TRAFFIC IMPACT ASSESSMENT

SOLAR PHOTOVOLTAIC (PV) POWER GENERATING FARM & ASSOCIATED SUPPORTIVE INFRASTRUCTURE

LOT 489 DP 754944
115 AIRPORT ROAD, NARRABRI

PREPARED FOR: PROVIDENCE ASSET GROUP

JANUARY 2021

20/193

TRAFFIC IMPACT ASSESSMENT
PROVIDENCE ASSET GROUP

SOLAR PHOTVOLTAIC (PV) POWER FARM
LOT 489 DP754944
115 AIRPORT ROAD, NARRABRI

Intersect Traffic Pty Ltd (ABN: 43 112 606 952)

Address:
16 Mount Harris Drive
Maitland Vale NSW 2320
PO Box 268
East Maitland NSW 2323

Contact:
(Mob) 0423 324 188
Email: jeff@intersecttraffic.com.au

QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	29/12/20	Draft	JG
B	30/12/20	Edit	JG
C	29/01/21	Final Proof	JG
D	29/01/21	Approved	JG

This document has been authorised by

Date 29th January 2021

Disclaimer

This report has been prepared based on the information supplied by the client and investigation undertaken by Intersect Traffic Pty Ltd & other consultants. Recommendations are based on Intersect Traffic's professional judgement only and whilst every effort has been taken to provide accurate advice, Council and any other regulatory authorities may not concur with the recommendations expressed within this report. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by Intersect Traffic Pty Ltd. Intersect Traffic makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.

Confidentiality Statement

All information, concepts, ideas, strategies, commercial data and all other information whatsoever contained within this document as well as any and all ideas and concepts described during the presentation are provided on a commercial in confidence basis and remain the intellectual property and Copyright of Intersect Traffic Pty Ltd and affiliated entities.

CONTENTS

ATTACHMENTS

FIGURES

PHOTOGRAPHS

TABLES

1.0 INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) has been engaged by Providence Asset Group to prepare a traffic impact assessment report for a proposed Solar Photovoltaic (PV) Power Farm (up to 5MW) on Lot 489 DP 754944 115 Airport Road, Narrabri.

The proposed development involves installation of solar panel banks, off-load area, inverter and AC combiner area, HV switchboard area, MV power station area, direct connection to a suitable existing power line near the site, on-site car parking and temporary construction office. Vehicular access to the site will be via a new access road with turnaround area off Airport Road approximately 220 metres north of Kaputar Road near an existing access gate to the property. The development concept plans are shown in ***Attachment A.***

This report is required to support a development application to Narrabri Shire Council and allow the Council to assess the proposal in respect of its impact on the local and state road network.

This report presents the findings of the traffic and parking assessment and includes the following:

1. An outline of the existing situation near the site.
2. Assessment of the additional traffic generated by the proposal, identifies a preferred delivery route and the additional traffic's impact on the local road network.
3. Review of the adequacy of the proposed vehicular access to the site.
4. Review of the suitability and provision of on-site car parking through assessment against Council and Australian Standards requirements.
5. Presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site is shown in ***Figure 1*** below. It is located on the western side of Airport Road, Narrabri approximately 200 metres north of Kaputar Road and approximately 4 kilometres south-east of the Narrabri CBD. The site currently contains vacant rural pasture used for agricultural purpose.

The property has the formal title of Lot 489 DP754944, 115 Airport Road, Narrabri with road frontage access directly off Airport Road. The development area for the proposal is approximately 15 hectares. The site is currently zoned RU1 – Primary Production pursuant to the Narrabri LEP (2012).

The proposed vehicular access to the site will be provided off Airport Road approximately 220 metres north of Kaputar Road near an existing access gate to the property. Deliveries to the site will use the identified delivery road shown on ***Figure 1*** being via the Kamilaroi Highway from the south from Sydney and Newcastle or from the north from Brisbane. Noting that whilst Old Gunnedah Road is a designated B-Double route, both Kaputar Road and Airport Road are not designated B-Double routes. Therefore Council will need to provide special permission for B-Doubles to deliver materials to the site. It is considered that the short length of Kaputar Road and Airport Road to be used by B-Double delivery vehicles is suitable for the short construction period. ***Photograph 1*** below shows the existing development site from Airport Road and the existing access gate to the site while, ***Photograph 2*** shows the existing Old Gunnedah Road / Kaputar Road T-intersection near the site, which lies on the proposed construction vehicle delivery route.

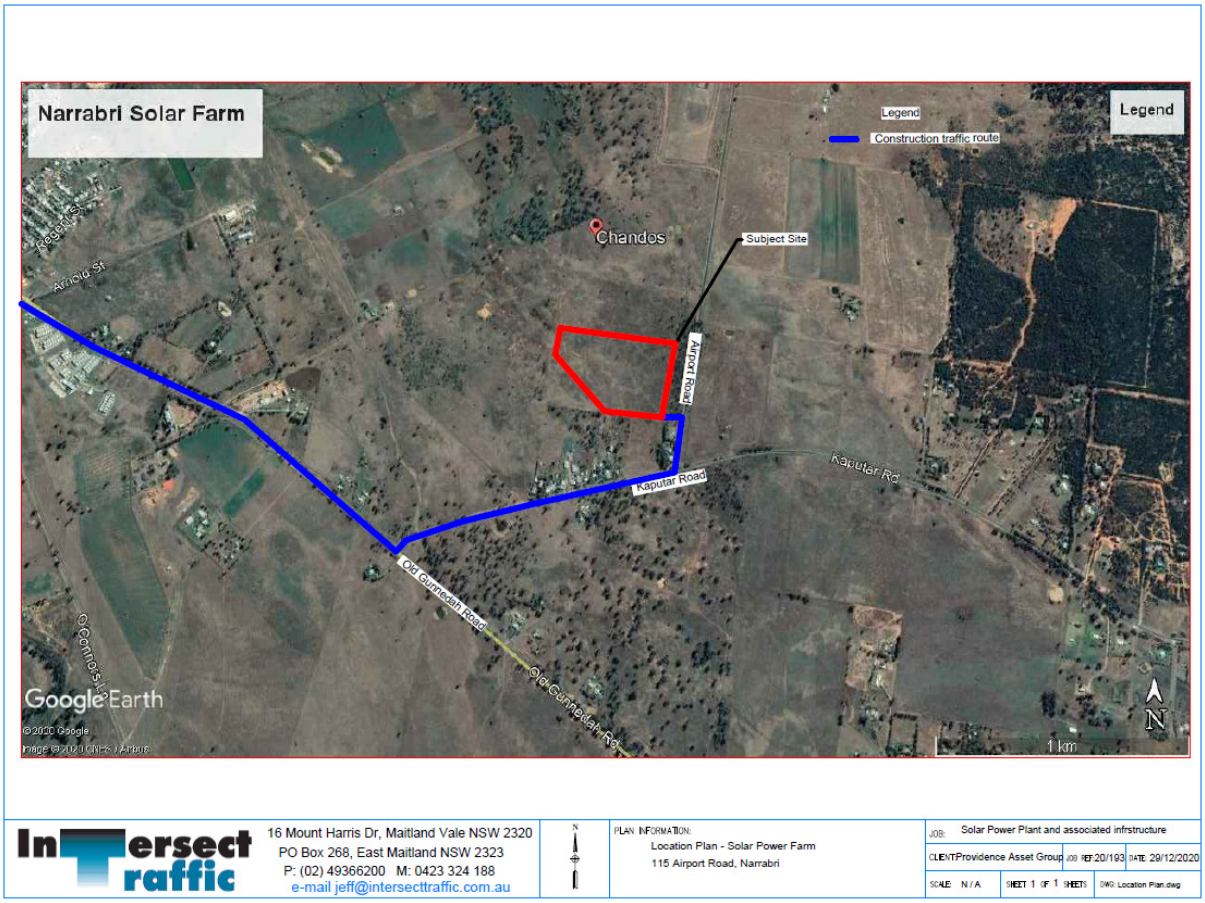


Figure 1 – Site Location

Photograph 1 – Development site from Airport Road near existing access gate

Photograph 2 – Old Gunnedah Road / Kaputar Road stop sign controlled intersection.

3.0 EXISTING ROAD NETWORK

3.1 Kamilaroi Highway

The Kamilaroi Highway is a classified state highway (SH29) with its primary function to connect the New England Highway at Willow Tree to the Mitchell Highway at Bourke through Gunnedah, Boggabri, Narrabri, Wee Waa, Walgett and Brewarrina. As such, it is an arterial road and major NSW transport route from inland NSW to the NSW coastal area. As a sealed rural arterial road, the Kamilaroi Highway is under the care and control of Transport for NSW (TfNSW).

Near Narrabri the Kamilaroi Highway is a two-lane two-way sealed rural road with a 9-metre wide sealed carriageway consisting of 3.5 metre wide travel lanes and 1 metre wide sealed shoulders. Additional turning lanes are provided at major intersections along its length. North and south of Narrabri, the speed zoning is 100 km/h north while a 60 km/h speed zoning exists through Narrabri. At the time of inspection, the Kamilaroi Highway was observed to be in good condition as shown in ***Photograph 3*** below. It is considered suitable for use by heavy vehicle traffic.

Photograph 3 – Kamilaroi Highway, near site.

3.2 Old Gunnedah Road

Old Gunnedah Road is a local sealed rural collector road with its primary function to collect and distribute traffic from the south-eastern area of Narrabri to the arterial road network at Narrabri, as well as provide vehicular access to properties along its length. As a local rural sealed road, it is under the care and control of Narrabri Shire Council and 80 km/h and 100 km/h speed zoning apply to the road from Narrabri through to Kaputar Road. Old Gunnedah Road is a designated B-Double route.

Old Gunnedah Road is a two-lane two-way sealed rural road. It has a 7 metre wide sealed pavement and gravel / grass shoulders and verge that comfortably allows two lanes of traffic flow,

one in each direction, with parking or pull over areas along its length. At the time of inspection, Old Gunnedah Road near Kaputar Road was found to be in good condition as shown in ***Photograph 4*** below.

Photograph 4 – Old Gunnedah Road near Kaputar Road.

3.3 Kaputar Road

Kaputar Road is a local sealed rural road with its primary function to provide vehicular access to properties along its length. As a local rural road, it is under the care and control of Narrabri Shire Council and a 100 km/h speed zoning would apply to Kaputar Road. Kaputar Road is not a designated B-Double route.

Near the site, Kaputar Road is a two-lane two-way sealed rural road with a 7-metre wide sealed carriageway which comfortably allows two-way traffic flow. It currently services a number of rural residential and rural properties along its length. At the time of inspection, Kaputar Road near Airport Road was found to be in good condition as shown in ***Photograph 5*** below.

3.4 Airport Road

Airport Road is a local sealed rural road with its primary function to provide vehicular access to properties along its length, including Narrabri airport. As a local rural road it is under the care and control of Narrabri Shire Council and a 100 km/h speed zoning would apply to Airport Road. Note Airport Road is not a designated B-Double route.

Near the site, Airport Road is a two-lane two-way sealed rural road with a 7-metre wide sealed carriageway which comfortably allows two-way traffic flow. It currently services a couple of rural properties along its length, as well as Narrabri Airport. At the time of inspection, Airport Road near the site was found to be in good condition as shown in ***Photograph 6*** below.

Photograph 5 – Kaputar Road near Airport Road.

Photograph 6 – Airport Road near the site.

4.0 ALTERNATE TRANSPORT MODES

Forest Coach Lines provide regular public transport (bus) services within Narrabri with their route map shown below in ***Figure 2***. It is noted however that the nearest service to the site Route 457C (Narrabri Town Loop) is still some 3.5 km by road to the site and therefore not considered appropriate for the development.

As a rural area, there are no pedestrian footpaths or on / off road cycleways within the local road network. Near the site, pedestrians are generally required to utilise the grass verges and road shoulders / pavement, while cyclists are required to utilise the road shoulders or share the travel lanes with other vehicles.

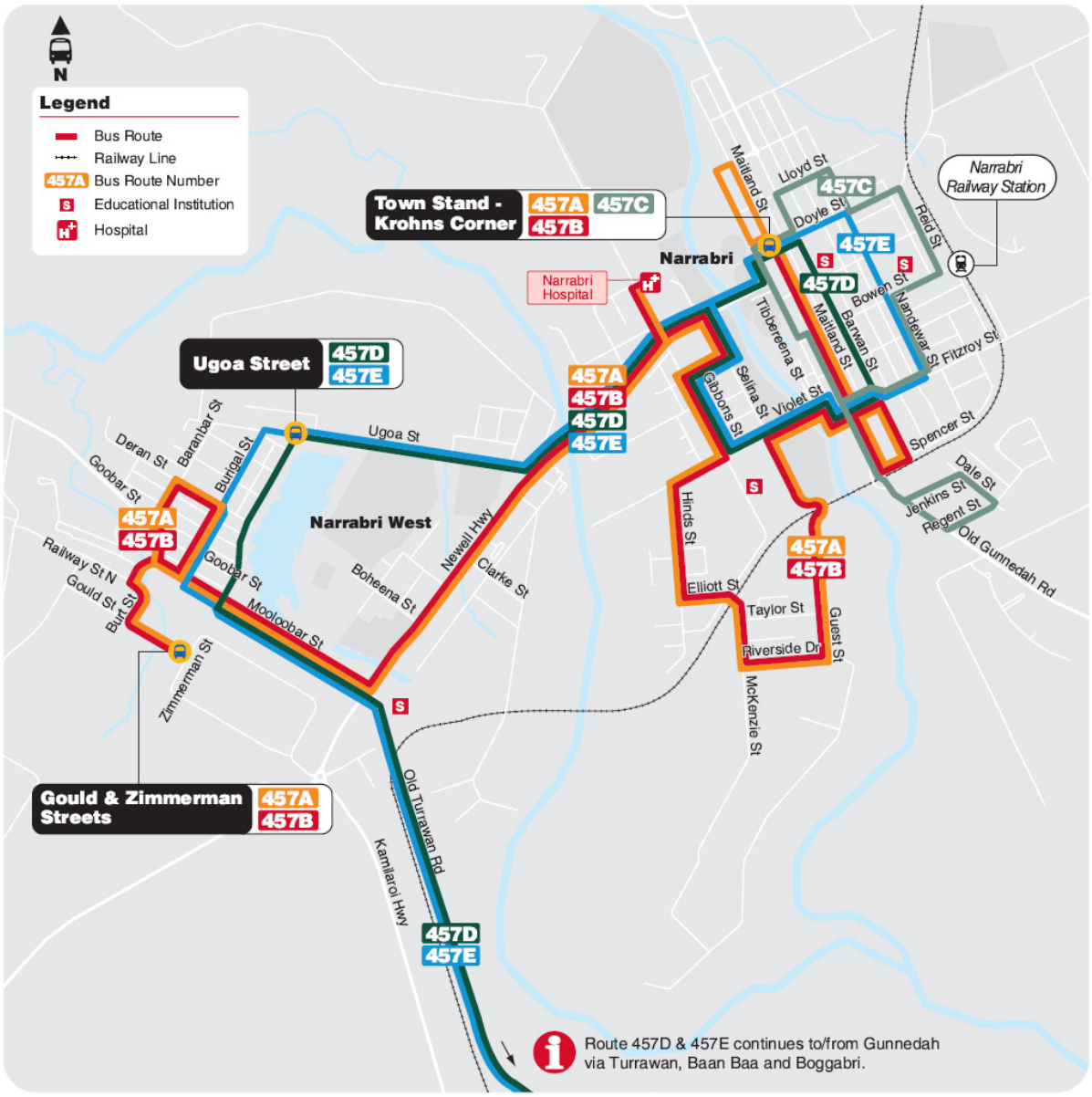


Figure 2 – Forest Coach Lines – Narrabri bus routes

5.0 DEVELOPMENT PROPOSAL

The proposed development involves the construction of a Solar Photovoltaic (PV) Power Farm on the site. The development concept plans are shown in ***Attachment A*** with the specific works involved in the expansion listed below:

- Installation of temporary construction office and amenities.
- Installation of Solar Panel arrays.
- Earthworks for construction lay-down area, hardstand areas and internal roads.
- Installation of inverters, transformers and switchgear.
- Construction of unsealed access road from Airport Road to the construction site.
- Construction of security fence and entrance gate; and
- Drainage and landscaping to Narrabri Shire Council requirements.

The development will require a team of 30 construction employees for a period of up to 6 months working 7 am to 5 pm Monday to Friday and 8 am – 1 pm on Saturdays. The majority of traffic movements associated with the development will occur during the construction of the solar power farm. Traffic movements generated by the operation of the development would include a single staff light vehicle movement associated with maintenance inspections as required and specific maintenance work which would be short term and infrequent. Deliveries during construction works would be expected to be within rigid and articulated vehicles. More detail on construction traffic is provided later in this report.

6.0 TRAFFIC IMPACTS

6.1 – Traffic Generation and Trip Distribution

The TfNSW publication "*RTA's Guide to Traffic Generating Developments (2002)*" provides advice on the traffic generating potential of different land uses. However this document does not cover Solar Farms therefore determining traffic generation is reliant on advice from the applicant regarding construction and operation of the development.

From an operational perspective traffic generation is expected to be minimal with only regular daily maintenance inspections carried out when necessary. Therefore based on 1 visit per day per week a peak hour traffic generation of 2 vehicle trips per hour (vtph) has been assumed for this assessment. There may be times when specific maintenance tasks have to be undertaken but these will be infrequent, short-term and undertaken under a construction traffic management plan for the work. Construction traffic estimates for the development are as follows based on the information provided in ***Attachment C***.

- Construction employees on-site – Maximum 30 transported in up to 10 light vehicles per day arriving between 6 am and 7 am and departing between 5 pm and 6 pm.
- Deliveries – Mainly heavy rigid vehicles and articulated vehicles (AV). Maximum – 8 per day but average of 5 per day between 10 am and 4 pm. Whilst these are likely to mostly arrive outside the peak hour traffic generation periods associated with the arrival and departure of employees, logistically there could be occurrences when due to circumstances out of the control of the contractor, a delivery arrives during the peak hour periods.
- Other vehicles – Some earthworks plant may be required on-site as well as concrete agitators and road base material deliveries during construction of the access. It would be expected a maximum frequency of 3 deliveries within a peak hour is assumed.
- Construction period – up to 6 months

Based on this advice, the likely peak hour traffic generation, which will occur in the AM peak coinciding with employees arriving on site and in the PM peak coinciding with employees leaving the site, is calculated below. It is also noted deliveries involve 2 trips with an inbound trip and an outbound trip.

AM peak = 10 inbound employees + 3 x 2 roadworks and other plant + 1 x 2 deliveries = 18 vtph (14 inbound and 4 outbound).
PM peak = 10 outbound employees + 3 x 2 roadworks and other plant + 1 x 2 deliveries = 18 vtph (14 outbound and 4 inbound).

It is expected that the distribution of trips will be all north-west towards or from Narrabri, with deliveries being via the New England Highway and Kamilaroi Highway from the south or via Newell Highway and Kamilaroi Highway from the north, originating from either Newcastle or Sydney or Brisbane. In accessing the site, the likely transportation route as envisaged is shown on the location plan (***Figure 1***) in this report.

Existing traffic volumes in the area were recorded by Intersect Traffic at the Old Gunnedah Road / Kaputar Road and Kaputar Road / Airport Road intersections during the likely peak AM and PM traffic periods (road network) i.e. 3 pm – 4 pm and 8 am – 9 am on Thursday 3rd December 2020 and Friday 4th December 2020 respectively. These periods were chosen following interrogation of Transport for NSW (TfNSW) data in the area on its Traffic Volume Viewer application. The data sheets for these counts are provided in ***Attachment B***.

These traffic counts determined that the relevant peak hour two-way mid-block traffic volumes on the state and local road network in the AM and PM periods during this period were.

- Old Gunnedah Road west of Kaputar Road - 213 vtph in the AM peak and 198 vtph in the PM peak.
- Old Gunnedah Road east of Kaputar Road – 106 vtph in the AM peak and 136 vtph in the PM peak.
- Kaputar Road north of Old Gunnedah Road and west of Airport Road – 100 vtph in the AM peak and 72 vtph in the PM peak.
- Kaputar Road east of Airport Road – 97 vtph in the AM peak and 62 vtph in the PM peak; and
- Airport Road north of Kaputar Road – 3 vtph in the AM peak and 6 vtph in the PM peak.

Northern Transport Planning and Engineering (NTPE) also installed a traffic classifier on Old Gunnedah Road approximately 80 metres west of Kaputar Road from Friday 27th November 2020 until Thursday 3rd December 2020, a period of 1 week. This count recorded a peak two-way AM traffic volume of 276 vtph on Tuesday 1st December 2020 and a peak two-way PM traffic volume of 306 vtph on Tuesday 1st December 2020. It is noted the traffic classifier counts are higher than the intersection counts and have therefore been used in this assessment. The classifier counts also determined a heavy vehicle percentage of approximately 5%. The traffic classifier summary spreadsheets are also provided in ***Attachment B***.

Given the construction will be completed within a 6 month period and the peak operational traffic volume from the site is only 2 vtph, there is no need to undertake a 2030 (10 year horizon period) assessment of this development.

6.2 – Road Capacity

Table 4.5 of the TfNSW publication "*RTA's Guide to Traffic Generating Developments"* provides some guidance on likely mid-block capacity of two-lane two-way rural roads. This table is reproduced below as ***Table 1***:

Table 1 – Rural Road Mid-Block Capacity Table

Table 4.5
peak hour flow on two-lane rural roads (veh/hr)
(Design speed of 100km/hr)

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

The data for Table 4.5 assumes the following criteria:

- *terrain level* with 20% no overtaking.
- *rolling* with 40% no overtaking.
- *mountainous* with 60% no overtaking.
- 3.7 m traffic lane width with side clearances of at least 2m.
- 60/40 directional split of traffic.

Source: - RTA's Guide to Traffic Generating Developments (2002)

It is assumed that the appropriate terrain levels for Old Gunnedah Road, Kaputar Road and Airport Road are Level and that a satisfactory level of service (LoS) on the road network is a LoS C. Therefore, after adopting a 5% heavy vehicle percentage on traffic volumes, the above table suggests the relevant two-way mid-block road capacities for a LoS C are as follows:

- All roads – 970 vtph.

Therefore the two-way mid-block road capacity thresholds adopted in this assessment are:

- Old Gunnedah Road, Kaputar Road and Airport Road – 970 vtph.

As the combination of the two-way mid-block peak hour traffic data and traffic generation figures reported in ***Section 6.1*** in the AM and PM peak hour traffic volumes on the local and state road network during construction will be well below the existing capacity thresholds determined above, then the local road network has sufficient spare two-way mid-block capacity to cater for the construction and operation of the Solar Farm. The addition of up to 18 vtph will not cause the capacity thresholds determined above to be reached. Therefore it can be concluded that the proposed development will not adversely impact on the local road network mid-block efficiency.

6.3 – Intersection Capacity

The main intersections impacted by the construction of the development is the Old Gunnedah Road / Kaputar Road priority controlled stop sign T-intersection and the Kaputar Road / Airport Road priority controlled give way T-intersection. However traffic volumes at this intersection are well below the thresholds sourced from Austroads *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings (2010),* reproduced below in ***Table 2*** of this report**.** The Guide states that if traffic volumes are not above these thresholds, then uninterrupted flow

conditions can be assumed and little or no delay will be experienced by motorists at these intersections. No further intersection analysis is then required.

Table 2 – Uninterrupted flow condition thresholds at an intersection

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Source: - Austroads Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings (2010)

With traffic flows on Old Gunnedah Road being less than 306 vtph and traffic flows on Kaputar Road and Airport Road being less than 100 vtph and 6 vtph respectively, it is clearly seen that these intersections are currently operating with uninterrupted flow conditions, confirmed by observation on site during the traffic counts. The additional 18 vtph generated by the construction of the Solar Farm will not result in the thresholds within the above table being reached. Therefore it can be concluded that during construction and post development, the Old Gunnedah Road / Kaputar Road priority controlled stop sign T-intersection and the Kaputar Road / Airport Road priority controlled give way T-intersection will continue to operate with uninterrupted flow conditions. Therefore it is reasonable to conclude that the development does not adversely impact on the operation of this intersection or any other intersection on the local and state road network.

6.4 Access Assessment

In terms of width, the access to the development providing access to a user class 1 (long term) car parking facility with less than 25 car spaces fronting a local road is required to be a category 1 access (Table 3.1 of the Standard). Table 3.2 of the Standard then specifies a category 1 access facility as a combined entry / exit between 3.0 to 5.5 metres wide. However the proposed entrance width at the combined entry / exit access at Airport Road will need to be a minimum 12.5 metres wide to cater for the swept turning paths for delivery vehicles during the construction stage and satisfy the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* and Australian Standard *AS2890.2-2002 Parking Facilities – Part 2 Off-street commercial vehicle facilities.*

Sight distance at the proposed access off Airport Road was observed to be in excess of 250 metres in each direction which therefore complies with the requirements of Figure 3.2 of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking (160 metres minimum SSD for 100 km/h*) as well as Austroads *Guide to Road Design – Part 4A – Unsignalised and signalised intersections - Table 3.2 (248 metres for 100 km/h)* for safe intersection sight distance.

It is therefore concluded that the proposed site access is suitably located and satisfactory for use for the Solar Farm as it complies with the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* and Australian Standard *AS2890.2-2002 Parking Facilities – Part 2 Off-street commercial vehicle facilities.*

The main issue with access for construction vehicles to the site, is the suitability of the local road network to safely cater for heavy vehicle deliveries. In this regard it is noted that Airport Road has sealed pavement approximately 7 metres wide and therefore complies with Austroads Standards for Rural Roads with more than 500 vtph. It would therefore allow two heavy vehicles to pass each other at normal speed. Therefore it is considered the proposed transportation route to the site is suitable to carry heavy vehicles and thus is suitable to cater for the construction traffic from the Solar Farm construction. However, the additional heavy vehicle loading from the construction may

accelerate the deterioration in the sealed pavement along the transportation route. It is therefore recommended that a dilapidation report be prepared for the project in regard to Kaputar Road and Airport Road caused by the construction of the Solar Farm and ensure the road network is repaired to Council's satisfaction post the construction stage of the development. This will require pre and post construction stage inspections of the road pavement along the proposed transport routes.

Overall, with a suitable condition of consent included for the preparation of a dilapidation report covering Kaputar Road and Airport Road and the satisfactory repair of the local road network post construction, it is considered the local road network would be suitable to cater for the expected construction traffic associated with the development.

7.0 ON-SITE CAR PARKING

On-site car parking for the proposal is required to comply with the Industrial Development controls of the Narrabri Shire Council's Development Control Plan – Parking Code No. 1. Adopting the factory rates for this project the relevant on-site car parking provision during the operation of the Solar Farm is.

- *1.3 spaces per 100m² GFA .*

With no building proposed for the Solar Farm, the development is theoretically not required to provide any on-site car parking space under the DCP requirements. However, with a single maintenance vehicle visit to the site likely to occur at most once a week, it would be prudent to provide at least 1 on-site vehicle car park within the development. However, it is also the responsibility of the applicant to provide sufficient on-site car parking for construction employees during the construction of the development to comply with the car parking objectives of the DCP. Construction employee car parking will be provided on the hard stand area identified as the construction lay down area and is large enough to cater for the expected storage requirements during construction as well as the provision of at least 10 on-site car parks for construction employees, which is the expected traffic generation from employees to the site. This is in excess of the Industrial land use requirements of the Narrabri Shire Council Development Control Plan – Parking Code No. 1. With significant overflow parking areas also on site, it is reasonable to conclude the development provides sufficient on-site car parking that complies with the objectives and controls related to car parking required within Narrabri Shire Council's Development Control Plan – Parking Code No. 1.

The employee car parking area would need to comply with the requirements of Australian Standard *AS2890.1-2004 Parking Facilities – Part 1 Off-street car parking* with parking bay sizes 2.4 m x 5.4 m and aisle widths of 5.8 metres. There is sufficient room on-site to ensure compliance with this requirement, which could be covered by a suitable condition of consent. Overall, it is considered suitable on-site car parking can be provided for the development ensuring all vehicle movements to and from the site off Airport Road will be undertaken in a forward direction.

8.0 ALTERNATE TRANSPORT MODES

The proposed development will not generate any increase in public transport demand during both the construction and operational phases of the development particularly given the site is not currently serviced by convenient public transport. Therefore there is no nexus for the provision of new services or improved infrastructure resulting from the development. Similarly, the development will not generate any additional pedestrian or cycle traffic during both the construction and operation phases of the development therefore no nexus exists for the provision of additional pedestrian paths or cycle ways near the site.

9.0 CONCLUSIONS

This traffic and parking assessment for the proposed Solar Photovoltaic (PV) Power Farm (up to 5MW) on Lot 489 DP 754944 115 Airport Road, Narrabri has determined the following:

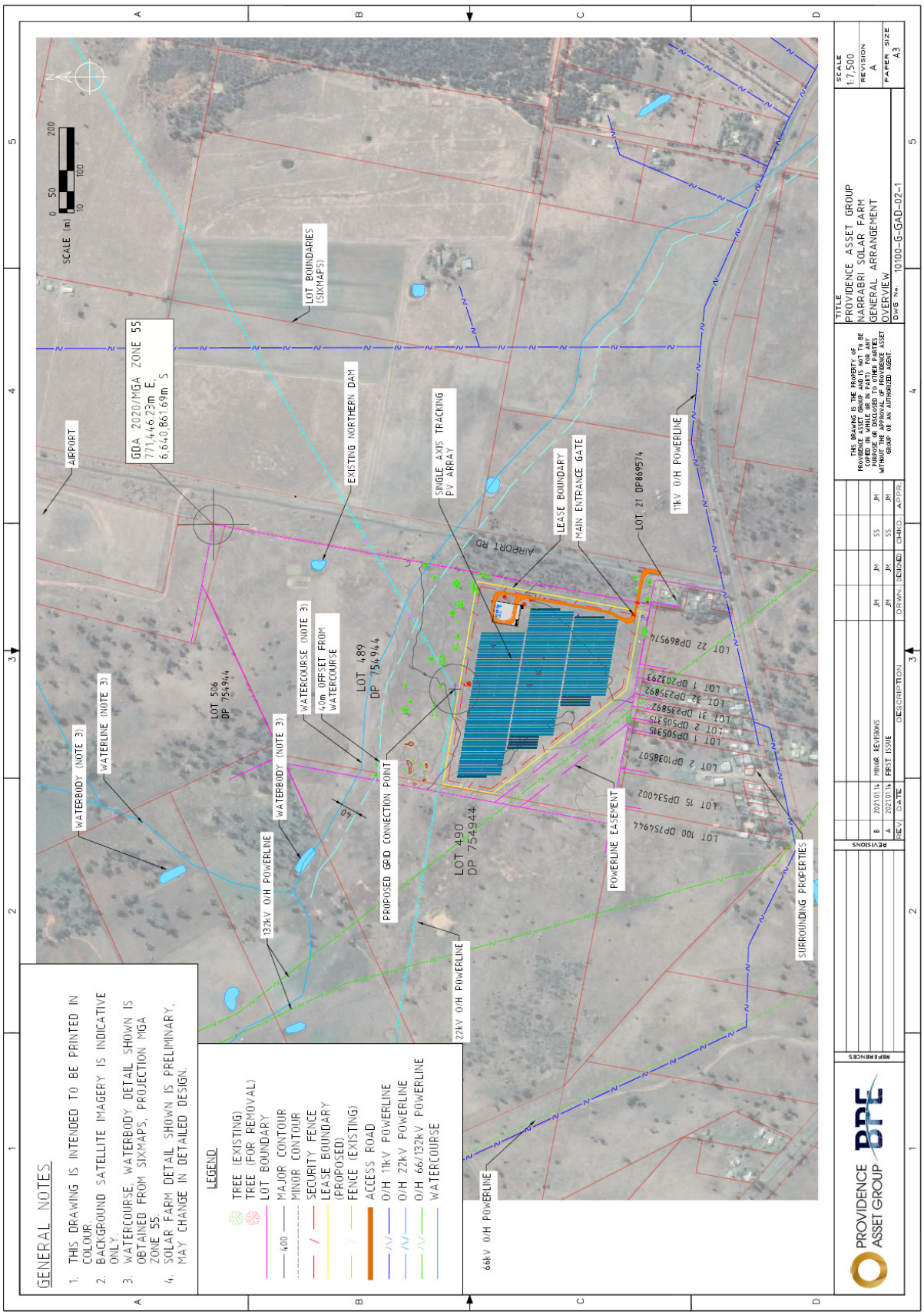
- The development during construction will generate up to an additional 18 vehicle movements to and from the site during the weekday AM and PM peak periods but only 2 vtph during the operation of the Solar Farm.
- The existing peak traffic volumes on the local road network are well below the two-way mid-block capacity threshold of 970 vtph for the local road network (LoS C). Traffic volumes will remain below this threshold during the construction and operation of the development.
- The Old Gunnedah Road / Kaputar Road priority controlled stop sign T-intersection and the Kaputar Road / Airport Road priority controlled give way T-intersection will continue to operate with uninterrupted flow conditions during and post construction of the Solar Farm with little if any impact on the operation of the intersection resulting from the development.
- It is also reasonable to conclude the development will not adversely impact on the intersections on the wider local and state road network given the high levels of intersection control on the major intersections and the relatively low traffic generation from the development.
- Therefore, the additional construction and operational traffic generated by this development will not adversely impact on the efficiency or effectiveness of the local and state road network.
- The proposed site access is suitable for use for construction and operation of the development being compliant with Australian Standard and Austroads requirements.
- With a suitable condition of consent included for the preparation of a dilapidation report covering Kaputar Road and Airport Road and the satisfactory repair of the local road network post construction, it is considered the local and state road network would be suitable to cater for the expected construction traffic associated with the development.
- There is sufficient area on-site to accommodate the expected peak parking demand generated by the development during both construction and operation with the provision of an AS2890.1-2004 compliant car park within the construction laydown area for a minimum 10 spaces as well as the provision of numerous overflow parking areas on the site.
- The proposed development will not generate any increase in public transport demand; therefore no nexus exists for the provision of new services or improved infrastructure resulting from the development. Similarly, the development will not generate any additional pedestrian or cycle traffic, therefore no nexus exists for the provision of additional pedestrian paths or cycle ways near the site.

10.0 RECOMMENDATION

Having carried out this traffic and parking assessment for the proposed Solar Photovoltaic (PV) Power Farm (up to 5MW) on Lot 489 DP 754944 115 Airport Road, Narrabri, it is recommended that the proposal can be supported from a traffic perspective as the development will not adversely impact on the local and state road network and complies with all relevant requirements of Narrabri Shire Council, Austroads, Australian Standards and TfNSW.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

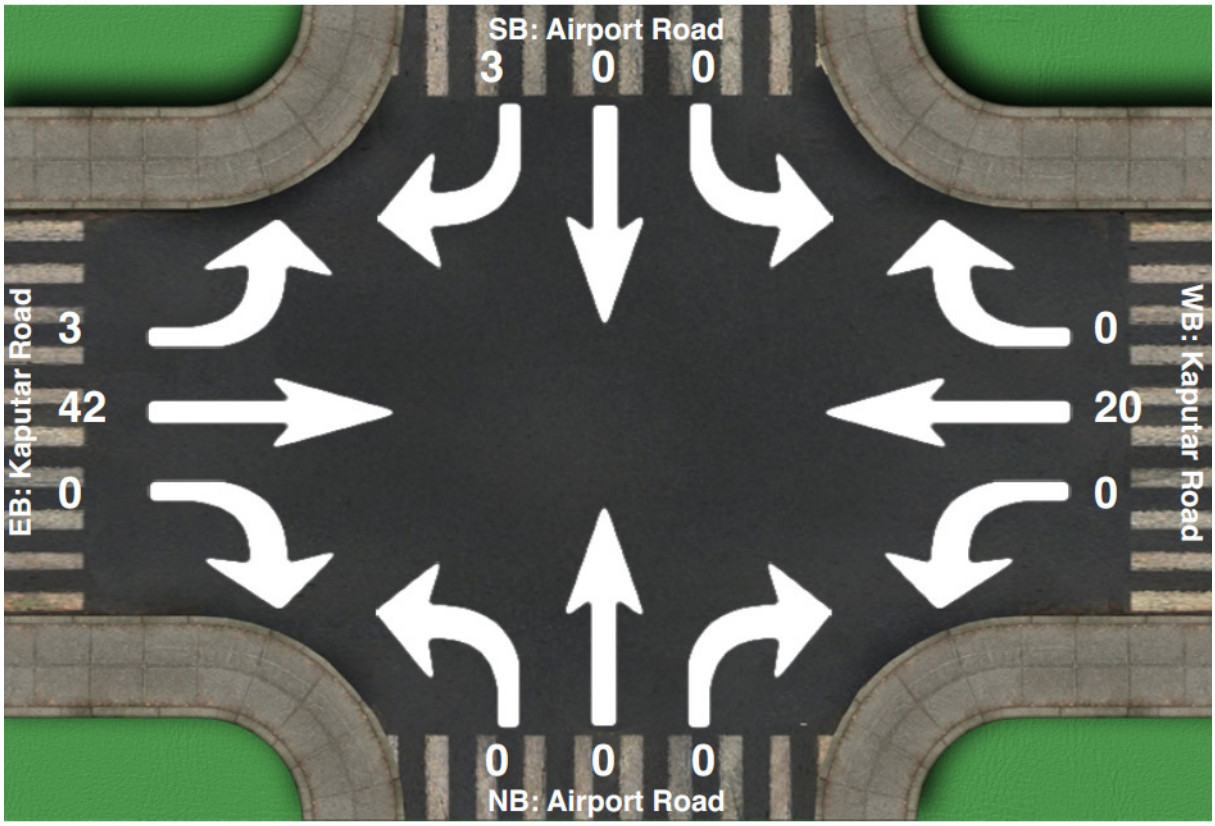
ATTACHMENT A
DEVELOPMENT PLANS



ATTACHMENT B
TRAFFIC COUNT DATA

Intersection Peak Hour

Location: Airport Road at Kaputar Road, Narrabri
GPS Coordinates: Lat=-30.319506, Lon=149.781525
Date: 2020-12-03
Day of week: Thursday
Weather:
Analyst: Lezette



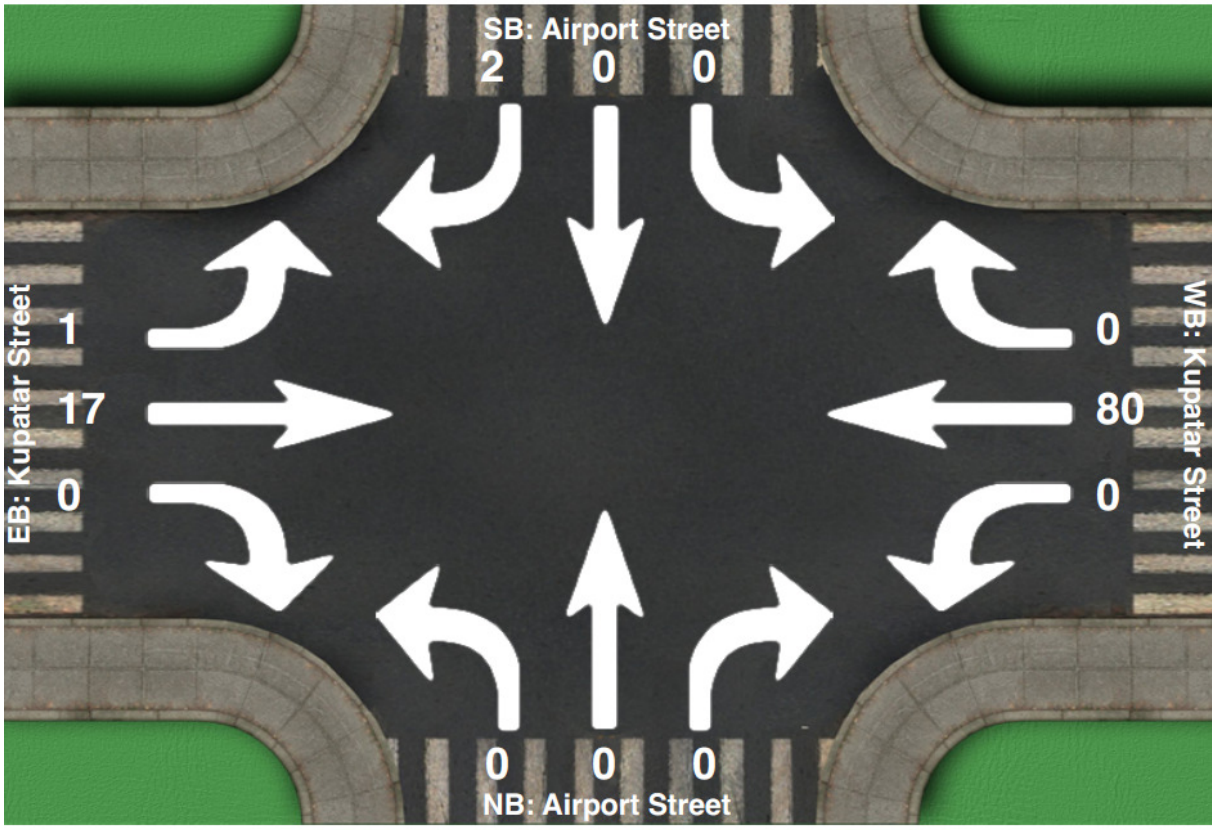
Intersection Peak Hour

15:00 - 16:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	3	0	20	0	0	0	0	3	42	0	68
Factor	0.00	0.00	0.38	0.00	0.71	0.00	0.00	0.00	0.00	0.75	0.95	0.00	0.89
Approach Factor	0.38			0.71			0.00			0.94			

Intersection Peak Hour

Location: Airport Street at Kupatar Street, Narrabri
GPS Coordinates: Lat=-30.347930, Lon=149.809599
Date: 2020-12-04
Day of week: Friday
Weather:
Analyst: Lezette



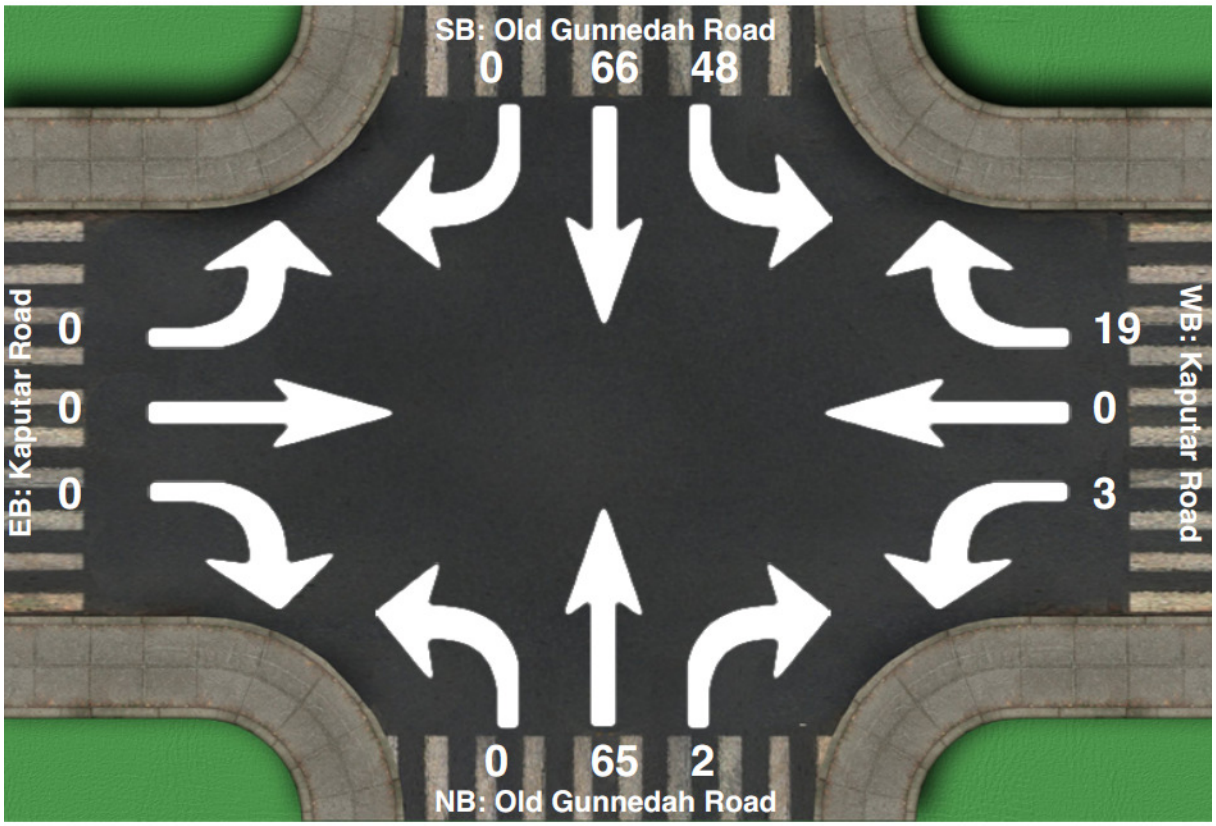
Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	2	0	80	0	0	0	0	1	17	0	100
Factor	0.00	0.00	0.50	0.00	0.74	0.00	0.00	0.00	0.00	0.25	0.71	0.00	0.78
Approach Factor	0.50			0.74			0.00			0.75			

Intersection Peak Hour

Location: Old Gunnedah Road at Kaputar Road, Narrabri
GPS Coordinates: Lat=-30.324583, Lon=149.782975
Date: 2020-12-03
Day of week: Thursday
Weather:
Analyst: Jeff



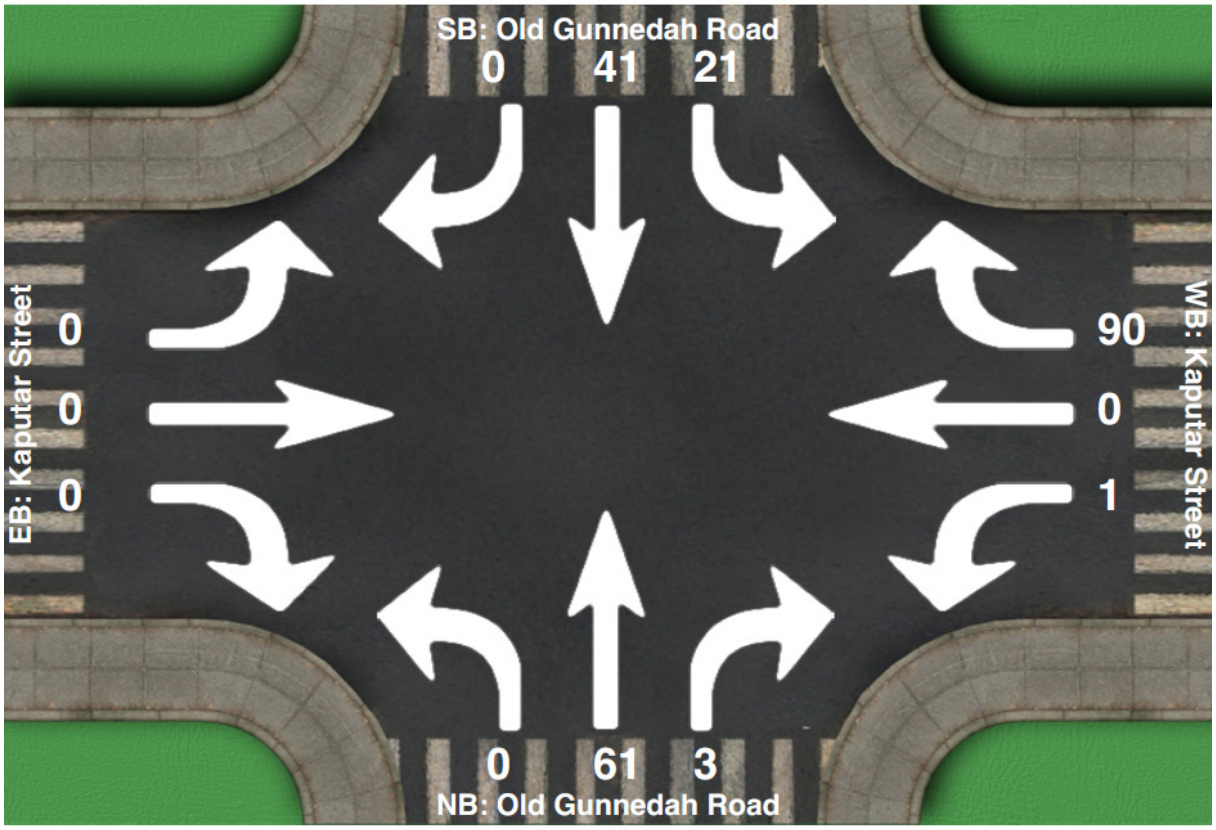
Intersection Peak Hour

15:00 - 16:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	48	66	0	3	0	19	0	65	2	0	0	0	203
Factor	0.80	0.87	0.00	0.75	0.00	0.59	0.00	0.74	0.25	0.00	0.00	0.00	0.78
Approach Factor	0.84			0.61			0.76			0.00			

Intersection Peak Hour

Location: Old Gunnedah Road at Kaputar Street, Narrabri
GPS Coordinates:
Date: 2020-12-04
Day of week: Friday
Weather:
Analyst: Jeff



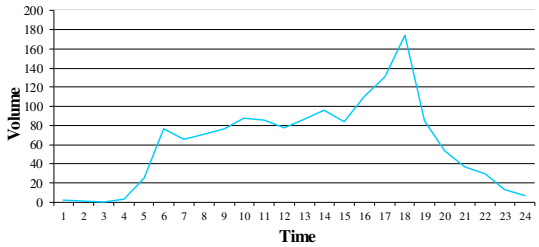
Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	21	41	0	1	0	90	0	61	3	0	0	0	217
Factor	0.66	0.64	0.00	0.25	0.00	0.68	0.00	0.80	0.38	0.00	0.00	0.00	0.82
Approach Factor	0.70			0.69			0.84			0.00			

Site 1 Old Gunnedah Rd N of Kaputa Rd [80] **Eastbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	27/11/2020	28/11/2020	29/11/2020	30/11/2020	1/12/2020	2/12/2020	3/12/2020	*Ave.*	*Ave.*	*Ave*
0:00	1	4	9	3	1	2	2	2	7	3
1:00	0	2	4	0	4	3	0	1	3	2
2:00	2	5	2	0	1	1	0	1	4	2
3:00	5	1	1	2	1	3	6	3	1	3
4:00	23	20	14	22	26	24	30	25	17	23
5:00	57	36	30	76	89	83	78	77	33	64
6:00	66	24	18	62	74	70	57	66	21	53
7:00	71	50	45	68	75	80	61	71	48	64
8:00	66	59	45	66	86	76	88	76	52	69
9:00	93	87	78	93	84	95	76	88	83	87
10:00	81	105	84	81	85	82	100	86	95	88
11:00	87	96	83	77	82	66	74	77	90	81
12:00	90	104	99	71	95	85	93	87	102	91
13:00	112	85	74	90	99	86	91	96	80	91
14:00	101	62	53	80	88	79	74	84	58	77
15:00	139	64	55	104	100	97	115	111	60	96
16:00	122	66	92	127	132	128	145	131	79	116
17:00	164	75	78	172	183	183	167	174	77	146
18:00	84	82	60	87	91	79	84	85	71	81
19:00	63	46	48	51	57	57	40	54	47	52
20:00	41	40	27	27	31	53	32	37	34	36
21:00	31	28	15	26	31	33	29	30	22	28
22:00	30	19	6	4	12	9	11	13	13	13
23:00	17	18	4	5	3	5	4	7	11	8
Total	**1546**	**1178**	**1024**	**1394**	**1530**	**1479**	**1457**	**1481**	**1101**	**1373**

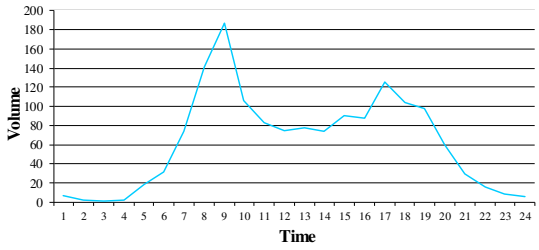


Summary

	from	to	
AM Peak	10:00 AM	11:00 AM	**100**
PM Peak	5:00 PM	6:00 PM	**183**
		Week Day Average	**1481**
		Weekend Day Average	**1101**
		7 Day Average	**1373**

Site 1 Old Gunnedah Rd N of Kaputa Rd [80] **Westbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	27/11/2020	28/11/2020	29/11/2020	30/11/2020	1/12/2020	2/12/2020	3/12/2020	*Ave.*	*Ave.*	*Ave*
0:00	4	6	6	2	9	8	9	6	6	6
1:00	5	2	4	0	5	1	0	2	3	2
2:00	1	3	2	1	2	2	1	1	3	2
3:00	2	5	2	2	3	1	3	2	4	3
4:00	17	9	3	16	22	19	20	19	6	15
5:00	28	11	8	30	35	33	33	32	10	25
6:00	57	47	40	73	88	83	68	74	44	65
7:00	121	74	57	149	127	150	159	141	66	120
8:00	185	94	58	185	190	195	181	187	76	155
9:00	107	104	101	107	112	104	102	106	103	105
10:00	91	99	93	91	74	70	88	83	96	87
11:00	80	88	63	73	72	76	74	75	76	75
12:00	82	74	71	79	78	76	74	78	73	76
13:00	85	78	56	68	82	65	72	74	67	72
14:00	112	53	69	79	101	70	92	91	61	82
15:00	109	62	59	74	86	87	84	88	61	80
16:00	106	81	73	121	151	134	114	125	77	111
17:00	88	77	66	97	123	108	105	104	72	95
18:00	104	101	82	105	101	98	80	98	92	96
19:00	62	75	57	54	58	73	52	60	66	62
20:00	39	20	25	26	30	25	27	29	23	27
21:00	17	27	20	12	17	15	20	16	24	18
22:00	11	13	2	4	9	8	11	9	8	8
23:00	9	8	6	6	2	8	5	6	7	6
Total	**1522**	**1211**	**1023**	**1454**	**1577**	**1509**	**1474**	**1507**	**1117**	**1396**



Summary

	from	to	
AM Peak	8:00 AM	9:00 AM	**195**
PM Peak	4:00 PM	5:00 PM	**151**
		Week Day Average	**1507**
		Weekend Day Average	**1117**
		7 Day Average	**1396**

ATTACHMENT C
TRAFFIC GENERATION INFORMATION

PROVIDENCE ASSET GROUP

Preliminary Solar Farm Vehicle Movement Guidance

27/03/2020

1 Traffic Generated by Construction Works

During the construction of the solar farm, it is estimated that approximately 50 x 40 ft containers will be transported to site. Added to these containers are waste traffic, equipment, temporary installations and workforce transport to and from site. A logistics agent will be engaged to manage the freight from the delivery port [TBC] to the solar farm site.

An estimation of the traffic created by the worksite is provided in Figure 1, below.

The vehicular traffic for the transport vehicles is based on a 3-axle rigid truck. The General Mass Limit (GML) for a 3-axle load is assumed to be 20 tonnes based on The Australian Trucking Association's 'Technical Advisory Procedure for Truck Configurations' [24]. Depending on the availability of vehicles it may be possible that a conventional B-doubles will transport equipment to site. The GML for this vehicle is 40 tonnes. In this case the vehicular traffic for the container loads will reduce by a factor of 2 for each B-double transporting equipment to site.

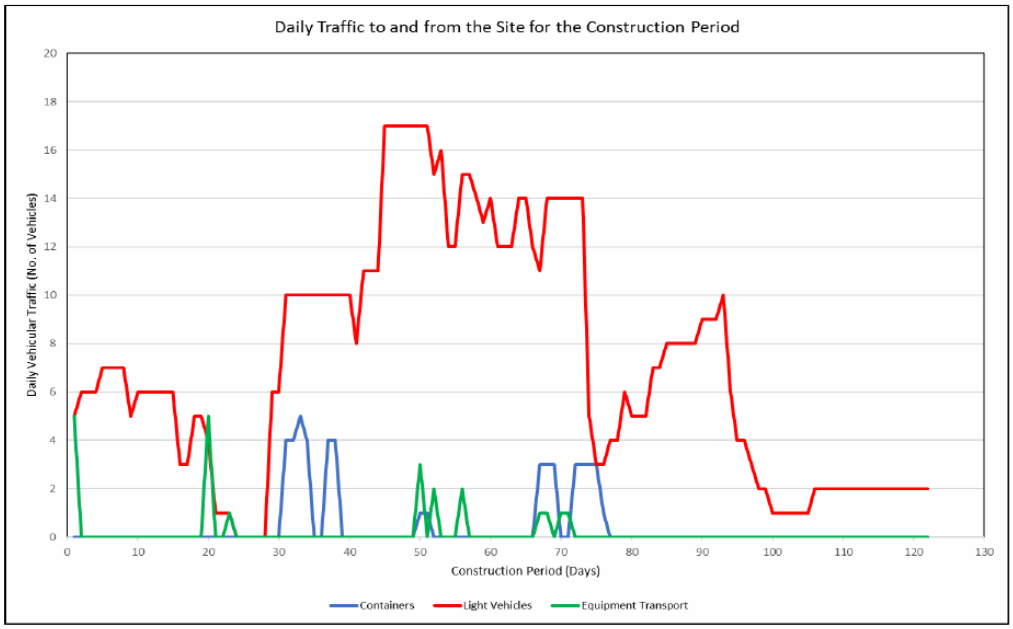


Figure 1 - Daily Traffic to and from Site for the Construction Period

At the peak of the equipment supply, the number of transport vehicles entering and leaving the solar farm site will be 4 to 5 daily for a period of just over a month into the construction period. There will be another busy week midway through the construction period where there will be approximately 3 transport vehicles entering and leaving the site daily.

All heavy transport to and from the site will predominantly be on standard working days between 8am and 4pm.

It is anticipated that there will be up to 30 personnel working on the site during the construction period that will generate the anticipated light vehicle traffic.

The light traffic will be concentrated at the beginning and the end of the day around 6-7am and 4-5pm. The container transport will be concentrated between 10am and 3pm.

2 Impact on Existing Traffic

With a maximum of eight to ten light vehicles and six to eight heavy vehicles travelling to and from the site daily, it is not anticipated that the increased traffic due to construction works will have any significant impact on the existing traffic.

3 Additional Road Signage of Existing Road

It is suggested that road signage is provided for the proposed site entrance on Manilla Road. The recommended locations of the warning signs be placed at distances of 200 metres approaching the intersection to the north and south. The warning signs will indicate that it is a construction site entrance. The entrance to the site on Mannum Road will be designed for the anticipated heavy transport loads volumes during the construction period that are detailed in Section 1. A Traffic Control Plan will be submitted to the DPTI Traffic Management Centre for approval, with all signage to be placed and maintained to the satisfaction of the Commissioner of Highways.

4 Parking

All parking for site personnel will be on site. This will be sign posted at the site entrance. Balance will not permit parking on Mannum Road and will incorporate this in the site induction.

5 O&M Traffic

Once the solar farm has been constructed and has entered the “operations and maintenance” stage the traffic onto site will consist of light vehicles, with few exceptions, at a frequency of 1 to 5 visits per fortnight.

5MW Solar Farm - Typical Vehicle Movements			
Construction - Major Equipment	Load	Quantity	Comments
Piling & Tracker Components	40' Container / Trailer	24	Doubles if permitted / practical
PV Modules	40' Container / Trailer	26	Doubles if permitted / practical
Switchgear	20' Container / Trailer	1	
Inverters	20' Container / Trailer	2	
Cranes	~50T	3	
Cables	40' Container / Trailer	2	Doubles if permitted / practical
Balance of Plant (BOP)	40' Container / Trailer	3	
Civil Plant	Float or Drop Deck	8	4ea at mob / demob
Piling Plant	Float or Drop Deck	4	2ea at mob / demob
Site Facilities	Float/Drop Deck/40' Trailer	8	4ea at mob / demob
Light trucks - 6 wheelers	local deliveries - sand, gen fteight etc	10	
Light trucks - 4 wheelers	local deliveries - sand, gen fteight etc	10	
		101	
Construction - Light Vehicles / Other	Load	Quantity	Comments
Light Vehicle - 4WD ute or similar	Personell / tools	384	Average 4 per day
Light Vehicle - ?	Workforce private vehicles	576	Average 6 per day - depends on engagement of workforce
		960	
O&M	Load	Quantity	Comments
Light Vehicle - 4WD ute or similar	fortnightly inspection	30	1 per fortnight, plus additional
Light Vehicle - 4WD ute or similar	3 monthly Inspections	8	2 visits, 4 times per year
Light Vehicle - 4WD ute or similar	Faults	4	
Light trucks - 4 wheelers	PV Module cleaning	2	Once per Year
		44	