Tilbuster 2 Solar Farm

Traffic Impact Assessment

Enerparc Australia

4 March 2025

→ **The Power of Commitment**

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Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.

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Glossary

Term	Definition
AV	Articulated vehicles
BAL	Basic left turn treatment
BAR	Basic right turn treatment
BESS	Battery Energy Storage System
CTMP	Construction Traffic Management Plan
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental impact statement
Enerparc	Enerparc Australia Pty. Ltd.
EP&A Act	Environmental Planning and Assessment Act 1979
GHD	GHD Pty Ltd
ha	Hectare
HRV	Heavy Rigid Trucks
km	Kilometre
km/hr	Kilometres per hour
kV	Kilovolt
LGA	Local Government Area
LoS	Level of Service
m	Metre
MRV	Medium Rigid Trucks
MW	Megawatt
MWh	Megawatt per hour
OSOM	Over size over mass
Proposal	The construction, operation and decommissioning of a ground-mounted photovoltaic (PV) solar array, which would generate approximately 140 MW
Project	Approved Stage 1 of Tilbuster Solar Farm
PV	Photovoltaic
RAV	Restricted Access Vehicle
SEARs	Secretary's environmental assessment requirements
SSD	State Significant Developments
TIA	Traffic Impact Assessment
Transport	Transport for NSW
Transport and Infrastructure SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
veh/h	Vehicles per hour
vpd	Vehicles per day
vph	Vehicles per hour

1. Introduction

1.1 Background

Enerparc is developing the Tilbuster Solar Farm (State Significant Development (SSD) 9619), which was approved under Section 2.22 and Clause 20 of Schedule 1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 3 March 2022. The Tilbuster Solar Farm (the project) is located approximately 15 kilometres (km) north of Armidale in the Armidale Regional local government area (LGA), see Figure 1.1.

The project involves the construction, operation and decommissioning of a new solar farm with a generating capacity of 150 megawatts (MW) and 15 MW/30 MW per hour (MWh) of battery energy storage. The solar farm will connect to the existing Transgrid 330 kilovolt (kV) transmission line, which traverses the site and connects the Dumaresq Substation to the Armidale Substation.

Due to design refinements made in response to ecological and heritage constraints identified during the preparation of the Environmental Impact Statement (EIS), the project was approved with a lower MW capacity than originally anticipated. As a result, Enerparc have acquired adjacent land and proposes developing Stage 2 of the project to maximise the generation potential of the site (the proposal).

The proposal is located on land adjoining the project and would make use of transmission, storage and construction facilities on that site.

1.2 Proposal overview

The proposal involves the construction, operation and decommissioning of a ground-mounted photovoltaic (PV) solar array, which would generate approximately 140 MW in addition to the 150 MW generated by the project.

The proposal site is located at Lot 4 DP800611, 11915 New England Highway, Black Mountain NSW 2365. The proposal site has an area of approximately 250 hectares (ha), with the proposed development to be constructed on approximately 140 ha of this land.

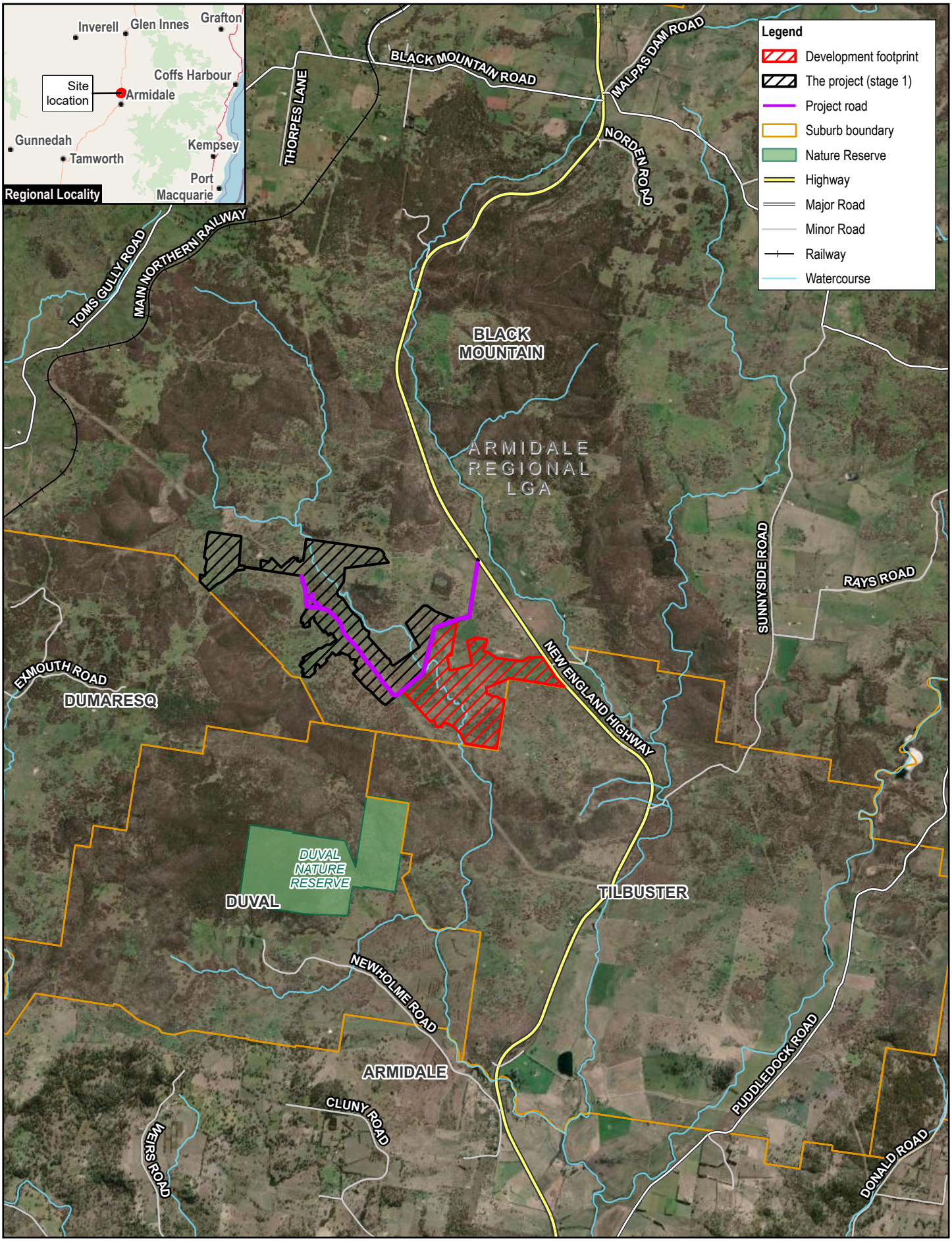
In total, the construction phase of the proposal is expected to take nine months, and the facility is expected to operate for around 30 years or extended pending further approvals. The proposal would be constructed as part of the overall construction of the approved project. This would reduce the construction period for the proposal and minimise impacts on the community.

The primary access point for light and heavy vehicles during construction and operation would be via an existing access off the New England Highway, which is currently under construction for the project. Temporary construction compounds and laydown areas would also be located on the project site.

Construction of the proposal is anticipated to take nine months, with work commencing, pending approval, in early 2025. Up to 100 construction workers would be required.

Up to five full time equivalent operations and maintenance staff and service contractors would operate the proposal as part of the operation of the approved project. Existing transmission and storage infrastructure within the approved project footprint would be used to connect the proposal to the national electricity grid.

Figure 1.2 shows the indicative layout for the proposal, including the location of solar PV panels, associated infrastructure and internal access roads.



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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Local context

Project No. **12636761**
Revision No. **0**
Date **23/10/2024**

FIGURE 1.1

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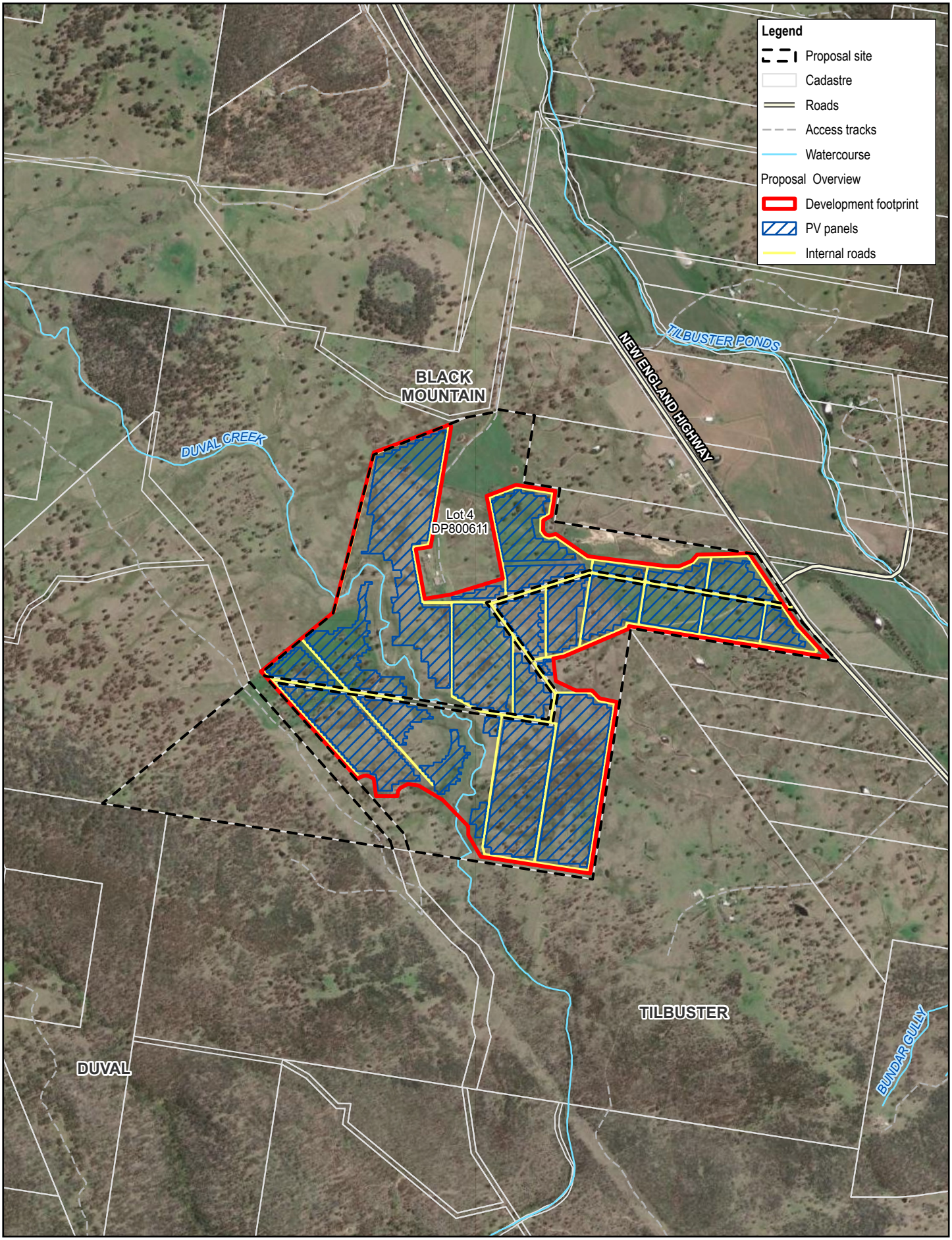

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Map Projection: Transverse Mercator
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Tilbuster 2 Solar Farm
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Project No. **12636761**
Revision No. **0**
Date **23/10/2024**

Overview of the proposal

FIGURE 1.2

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Data source: LPI: DTDB / DCDB, 2023; Enerparc: Proposal data, 2024; World Imagery: Maxar. Created by: fmackay

1.3 Purpose of this report

GHD has prepared this TIA to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) for the proposal. A summary of the SEARs is provided in Table 1.1 together with the relevant sections of the TIA addressing the particular requirement.

Additionally, Transport for NSW (Transport) have provided additional requirements for the proposal in response to correspondence sent by GHD on 1 July 2024. These are addressed in Appendix A.

The TIA will support the preparation of an Environmental Impact Statement (EIS) for the proposal.

Table 1.1 Traffic and transport SEARs

SEARs	Where addressed in this report
Detail of the proposed development, including daily and peak traffic generation (Including over mass and over dimensional vehicles/ heavy vehicles requiring escort and construction worker transportation.	Details of the proposed development are provided in Section 3.1. The expected vehicle activity is detailed in Section 3.2.
Analysis of the impacts of the proposed development to the site access route (s), site access point (s) and any Crown land including road capacity and condition, intersection performances, road safety and any impact from surrounding development.	The traffic impacts of the proposed development are detailed in Section 3.4.
Measures to mitigate any traffic impacts, including a schedule and strategic design of required road upgrades (including those resulting from heavy vehicle and over mass and over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, prepared in consultation with relevant road and rail authorities (if required).	Mitigation measures are detailed in Section 4.

1.4 Scope of work

The scope of work for this TIA is to identify the traffic and transport impacts of the proposal on the adjoining road network. The report:

- Identifies the traffic and transport facilities in proximity to the subject site.
- Assesses the traffic/transport impacts of the construction and operation of the proposal.
- Recommends measures to mitigate and manage the potential traffic/transport impacts.

1.5 Assumptions and qualifications

This report is based on the following assumptions and qualifications:

- Traffic volumes from the New England Highway were sourced from publicly available data.
- No traffic surveys or intersection modelling has been undertaken.
- The site will generate negligible additional operational vehicle activity.
- Two shuttle buses with a capacity of 25 workers each will transfer workers to and from the subject site during peak morning and afternoon periods.
- The remaining 50 workers will drive, with an average occupancy of 1.35 persons per car, corresponding to 37 light vehicle trips.
- During the construction of the proposal, up to 125 workers would be employed, and up to 42 heavy vehicle movements would be generated per day (based on information provided by Enerparc).

1.6 Limitations

This report has been prepared by GHD for Enerparc Australia and may only be used and relied on by Enerparc Australia for the purpose agreed between GHD and Enerparc Australia as set out in this report.

GHD otherwise disclaims responsibility to any person other than Enerparc Australia arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Existing conditions

2.1 Literature review

In August 2021, Amber Traffic and Transportation prepared the *Tilbuster Solar Farm Traffic Impact Assessment for Stage 1 of the Tilbuster Solar Farm*. Key aspects of the TIA were as follows:

- The (Stage 1) solar farm is expected to take approximately 12 months to construct.
- A maximum of 125 workers will be onsite during construction, with an average of 90 workers.
- Shuttle buses (with a capacity of 25 persons) will be used to transfer approximately 80 percent of workers to and from the construction site.
- The remaining workers will drive with an average vehicle occupancy of 1.35 workers per car.
- During peak construction activity, the site could generate up to 35 heavy and 66 light vehicle movements per day.
- During operation, the solar farm will generate up to six vehicle movements per day.
- Vehicles will access the site via the New England Highway and will then travel south along an unnamed road before entering the site using the access point.
- It is anticipated that most workers will be located in nearby regional towns such as Armidale and Guyra. For the purposes of the assessment, it was estimated that 75 percent of staff will be travelling from the south, and the remaining 25 percent will travel from the north.
- Rigid heavy vehicles will predominantly consist of water trucks and vehicles transporting materials such as concrete and fencing supplies.
- It was assumed that 75 percent of heavy vehicles will be travelling from the south and the remaining 25 percent will travel from the north.
- The construction impacts of the Stage 1 solar farm were expected to be minimal.
- The intersection of the unnamed access road with the New England Highway would be upgraded to a basic right (BAR) and basic left (BAL) turning lanes.

With respect to the proposed upgraded access intersection, it is noted that it:

- Will be constructed prior to the Stage 1 solar farm construction works.
- Will be shared by the proposal construction and operational vehicles.

2.2 Existing road network

2.2.1 Road hierarchy

Functional road classification involves the relative balance of mobility and access functions. Transport defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility to high accessibility and low mobility. These road classes are:

- **Arterial Roads** – generally controlled by Transport, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- **Sub-Arterial Roads** – can be managed by either Transport or local council. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a subregion or provide connectivity from arterial road routes (regional links).
- **Collector Roads** – provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads** – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 New England Highway

The New England Highway (A15, refer to Figure 2.1) is an arterial road that connects Newcastle in NSW to Yarraman in Queensland. The New England Highway connects the townships within the New England Northwest and the Hunter Regions and serves as a vital freight transport route linking inland mining areas in the Hunter to the Port of Newcastle.

The key features of New England Highway in the vicinity of the study area are summarised in Table 2.1.

Table 2.1 New England Highway key features

Feature	Description
Carriageway	Sealed, divided, line marked, single carriageway with one lane in each direction Carriageway widths of approximately seven metres (3.5 metres per lane)
Road owner	Transport for NSW (classified road)
Parking	No designated parking facilities are provided
Speed limit	100 km per hour (km/hr) outside urban areas
Pedestrian facilities	No pedestrian facilities are provided
Bicycle facilities	No dedicated cycling facilities
Public transport	No bus stops in the vicinity of the proposal site

Figure 2.1 New England Highway at access road (source: Transport for NSW)

2.3 Crash data review

A review of crash data from the Transport Centre for Road Safety has been undertaken based on the last five years of data (2018 – 2022), as displayed in Figure 2.2.

Figure 2.2 Crash data in proximity to subject site (2018 – 2022) (source: Transport for NSW)

The data indicates one crash was recorded approximately 150 southeast of the proposal site. The crash resulted in a head-on collision that lead to moderate injury to two people. Another two incidents are identified approximately 1.6 km southeast of the proposal site, neither of which resulted in a casualty.

2.4 Active and public transport

There are no active transport facilities in proximity to the proposal. There are school bus routes along the New England Highway travelling from Armidale to Llangothlin (S303) and from Armidale to Guyra Tenterden Road (S304). The Armidale to Tenterfield Coach Service (327) provides a daily service that traverses the New England Highway. In summary, there are few public transport services in proximity to the proposal site.

2.5 Over size and over mass (OSOM) vehicles

The National Heavy Vehicle Regulator (NHVR) refers to OSOM vehicles as 'Class 1 load carrying vehicles', which are defined as:

– A vehicle and its load exceeding proscribed mass or dimension requirements.
– Carrying a designed for purpose or large indivisible item.

The Additional Access Conditions: Oversize and overmass heavy vehicles and loads (TfNSW 2020) specifies the requirements for escort/pilot vehicles in accordance with the size of the OSOM vehicle, as follows:

– Vehicles up to 3.5 metres wide and 26 metres long do not require and escort vehicle.
– Vehicles between 3.6 metres to 4.6 metres wide and 19 metres to 30 metres long require a single escort vehicle.
– Vehicles larges than this require two to three escort vehicles.

Transport for NSW (TfNSW) has developed a load declaration form that certifies the mass and dimensions of the OSOM vehicle comply with permit conditions. Additionally, a Transport Management Plan (TMP) that describes how an OSOM movement will be undertaken for 'high risk' OSOM movements is required. A high risk movement is defined as:

– Vehicles that exceed certain dimensions i.e. longer than 40 metres and six metres wide.
– Vehicles that travel on high risk routes.
– Vehicles that with sensitive loads i.e. radiation, chemicals etc.

Additionally:

– State wide curfews are imposed by the NSW Government on the movement of OSOM vehicles during key holiday periods i.e. 23 December 2024 and 03 January 2025.
– Restrictions can be applied to specific sections of roads, i.e. on the Hunter Expressway between Seahampton and Branxton, vehicles exceeding 3.2 metres width are not permitted to travel from Monday to Friday 5:00 am – 9:00 am and 4:00 pm – 6:00 pm.

2.6 Freight routes

The NHVR map indicates that the New England Highway and other arterial road in general proximity to the subject site are authorised to 26 metre B-doubles and OSOM vehicles, as displayed in Figure 2.3.

Figure 2.3 Freight routes – 26 metre B-double and OSOM (source: Transport for NSW)

2.7 Traffic data

Traffic volume data for the New England Highway was obtained from the Transport count station (Station ID: 92065), approximately 8.5 km south of the proposal site, as displayed in Figure 2.4. This is the closest count station to the proposal site.

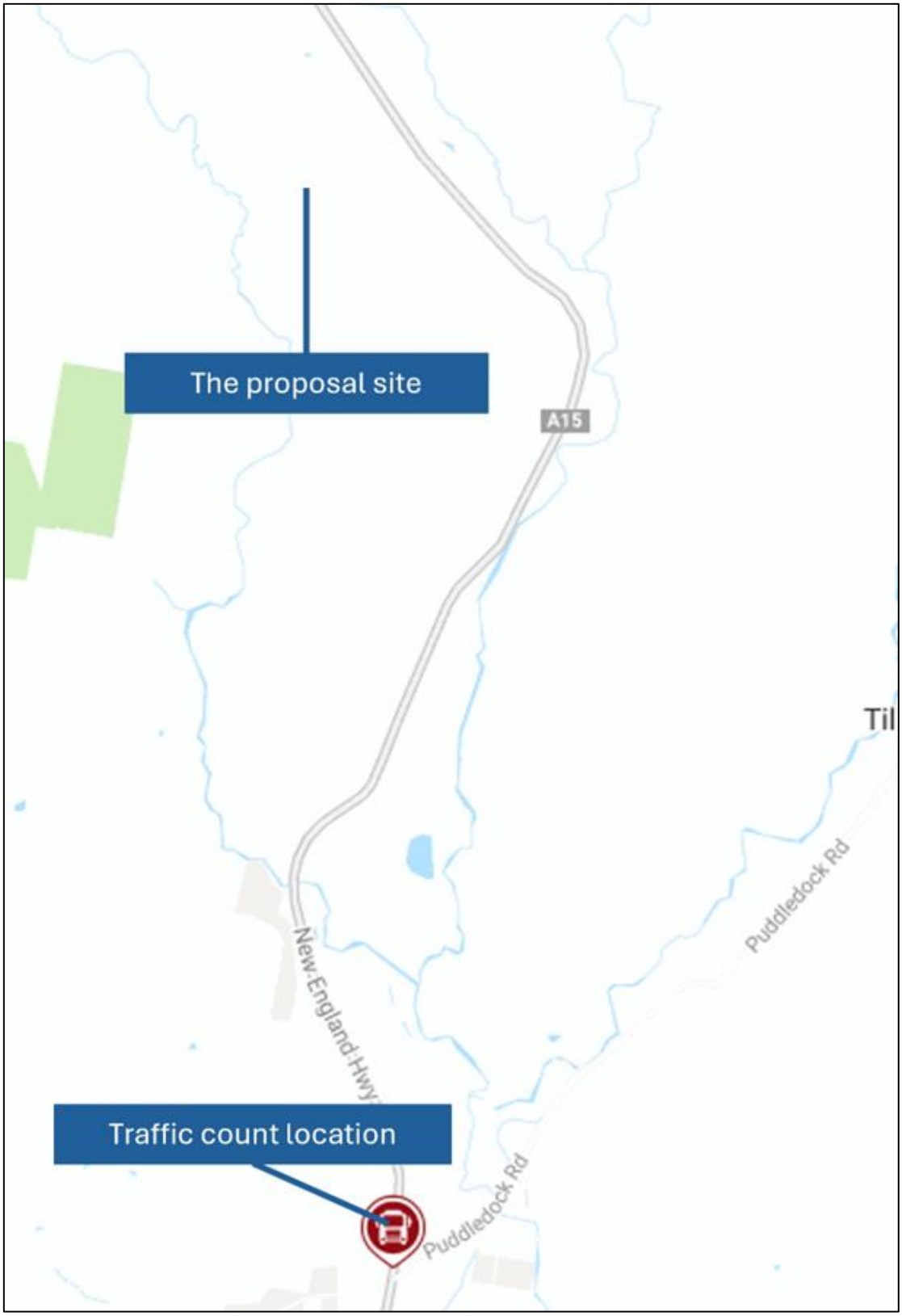

Figure 2.4 Count station location (source: Google Maps modified by GHD)

The most recent available traffic data from the Transport count station is from 2011. As such, an annual growth rate of 1.5 percent has been applied to the 2011 data to calculate the traffic volumes for 2024 (vehicles per day, vpd) (refer to Table 2.2).

Table 2.2 New England Highway weekday traffic volume data

Road	Survey location	Survey year	Recorded volume	Peak hour	Growth factor	Current traffic volume (2024)
New England Highway	50 m south of Blanches Road	2011	2,143 vpd 83% light 17% heavy	AM - 202 vph PM - 184 vph	1.5%	2,716 vpd 246 vpd (AM) 214 vpd (PM)

The 2024 average weekday traffic volumes on the New England Highway, accounting for the growth rate, are displayed in Figure 2.5.

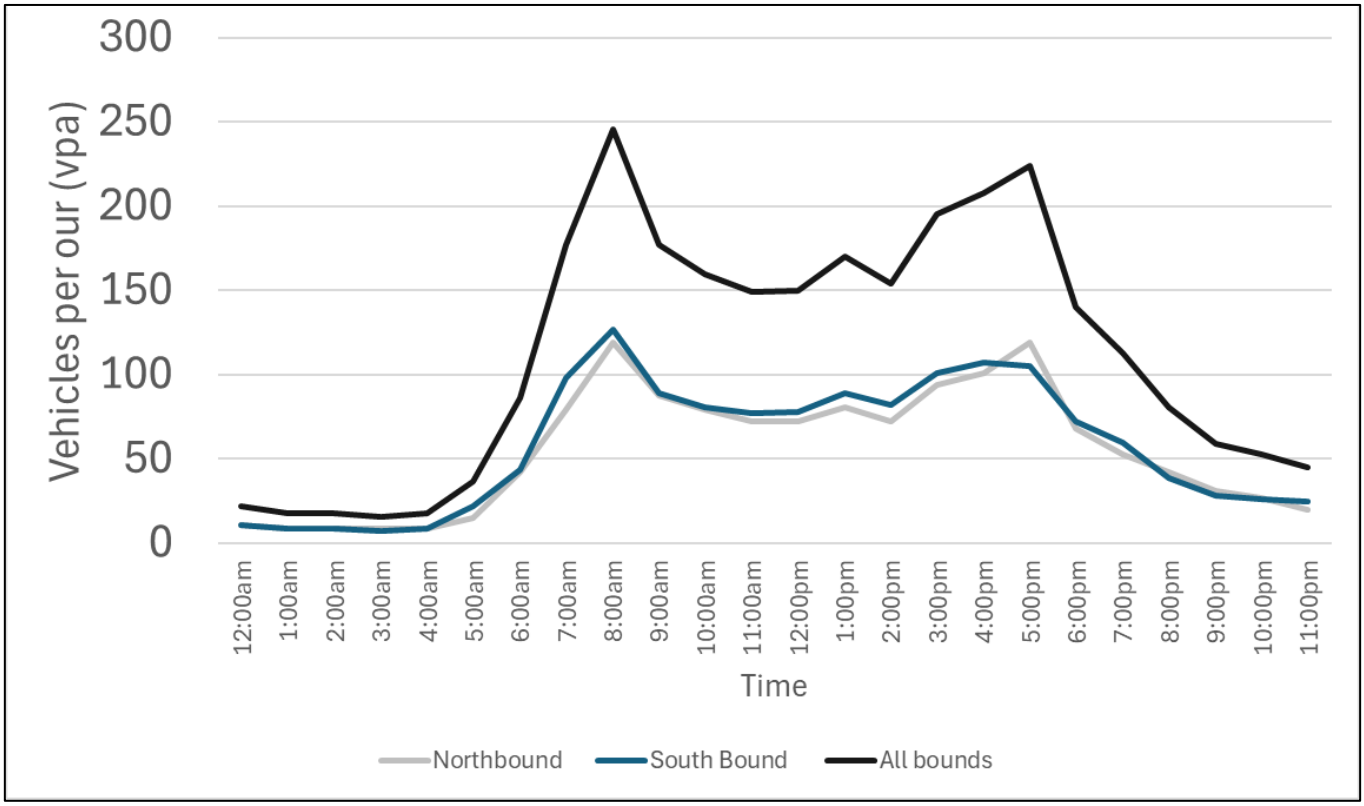

Figure 2.5 New England Highway traffic volume data calculated to 2024 (weekdays)

Analysis of the traffic survey data in Figure 2.5 indicates that:

– The AM peak hour was recorded from 7:00 am to 8:00 am, with 119 northbound vehicles and 127 southbound vehicles.
– The PM peak hour was recorded between 4:00 pm to 5:00 pm, with 114 northbound vehicles and 100 southbound vehicles.

2.8 Road network performance

Level of Service (LoS) is a qualitative measure used to describe the operating conditions of a section of road or an intersection. LoS are designated from A to F, from best (free flow conditions) to worst (forced flow with stop-start operation, long queues and delays), and represent the perception of the road conditions by motorists, including speed and travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience, and safety.

The *Transport Guide to Traffic Generating Developments* (October 2002), suggests that ideally, rural roads should not exceed service volumes at LoS D. Table 4.5 of the Transport Guide sets out two-way hourly road capacities for two-lane roads for different levels of service with a design speed of 100 km/hr based on different terrain types.

For level rural roads with a 100 km/h speed limit and approximately 15 percent heavy vehicles, the Transport Guide specifies a capacity of 1,410 vehicles per hour (veh/h).

The data in Figure 2.5 indicates that the New England Highway is currently estimated to be accommodating 246 vehicles in the morning peak hour and 214 vehicles in the afternoon peak hour, which is well within the capacity of the road network and the road is expected to operate within a good LoS.

Accounting for the higher traffic volumes and greater percentage of heavy vehicles at the Transport count station, the data indicates that the New England Highway is operating well within its mid-block capacity.

3. Impact assessment

3.1 Proposed development

3.1.1 Construction activities

Construction of the proposal is anticipated to take nine months, with work commencing, pending approval, in early 2025.

The main construction activities are expected to include:

– Site preparation and earthworks.
– Establishment of temporary construction facilities and fencing.
– Geotechnical investigations, surveying, etc.
– Construction of the internal road network.
– Installation of PV panels and associated infrastructure.
– Testing and commissioning.
– Removal of temporary construction facilities and rehabilitation of disturbed areas.
– Landscaping.

Materials transported to the site on heavy vehicles up to B-double would include, but not limited to the following:

– Photovoltaic (PV) solar panels.
– Piles, mounting structures and frameworks.
– Electrical equipment and infrastructure including cabling, auxiliary electrical equipment and machinery.
– Construction buildings and associated infrastructure.
– Earthworks, grading and lifting machinery and equipment.

Pending the finalisation of the construction schedule, it is expected some stages of construction would occur concurrently. The intent is for construction to be undertaken in conjunction with works for the adjacent approved project. This would reduce the timeframe of impacts for the community.

3.1.2 Construction hours

The proposed working hours are as follows:

– Monday to Friday: 7:00 am – 6:00 pm.
– Saturday: 8:00 am – 1:00 pm.
– No work on Sundays or public holidays.

Construction works are proposed to be carried out during the standard construction hours only.

If works are required outside standard construction hours, additional assessment and mitigation would be required.

3.1.3 Workforce

Construction supervisors and the construction labour force, made up of labourers and technicians, would be hired locally where possible. Workers that are not local are expected to use existing accommodation within the local area such as Armidale, Uralla and Guyra. The proposal would largely be constructed using the existing workforce for the approved project, which is estimated to require up to 100 workers.

3.1.4 Operational activities

During operation, the following activities would be undertaken:

– Routine visual inspections, general maintenance and cleaning of the solar array as required.
– Vegetation management in accordance with the landscaping, fire management and biodiversity management plans, as relevant.
– Site security response (24 hour), if required.
– Site operational response (24 hour), if required.
– Pest plant and animal control, as required.

It is estimated that the daily peak travel demand during operation would be approximately six light vehicle movements a day.

3.1.5 Decommissioning traffic

Once the proposal reaches the end of its operational life, a decision will be made to either decommission or repower the facility, subject to approval requirements.

If the proposal is decommissioned, all above ground structures will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. The disposal and recycling of the proposal infrastructure will be done in accordance with current waste management legislation at the time of decommissioning. Wherever possible, efforts will be made to reduce the amount going to landfill in line with best-practice sustainability principles.

3.1.6 Access arrangements

The proposal would be accessed via the existing unnamed Crown road off the New England Highway. The unnamed Crown road will be sealed and widened as part of the approved Stage 1 project.

The approved Stage 1 project will also upgrade the intersection of the unnamed road with the New England Highway in accordance with Austroads and Transport requirements to accommodate the required construction and operational traffic for that project. The intersection upgrade will include the provision of basic right (BAR) and basic left (BAL) lanes on the New England Highway (refer to Figure 3.1).

The intersection upgrades will be constructed prior to the commencement of the construction of the Tilbuster Solar Farm (Stage 1 and Stage 2). The construction of additional access points from the New England Highway is, therefore, not required for the proposal.

Swept path analysis (sourced from the 2021 Traffic Impact Assessment) showing a 26 metre B-double truck accessing and egressing the subject site via the proposed upgrades intersection is displayed in Appendix B.

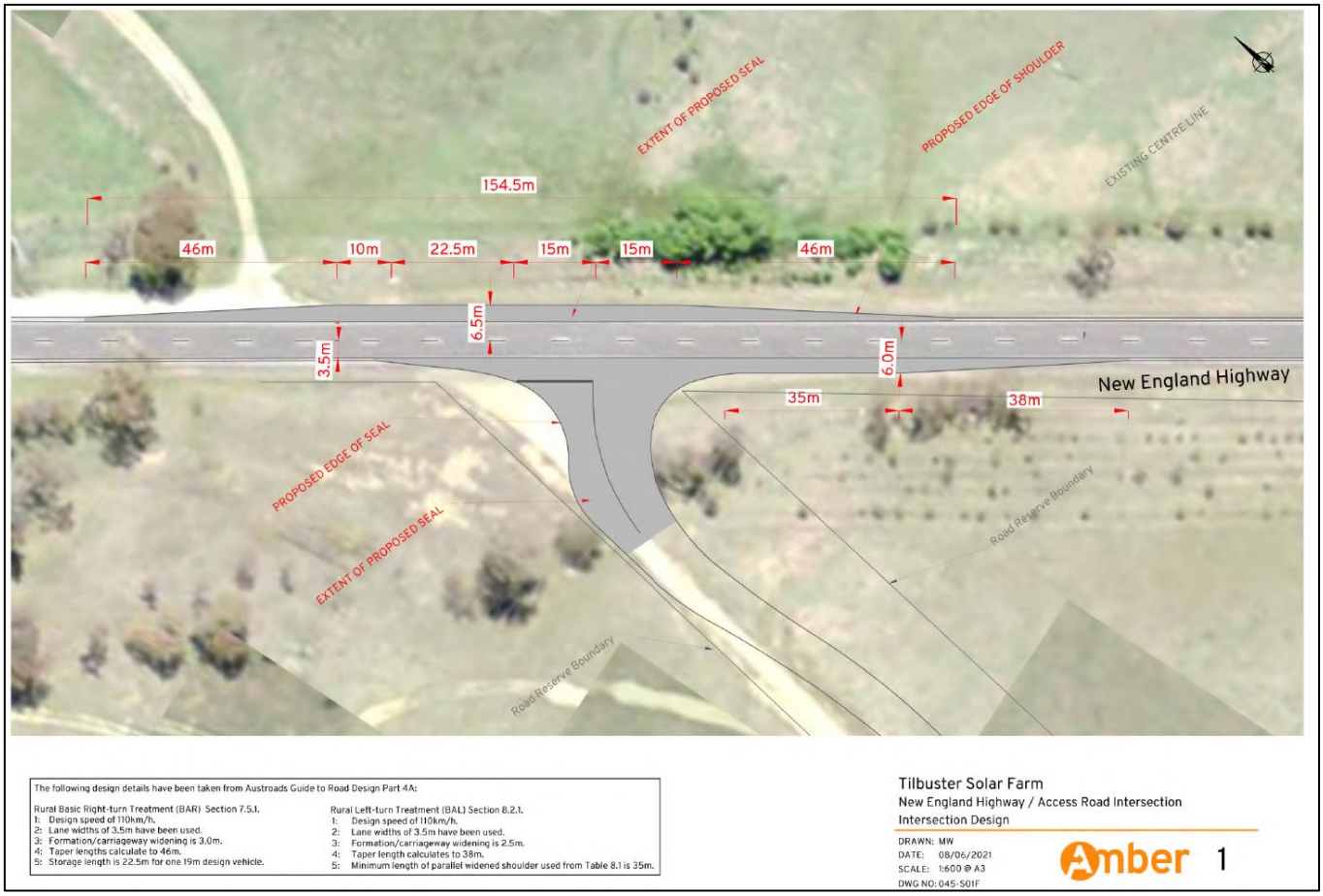

Figure 3.1 Proposed upgraded intersection layout (source: Amber Traffic and Transport Direction 2021)

3.2 Traffic generation

Construction traffic generated by the proposal can broadly be separated into the following four categories:

- Light vehicles associated with transporting staff to/from the site, including mini-buses and personal vehicles.
- Medium and Heavy Rigid Trucks (MRV and HRV as defined within AS 2890.2:2009) used to deliver raw materials and smaller plant equipment.
- Articulated Vehicles (AV as defined within AS 2890.2:2009) and 26 metre B-Doubles used to transport plant and equipment such as the PV panels.
- OSOM vehicles associated with the delivery of the larger plant and equipment. The available data indicates that the proposal may require up to 10 OSOM vehicles.

It is anticipated that the road network is able to accommodate these vehicles given that similar loads and vehicles are regularly transported on the highway for similar projects, such as the Sapphire and White Rock Solar Farms, which are both located within the vicinity of the proposal site.

Enerparc have provided a summary of the expected vehicle activity (light and heavy) associated with the construction of the proposal, with a copy of the Traffic Access Plan included in Appendix C. The data provided by Enerparc indicates that under a worst case scenario:

- Up to 100 workers are expected on site during construction.
- Up to 42 heavy vehicles are expected to access/egress the proposal site per day.

Additionally, with respect to the movement of workers:

- Two shuttle buses with a capacity of 25 workers each will transfer workers to and from the proposal site during peak morning and afternoon periods. It is assumed that the two shuttle buses will access and egress the proposal site in the morning and afternoon peak periods.

– The remaining 50 workers will drive, with an average occupancy of 1.35 persons per car, corresponding to 37 light vehicle trips.

As detailed in Section 3.1.2, the construction site will typically operate 11 hours per day between 7:00 am and 6:00 pm. Assuming heavy vehicles access/egress the site over the course of a day, this equates to an average of (approximately) four inbound and four outbound heavy vehicle trips per hour. To be conservative, it is assumed that up to eight heavy vehicles will access/egress the subject site in a single hour.

Table 3.1 summarises the peak traffic movements generated during the construction period for the proposal.

Table 3.1 Traffic generation during peak construction periods

Vehicle type	Peak vehicle movements per day	
	Daily (vpd)	**Peak hour (vph)**
Light vehicle (car / 4WD)	74	37 (inbound AM peak and outbound PM peak)
Shuttle bus	8	4 (two inbound and outbound in peak periods)
MRV/HRV/AV/B double/semi trailer (Heavy vehicles)	42	16 (eight inbound and outbound in peak periods)
Total	**124 vehicles**	**57 vehicles**

Accordingly, the site is expected to generate up to approximately 57 vehicle movements during the morning and evening peak hours and 124 movements daily during the peak construction period.

For assessment purposes, the proposal is assumed to require up to 10 OSOM vehicles (this is anticipated to be very conservative). The majority of OSOM movements are expected to be low risk. However OSOM movements associated indivisible loads i.e. the PCUs are expected to be high risk.

All OSOM movements will comply with the conditions summarised in Section 2.5.

3.3 Traffic distribution

Construction traffic will access/egress the site via the New England Highway, the upgraded access point and the proposed internal road network. The following provides a breakdown of the distribution for each of the vehicle classifications outlined within Table 3.1.

– Light vehicles: It is anticipated that most staff will be located in nearby regional towns such as Armidale and Guyra. For the purposes of this assessment, it is estimated that 75 percent of staff will be travelling from the south, and the remaining 25 percent will travel from the north.
– Shuttle bus: It has been assumed that all shuttle buses will travel to/from the south.
– MRV/HRV: These vehicles will predominantly be water trucks and vehicles transporting materials such as concrete and fencing supplies. These materials will be sourced within the surrounding area and as such, it has been assumed that 75 percent of these vehicles will be travelling from the south and the remaining 25 percent will travel from the north.

For the purposes of analysis, it has been assumed that:

– The peak hour for the proposal will occur in morning and afternoon periods, when staff are transported to/from the site.
– Heavy vehicle movements will be distributed throughout the day and will be split evenly between inbound and outbound movements.

Materials/equipment requiring OSOM vehicles will be transported from Port Botany or the Port of Newcastle. In accordance with the NHVR, transport routes for OSOM vehicles will be as follows:

– Port Botany route – M1 Motorway, Hunter Expressway and New England Highway – refer to Figure 3.2.
– Port of Newcastle route – Industrial Drive, Maitland Road, Hunter Expressway and New England Highway – refer to Figure 3.3.

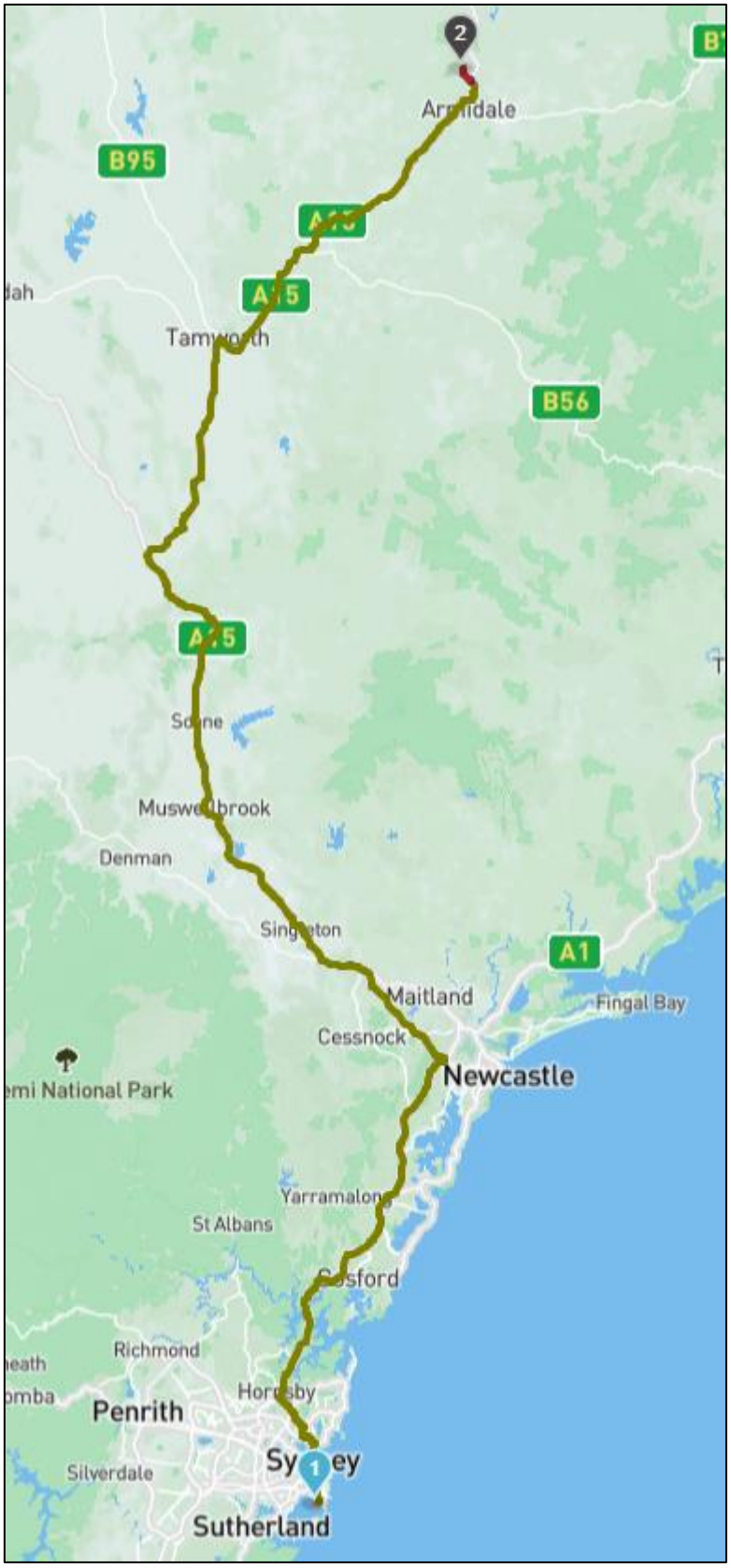

Figure 3.2 OSOM routes to/from Port Botany (source: NHVR)

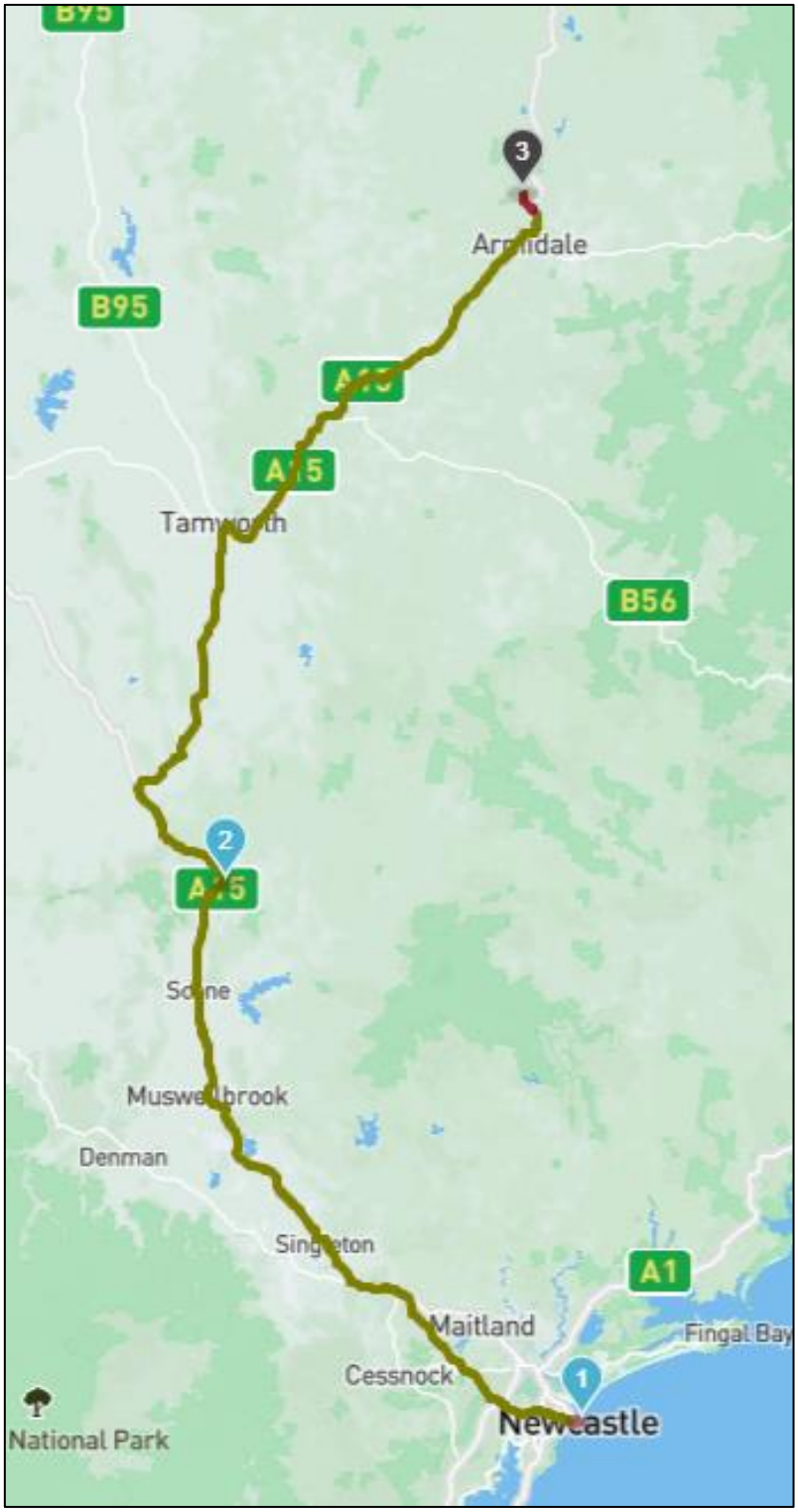

Figure 3.3 OSOM route to/from Port of Newcastle (source: NHVR)

Figure 3.2 and Figure 3.3 show the designated OSOM routes between Port Botany/Port of Newcastle and the access driveway on the New England Highway.

An additional swept path analysis (Amber Organisation, 2025) for Tilbuster Stage 1 (see Appendix D) indicates that an OSOM vehicle with dimensions of 5.3 metres by 33 metres can navigate key pinch points on the route between Port Botany/Port of Newcastle and the access driveway on the New England Highway. This is the largest vehicle associated with the construction of the proposal (refer to Figure 3.4).

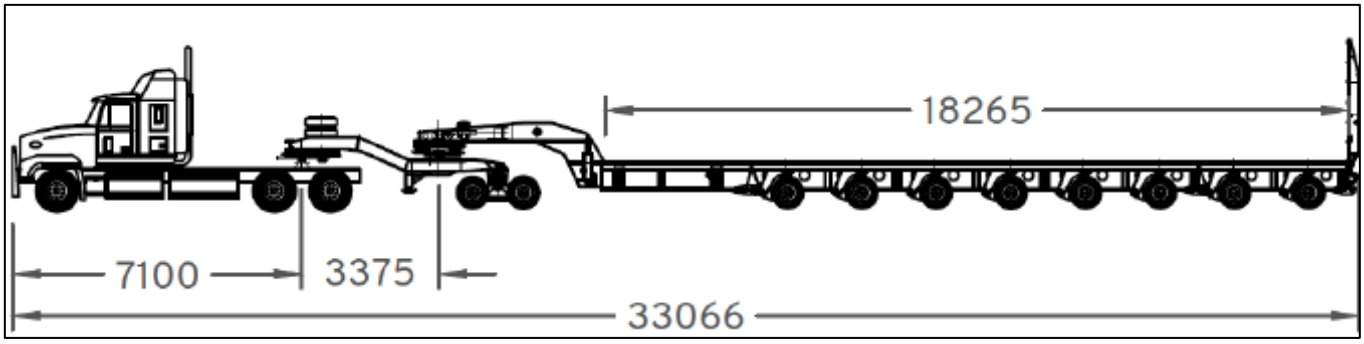

Figure 3.4 OSOM design vehicle

In summary the movement of OSOM vehicles are expected to have a minor impact on the operation of the road network.

3.4 Site impacts

3.4.1 Impacts to traffic

With respect to the traffic impacts of the proposal, the following is noted:

– The available information indicates that the roads in proximity to the proposal site are operating with a good LoS during peak periods of road network activity.
– Operational vehicle activity is expected to be negligible.
– The vehicle activity associated with the construction of the proposal would be minor. It is anticipated that during peak construction, the proposal would generate up to 57 peak hour trips.
– There is a designated OSOM route between the subject site and Port Botany/Port of Newcastle.

Accordingly, the traffic impacts of the proposal are expected to be negligible and fall within the daily fluctuations of the adjoining arterial road network.

3.4.2 Impacts to public and active transport

As there are no active transport facilities in proximity to the proposal site, there will be no impact on such facilities.

There are some public transport routes on the New England Highway, including the Armidale to Tenterfield Coach Service and a small number of school buses. However, given their infrequent nature as well as the small number of construction vehicles, the impact on public transport services is expected to be negligible.

3.4.3 Impacts to road safety

With respect to impacts on road safety:

– The crash review outlined in Section 2.3 shows there have been three recorded crashes in proximity to the proposal site in the last five years on New England Highway.
– Appropriate traffic control measures in the vicinity of the site should be adopted to ensure that the safety of all road users is not impacted by construction-related vehicles travelling to and from the site.
– The construction/operational volumes generated by the proposal are minor.

Accordingly, the impacts of proposal construction and operational vehicles on road safety are expected to be negligible.

3.4.4 Impacts to parking

With respect to impacts on parking, the following is noted:

– On-street parking is not permitted on New England Highway in proximity to the proposal site, therefore there is not expected to be any impact to on street parking.
– Parking for workers would be provided within the proposal site.

Accordingly, the impacts on parking associated with the construction and operation of the proposal are expected to be negligible.

3.5 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposal has also been assessed in accordance with *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP), clause 2.119 (development with frontage to a classified road).

The objectives of the clause are as follows:

– To ensure that new development does not compromise the effective and ongoing operation and function of classified roads.
– To prevent or reduce the potential impact of traffic noise and vehicle emission on development adjacent to classified roads.

Clause 2.119 specifies that the consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:

(a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and

(b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of—

(i) the design of the vehicular access to the land, or

(ii) the emission of smoke or dust from the development, or

(iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and

(c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

The proposal would be accessed via the approved Stage 1 access road off the New England Highway (A15). Transport is the roads authority for the New England Highway. The unnamed Crown road will be sealed and widened as part of the approved project. The project will also upgrade the intersection of the unnamed road with the New England Highway in accordance with Austroads and Transport requirements to accommodate the required construction and operational traffic for that project.

The sealing of the Crown road will reduce the potential dust emissions. As such, the proposal is consistent with the objectives in clause 2.119 of the Transport and Infrastructure SEPP.

3.6 Cumulative impact

The primary traffic impact of the proposal is generated during construction. The assessment undertaken in the preceding sections demonstrates that the road network will continue to operate with capacity during the peak construction period of the proposal. The following provides an assessment of the cumulative impacts of major projects that are proposed in the surrounding area.

Table 3.2 Potential cumulative Impact

Project and timing	Description	Potential vehicle conflict
Tilbuster Solar Farm Stage 1 (Determination)	The project is located adjacent to the proposal site. The proposal is the second stage of the Tilbuster Solar Farm.	The construction of Stage 1 and Stage 2 will coincide. The proposal will utilise the same route and intersection upgrade planned for Stage 1 during construction and operation. Both projects are anticipated to have staff located in Armidale and Guyra.
Doughboy Wind Farm (Prepare EIS)	The project is located about 40 km east of Armidale and involves the construction of approximately 52 wind turbines. Access to the site is proposed from Waterfall Way and Guyra Road. The site is expected to generate approximately 40 vehicle movements during the morning and evening peak hours during the peak construction period, and 138 vehicle movements per day.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale and Guyra.
New England Solar Farm (Determination)	New England Solar Farm is located approximately 6 km east of the township of Uralla. Stage 1 for the New England Solar Farm is completed. The Stage 2 modification was approved and construction is proposed to commence in 2024.	There is potential for construction of both projects to overlap. The traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Oxley Solar Farm (Determination)	Oxley Solar Farm is located approximately 10 km southeast of Armidale, to the south of Waterfall Way. Construction workers are proposed to be located in Armidale, with access proposed via Waterfall Way and Gara Road. The project was approved in December 2023.	There is potential for construction of both projects to overlap. Construction traffic generated by the projects may interact within the township of Armidale where staff for both projects are proposed to be located.
Thunderbolt Wind Farm (Determination)	The proposed Thunderbolt Wind Farm is located in the Kentucky area approximately 40 km northeast of Tamworth adjacent to New England Highway. The Thunderbolt Wind Farm is proposed to include wind electricity generation and battery storage.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale.
Rangoon Wind Farm (Prepare EIS)	The wind farm is located near the villages of Ben Lomond and Glencoe NSW approximately 60 km north of Armidale and 40 km south of Glen Innes. The proposal involves construction of approximately 25 wind turbines.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale and Guyra.
Windbourne Wind Farm (Response to Submission)	The Windbourne Wind Farm is located 7 km east of Walcha and involves the construction of approximately 133 wind turbines. Access to the site is proposed from	The construction periods for the project could potentially overlap. Both projects are anticipated to have staff located in Armidale and will utilise a similar transport route with plant for the wind farm to be delivered from the Port of Newcastle.
Armidale BESS (Prepare EIS)	The Armidale Battery Energy Storage System (BESS) is the development of a 500 MW/1000 MWh battery energy storage facility with associated infrastructure. The project is located. The BESS is approximately 18 km west of Armidale. Construction is expected to commence in late-2025 or 2026.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale.

Project and timing	Description	Potential vehicle conflict
Gara BESS (Prepare SEARS)	The Gara BESS is the development of a 400 MW/1760 MWh battery storage system and associated infrastructure including grid connection. The proposed vehicle access would be via the New England Highway and Waterfall Way/Grafton Road, utilising a proposed access location. Construction is expected to commence in late-2025.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale and utilise the New England Highway.
Eathorpe BESS (Prepare EIS)	The Eathorpe BESS is the development of a 100 MW / 200 MWh battery energy storage system with associated infrastructure and connection works. This project is located adjacent to the Armidale. The project is anticipated to commence in 2025.	The construction periods for the projects could potentially overlap. Both projects are anticipated to have staff located in Armidale and utilise the New England Highway.
Eastern Hub Firming Battery (SEARs)	The Eastern Hub firming battery is the development of a 1000 MW battery energy storage system and associated infrastructure. This project is located at Salisbury Plains. Current scheduling anticipates that construction phase of the project will commence late 2027–early 2028.	The construction periods for the projects are unlikely to overlap. Both projects are anticipated to have staff located in Armidale.
Deeargee Solar Farm (Prepare EIS)	The Deeargree Solar Farm involves the construction, operation, and decommissioning of a 320 MW Solar Farm, ancillary infrastructure, and a battery energy storage system. The project will be located about 12 km south-east of Uralla. Project construction is expected to commence in 2027.	The construction periods for the projects are unlikely to overlap. Both projects are anticipated to utilise the New England Highway.

Based on the above assessment, the surrounding major projects have the potential to generate a number of staff vehicle movements during the peak periods associated with construction, with a number of staff and resources located in Armidale and Guyra. Other key projects, including Oxley Solar Farm and Doughboy Solar Farm, have the potential to generate traffic on the New England Highway.

This assessment has identified that New England Highway is operating with a good LoS with spare capacity. Therefore, the cumulative increase in traffic generated by the proposal and these other key projects would have a minimal impact on the road network through Armidale and Guyra.

4. Mitigation measures

A Construction Traffic Management Plan (CTMP) will be prepared by the appointed contractor prior to the commencement of construction activities. Mitigation measures that should be included in the CTMP to avoid or minimise traffic and transport impacts during the construction of the proposal are listed in Table 4.1.

Table 4.1 Mitigation measures – traffic and transport

Outcome	Mitigation measure	Timing
Potential for traffic, transport, access and parking impacts during construction	A CTMP will be prepared prior to construction and implemented as part of the Construction Environmental Management Plan. The plan will detail processes and responsibilities to minimise traffic and access delays and disruptions and identify and respond to changes to road access. The plan will be developed in consultation with relevant stakeholders, including Armidale Council, Transport, emergency services and public transport/ bus operators as necessary. The plan will include a driver's code of conduct for haulage operations, which will include but not be limited to: – Safety initiatives for haulage through residential areas and/or school zones. – An induction process for vehicle operators and regular toolbox meetings. – A public complaint resolution process.	Pre-construction, construction
Minimise environmental impacts associated with the movement of vehicles	Rectify any road deposits caused by site vehicles, to maintain the safety of road users. Where possible, offset the construction vehicle activity from peak periods of road network activity. Induct employees and contractors to raise awareness and understanding of traffic and transport mitigation measures to be implemented during construction.	Construction
Emergency vehicle access	Emergency vehicle access routes that may be impacted by the project will be identified, and appropriate control measures will be implemented in consultation with the relevant emergency services providers. Emergency services will be advised of any restrictions to vehicular access for both public and private areas where traffic conditions are changed.	Construction
Impacts on local roads	Road condition surveys will be undertaken of the public roads proposed to be used, prior to and following completion of construction, and provided to the relevant road authority. Condition monitoring will be carried out during construction. Rectification measures will be implemented as needed, during and/or following completion of construction, to address any damage caused during construction.	Construction
Managing the potential for cumulative transport and traffic impacts	The potential for cumulative construction transport and traffic impacts will be reviewed and coordinated with other projects, in consultation with relevant stakeholders, including, Armidale Council, private developers and Transport for NSW. The review will include: – Projects with the potential to affect access and capacity. – Coordinating works and identifying efficient re-routing options as appropriate.	Construction

5. Conclusion

GHD has prepared this TIA on behalf of Enerparc to accompany the EIS for the proposal.

The proposal involves the construction, operation and decommissioning of a new solar farm with a generating capacity of 140 MW, which would connect to the existing Transgrid 330 kV transmission line that traverses the site and connects the Dumaresq Substation to the Armidale Substation.

The proposal would be accessed via the existing unnamed Crown road off the New England Highway. The unnamed Crown road will be sealed and widened as part of the approved Tilbuster Solar Farm Stage 1 project.

The approved Stage 1 project will also upgrade the intersection of the unnamed road with the New England Highway in accordance with Austroads and Transport requirements to accommodate the required construction and operational traffic for that project. The intersection upgrade will include the provision of basic right (BAR) and basic left (BAL) lanes on the New England Highway.

The assessment herein determined the following:

– The available traffic survey data indicates that the New England Highway is currently operating well within its midblock capacity.
– The site will generate up to 124 vehicle movements per day and 57 vehicle movements per hour during peak periods of construction.
– The traffic impacts of the proposal are expected to be negligible and fall within the daily fluctuations of the adjoining arterial road network.
– There is no active transport in proximity to the proposal site.
– There are infrequent bus routes in proximity to the site that operate at most once a day. The impact of the construction activity on these services are expected to be negligible.
– The impacts of proposal construction and operational vehicles on road safety are expected to be negligible.
– In order to mitigate the impacts of development during construction, a CTMP will be prepared which should include recommendations detailed in Section 4.

In summary, it is concluded that the proposal's construction and operational vehicle activity will have a minor impact on the operation of the nearby traffic and transport facilities.

6. References

Amber 2021, *Tilbuster Solar Farm (Stage 1) Traffic Impact Assessment*, NGH Consulting Pty Ltd.

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NSW Government n.d., *Major Projects*, accessed 10 July 2024, https://www.planningportal.nsw.gov.au/major-projects, NSW Government, Sydney.

RTA 2002, *Guide to Traffic Generating Developments*, NSW.

Transport for NSW (TfNSW) 2016, *New England Highway Urban Design Framework*, NSW Government.

TfNSW, 2020, Additional Access Conditions Oversize and overmass heavy vehicles and loads, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.transport.nsw.gov.au/system/files/media/documents/2022/osom-additional-access-conditions.pdf

TfNSW 2024, Traffic Volume Viewer, accessed 5 July 2024, https://maps.transport.nsw.gov.au/egeomaps/traffic-volumes/index.html#/?z=6, NSW Government.

TfNSW 2024, *NSW Combined High Mass Limits (HML) and Restricted Access Vehicle (RAV) Map* , accessed 3 July 2024, https://maps.transport.nsw.gov.au/egeomaps/restricted-access-vehicles-map/index.html, Land and Registry Services.

TfNSW n.d. *LGA view – Crashes map*, accessed 3 July 2024, https://www.transport.nsw.gov.au/roadsafety/statistics/interactive-crash-statistics/lga-view-crashes-map, NSW Government.

TfNSW 2024, *Trip Planner*, accessed 3 July 2024, https://transportnsw.info/trip#/trip, NSW Government.

Appendices

Appendix A

Transport additional requirements

Transport for NSW response received 24 July 2024

Requirement	Response
Traffic Impact Assessment requirements	
The TIA is to be tailored to the scope of the proposed development and include, but not be limited to, the following:	
– Identify the hours of construction of works, days for construction, staging and scheduling of construction (inclusive of pre-construction minor works), peak of construction and timeframe for construction (i.e. commencement year and completion year).	Construction hours of operation are detailed in Section 3.1.2.
– Detailed plans identifying the proposed location of any infrastructure within or outside of the project boundaries.	Proposed access intersection upgrades are detailed in Section 3.1.
– Identify the key accesses and routes for all traffic types required for the project.	Freight routes are detailed in Section 2.4. Trip distribution assumptions are detailed in Section 3.2.
– The EIS and TIA must identify the source for input materials and quantify the traffic generation associated with the haulage of the source materials.	Traffic generation assumptions are detailed in Section 3.2.
Traffic generation assessments and traffic surveys requirements:	
– Existing background traffic must be informed by traffic surveys undertaken at the intersection or access point with the state classified road network at all access points with the classified road network associated with the light and heavy vehicle routes. The traffic surveys are required to be undertaken in accordance *with Austroads Guide to Traffic Management* (AGTM) Part 3 with raw data from the surveys provided with the TIA. • Project-related traffic primarily for worst-case scenario for the project (generally peak of construction). • Assessment of the turn warrants for the applicable design speed and in accordance with the requirements for turn warrants assessment specified in AGTM Part 6. The worst-case scenario traffic generation for the project AM/PM peaks is required to be applied to the background traffic volumes. To be representative of the traffic volumes of the network the following must be included to inform the background traffic volumes for the turn warrants assessment, the existing background traffic volumes at the network AM/PM peak, annual growth rate applied linearly to the year of peak of the traffic vehicle movements and accumulative traffic associated with Major Projects (EIS and approved) with coinciding construction timeframes using through and turning movements using the same routes and intersections as the project.	The details of the traffic volumes on the New England Highway are detailed in Section 2.6. The worst case traffic generation is detailed in Section 3.2. The proposed access intersection will be designed in accordance with Austroads Design Guidelines.

Requirement	Response
• Assess the Safe Intersection Sight Distance (SISD) in accordance with Part 4A of *Austroads Guide to Road Design (AGRD)* and TfNSW supplements. • Identify the necessary road network infrastructure upgrades that are required to cater for and mitigate the impact of project related traffic at the key state classified road intersections that form part of the project construction routes.	
Traffic characteristics:	
Number and ratio of heavy vehicles to light vehicles.	Construction traffic volume data is detailed in Section 3.2.
Identify the number of OSOM that do not require an NHVR permit and if they will occur during the AM/PM project peaks.	Available data suggests up to 10 OSOM vehicles will be required.
Identify the single vehicle trips required for each type of vehicle required to access the site during the AM/PM project peak, vehicles per an hour and vehicles per a day.	Construction traffic volume data is detailed in Section 3.2.
Include traffic volumes associated with input and outputs required during the construction of the development.	Construction traffic volume data is detailed in Section 3.2.
Identify the vehicle types required to access each intersection and access point along the route and site access points connecting to the state classified road network:	Construction traffic volume data is detailed in Section 3.2.
The origins, distribution, and directional splits for the worst-case scenario for all vehicle types at each state classified road intersections and access points required to facilitate the vehicle movements for the proposed project. Including low risk OSOMs moving in accordance with the NSW Class 1 Operators Guide.	Trip distribution data is detailed in Section 3.3.
Capacity analysis using AGRD at intersections with classified (State) road/s, and where relevant, analysis of any other intersections along the proposed transport route/s.	Traffic impacts are detailed in Section 3.4.1.
Impact on rail corridors and level crossings along transport route/s detailing any proposed interface treatments, where applicable.	NA
A review of crash data along the identified transport route/s for the most recent 5-year reporting period and an assessment of road safety along the proposed transport route/s.	Crash data is detailed in Section 3.2.

Requirement	Response
Workforce Accommodation Camp (if applicable)	
If workforce accommodation is proposed, then the TIA is required to assess the worst-case scenario based on the inclusion of the workforce accommodation camp, with respect to: – The construction schedule, staging, traffic generation until the point of when the workforce would be fully accommodated at the camp. – The traffic volumes during construction and if any parallel construction or pre-construction would be occurring in parallel. – Identify the traffic generation of all construction traffic post full occupation of the workforce accommodation camp. – Identify the traffic volumes associated with any pre-construction and construction works occurring in parallel to the construction and full occupation of the workforce accommodation camp. – Assess for the full and partial (where staged) the traffic volumes, vehicle types, changes to routes, turning directions/distributions, changes to the AM/PM project peaks for the operation of the workforce accommodation camp. – Identify any emergency accesses or other accesses to the state classified road required for the workforce accommodation camp.	NA
A review of crash data along the identified transport route/s for the most recent 5-year reporting period and an assessment of road safety along the proposed transport route/s.	
Emergency access to a state classified road (if applicable):	
Must identify how the access will be managed (i.e. gates) to prevent the use of the access for other vehicles associated with the development during peak of construction and operation.	No gates are proposed during construction.
Identify the emergency design vehicle and provide a swept path analysis identifying.	
Provision of sufficient storage at the throat of the access to allow for the emergency vehicle to store within the access and not within the through lane or shoulder.	The access intersection can accommodate emergency vehicles. The internal road network will be designed to accommodate emergency vehicles.
Identify compliance with SISD for the design speed (posted speed +10 km/hr).	

Requirement	Response
Concept Level Route Analysis required for High Risk OSOM	
The route assessment is required for **high risk OSOM (as defined on TfNSW website)** required to deliver components to the project. The concept level route analysis must include: – The port or point of origin and must be for the entire route to the site access or intersections required to facilitate the high risk OSOM movements required for the project. – The TIA is required to include details of all high risk OSOM loads and vehicle configurations for the project. – The location of pull-over bays / rest areas along the high risk OSOM routes (including GPS coordinates) and demonstrate through swept paths that the high risk OSOMs can be physically accommodate all high risk OSOMs for the project (in terms of size, width and accessibility).	Up to 10 OSOM vehicles are proposed. There is a designated OSOM route between Port Botany/Port of Newcastle and the subject site. A portion of the OSOM loads associated with the larger indivisible items are expected to be designated as high risk. Details of the largest vehicle associated with the construction of the proposal are provided in Figure 3.4.
Expanding on the points above, the concept route assessment is required to include:	
Details of the road geometry and alignment along the identified transport route/s, including existing formations, crossings, bridges, intersection treatments and any identified hazards, including: – Bridge Assessments for any at risk bridges on the classified road network due to dimensions and weight of OSOM vehicles. – Swept path analysis demonstrating the largest design vehicle can enter and leave the development, and simultaneously pass through intersections along the proposed transport route/s. – The design vehicle templates used in 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). – Highlighting 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.	

Requirement	Response
Identify and provide the following measurements parameters of OSOM components / materials to be moved: – Identify types and numbers of high risk OSOM vehicles proposed to be used for the project. – Overall combination type, configuration, load and vehicle configuration: • Length, width, height and mass (GCM, tare, weight to axle and payload) for components and nominated vehicles. • Wheelbase dimensions. • Maximum trailer articulation angle(s). • Minimum overhang heights above the road surface. • Vehicle configurations. • Traffic mitigation measures or road works, modifications, or road upgrades to facilitate the movement of the high risk OSOM(s) associated with the project. • Potential high level mitigation measures or commitments to mitigate known traffic, safety and impacts to road users along the high risk OSOM route (i.e. school bus routes, mining shift changes, TSRs, harvest periods and events).	As above
Identify and assess implications of any road and rail projects that may be under construction during the indicative schedule for the OSOM movements. *Note: NHVR permits do not cover road works or upgrades and environmental approvals required along any proposed OSOM route. Any road works or upgrades works required along the OSOM route must be included within the scope of works in the SSD to ensure the development is constructable.* *Note: given the high number of renewable energy and other large scale projects requiring haulage of OSOM components on the road network, restrictions, and limitations on OSOM movements may be in imposed. In this regard, it is recommended that you engage earlier with TfNSW's Development Services Renewables team to discuss the requirements of the route assessment.*	As above
Strategic concept designs	
Identify the necessary road upgrades and scope to achieve compliance with Austroads and TfNSW requirements to mitigate the traffic, safety, efficiency and impacts to TfNSW assets on the state classified road network associated with the project. Any identified road infrastructure upgrades will need to be to the satisfaction of TfNSW and Council. Works must be appropriately designed in accordance with *Austroads Guide to Road Design*.	The proposed intersection upgrades are detailed in Section 3.1.5.

Requirement	Response
Strategic concept designs will need to be accompanied by swept paths for the largest vehicle required to access the access point or intersection. The swept paths must demonstrate that the largest vehicle can turn concurrently in all turn directions without crossing into the incorrect lane, tracking off the proposed/existing pavement and within the existing intersection treatments (where applicable). Swept paths will be required for the high risk OSOM to demonstrate that the high risk OSOM can be delivered within the existing or proposed pavement and if further pavement widening is required to accommodate these movements.	Swept path drawings including OSOM vehicles are displayed in Appendix B.
The strategic concept designs must identify any acquisition required to facilitate the scope of the road upgrades and road works. The Developer will be responsible for the dedication and acquisition of land if required to accommodate the road infrastructure including, but not limited to, footways, structures, stormwater drainage, batters, maintenance access and utilities, to the satisfaction of TfNSW. *Note: The design needs to comply with TfNSW Strategic design requirements for DAs, TfNSW technical directions, supplements, corridor strategies and Austroads and any other applicable TfNSW policies/strategies. To assist you in preparing the designs, please refer to link below:* **https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/planning-principles/strategic-design-fact-sheet-02-2022.pdf**	The proposed intersection upgrades are detailed in Section 3.1.5.

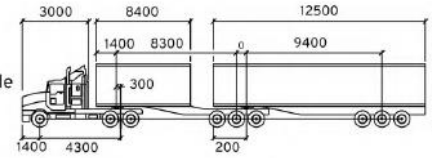
Appendix B

Swept path analysis - B-doubles

Vehicle Envelope

300mm Clearance

B-Double



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Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock	: 6.0s
Steering Angle	: 22.2
Articulating Angle	70.0

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment

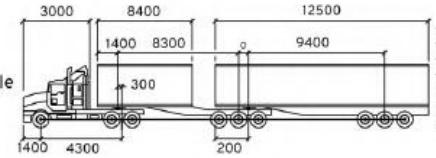
DRAWN: MW
DATE: 08/06/2021
SCALE: 1:600 @ A3
DWG NO: 045-S01F

Amber 2

Vehicle Envelope

300mm Clearance

B-Double



	mm
Tractor Width	: 2500
Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock	: 6.0s
Steering Angle	: 22.2
Articulating Angle	70.0

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment

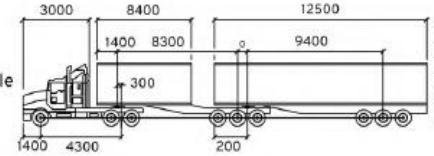
DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 3

Vehicle Envelope

300mm Clearance

B-Double



	mm
Tractor Width	: 2500
Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock	: 6.0s
Steering Angle	: 22.2
Articulating Angle	70.0

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment

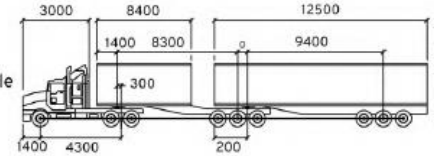
DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 4

Vehicle Envelope

300mm Clearance

B-Double



	mm
Tractor Width	: 2500
Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock	: 6.0s
Steering Angle	: 22.2
Articulating Angle	70.0

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment

DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 5

Vehicle Envelope

300mm Clearance

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment - OSOM Vehicle

DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 6

Vehicle Envelope

300mm Clearance

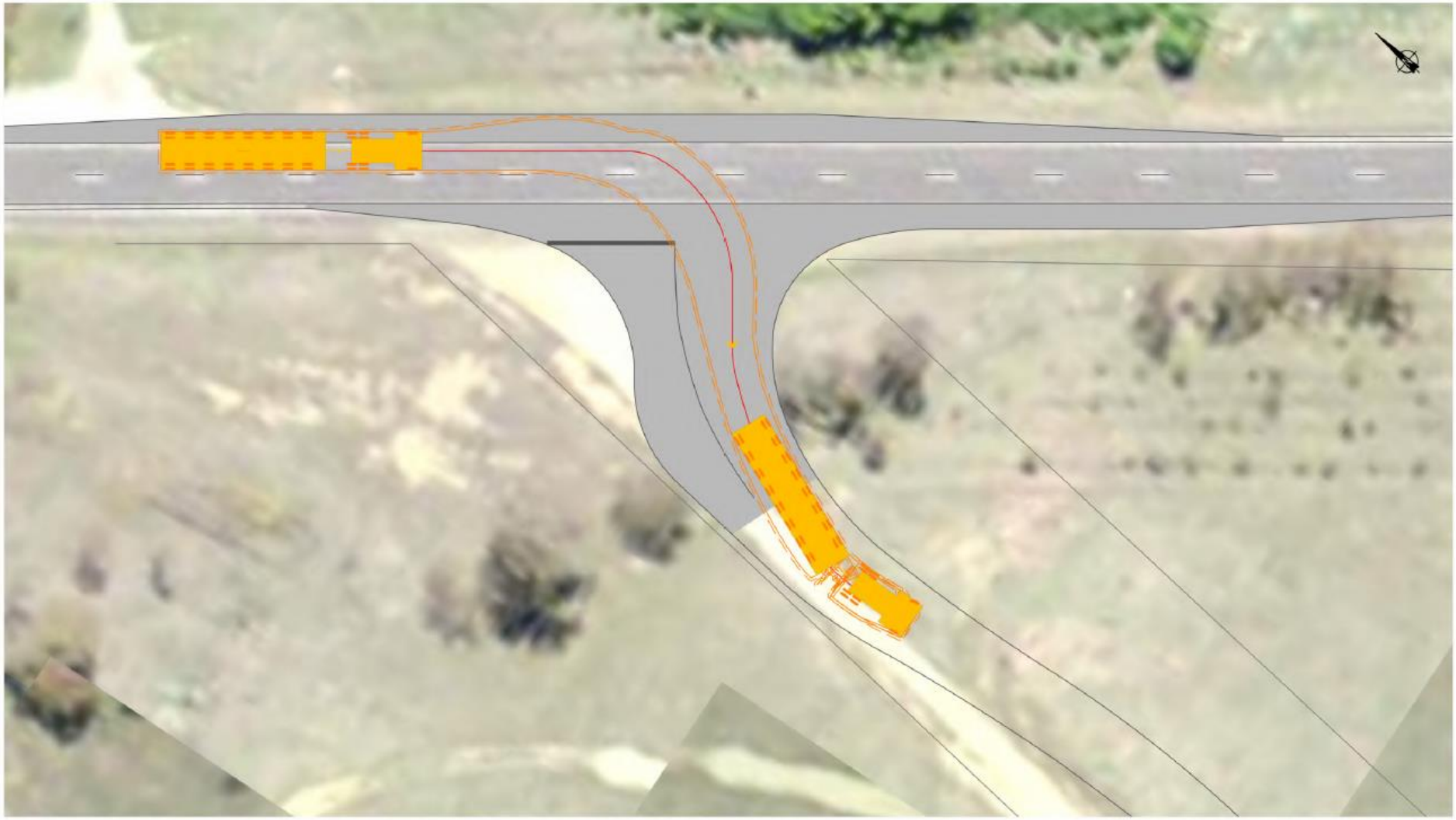
Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment - OSOM Vehicle

DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 7



Vehicle Envelope

300mm Clearance

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment - OSOM Vehicle

DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 8

Vehicle Envelope

300mm Clearance

Tilbuster Solar Farm

New England Highway / Site Access Intersection

Swept Path Assessment - OSOM Vehicle

DRAWN: MW
DATE: 08/06/2021
SCALE: 1:400 @ A3
DWG NO: 045-S01F

Amber 9

Appendix C

Traffic access plan

Tilbuster 2 Traffic Access Plan

Output (MW)		140 MWp								
Construction Duration		9 month	3-4 months peak							
Transportation Type	**Item**	**Manufacture/Description**	**Specifications**	**Quantity**	**Type of Vehicle**	**Qty/Vehicle**	**Total Estimated No. of Vehicles/Trips**	**Estimated Daily Movements (Note 2)**	**Worst Case Daily Movements Estimation (per item)**	**Notes/Assumptions**
Equipment	Solar Panels	CS BiHiKu 7	690 Wp	203,472	B-Double	810	251	-	6	Continuous delivery after site establishment until all modules have been delivered
	PCU	SMA	40' Container	22	Semi-Trailer	1.0	22	-	2	1 truck per PCU Continuous delivery and pick up during the first half of construction
	Switchboards	Self-contained Building	-	1	Semi-Trailer	1	1	-	1	One-off delivery and pick up, no other heavy vehicles to enter site on the same day
	Substation Transformer	Grid Connection Transformer	-	-	Oversize Vehicles	1.00	-	-	-	
	Total Cables	-	-	-	Semi Trailer	-	20	-	2	Continuous delivery and pick up during the construction period
	30 MWH Battery Storage	-	-	-	Semi-Trailer	1 MWH	-	-	-	
	Auxiliary electrical equipment and machineries	Allowance for 5 deliveries/vehicles	-	-	Semi-Trailer	-	5	-	2	One-off delivery and pick up
	Steel - Posts, Tables, and Brackets	-	-	140	Semi-Trailer	0.5	280	1	6	Assume 2 trucks/1 MW Continuous delivery and pick up
Buildings	Control Room	-	-	1	Semi-Trailer	1	1	-	1	One-off delivery and pick up
	Warehouse	-	-	1	Semi-Trailer	1	1	-	1	One-off delivery and pick up
	Site Offices	-	-	1	Semi-Trailer	1	1	-	2	One-off delivery and pick up
Heavy Machineries	Earthworks and Grading Machine	-	-	3	Semi-Trailer	1	3	-	2	Delivery and pick up once during the entire construction period
	Telehandler	-	-	2	Semi-Trailer	1	2	-	2	Delivery and pick up once during the entire construction period
	Miscellaneous Trucks	-	-	Estimate	Standard Truck	1	700	3	10	Assume 5 trucks continuous delivery and pick-up only during the peak construction period.
	Water Tankers	20000L Tanker	N/A		Standard Truck	20000	254	2	5	
Construction Personnel	Construction Workers	Peak construction workforce of 100 daily	N/A	100	Shuttle Buses	25	390	2	4	Assume 2 Shuttle buses available
					Cars	1.35	5800	30	45	
Total Vehicles							**7731**		**91**	

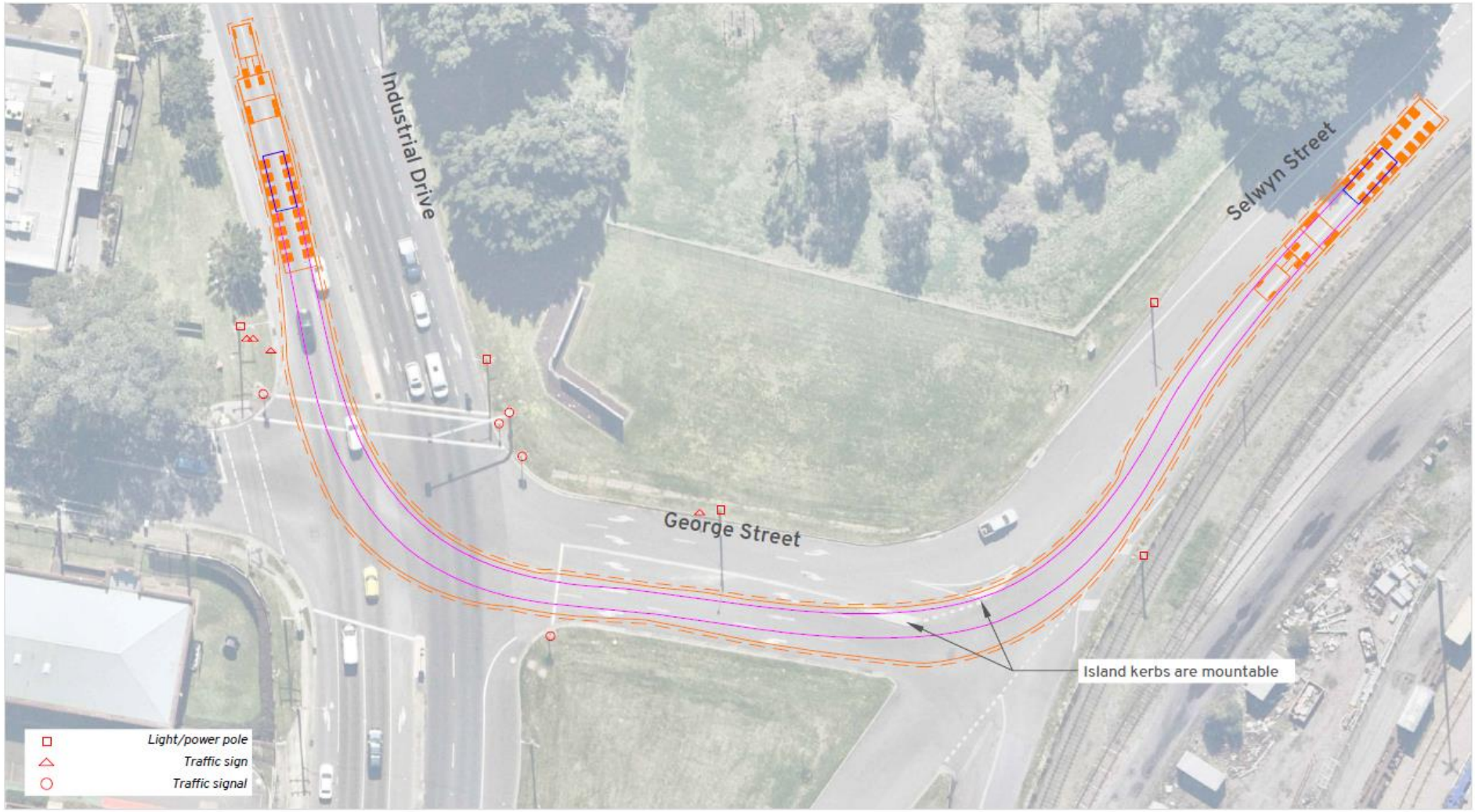
Notes:

1. No. of days assumed for construction is 195, for 9 months (39 weeks) of 5 working days/week.
2. Two movements per day per vehicle

	AV/B-Double/Semi-trailer	587
	MRV/HRV	954

Appendix D

Swept path analysis - OSOM



Vehicle Envelope

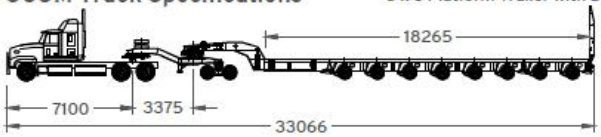
0.5m Clearance

Load Outlines

Load Path

OSOM Truck Specifications

8 x 8 Platform Trailer with Dolly



	mm
Overall Length	: 33066
Trailer Width (Closed)	: 3300
Trailer Width (Open)	: 5300
Approx. Load Length	: 8000
Approx. Load Width	: 3000
Approx. Load Height	: 4000
Lock to Lock	: 6.0s

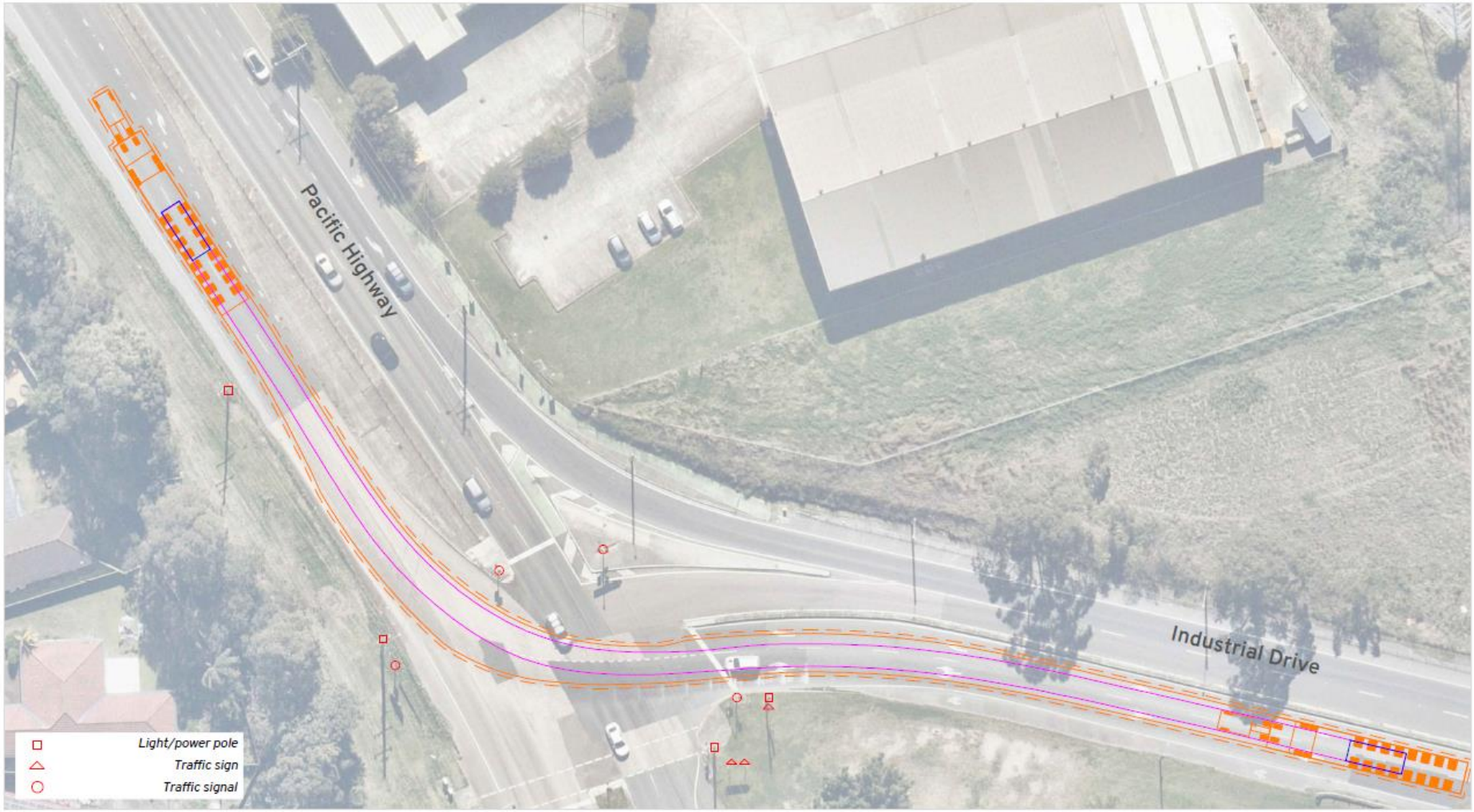
Transformer OSOM Vehicle

Tilbuster Solar Farm

Swept Path Assessment

DRAWN: TD
DATE: 31/10/2024
DWG NO: 045 RA01A
SCALE at A3: 1:500

Amber 01



Vehicle Envelope

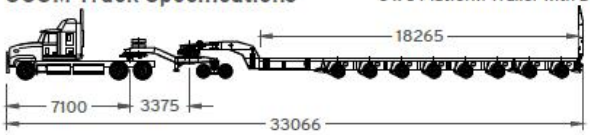
0.5m Clearance

Load Outlines

Load Path

OSOM Truck Specifications

8 x 8 Platform Trailer with Dolly



	mm
Overall Length	: 33066
Trailer Width (Closed)	: 3300
Trailer Width (Open)	: 5300
Approx. Load Length	: 8000
Approx. Load Width	: 3000
Approx. Load Height	: 4000
Lock to Lock	: 6.0s

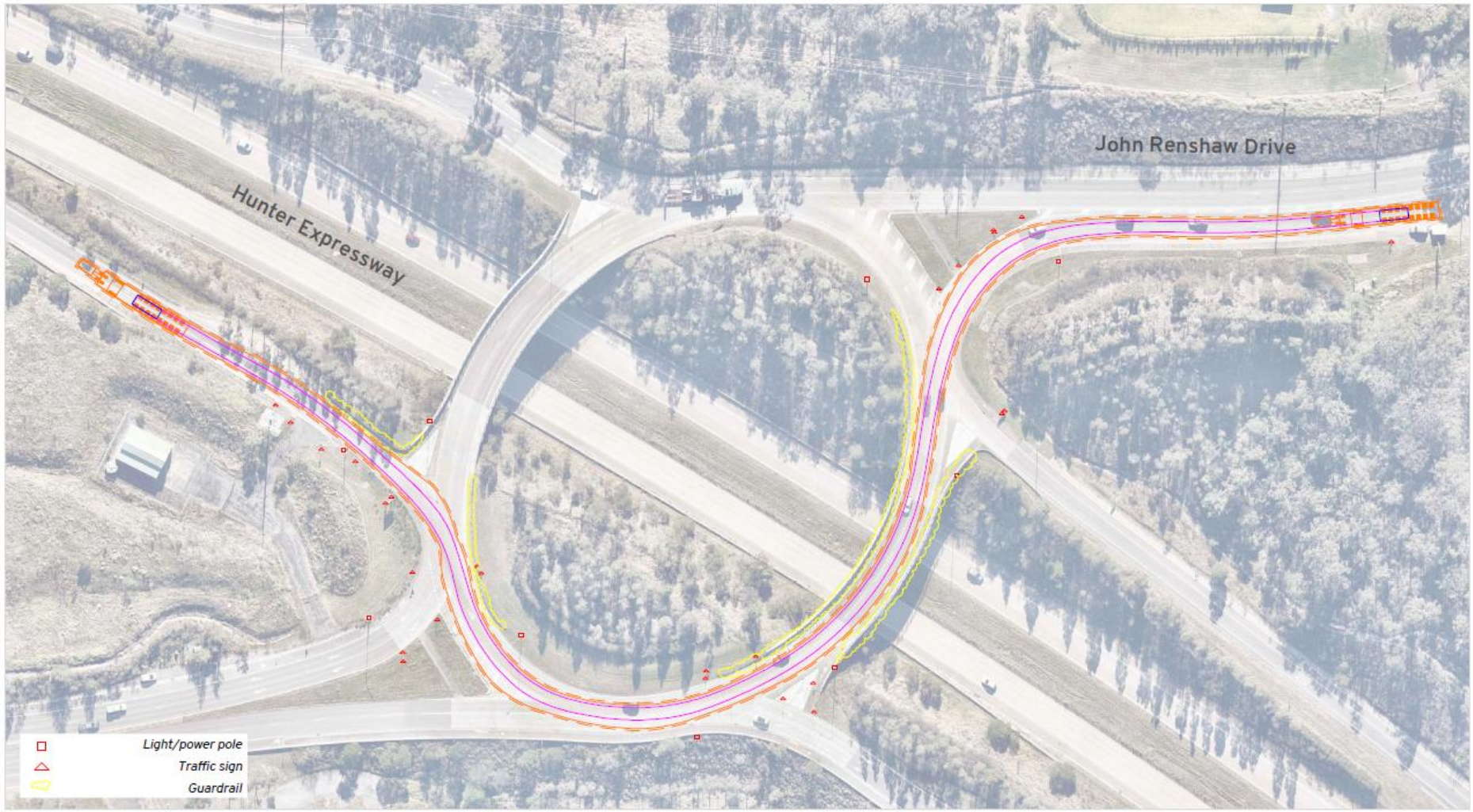
Transformer OSOM Vehicle

Tilbuster Solar Farm

Swept Path Assessment

DRAWN: TD
DATE: 31/10/2024
DWG NO: 045 RA01A
SCALE at A3: 1:500

Amber 02



Vehicle Envelope

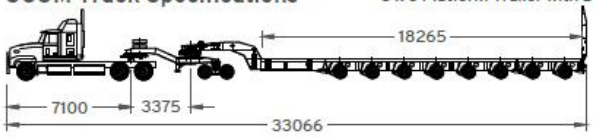
0.5m Clearance

Load Outlines

Load Path

OSOM Truck Specifications

8 x 8 Platform Trailer with Dolly



	mm
Overall Length	*: 33066*
Trailer Width (Closed)	*: 3300*
Trailer Width (Open)	*: 5300*
Approx. Load Length	*: 8000*
Approx. Load Width	*: 3000*
Approx. Load Height	*: 4000*
Lock to Lock	*: 6.0s*

Transformer OSOM Vehicle

Tilbuster Solar Farm

Swept Path Assessment

DRAWN: TD
DATE: 31/10/2024
DWG NO: 045 RA01A
SCALE at A3: 1:1000

Amber 03

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