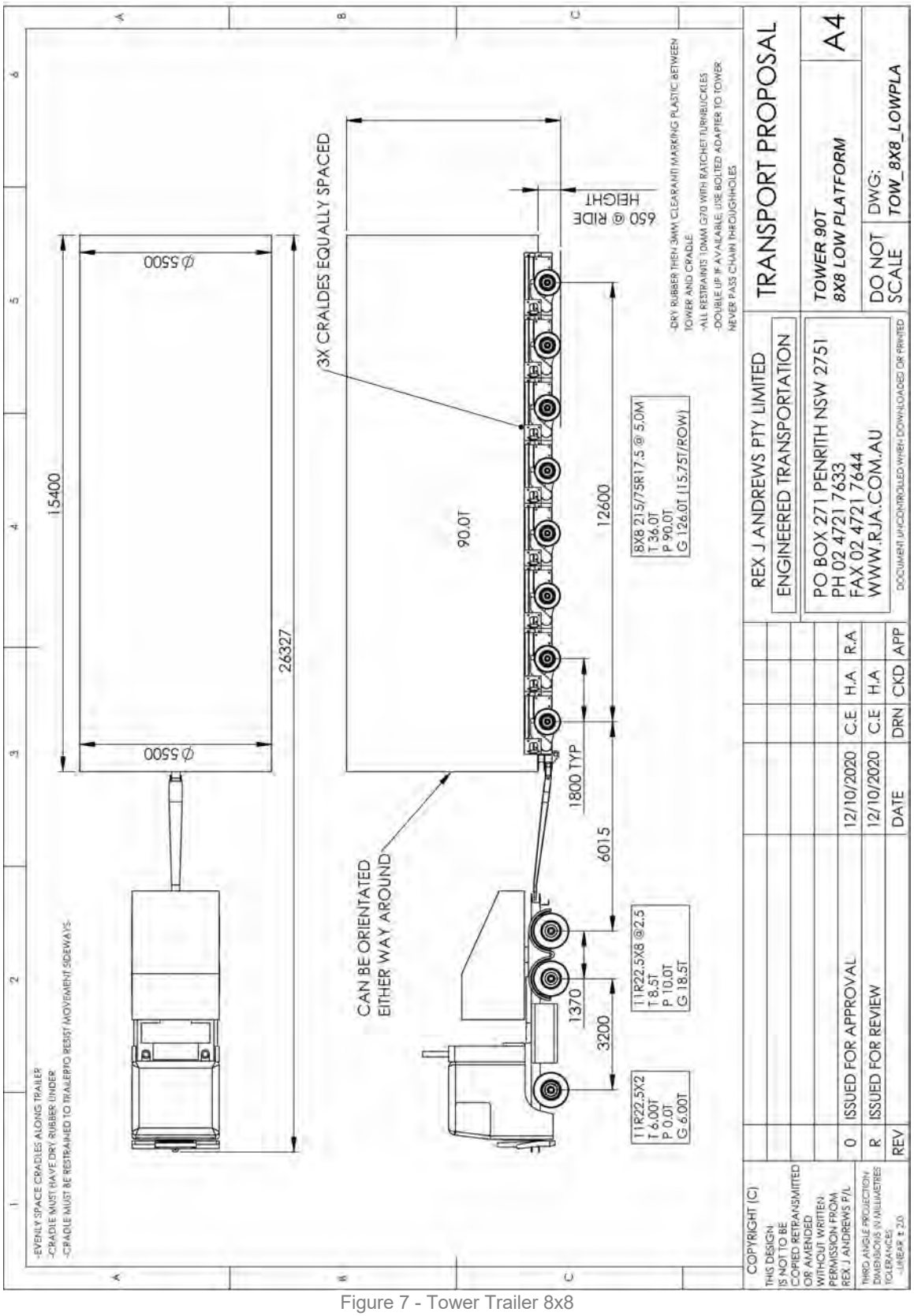


Figure 7 - Tower Trailer 8x8

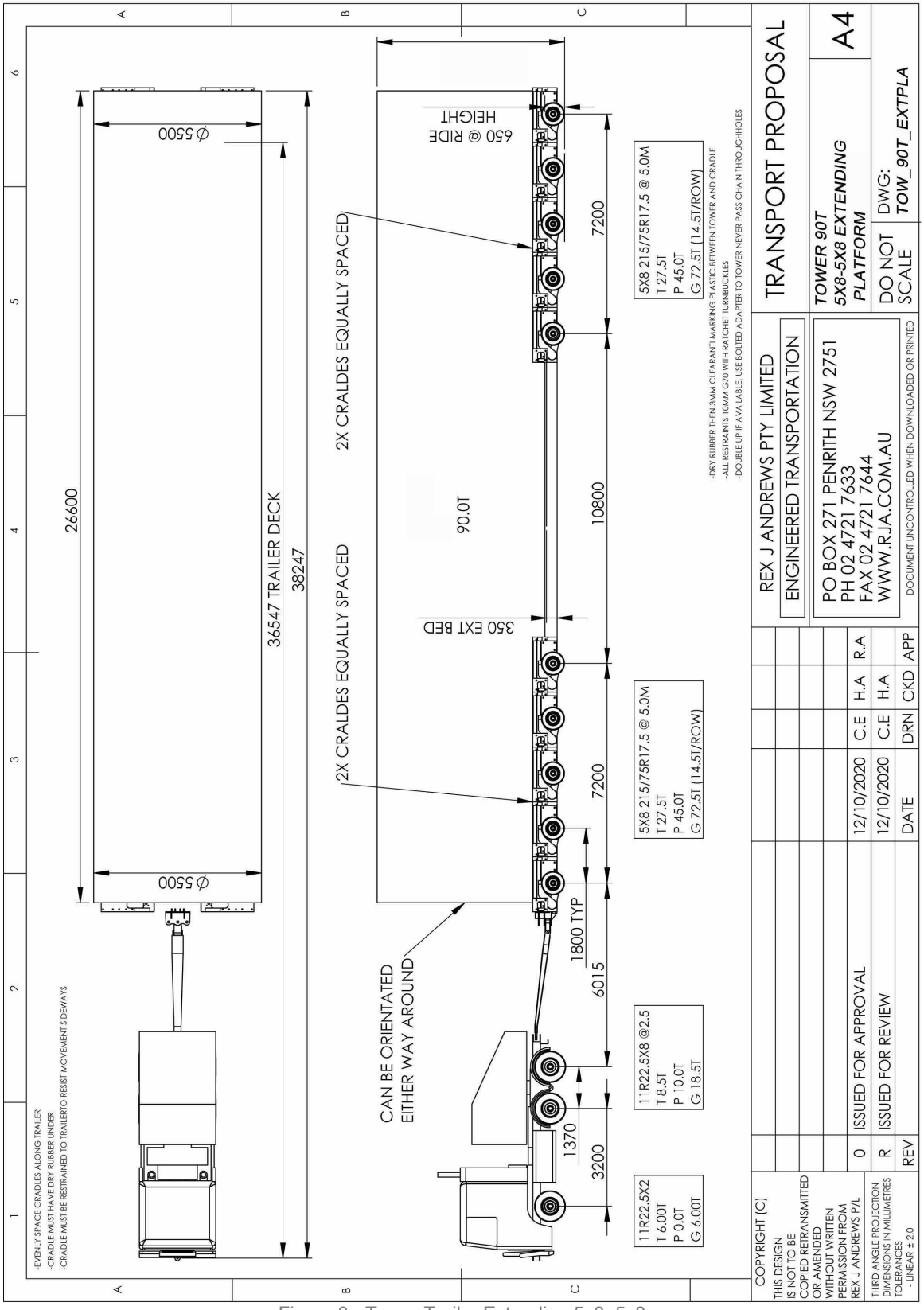


Figure 8 - Tower Trailer Extending 5x8_5x8

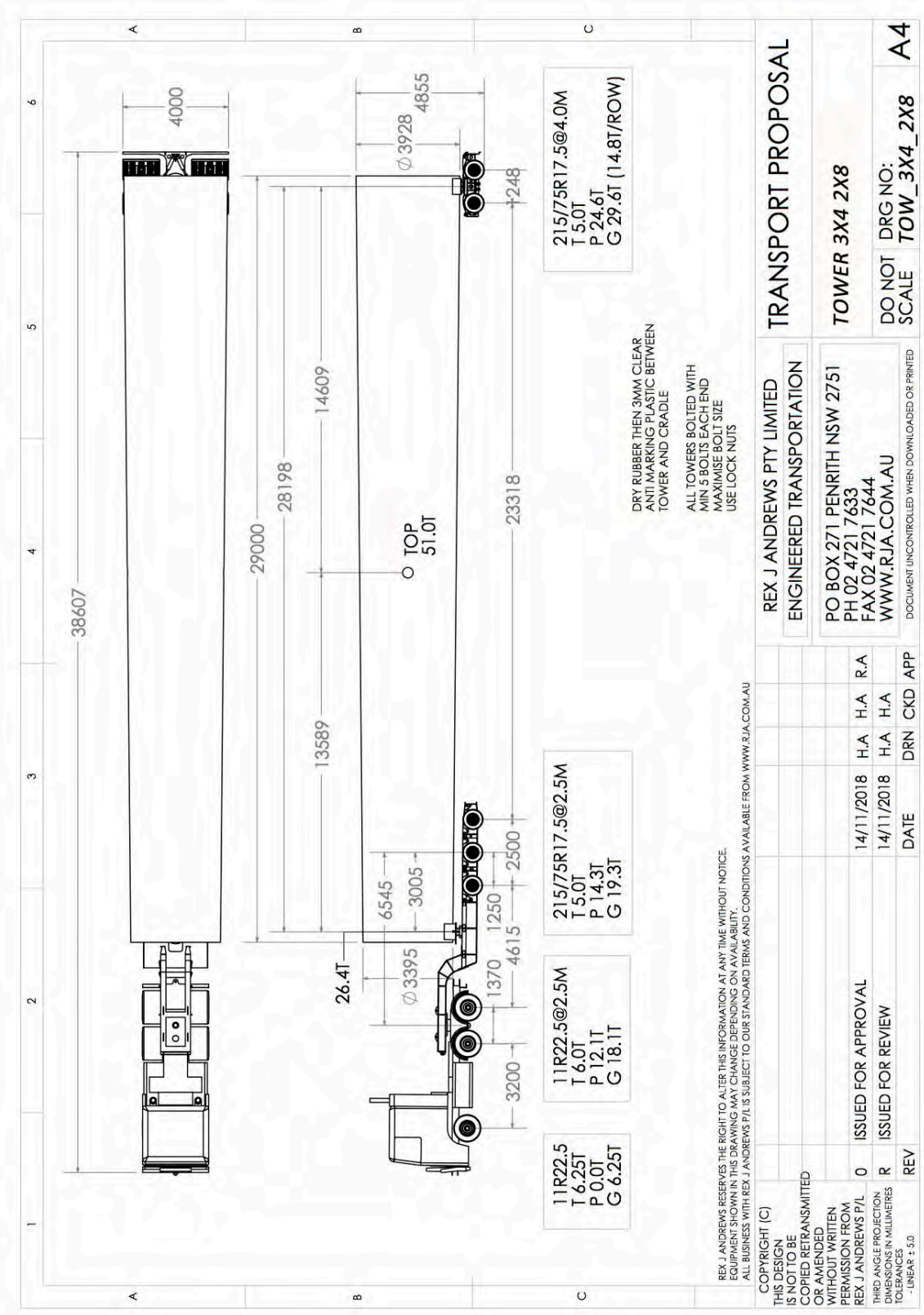


Figure 9 - Tower Trailer Dolly And Jinker

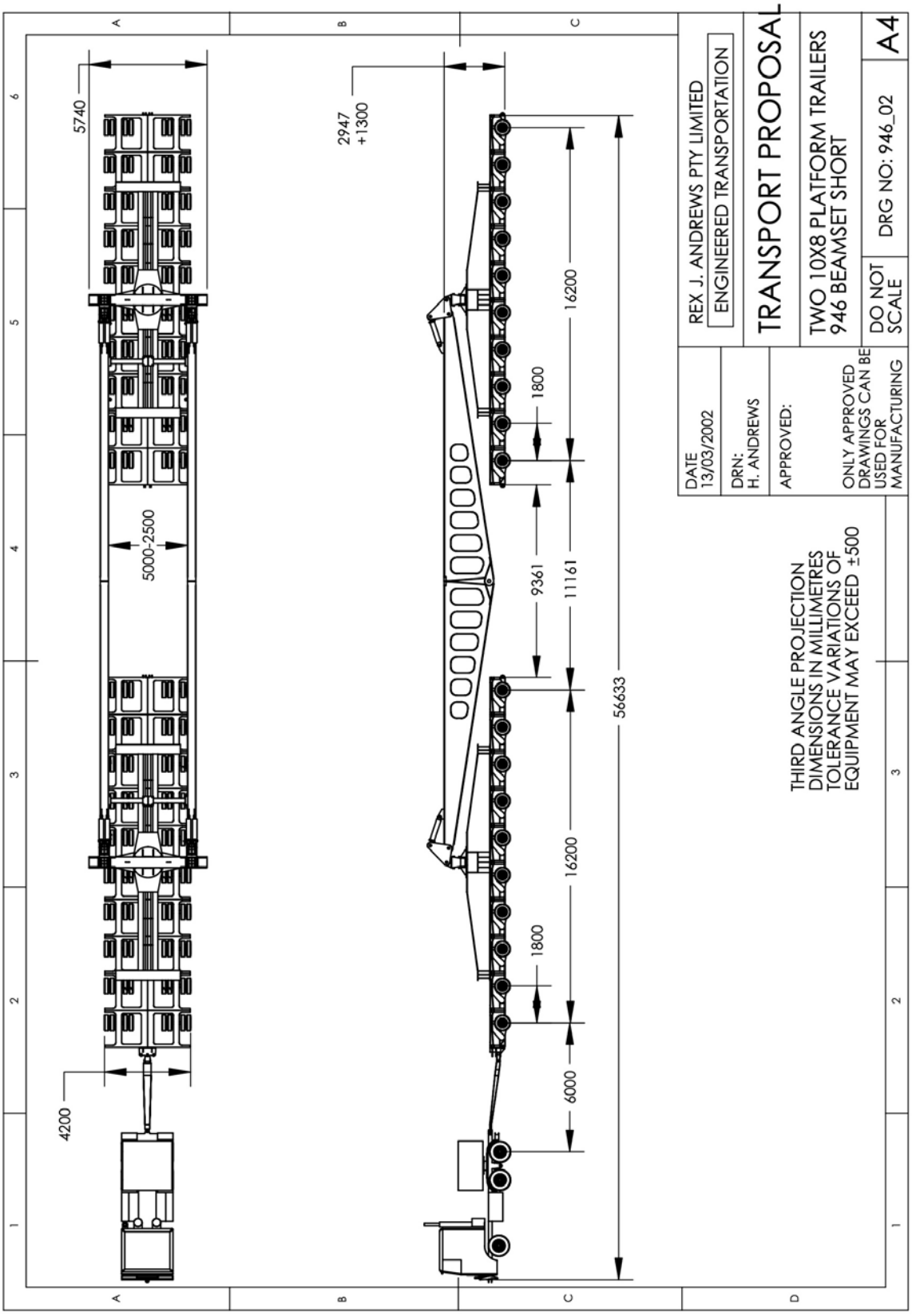


Figure 10 – 300MVA Transformer Trailer 10x8-10x8 Beamset

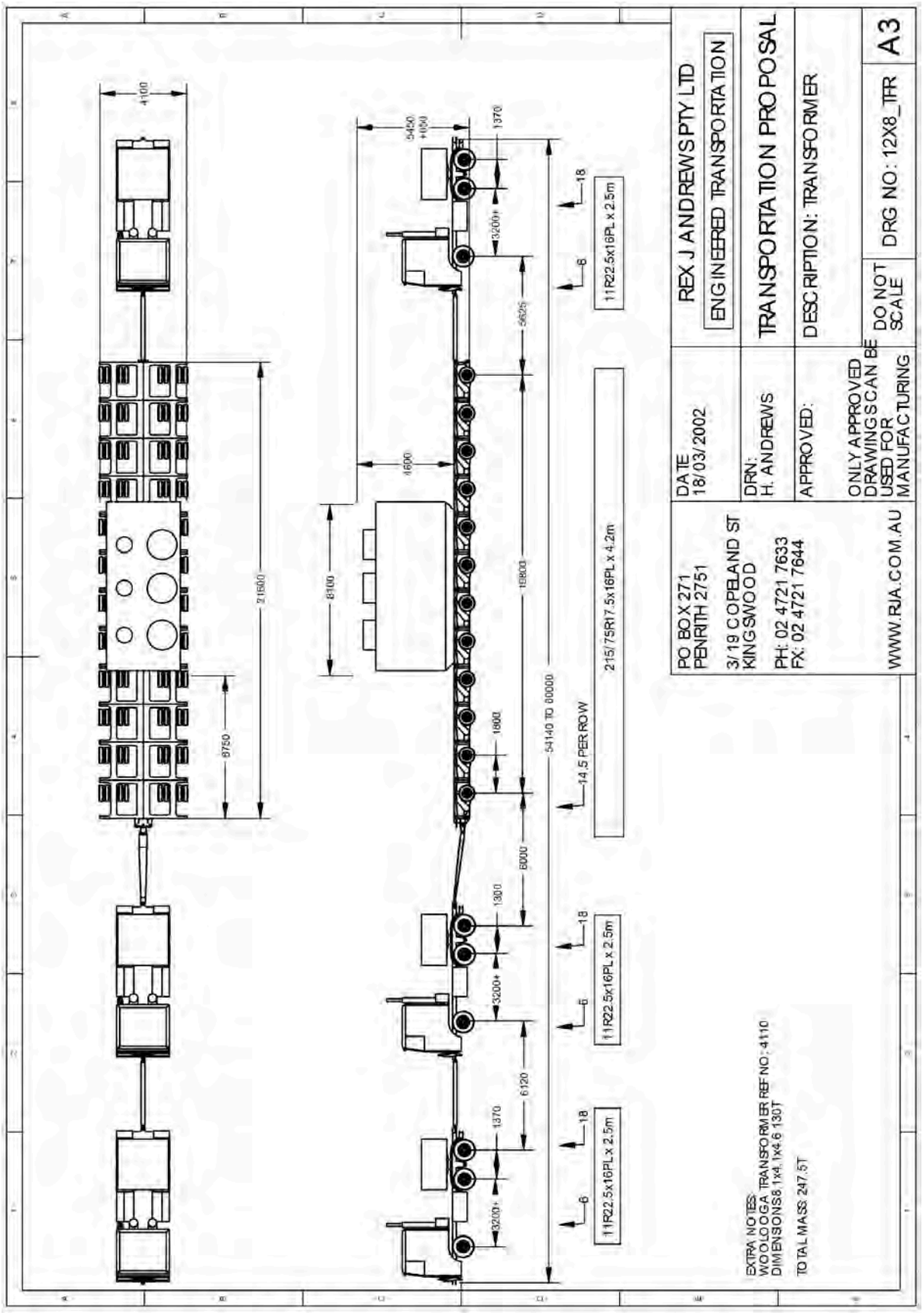


Figure 11 – 150MVA Transformer Trailer 12x8 Platform

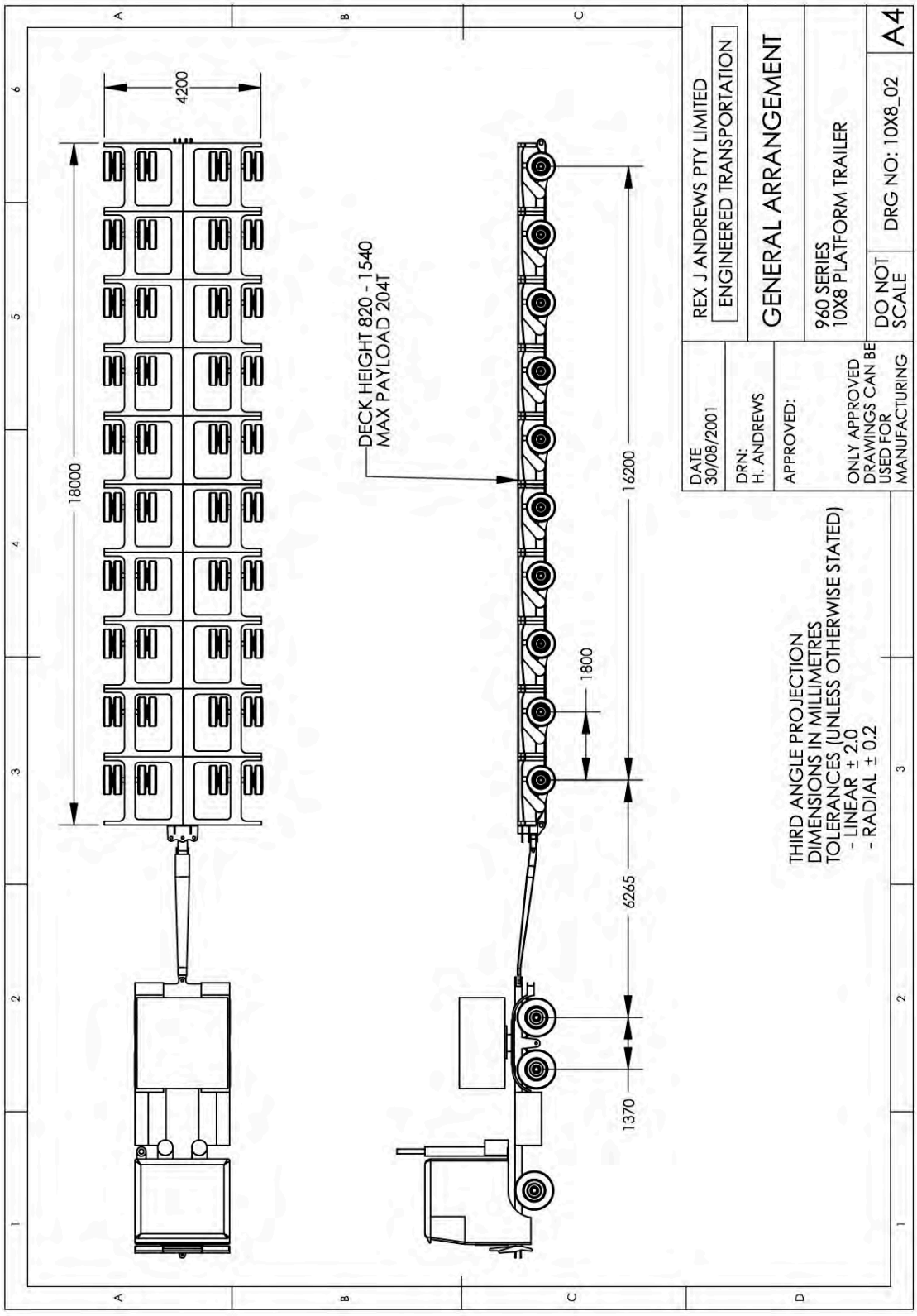


Figure 12 - Crane Trailer 10x8 Platform

6.0 Dinawan Windfarm Site Location

This proposed Dinawan Energy Hub development is located approximately 30 kilometres (km) Southwest of Darlington Point, in southwest New South Wales. Access is via Kidman Way. The Project Area is within the Murray Region of New South Wales (NSW)

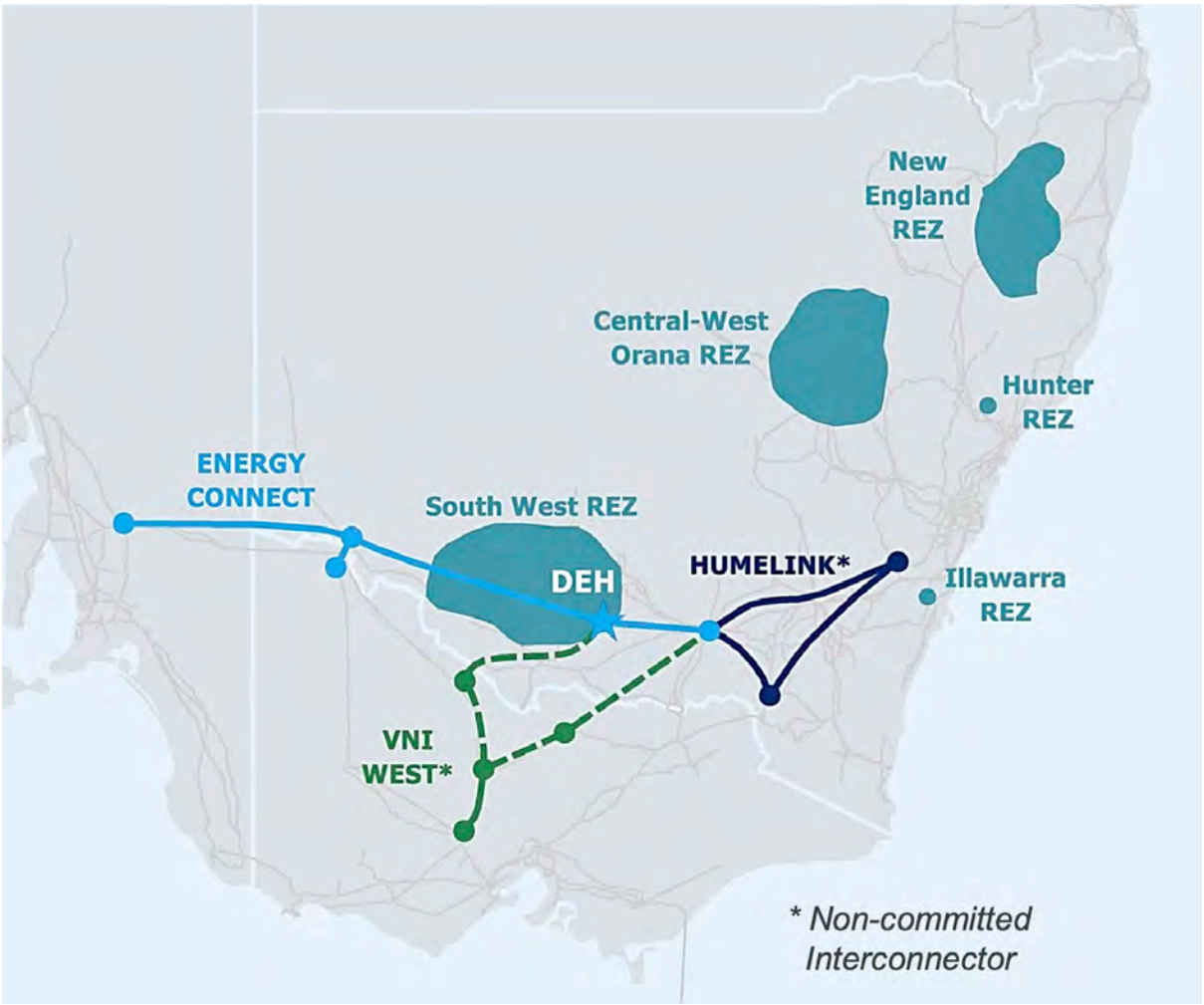


Figure 13 - Dinawan Energy Hub Location

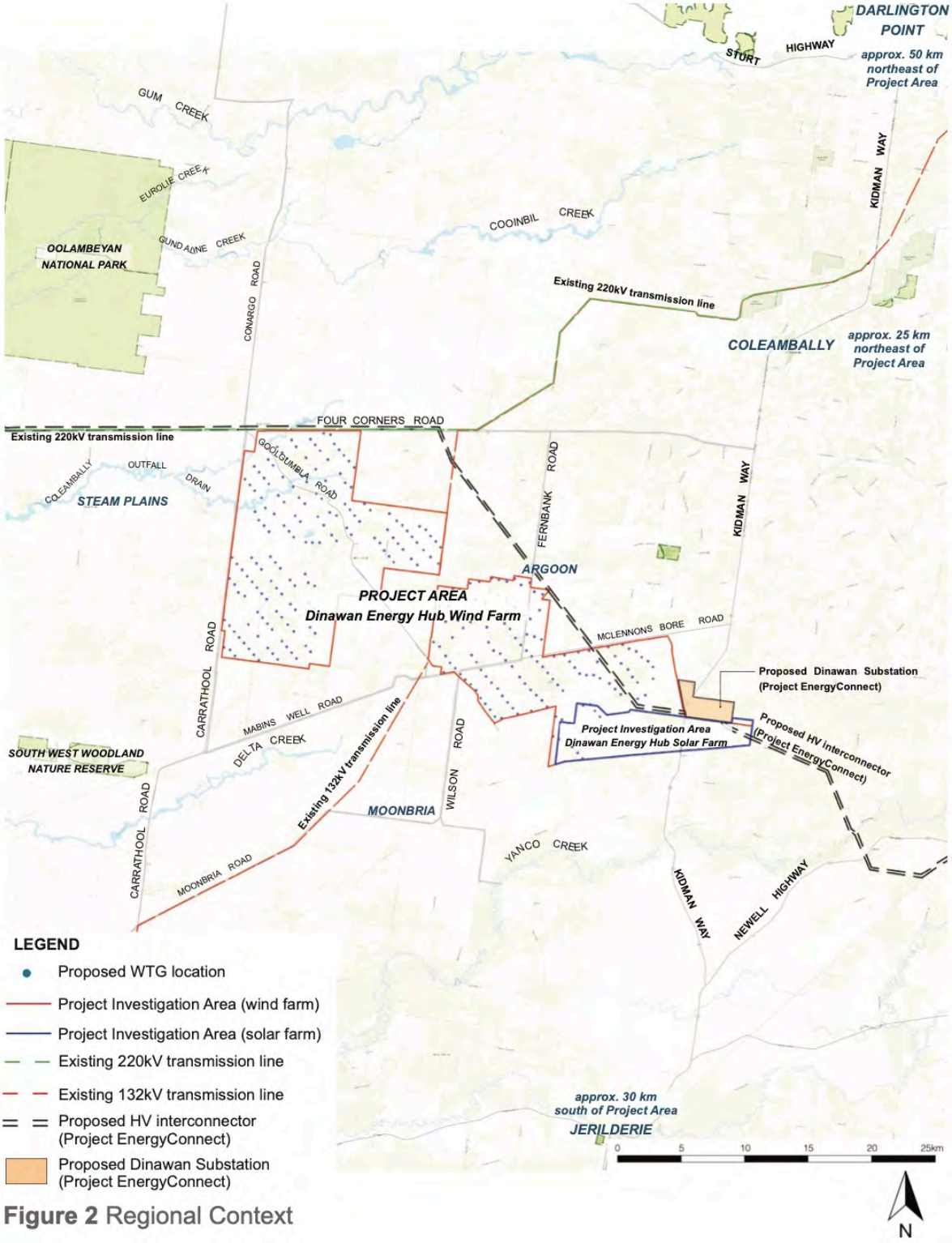


Figure 14 - Dinawan Energy Hub Site Layout

7.0 Port of Import

The wind turbine equipment will be imported from various countries and will arrive on ships into the Port of Newcastle. The client may alternately source local towers. The ideal berth for these shipments is the Mayfield No.4 Berth. This facility has a hardstand storage area of roughly 100,000 s/q meters, adjacent to the berth. Access from the storage to the public roads, is via a port operated road onto Selwyn Street. There will need to be a small amount of road modifications within the port.

Figure 15 - Mayfield No.4 Berth Overview

Figure 16 - Mayfield No.4 Port Storage Area

8.0 Transport Summary

The study is based on the turbine components and imported towers entering Australia via the Port of Newcastle. The study details the likely routes for these components, and the constraints that they may encounter on the proposed routes.
Route survey 1 would be used as the option for the blades and components under 5.0m loaded Hight.
Route survey 2 is the option for all loads over 5.0m with a **maximum loaded height of 5.9m**

ROUTE SURVEY 1: Blades and components **under 5.0m** loaded height
DISTANCE: 850 kilometres
GPS LINK: https://maps.app.goo.gl/V9LZX9XWJYGhWQ466
This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, NorthConnex tunnel, M2, M7, M5, Hume Highway, Sturt Hwy, Kidman Way, Mclennons Bore Rd, Wilson Rd.

ROUTE SURVEY 2: High load route. **Maximum loaded height 5.9m**
DISTANCE: 971 kilometres
GPS LINK: https://maps.app.goo.gl/RyKYeLy3bnXmbLjH9
This route took us via This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Golden Highway, Boothenba Road,Troy Bridge Road, Bunglegumbie Road, Mitchell Highway, Manildra Street, Derribing Avenue, Algalah Street, Tomingley Road, Newell Highway, Thomas Street, Moulden Street, Henry Parkes Way, Westlime Road, Hartigan Avenue, Newell Highway, Compton Road, Showground Road, Newell Highway, Sturt Highway, Kidman Way, Mclennons Bore Rd, Wilson Rd.

9.0 Route Survey 1: Blades And Components Under 5.0 m Loaded Height

DISTANCE: 850 kilometres
GPS LINK: https://maps.app.goo.gl/V9LZX9XWJYGhWQ466
This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, M1, NorthConnex tunnel, M2, M7, M5, Hume Highway, Sturt Hwy, Kidman Way, Mclennons Bore Rd, Wilson Rd.

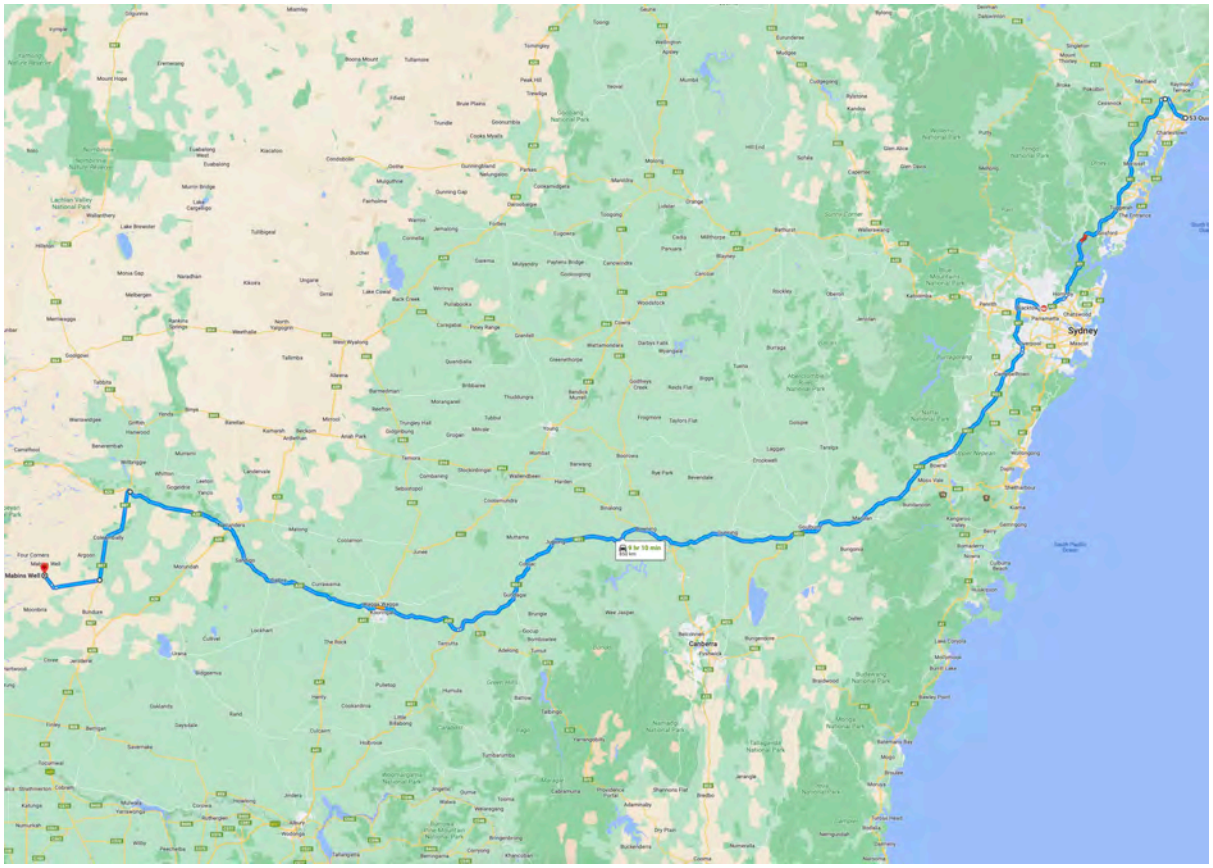


Figure 17 - Route 1

KEY	
MODIFICATIONS REQUIRED	
MINOR WORKS OR CAUTION	
PARKING	

KM index	Location	Section of road	Current clearance	Procedure	Comments
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street https://goo.gl/maps/afLwPYKuNdm	Length: 70.0m Width: 8.0m	Moderate right hand turn	Hardstand will need to be added to the left entry and exit of the corner. The existing culvert will need to be extended. Some signs will need to be relocated and or made removable and some fence and gate will need to be relocated.
0.4	Mayfield	Selwyn Street rail crossing https://goo.gl/maps/864FhMSaF9P2	Width: 9.0m	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto Industrial Drive via George Street https://goo.gl/maps/brPRAckLr572	Length: 70.0m Width: 8.0m	Right hand turn	The first right hand turn through George Street will need a sign made removable and a disused pole on the overhang removed. On the inside of the corner hardstand will need to be added, a sign made removable, and a light pole relocated. On the outside tailswing the disused pole next to the railway line will need to be removed and hardstand added to the south side of the intersection. Entering Industrial Drive, the prime mover will cross from the correct side to the correct side with the trailer cutting the corner and travelling over the centre median strip. The traffic lights in the centre median will need to be relocated or made to fold down.
4.9	Mayfield	Industrial Drive under traffic signals https://goo.gl/maps/5DpD3b7KnT72	Clearance: Height: 5.4m	Travel directly ahead	The blades will need to cross to the incorrect side of the intersection 200 metres prior, before crossing back over to the correct side 120 metres to the north of the intersection. A light pole on the inside of the corner will need to be made removable, and two signs will need to be made removable or relocated.
5.5	Mayfield West	Industrial Drive onto Maitland Road https://goo.gl/maps/Kn49dhWG2qG2	Length: 70.0m Width: 8.0m	Right hand turn	The blades will need to cross to the incorrect side of the intersection 200 metres prior, before crossing back over to the correct side 120 metres to the north of the intersection. Two signs will need to be made removable or relocated.
14.8	Tarro	New England Highway https://goo.gl/maps/hkKqsZMfdVJncRdu6	Length: 100.0m Width: 12.0m	Left hand bend	Spotter to guide load through this section of road.

KM index	Location	Section of road	Current clearance	Procedure	Comments
17.4	Tarro	New England Highway onto John Renshaw Drive https://goo.gl/maps/SRDr5JiqkBp	Length: 100.0m Width: 12.0m	Left hand merge	No problems with this section of road.
18.4	Beresfield	John Renshaw Drive onto the M1 https://goo.gl/maps/A34ihxCjM5wfRDdg6	Length: 80.0m Width: 8.0m	Left hand bend	2x light poles need to be removed on the outside of this corner for the tail swing.
113.0	Mt White	M1 Motorway under Mt White overpass https://goo.gl/maps/K3fPPe4fNx63xB3j7	Height clearances: Left Lane: 5.2m Centre Lane: 5.3m Right Lane: 5.4ms	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the far-right lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
122.0	Hawkesbury River	M1 Motorway https://goo.gl/maps/vDzjirEKLAbREE8B6	100.0 long x 6.0 wide	Merge to left	Large parking area
146.4	Wahroonga	M1 onto North Connex GPS link: https://goo.gl/maps/7TMrKXHJzJDzimqZ7	Height: 5.0m 120 metres	Right Hand Merge	Merge into right hand lane ready to enter North Connex Tunnel.
155.9	West Pennant Hills	North Connex onto M2 GPS Link: https://goo.gl/maps/C6aAHGR54c4KbkeJ7	Height: 5.25m 120 metres	Right Hand Merge	Merge onto the M2 Motorway
167.0	Kings Park	M7 Motorway https://goo.gl/maps/T8WcbR9T84Zs7WpF7	100.0 long x 6.0 wide	Merge to left	Large parking area
201.0	Prestons	M7 Motorway onto M5 Motorway https://goo.gl/maps/FA2mF7PxZkxrRDTR9	Width: 10.0 metres	Travel directly ahead	No problems with this section of road.
229.0	Menangle	Hume Highway https://goo.gl/maps/KPMdLS1XuRWHrcyb6	200.0 long x 8.0 wide	Merge to left	Large parking area for towers and motors, no blades to enter this parking bay.
238.0	Wilton	Hume Highway under Farm access overpass https://goo.gl/maps/2ZsVqYJ9j9gPTGqa9	Height clearances: Left Lane: 5.5m Centre Lane: 5.4m Right Lane: 5.3m	Travel directly ahead	Loads that exceed 5.3 metres high are not to travel under this structure. Loads over 5.2 metres high are to travel under the bridge in the left lane, and at a speed of no more than 5 km's per hour. Spotter to guide load through this section of road.
303.0	Sutton Forest	Hume Highway https://goo.gl/maps/uT1ubtSuawS2	150.0 long x 10.0 wide	Merge to left	Large parking area
352.0	Goulburn	Hume Highway https://goo.gl/maps/7HywRcjZiJy	180.0 long x 15.0 wide	Merge to left	Large parking area
380.0	Breadalbane	Hume Highway https://goo.gl/maps/UWjx3XndLejWG1UD9	140.0 long x 14.0 wide	Merge to left	Large parking area
453.0	Bowning	Hume Highway https://goo.gl/maps/vRMmSbJCke5d65PJ9	200 long x 8.0 wide	Merge to left	Large Parking area
456.0	Bowning	Hume Highway https://goo.gl/maps/XENMvuFeHCevVo8J6	80 long x 25 wide	Merge to left	Large parking area
510.0	Jugiong	Hume Highway https://goo.gl/maps/QzzfyAAnixQn3nwx8	140.0 long x 14.0 wide	Merge to left	Large parking area
573.70	Tarcutta	Hume Hwy onto Sturt Hwy GPS Link: https://goo.gl/maps/ruqNDSw5vanJDd4x5	200m long	Left Hand Merge	Merge left to left lane to exit Hume Hwy, follow road right onto overpass onto Sturt Hwy. No problems with this section of road.

KM index	Location	Section of road	Current clearance	Procedure	Comments
614.6	Wagga Wagga	Sturt Hwy GPS Link: https://goo.gl/maps/7VDWUyW8KnUhCEdd7	80m long	Second Exit on Round-about	Sign to be removed in the middle of the roundabout. Roundabout made trafficable.
617.3	Wagga Wagga	Sturt Hwy GPS Link: https://goo.gl/maps/VeavHs6e4AiLaggDA	80m long	Second Exit on Round-about	Sign to be removed in the middle of the roundabout. Handstand to be installed on roundabout and roundabout made trafficable.
618.4	Wagga Wagga	Sturt Hwy GPS Link: https://goo.gl/maps/dBrte59BvHyvcGSr5	80m long	Second Exit on Round-about	The truck will need to cut across the centre of the roundabout. The existing pavement is ok to drive on without any extra work. 2x signs to be removed in the middle of the roundabout.
618.75	Wagga Wagga	Sturt Hwy under rail overpass GPS Link: https://goo.gl/maps/JPkJBAyzJuMAiHUz8	Height clearances: 5.25m	Travel under rail overpass	Detailed vertical curve assessment required to determine whether blade loads can travel under the rail bridge and maintain clearance, as well as maintaining tip clearance to the ground on entry and the bridge on exit while travelling through the dip. Also trailer clearance.
621.5	Wagga Wagga	Sturt Hwy GPS Link: https://goo.gl/maps/fx388veUAjbykivPA	80m long	Second Exit on Round-about	Signs to be removed in the middle of the roundabout. Roundabout made trafficable.
711	Gillenbah	Sturt Hwy GPS Link: https://goo.gl/maps/C7gJ8ouDVdpcH5Rz7	80m long	Left Hand Turn	Several signs to be relocated or made removable. Power pole to be relocated out of swept path. Vegetation to be removed or trimmed for blade oversail. Traffic island to be removed and replaced with paint to make trafficable.
711.1	Gillenbah	Sturt Hwy GPS Link: https://goo.gl/maps/w4bRo2oaCsWADQcA7	100.0 metres long 5.0 metres wide	Merge to	Emergency parking
768	Darlington Point	Sturt Hwy onto Kidman Way GPS Link: https://goo.gl/maps/H2YaBQvXqqHZRz4a7	45 metres	Left hand turn	Hardstand to be installed on inside of corner. Sign to be relocated or removed.
819	Coleambally	Kidman Way onto Mclennons Bore Rd GPS Link: https://goo.gl/maps/t2iiaAnyz7w4DNQ96	30 meters	Right hand turn	Hardstand to be installed on inside and outside of corner. Signs to be relocated or made removable.
841	Jerilderie	Mclennons Bore Rd onto Wilsons Rd GPS Link: https://goo.gl/maps/zSfwKKvXzHs9m9nb7	40 metres	Right hand turn	Hardstand to be installed on inside and outside of corner. Overhead conductor clearance to be confirmed.
842	Argoon	Bend on Wilsons Rd GPS Link: https://maps.app.goo.gl/Vq7BcMS9mx2bMZNP8	100 metres	Right hand bend	No problems with this section of road.
849	Argoon	Wilsons Rd Stock Grid GPS Link: https://maps.app.goo.gl/Mo6o2EoLw8Q2treX7	5.8 M Wide	Travel straight ahead	All stock grids to be upgraded to accommodate all proposed loads.
850	Argoon	End Route			All site roads to be constructed to accommodate the vertical curve, swept path, weight and height of all proposed loads.

0.0 Km's: Mayfield No.4 onto Selwyn Street at Mayfield

Figure 18 - Mayfield No.4 onto Selwyn Street at Mayfield

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/afLwPYKuNdm
PROCEDURE: Right hand turn.
ROAD MODIFICATIONS: Hardstand will need to be added to the left entry and exit of the corner. The existing culvert will need to be extended. Some signs will need to be relocated and or made removable and some fence and gate will need to be relocated.

0.4 Km's: Rail crossing over Selwyn Street at Mayfield

Figure 19 - Rail crossing over Selwyn Street at Mayfield

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/864FhMSaF9P2
PROCEDURE: Travel directly ahead over the crossing.
COMMENTS: Large width clearance and good ground clearance over this crossing. Police and escorts to control local traffic either side of the crossing. ARTC approval will need to be obtained to travel over this crossing. Likely to cross with caution, no escort required.
ROAD MODIFICATIONS: No works are required.

1.3 Km's: Selwyn Street onto Industrial Drive, via George Street at Mayfield

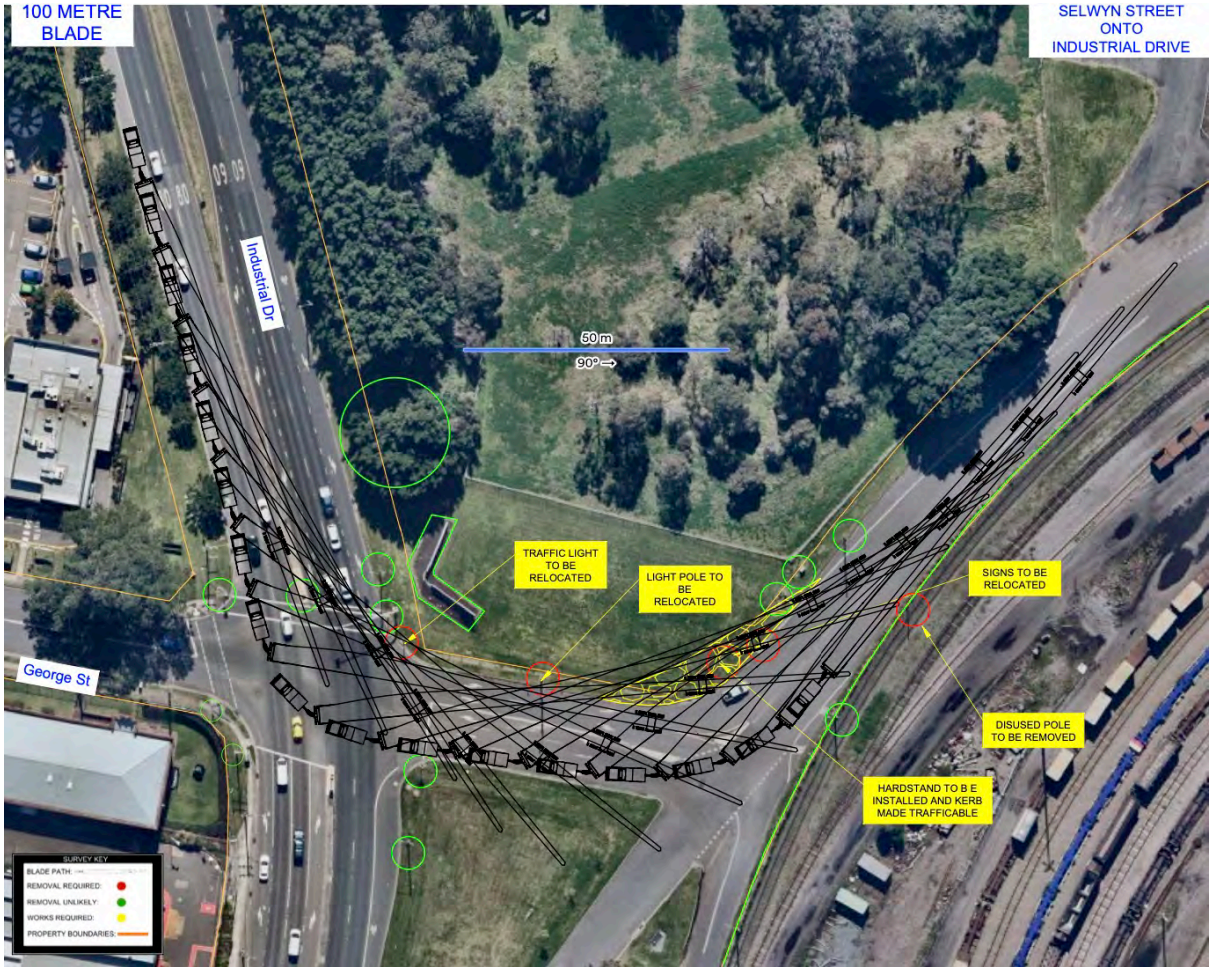


Figure 20 - Selwyn Street onto Industrial Drive

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/brPRAckLr572
PROCEDURE: Right hand turn from Selwyn Street through George Street and onto Industrial Drive. Entering Industrial Drive, the prime mover will cross from the correct side to the correct side with the trailer cutting the corner and travelling over the centre median strip.
ROAD MODIFICATIONS: The first right hand turn through George Street will need a sign made removable and a disused pole on the overhang removed. On the inside of the corner hardstand will need to be added, a sign made removable, and a light pole and traffic signal relocated.

4.9 Km's: Standard Overhanging Traffic signals Mayfield to Hunter Expressway

Figure 21 - Typical Traffic Signal Mayfield to Hunter Exp

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/5DpD3b7KnT72
PROCEDURE: Overhanging signals while travelling through the intersection.
COMMENTS: The lowest traffic signal on route has 5.4 metres clearance. This signal is on the corner of Steel River Blvd at Mayfield West. Loads with an overall height of 5.3 or higher, can avoid this signal by travelling in the centre lane. Loads to slow down while doing this manoeuvre. All other signals exceed 5.6 metres high on this section of road.
ROAD MODIFICATIONS: No works are required.

5.5 Km's: Industrial Drive onto Maitland Road at Mayfield West

Figure 22 - Industrial Drive onto Maitland Road

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/Kn49dhWG2qG2
PROCEDURE: Right hand turn from Industrial Drive onto Maitland Road. The blades will need to cross to the incorrect side of the intersection 200 metres prior, before crossing back over to the correct side 120 metres to the north of the intersection.
ROAD MODIFICATIONS: A light pole on the inside of the corner will need to be relocated outside of the swept path, and two signs will need to be made removable or relocated. Traffic islands to be replaced with painted lines to be trafficable.

14.8 Km's: New England Highway at Tarro

Figure 23 - New England Highway/Maitland Rd at Tarro

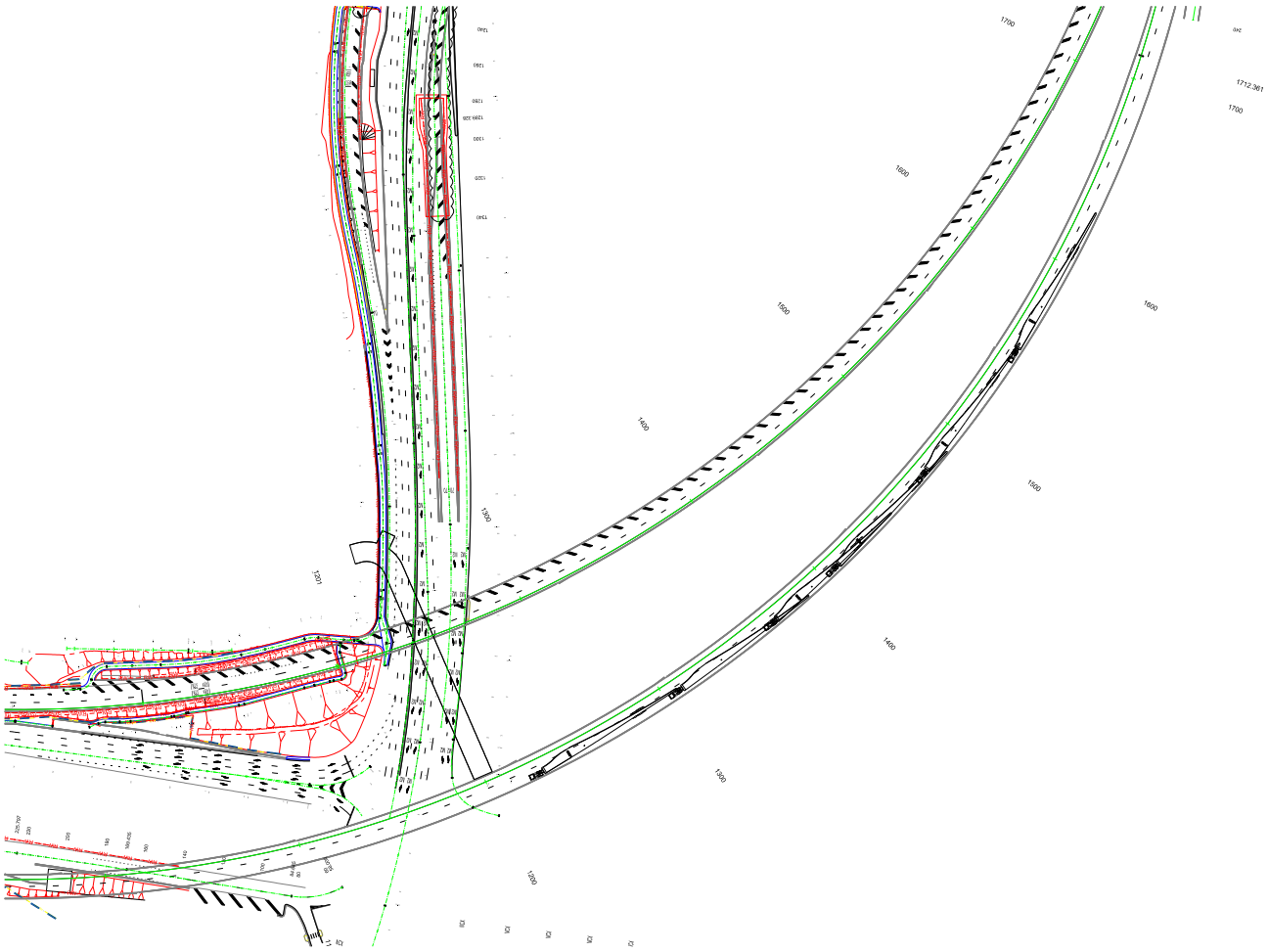
GPS LINK FOR THIS LOCATION: https://goo.gl/maps/hkKgsZMfdVJncRdu6
PROCEDURE: Left hand bend.
ROAD MODIFICATIONS: No works required. The blades will stay on the correct side of the road for the entirety.
Spotter to keep the driver informed throughout the procedure.

18.4 Km's: Intersection of John Renshaw Drive and M1 at Beresfield

Figure 24 - John Renshaw Drive onto Pacific Mwy

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/A34ihxCjM5wfRDdq6
PROCEDURE: Left hand turn via slip lane.
ROAD MODIFICATIONS: 2x light poles to be removed or relocated on the outside of corner for tail swing. Signs to be relocated/removed. Kerb and gutter to be modified to be trafficable for trailer.

146.1 – 155.9 Km's: M1 Motorway onto M2 Motorway through the Northconnex tunnel.



GPS LINK FOR THIS LOCATION: https://goo.gl/maps/BZaXJ5V6CmT2Pt8v8
PROCEDURE: Travel through the Northconnex tunnel.
COMMENTS: The tunnel has very large radius corners that will be no issues for the blades. The tightest section is shown above.
Spotter to guide the load throughout the intersection. Police to control traffic, pilots to warm all traffic. Maximum height of 5.0 metres.
ROAD MODIFICATIONS: No works are required.

614.6 Km's: 1st Roundabout on the Sturt Highway at Wagga Wagga

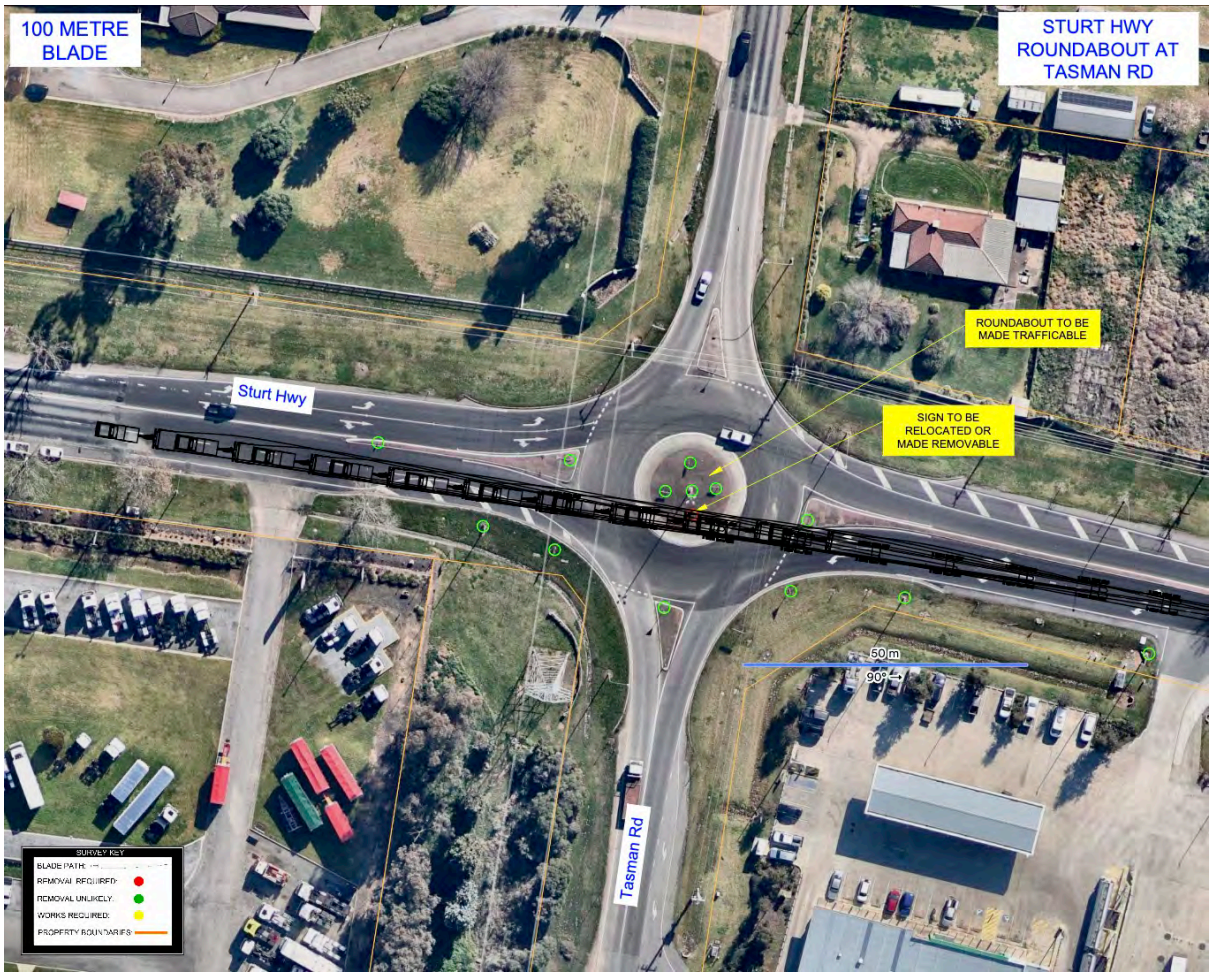


Figure 25 - Sturt Hwy Roundabout at Tasman Rd

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/7VDWUyW8KnUhCEdd7
PROCEDURE: Continue straight ahead. The truck will need to cut across the centre of the roundabout.
warm all traffic.
ROAD MODIFICATIONS: Sign to be removed in the middle of the roundabout. Roundabout made trafficable.

617.3 Km's: 2nd Roundabout on the Sturt Highway at Wagga Wagga

Figure 26 - Sturt Hwy Roundabout at Kooringal Rd

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/VeavHs6e4AjLagqDA
PROCEDURE: Continue straight ahead. The truck will need to cut across the centre of the roundabout.
ROAD MODIFICATIONS: Sign to be removed in the middle of the roundabout. Handstand to be installed on roundabout and roundabout made trafficable.

618.4 Km's: 3rd Roundabout on the Sturt Highway at Wagga Wagga

Figure 27 - Sturt Hwy Roundabout at Norton St

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/dBrte59BvHyvcGSr5
PROCEDURE: Continue straight ahead. The truck will need to cut across the centre of the roundabout.
ROAD MODIFICATIONS: Sign to be removed in the middle of the roundabout. Roundabout made trafficable.

618.75 Km's: Sturt Hwy under Edward St Rail Bridge

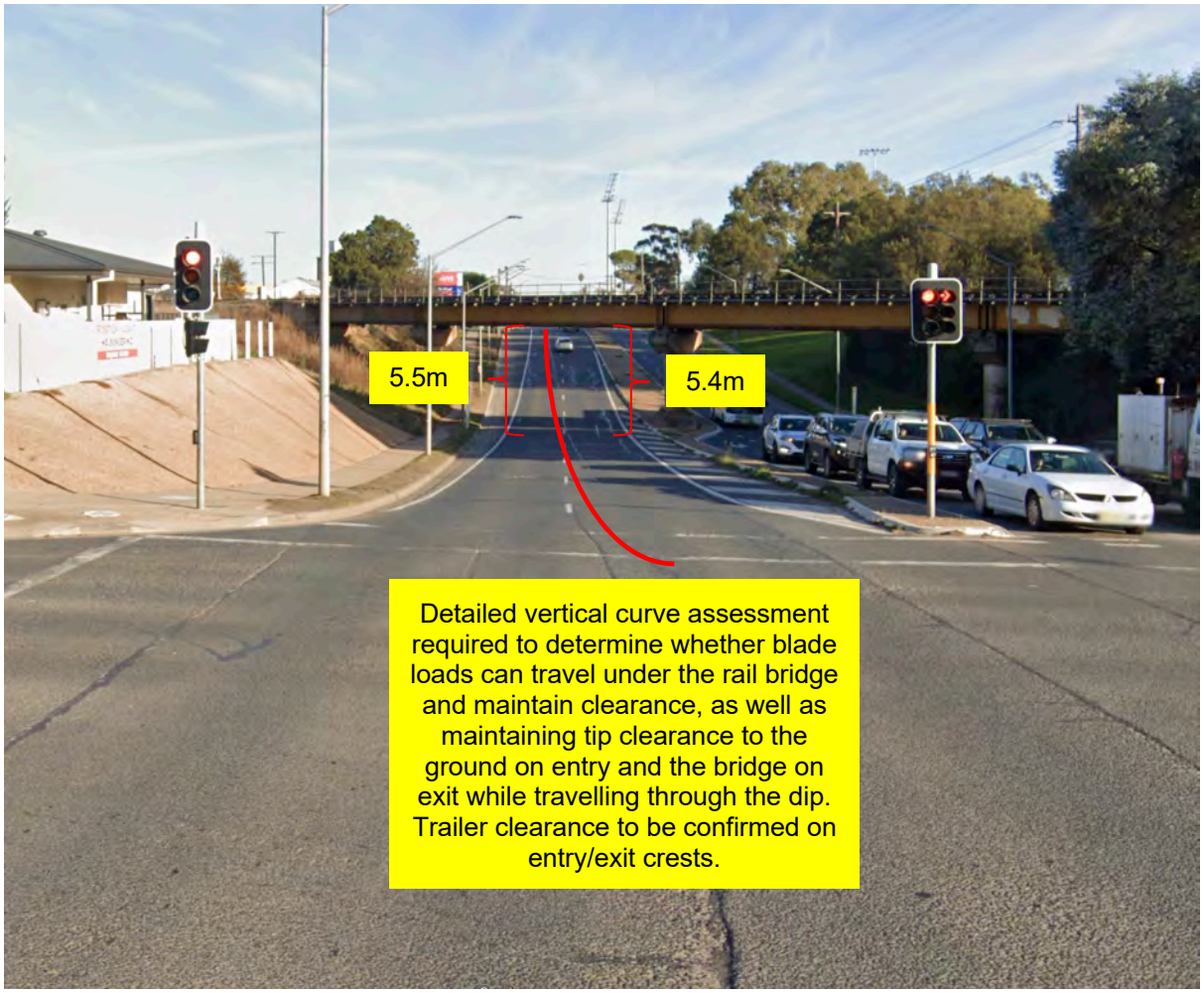


Figure 28 - Sturt Hwy under Edward St Rail Bridge

621.5 Km's: 4th Roundabout on the Sturt Highway at Wagga Wagga

Figure 29 - Sturt Hwy Roundabout at Pearson St

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/fx388veUAjbykiyPA
PROCEDURE: Continue straight ahead. The truck will need to cut across the centre of the roundabout.
ROAD MODIFICATIONS: Signs to be removed in the middle of the roundabout. Roundabout made trafficable.

711.0 Km's: Left hand bend to stay on the Sturt Highway at Gillenbah

Figure 30 - Left hand bend on the Sturt Highway at Gillenbah

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/C7gJ8ouDVdpcH5Rz7
PROCEDURE: Left hand Turn. The truck will need to cross onto the wrong side of the road for about 100m by cutting across the medium strip.
ROAD MODIFICATIONS: Several signs to be relocated or made removable. Power pole to be relocated out of swept path. Vegetation to be removed or trimmed for blade oversail. Traffic island to be removed and replaced with paint to make trafficable.

768.0 Km's: Sturt Hwy onto Kidman Way

Figure 31 - Sturt Hwy onto Kidman Way

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/H2YaBQvXqqHZRz4a7
PROCEDURE: Left hand turn
ROAD MODIFICATIONS: Hardstand to be installed on inside of corner. Sign to be relocated or removed.

819.0 Km's: Kidman Way onto Mclennons Bore Rd

Figure 32 - Kidman Way onto Mclennons Bore Rd

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/t2ijaAnyz7w4DNQ96
PROCEDURE: Right hand turn.
ROAD MODIFICATIONS: Hardstand to be installed on inside and outside of corner. Signs to be relocated or made removable.

841.0 Km's: Mclennons Bore Rd onto Wilsons Rd

Figure 33 - Mclennons Bore Rd onto Wilsons Rd

GPS LINK FOR THIS LOCATION: https://goo.gl/maps/zSfwKKyXzHs9m9nb7
PROCEDURE: Right hand turn
ROAD MODIFICATIONS: Hardstand to be installed on inside and outside of corner. Overhead conductor clearance to be confirmed.

842.0 Km's: Bend on Wilsons Rd

Figure 34 - Bend on Wilsons Rd

GPS LINK FOR THIS LOCATION: https://maps.app.goo.gl/Vg7BcMS9mx2bMZNP8
PROCEDURE: Right hand bend
ROAD MODIFICATIONS: No problems with this section of road.

849.0 Km's: Wilsons Rd Stock Grid

Figure 35 - Wilsons Rd Stock Grid

GPS LINK FOR THIS LOCATION: https://maps.app.goo.gl/Mo6o2EoLw8Q2treX7
PROCEDURE: Travel straight ahead
ROAD MODIFICATIONS: All stock grids to be upgraded to accommodate all proposed loads.

All site roads to be constructed to accommodate the vertical curve, swept path, weight and height of all proposed loads.

10.0 Conclusion Route 1

After studying all options and undertaking a route survey, this route in its current condition will require a moderate to major amount of upgrades before it could be deemed suitable for transporting the proposed components.
The following are the key points that need to be taken into consideration, if the project moves forward with this route.

SWEPT PATH:

- There are numerous sections along the route that need moderate to major work to allow a blade of this size through.
- The corners that we consider will need significant work and should be investigated early in the planning stages to avoid delays or rejections are outlined in the report.

OVERHEAD STRUCTURES: (5.0 Maximum loaded height)

- The maximum loaded height through the Northconnex tunnel should not exceed 5.00m.
- The rail overpass at wagga needs further investigation to determine the impact the change in vertical curve around this overpass may have.
- Loads higher than 5.0m cannot use this route and will need to travel along route 2 (high load route)

OVERHEAD UTILITIES:

- This route will need to be checked by an authorised scoping company. It is likely that a route of at least 5.0 metres is required for this project.

BRIDGES:

- Majority of the bridges have been used previously for similar loads so it is expected they will be ok. A bridge assessment will still be required.

RAIL ASSETS:

- There are a number of rail overbridges and crossings on route that will require approval from authorities before loads can access the routes.
- Detailed vertical curve assessment required to determine whether blade loads can travel under the rail bridge and maintain clearance, as well as maintaining tip clearance to the ground on entry and the bridge on exit while travelling through the dip. Trailer clearance to be confirmed on entry/exit crests.

PAVEMENT:

- The Pavement on all roads have adequate highway pavement up until the turn from Kidman Way onto Mclennons Bore Road.
- Mclennons Bore Road and Wilsons road through to site is gravel road of varying quality. The road will need to be graded before deliveries commence and regular grading will be required over the project delivery period. The road may become unusable in wet conditions which will impact delivery schedules. The average width is 6m so not a concern.

VEGETATION:

- The route requires a moderate amount of vegetation clearing at various locations.

ROADWORKS:

- The project will need to start discussions with government authorities at least 18 months prior to turbine transport to understand if the project would conflict with any upcoming roadworks. Once a Transport Management Plan “TMP” has been approved for the transport of the turbines, then the exact movement dates need to be communicated with all relevant authorities to make all road stakeholders are aware of the scheduled movements for each day.
- The project will need to regularly check on any new upgrades not listed in the report. If upgrades have taken place on a section of route after this report has been completed, then a swept path study would need to be undertaken on that section of road to confirm that it can still be used.

11.0 Route Survey 2: High Load Route. Maximum Loaded Height 5.9m

DISTANCE: 971 kilometres
GPS LINK: https://maps.app.goo.gl/RyKYeLy3bnXmbLjH9
This route took us via This route took us via Selwyn street, George Street, Industrial Drive, Maitland Road, New England Highway, John Renshaw Drive, Hunter Expressway, New England Highway, Golden Highway, Denman Road, Bengalla Road, Wybong Road, Golden Highway, Boothenba Road,Troy Bridge Road, Bunglegumbie Road, Mitchell Highway, Manildra Street, Derribing Avenue, Algalah Street, Tomingley Road, Newell Highway, Thomas Street, Moulden Street, Henry Parkes Way, Westlime Road, Hartigan Avenue, Newell Highway, Compton Road, Showground Road, Newell Highway, Sturt Highway, Kidman Way, Mclennons Bore Rd, Wilson Rd.

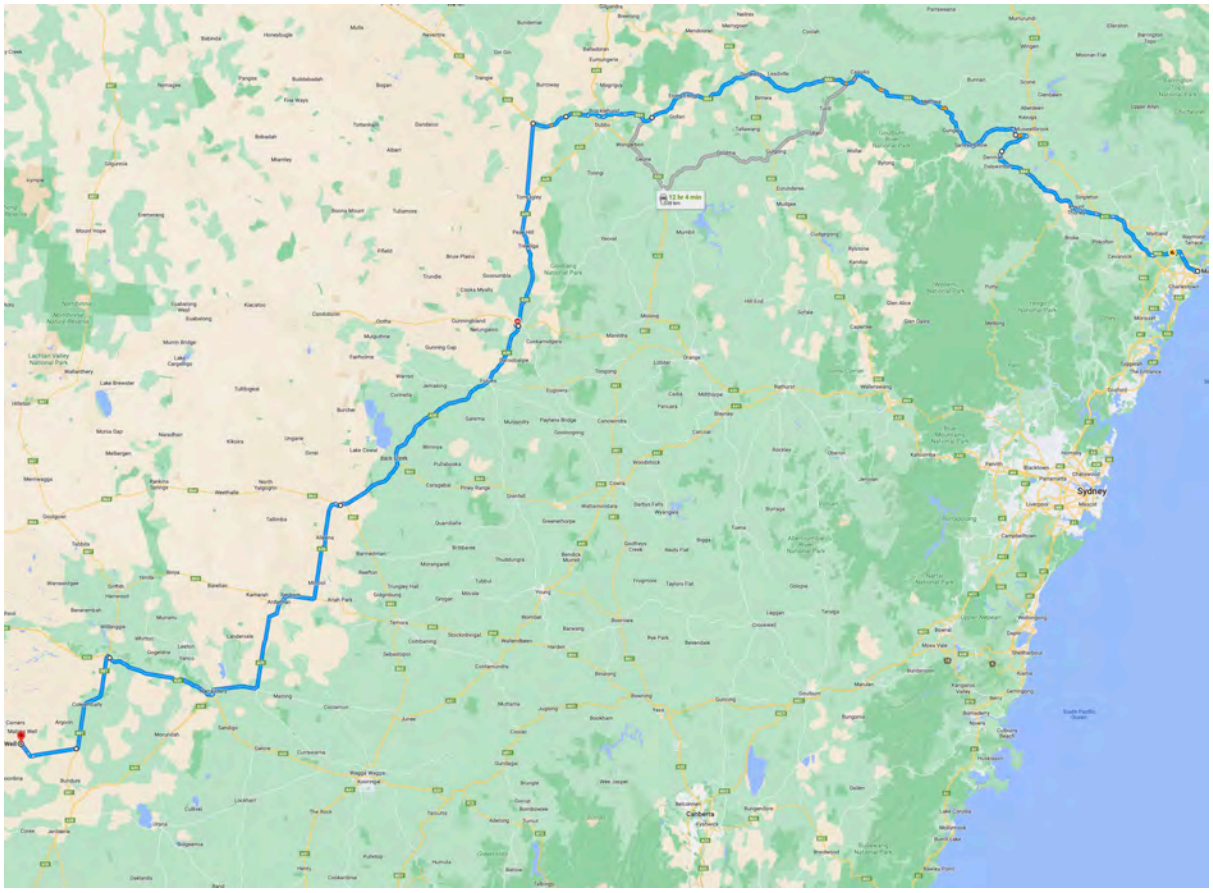


Figure 36 - Route 2

KEY	
CRITICAL	
CAUTION	
EMERGENCY PARKING	

KM index	Location	Section of road	Current clearance	Procedure	Notes
0.0	Mayfield	Mayfield #4 berth onto Selwyn Street https://goo.gl/maps/afLwPYKuNdm	Length: 70.0 Mtrs Width: 8.0 Mtrs	Moderate right hand turn	No problems with the towers on this section of road.
0.4	Mayfield	Selwyn Street over rail crossing https://goo.gl/maps/AmohE54hKSz	Length: 90 metres Width: 9.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
1.3	Mayfield	Selwyn Street onto George Street https://goo.gl/maps/gXeHvBtCp4D2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
1.4	Mayfield	George Street onto Industrial Drive https://goo.gl/maps/s4ayrsuoAsD2	Length: 40.0 Mtrs Width: 8.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
4.9	Mayfield	Industrial Drive under traffic signals https://goo.gl/maps/YmqhiS2iR582	Height: 5.4 metres	Travel directly ahead in the far right lane.	The lowest traffic signal on route is at the intersection of Steel River Blvd. Trucks that exceed 5.3 metres will need to travel in the right-hand lane. Clearance in the right end lane is 6.0 metres. Base towers (6.1m) will need to be lowered for travel through this intersection
5.5	Mayfield West	Industrial Drive onto Maitland Road https://goo.gl/maps/Kn49dhWG2qG2	Length: 40.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
6.4	Sandgate	Maitland Road over rail bridge https://goo.gl/maps/W2JWWjhfqv5UMviB7	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the right-hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
13.9	Hexham	New England Highway under gantry https://goo.gl/maps/YTMoFe7Aick	Height: 5.9 metres	Travel directly ahead	This is the lowest structure on route. There is no bypass around the gantry. A maximum loaded height of 5.9 metres should not be exceeded. Base towers (6.1m) will need to be lowered before travelling under this structure.
15.1	Tarro	New England Highway over rail bridge https://goo.gl/maps/tTnWLwQC2hzSPhAp6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead in the right-hand lane	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
17.4	Tarro	New England Highway onto John Renshaw Drive https://goo.gl/maps/SRDr5JigkBp	Length: 100.0 Mtrs Width: 12.0 Mtrs	Left hand merge	No problems with the towers on this section of road.
18.4	Beresfield	John Renshaw Drive https://goo.gl/maps/N19vJih1Fgr	Length: 100.0 Mtrs Width: 10.0 Mtrs	Travel directly ahead	The roundabout has been removed. A set of dual lanes now takes traffic directly across the intersection.
28.7	Buchanan	John Renshaw Drive onto the Hunter Expressway https://goo.gl/maps/1STJ1PfQt9E2	Length: 65.0 Mtrs Width: 7.0 Mtrs	Right hand turn	No problems with the towers on this section of road.
58.9	Branxton	The Hunter Expressway onto The New England Highway https://goo.gl/maps/7rauNuxzqjq	Length: 100.0 Mtrs Width: 12.0 Mtrs	Travel directly ahead	No problems with this section of road.

KM index	Location	Section of road	Current clearance	Procedure	Notes
67.3	Whittingham	The New England Highway onto the Golden Highway https://goo.gl/maps/nAnfkYfeUn42	Length: 70.0 Mtrs Width: 8.0 Mtrs	Left Hand turn	The NSW Government is currently upgrading this intersection. At this stage the data that is available for the upgrades shows that the section of road that we would need to access does not change considerably. However, it is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
67.4	Whittingham	Golden Highway https://goo.gl/maps/R86RFuPnmFU2	115.0 x 9.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
68.0	Whittingham	Golden Highway over rail bridge https://goo.gl/maps/5NwDQofandvvMKfY9	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.3	Mount Thorley	Golden Highway over rail bridge https://goo.gl/maps/qTxSbkxPu87L5hx4A	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
77.4	Whittingham	Golden Highway intersection with the Putty Road https://goo.gl/maps/7hQdEmK1EgE2	Length: 65 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
77.5	Mount Thorley	Golden Highway https://goo.gl/maps/zGvdupDuixx	100.0 x 10.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
80.6	Mount Thorley	Golden Highway over rail bridge https://goo.gl/maps/ipGU4USXmWZ8GkJs6	Length: 90 metres Width: 9.0 Metres	Travel directly ahead in the centre of the road.	Approval from Rail company required to cross this structure. Travel over this structure may have specific conditions.
80.8	Mount Thorley	Putty Road under Mt Thorley Road https://goo.gl/maps/SMzSLP1kvQYDMqa86	Heights: Left: 6.6 metres Centre: 6.3 Metres Right: 6.3 metres	Travel under the bridge in the left lane	Mt Thorley underpass is 6.3 metres in the centre of the road. Towers to pass under this structure on the correct side.
80.8	Mount Thorley	Golden Highway intersection with the Putty Road https://goo.gl/maps/QS9quvSyHYWaFHoX9	Length: 45 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
98.0	Warkworth	Golden Highway https://goo.gl/maps/Y6V6EXaCwxq	100.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
107.0	Jerrys Plains	Golden Highway through Jerrys Plains village https://goo.gl/maps/WgSCRsJ9ZGt	Length: 60 metres Width: 6.0 Metres	Left hand than right hand turn	No problems with this section of road.
126.0	Ogilvy	Golden Highway https://goo.gl/maps/58Tj9ojs7CC2	6% gradient	Travel directly ahead	This section of road has a steep mountain range that will require additional pull trucks to assists loads that exceed 80T gross weight. Additionally, the NSW Government is currently upgrading this section of road. It is recommended that you monitor the progress of the upgrades, and that any changes are thoroughly looked at.
131.9	Denman	Golden Highway onto Denman Road https://goo.gl/maps/sf4PNnycxB32	Length: 55 metres Width: 6.0 Metres	Right hand turn	No problems with this section of road.
137.9	Muswellbrook	Denman Road onto Bengalla Road https://goo.gl/maps/3sK4m6YSHNHqkqn68	Length: 60 metres Width: 8.0 Metres	Left hand turn	No problems with this section of road.
149.0	Bengalla	Bengalla Road onto Wybong Road https://goo.gl/maps/zfDyG4GQq6G37imB9	Length: 90 metres Width: 8.0 Metres	Left hand bend	No problems with this section of road.
158.0 to 183.0	Bengalla	Wybong Road https://goo.gl/maps/ekGZA5wFFK55Mvmc7	Length: 60 metres Width: 8.0 Metres	Travel directly ahead	This road is maintained by Muswellbrook Council. Approval will be required to travel on this section of Road.

KM index	Location	Section of road	Current clearance	Procedure	Notes
183.0	Sandy Hollow	Wybong Road onto Golden Highway https://goo.gl/maps/5ft3VnWpnPhpeN4u7	Length: 60 metres Width: 8.0 Metres	Right hand turn	No problems with this section of road.
190.1	Sandy Hollow	Golden highway https://goo.gl/maps/2THBuV165xx	50.0 x 4.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
193.0	Sandy Hollow	Golden Highway under safety Cam https://goo.gl/maps/b7t9zH2ankJcvWpT6	Height: Left: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.
201.0	Gungal	Golden highway https://goo.gl/maps/WDoL2LfeCoP2	70.0 x 6.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
221.0	Merriwa	Golden Highway under safety Cam https://goo.gl/maps/D92rzQ8vnUcYsqj56	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.
224.0	Merriwa	Golden highway https://goo.gl/maps/NqrWzTsRmnt	100.0 x 5.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
274.0	Cassilis	Golden highway https://goo.gl/maps/vs6YMT6TxCA2	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
305.0	Leadville	Golden highway https://goo.gl/maps/ujxMGukhopeFWRhb8	200.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
331.0	Dunedoo	Golden Highway over rail crossing https://goo.gl/maps/wsyNKfcoAij3SosY9	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
331.1	Dunedoo	Golden Highway intersection with Wargundy Street https://goo.gl/maps/WzACUHey3jYadj1K7	Length: 60 metres Width: 6.0 Metres	Right hand bend	No problems with this section of road.
384.0	Ballimore	Golden Highway https://goo.gl/maps/RuKKrfHarw1Mjy5E9	150.0 x 8.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
392.0	Ballimore	Golden Highway over rail crossing https://goo.gl/maps/yb15Kz6R2r3E69fj6	Length: 90 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
400.0	Dubbo	Golden Highway onto Boothenba Road https://goo.gl/maps/TJLi5W4ir11ejgtb6	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
411.0	Dubbo	Boothenba Road over rail crossing https://goo.gl/maps/72ageimPLqPWYY7M9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
411.1	Dubbo	Boothenba Road onto Troy Bridge Road https://goo.gl/maps/2u5uRf2BvKxseoFm9	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
414.0	Dubbo	Troy Bridge Road onto Bunglegumbie road https://goo.gl/maps/6Uke9jwPypNYVPux5	Length: 90 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
420.0	Dubbo	Bunglegumbie road onto the Mitchell Highway https://goo.gl/maps/jCWqmaQsd3fChp837	Length: 50 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
450.0	Narromine	Mitchell Highway onto Manildra Street https://goo.gl/maps/hFG648tcSMUHxJ8h6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.1	Narromine	Manildra Street over rail crossing https://goo.gl/maps/4s2HYJJfJQ5pGbKq7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
450.2	Narromine	Manildra Street onto Derribong Avenue https://goo.gl/maps/776aPaxgsFTWi6qL6	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
450.5	Narromine	Derribong Avenue onto Algalah Street https://goo.gl/maps/9s8cb8G4T2c75t1V8	Length: 40 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
452.0	Narromine	Algalah Street onto Tomingley Road https://goo.gl/maps/EWfZYo3Xos6T3J8A8	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
487.5	Tomingley	Tomingley Road onto the Newell Highway https://goo.gl/maps/NJtXmHCFHxaiMaq39	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	No problems with this section of road.
488.0	Tomingley	Newell Highway https://goo.gl/maps/ADMke5At2A1Uy1z4A	200.0 x 15.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
489.0	Tomingley	Newell Highway under safety Cam https://goo.gl/maps/9Vqu9xXxRwhHt4Uk6	Height: Right: 6.8 metres	Travel directly ahead on the correct side	No problems with this section of road.
490.0	South Tomingley	Newell Highway https://goo.gl/maps/1q8f6HJ2zsZSxup66	150.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
502.0	Peak Hill	Newell Highway https://goo.gl/maps/orKTBB8wobK6exsc6	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.

KM index	Location	Section of road	Current clearance	Procedure	Notes
503.0	Peak Hill	Newell Highway under safety Cam https://goo.gl/maps/sAbh8zwZzZVMriD2A	Height: Right: 6.3 metres	Travel directly ahead on the correct side	No problems with this section of road.
526.0	Alectown	Newell Highway https://goo.gl/maps/GMGbEJHAEkeWuRyz5	90.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
552.0	Parkes	Newell Highway onto Thomas Street https://goo.gl/maps/fSnFVWPr78RePSTz9	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
554.0	Parkes	Thomas Street onto Moulden Street https://goo.gl/maps/HpYrcwcx8BHrUmfc8	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
554.8	Parkes	Moulden Street onto Henry Parkes Way https://goo.gl/maps/atnNtdtyi21wK4PF9	Length: 55 metres Width: 6.5 Metres	Left hand turn	No problems with this section of road.
555.0	Parkes	Henry Parkes Way onto Westlime Road https://goo.gl/maps/Uk2nuLS7xvfnv5dt6	Length: 55 metres Width: 6.5 Metres	Right hand turn	No problems with this section of road.
556.0	Parkes	Westlime Road onto Hartigan Ave https://goo.gl/maps/XtKgPrWcZHY3im65A	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
557.0	Parkes	Hartigan Avenue under traffic signal https://goo.gl/maps/sQxVxzZivbDX7E3j6	Height: Left: 5.5 metres	Travel around the traffic signal on the incorrect side of the road.	Traffic signal is too low. Pass on right hand side.
558.0	Parkes	Hartigan Ave onto the Newell Highway https://goo.gl/maps/y3rabftt4HGreX9e6	Length: 55 metres Width: 6.5 Metres	Travel directly ahead	No problems with this section of road.
558.1	Parkes	Newell Highway over rail crossing https://goo.gl/maps/7tSoLfFManXyKV3T9	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
562.0	Parkes	Newell Highway over rail crossing https://goo.gl/maps/Kxa3shUCMiuKe2sX7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
569.0	Tichborne	Newell Highway over rail crossing https://goo.gl/maps/gxYUZLLe3jsCEJgD7	Length: 60 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
576.0	Daroobalgie rest area	Newell Highway https://goo.gl/maps/swec16PWh1N8ZbUR7	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
590.0	Forbes	Newell Highway intersection with Dowling Street https://goo.gl/maps/DqkvxH4qtWnXvLJ26	Length: 45 metres Width: 6.0 Metres	Left hand turn	No problems with this section of road.
590.2	Forbes	Newell Highway https://goo.gl/maps/Hsmjs9pqvZ5UYFAH7	100.0 x 6.5 metres	Parking Bay	Suitable parking for Fatigue breaks.
595.5	Forbes	Newell Highway under safety Cam https://goo.gl/maps/hUdv6YJunC9yfoxF7	Height: Right: 6.4 metres	Travel directly ahead on the correct side	No problems with this section of road.
658.0	Marsden	Newell Highway under safety Cam https://goo.gl/maps/fRpjbRoXfup29Swx6	Height: Right: 6.9 metres	Travel directly ahead on the correct side	No problems with this section of road.
659.0	Marsden rest area	Newell Highway https://goo.gl/maps/AfAfr2wuNTjQMdKT8	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
689.0	Wyalong	Newell Highway under safety Cam https://goo.gl/maps/sudP4qYXPWbDB6sL6	Height: Centre: 6.2 metres	Travel directly ahead on the correct side	No problems with this section of road.
698.0	West Wyalong	Newell Highway onto Compton Road https://goo.gl/maps/PeM4uWg5hLiyZiPd8	Length: 55 metres Width: 6.5 Metres	Left hand turn	Spotter to assist at this pinchpoint. Escorts to control traffic as per plan below for this section of road.
700.5	West Wyalong	Compton Road onto Showground Road https://goo.gl/maps/hts5qARMMWZcvW7R7	Length: 50 metres Width: 6.5 Metres	left hand turn	No problems with this section of road.
701.0	West Wyalong	Compton Road over rail crossing https://goo.gl/maps/KQwsgDkEDASMpB9r8	Length: 50 metres Width: 6.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
702.5	West Wyalong	Showground Road https://goo.gl/maps/C8GevkguVtpkHjkFA	150.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.

KM index	Location	Section of road	Current clearance	Procedure	Notes
703.0	West Wyalong	Showground Road onto the Newell Highway https://goo.gl/maps/yAyBdrZcocEeTBnz6	Length: 50 metres Width: 6.5 Metres	Left hand turn	Spotter to assist at this pinchpoint. Escorts to control traffic as per plan below for this section of road.
721.0	Allena	Newell Highway over rail crossing https://goo.gl/maps/GMHsd5ynEFwzjmnXA	Length: 50 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
749.0	Mirrool	Newell Highway over rail crossing https://goo.gl/maps/kFkwMBL9nfKgL954A	Length: 50 metres Width: 6.5 Metres	Travel directly ahead	Loads to travel over the crossing in the center of the road. Approval required crossing this line, likely cross with caution.
784.0	Ardlethan rest area	Newell Highway https://goo.gl/maps/Na3rzBt25sMnsBya6	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
823.0	Grong Grong rest area	Newell Highway https://goo.gl/maps/vBTyD3zJVMcbn6wy9	200.0 x 7.0 metres	Parking Bay	Suitable parking for Fatigue breaks.
836.0	Narrandera	Newell Highway over rail bridge https://goo.gl/maps/YBWuYYyVoZfSUTJ37	Length: 50 metres Width: 7.0 Metres	Travel directly ahead	Loads to travel over the bridge in the center of the road. Approval required crossing this line, likely cross with caution.
837.0	Narrandera	Newell Highway at Whitton Street https://goo.gl/maps/EXcuuBeMsXdhVDtm8	Length: 50 metres Width: 7.5 Metres	Left hand turn	Spotter to assist at this pinchpoint. Escorts to control traffic as per plan below for this section of road.
837.0 to 838.0	Narrandera	Newell Highway (Cadell St) https://goo.gl/maps/Z3ptasM9sGGtaB5A8	Length: 50 metres Width: 7.5 Metres	Travel directly ahead	Trees to be trimmed
839.0	Narrandera	Newell Highway onto Sturt Highway https://goo.gl/maps/uFiCyhp9uF147Wie8	Length: 80 metres Width: 7.5 Metres	Right hand turn	No problems with this section of road.
945.0	Jerilderie	Newell Hwy GPS Link: https://goo.gl/maps/zfi4N15wcsR8GqGX8	90.0 metres long 6.0 metres wide	Parking Bay	Possible Parking on correct side of road: AMPOL truck stop
888.0	Darlington Point	Sturt Hwy onto Kidman Way GPS Link: https://goo.gl/maps/H2YaBQvXqgHZRz4a7	45 metres	Left hand turn	No problems with this section of road.
939.0	Coleambally	Kidman Way onto Mclennons Bore Rd GPS Link: https://goo.gl/maps/t2ijaAnyz7w4DNQ96	30 meters	Right hand turn	Road becomes gravel. May become unusable in wet conditions.
962.0	Jerilderie	Mclennons Bore Rd onto Wilsons Rd GPS Link: https://goo.gl/maps/zSfwKKyXzHs9m9nb7	40 metres	Right hand turn	Gravel road. May become unusable in wet conditions.
963.0	Argoon	Bend on Wilsons Rd GPS Link: https://maps.app.goo.gl/Vq7BcMS9mx2bMZNP8	100 metres	Right hand bend	Gravel road. May become unusable in wet conditions.
970.9	Argoon	Wilsons Rd Stock Grid GPS Link: https://maps.app.goo.gl/Mo6o2EoLw8Q2treX7	5.8 M Wide	Travel straight ahead	All stock grids to be upgraded to accommodate all proposed loads.
971.0	Argoon	End Route			All site roads to be constructed to accommodate the vertical curve, swept path, weight and height of all proposed loads.

12.0 Conclusion Route 2

After studying all options and undertaking a route survey, this route is suitable in its current condition for transporting the proposed components.
The following are the key points that need to be taken into consideration, if the project moves forward with this route.

LENGTH

- The longest combination that can travel along this route without upgrades is **55m overall length**

OVERHEAD STRUCTURES: (Maximum loaded height 5.9m)

- The lowest unavoidable structures are the gantry's along the New England Highway. The lowest of these has a clearance of 5.9m. A maximum loaded height of 5.9m should not be exceeded on this route.
- Base towers will need to be lowered at a number of points along the route.

OVERHEAD UTILITIES:

- This route will need to be checked by an authorised scoping company. It is likely that a route of at least 6.2m metres is required for this project.

BRIDGES:

- Majority of the bridges have been used previously for similar loads so it is expected they will be ok. A bridge assessment will still be required for all items over 80T in weight.

RAIL ASSETS:

- There are a number of rail overbridges and crossings on route that will require approval from authorities before loads can access the routes.

PAVEMENT:

- The Pavement on all roads have adequate highway pavement up until the turn from Kidman Way onto Mclennons Bore Road.
- Mclennons Bore Road and Wilsons road through to site is gravel road of varying quality. The road will need to be graded before deliveries commence and regular grading will be required over the project delivery period. The road may become

ROADWORKS:

- The project will need to start discussions with government authorities at least 18 months prior to turbine transport to understand if the project would conflict with any upcoming roadworks. Once a Transport Management Plan "TMP" has been approved for the transport of the turbines, then the exact movement dates need to be communicated with all relevant authorities to make all road stakeholders are aware of the scheduled movements for each day.
- The project will need to regularly check on any new upgrades not listed in the report. If upgrades have taken place on a section of route after this report has been completed, then a swept path study would need to be undertaken on that section of road to confirm that it can still be used.

13.0 References

Rex J Andrews P/L
Rex J Andrews P/L Route survey # 419
Spark Renewables
Google Earth/Maps
Nearmaps
NHVR (OSOM)
Australian Load Restraint Guide

Disclaimer: This route study is provided on the basis of information only purposes and is to be used strictly as a guide only; Government approvals would be required before these routes could be deemed suitable for transporting the components over the listed routes.

Any, and all parties using information contained this submission do so at own risk.

RJA accept no responsibility for the use of all information contained within this report.

Actual approved routes may differ from those surveyed.

Proposed routes may change subject to approvals from authorities.

The blade listed in this report is a prototype only. More information on this blade is required before confirmation that the route can accommodate this size load.

This study was undertaken using data supplied by Rex J Andrews P/L. Equipment and swept paths might vary if using transport methodology other than the data supplied by Rex J Andrews.

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