

State Significant Development 18_9504

Traffic Impact Assessment

West Wyalong Solar Farm
Blands Lane, Wyalong NSW

Ref: 0738r01v5 SSD TIA_ West Wyalong Solar Farm
21/01/2019

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Project: West Wyalong Solar Farm

Address: 228-230 Blands Lane, Wyalong (Lot 17 and Lot 18 in DP753081)

Client: Lightsource Development Services Australia Pty Ltd

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1 Introduction

1.1 Overview

Ason Group has been engaged by Lightsource Development Services Australia (Lightsource) to prepare a Transport Impact Assessment (TIA) in regard to State Significant Development Application 18_9504 (SSDA 18_9504), which proposes the construction and operation of a solar farm (the Proposal) at 228-230 Blands Lane, Wyalong NSW (the Site).

The Proposal generally provides for:

- The installation of groups of solar panel modules on mounting structures across the Site, with a total of some 296,000 panels to be installed with tracking capabilities.
- The transmission of power generated by the solar panels to the local energy grid via a new substation to be installed on the Site.
- Ancillary on-site access and parking infrastructure.

The Site lies within the Bland Shire Council Local Government Area (LGA), though the SSDA will be assessed by the Department of Planning & Environment (DP&E).

1.2 Assessment Parameters

This TIA provides an assessment of the access, traffic and transport characteristics of the Proposal. From the outset, it is important to state that once operational, the solar farm would generate little daily traffic, with vehicle trips restricted to occasional maintenance requirements. Conversely, the construction of the solar farm will generate a (relatively) significant level of traffic, including light vehicle trips, (staff) shuttle bus trips, and truck trips over a period estimated at 9 - 12 months.

As such, the primary analysis provided in this TIA relates to the potential impacts of the solar farm construction period.

In determining an appropriate scope of work for this TIA, Ason Group has specifically referenced the Secretary's Environmental Assessment Requirements (SEARs) prepared by the DP&E and dated 8th November 2018 in response to the Preliminary Environmental Assessment (PEA) for SSDA 18_9504. **Table 1** below provides a summary of the response to those requirements relating to traffic and transport; as well as noting the section(s) of this TIA where those requirements are specifically addressed.

Table 1: Response to SEARs – Transport

SEARs Requirement	Response	TIA Section
An assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation.	During the peak Stage 2 construction period – estimated at some 3 months - the Site is expected to generate up to 140 vehicle trips per day, including 10 light vehicle trips, 80 shuttle bus trips and 50 truck trips. During this same construction period, the Site is estimated to generate up to 46 vehicle trips during the Site peak hours prior to and after each construction day.	Section 5
An assessment of the likely transport impacts to the site access route (including Newell Highway, Mid-Western Highway, Slee Street, Clear Ridge Road, Myers Lane and Blands Lane), site access point, rail safety issues, any Crown land, particularly in relation to the capacity and condition of the roads;	During peak construction, few if any trips would be generated to the key roads within Wyalong and West Wyalong (Newell Highway, Mid-Western Highway, Slee Street, Clear Ridge Road) with the majority of construction trips using the designated construction route via Newell Highway (east) - Bodells Lane - Blands Lane. The trips generated during the peak construction period would not compromise the Level of Service (LoS) or general operations of any of these key roads and intersections.	Section 5 & Section 7
A cumulative impact assessment of traffic from nearby developments;	A desktop assessment of other sub-regional developments has been undertaken, referencing projects detailed on the DP&E Major Projects Register.	Section 4
A description of any proposed road upgrades developed in consultation with the relevant road and rail authorities (if required)	Appropriate management strategies will be finalised in consultation with Council by which to monitor and - where appropriate - remediate the unsealed roads providing access to the Site, being Blands Lane and Bodells Lane. The moderate traffic generation of the Site during the construction period would not warrant any additional upgrades within the local road network.	Section 5 & Section 6
A description of the measures that would be implemented to mitigate any transport impacts during construction	Appropriate management strategies will be finalised in consultation with Council by which to monitor and - where appropriate - remediate the unsealed roads providing access to the Site, being Blands Lane and Bodells Lane. The moderate traffic generation of the Site during the construction period would not warrant any additional upgrades within the local road network.	Section 5 & Section 6
The TIA should reference the following: RTA Guide to Traffic Generating Developments Austroads Guide to Road Design Australian Standards Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development.	Ason Group has referenced the resources specified in the SEARs as well as other pertinent guidelines and standards.	Section 1.3

1.3 Additional Assessment References

This TIA references the following planning documents, guidelines and standards:

- Bland Shire Council Development Control Plan (2012) (DCP 2012)
- Bland Shire Council Local Environmental Plan (2011) (LEP 2011)
- Roads and Maritime Services, Guide to Traffic Generating Developments (RMS Guide)

- Austroads Guide to Road Design (Austroads GRD)
- Australian Road Research Board Unsealed Roads Manual (ARRB URM)
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (AS 2890.1)
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2)

During the preparation of this TIA, Ason Group has also had the opportunity to consult with representatives of Bland Shire Council (Council); Ason Group acknowledges the assistance provided by these officers, and specifically their insights into local traffic issues relevant to the assessment of the Proposal.

1.4 Report Structure

This TIA is structured as follows:

- Section 2 provides a summary of the Proposal.
- Section 3 describes the existing Site conditions.
- Section 4 describes the existing road network provided access to the Site.
- Section 5 assess the potential traffic impacts during Site construction.
- Section 6 provides a Draft Construction Traffic Management Plan.
- Section 7 assess the potential traffic impacts during Site operation.
- Section 8 provides a summary of key conclusions.

2 Overview of Proposal

2.1 Summary of Proposed Development

A detailed description of the Proposal is provided in the Environmental Impact Statement (EIS) which this TIA accompanies. In summary, the Proposal provides for:

- The installation of groups of modules on mounting structures across the Site. An estimated 296,000 panels will be installed with tracking capabilities;
- The transmission of power generated by the facility to the local energy grid via a new substation to be installed on the Site; and
- Ancillary on-site access and parking infrastructure.

Reference should be made to the detailed Site plans prepared by Lightsource BP which are provided in the EIS. A reduced copy of the Solar Farm Site Plan is reproduced for context below.



Figure 1: Solar Farm Site Plan



Figure 3: Site - Local Context

3.1.2 Site Access

All access to the Site is provided via a private driveway to Blands Lane. Blands Lane connects to Bodells Lane to the east of the Site, and to Clear Ridge Road to west of the Site; both Bodells Lane and Clear Ridge Road in turn connect south to the Newell Highway.

3.1.3 Trip Generation

The Site essentially generates no traffic at this time.

4 The Existing Road Network

The road network which will provide for Site access is shown in **Figure 3**, and further described in sections below.

4.1 Key Roads

4.1.1 Newell Highway

The Newell Highway is a National Highway (A39) which extends from Goondiwindi, Queensland in the north through north-western NSW to Tocumwal where it continues south as the Goulbourn Valley Highway.

In the vicinity of Bodells Lane, the Newell Highway has a sealed carriageway width of approximately 11.5m with additional wide sealed shoulders, and provides 2 traffic lanes (1 lane per direction) and an auxiliary right turn lane (to Bodells Lane). The Newell Highway in the vicinity of Bodells Lane has a posted speed limit of 110km/h.



Figure 4: Newell Highway at Bodells Lane (Looking East)



Figure 5: Newell Highway at Bodells Lane (Looking West)

In the vicinity of Clear Ridge Road (within Wyalong) the Newell Highway has a sealed carriageway width of approximately 8.0m as well as very wide (sealed) shoulders/parking lanes, and provides 2 traffic lanes (1 lane per direction). Within Wyalong, the Newell Highway has a posted speed limit of 50km/h.



Figure 6: Newell Highway at Clear Ridge Road

4.1.2 Clear Ridge Road

Clear Ridge Road is a rural collector road which extends from Blow Clear Road in the north to the Newell Highway in the south.

In the vicinity of the Site, Clear Ridge Road has a sealed carriageway width of 8.0m without significant shoulders, and provides 2 traffic lanes (1 lane per direction). Clear Ridge Road in the vicinity of Blands Lane has a nominal (unposted) speed limit of 100km/h.

It is noted that a number of concrete drainage channels are located along Clear Ridge Road between Blands Lane and the Newell Highway

In the vicinity of the Newell Highway, Clear Ridge Road has a sealed carriageway width of 8.0m with a wide unsealed shoulder on the eastern side of the carriageway, and provides 2 traffic lanes (1 lane per direction). Clear Ridge Road north of the Newell Highway has a 50km/h posted.



Figure 7: Clear Ridge Road at Blands Lane



Figure 8: Clear Ridge Road at Slee Street

4.1.3 Blands Lane

Blands Lane is a rural lane which extends from Bodells Lane in the east to Clear Ridge Road to the west. Blands Lane has an unsealed carriageway with a width of approximately 6.0m and unsealed shoulders of approximately 1.0m. Blands Lane generally provides for two-way traffic, and has a nominal (unposted) speed limit of 100km/h.

On-site observations indicate that Blands Lane is at times subject to minor flooding, which was observed to reduce the carriageway width in some locations, as shown in the figures below.



Figure 9: Blands Lane West of Bodells Lane



Figure 10: Blands Lane Midpoint



Figure 11: Blands Lane East of Clear Ridge Road

4.1.4 Bodells Lane

Bodells Lane is a rural lane which extends from north of Blands Lane south to the Newell Highway. Bodells Lane generally provides an unsealed carriage (with a short section of sealed/gravel carriageway immediately north of Newell Highway) with a width that varies between approximately 4.5m at Blands Lane; approximately 5.5 – 6.0m at a mid-point between Blands Lane and the Newell Highway; and approximately 6.5m at the Newell Highway. Unsealed shoulders of at least 1.0m are provided on each side of the carriageway. Bodells Lane generally provides for two-way traffic, and has a nominal (unposted) speed limit of 100km/h.



Figure 12: Bodells Lane at Blands Lane



Figure 13: Bodells Lane Midpoint



Figure 14: Bodells Lane North of Newell Highway

4.2 Key Access Intersections

4.2.1 Construction Vehicle Access Routes

Further to our discussions with Lightsource and with Council in regard to the most sustainable and viable access route(s) between the Site and the regional road network (at the Newell Highway) – particularly for truck trips during the construction phase - it has been determined that the following routes will be used:

- For all light vehicle, shuttle bus and truck trips to and from the east, which are expected to comprise the overwhelming majority of construction vehicle trips, a designated route via Newell Highway – Bodells Lane – Blands Lane (and vice versa).
- For light vehicle and shuttle bus trips to and from the south, which are expected to comprise a minority of construction vehicle trips, a route via Newell Highway (west) – Clear Ridge Road – Blands Lane (and vice versa).
- For truck trips to and from the south, which are expected to comprise a minority of heavy vehicle trips, a route via Newell Highway (south) – Showground Road – Compton Road - Central Road – Clear Ridge Road – Blands Lane (and vice versa). It is noted that the section of this route comprising Showground Road, Compton Road and Central Road is designated as the West Wyalong Heavy Vehicle Bypass.

Accounting for these construction routes, and with consideration of the peak potential construction traffic generation of the Proposal, the intersections identified for further assessment are detailed below.

4.2.2 Newell Highway / Bodells Lane

A priority T intersection under Give Way control, this intersection provides an Auxiliary Right (AUR) turn treatment for the right turn, Newell Highway to Bodells Lane, which allows a westbound vehicle to pass a right turn vehicle within the formal road carriageway. Sight distances at the intersection are excellent.

4.2.3 Newell Highway / Clear Ridge Road / Central Avenue

A priority four-way intersection under Give Way control, the intersection provides wide lanes on all approaches to accommodate the movement of oversized vehicles; these lanes also provide for through vehicles to pass turning vehicles on all approaches. It is noted that the Clear Ridge Road and Central Avenue approaches are slightly off-set; however, observations suggest that the intersection in practice works as a standard four-approach intersection with priority to Newell Highway, and through movements Clear Ridge Road to Central Avenue, and Central Avenue to Clear Ridge Road, having priority over right turn movements from these approaches.

4.2.4 Clear Ridge Road / Blands Lane

A priority T intersection nominally under Give Way control with priority to Clear Ridge Road. This intersection provides no auxiliary turning infrastructure; however, given the low traffic flows and excellent sight distances at the intersection no formal treatment would be considered warranted.

4.2.5 Blands Lane / Bodells Lane

A priority T intersection nominally under Give Way control with priority to Bodells Lane. This intersection provides no auxiliary turning infrastructure; however, given the speed of vehicles, minimal traffic flows and excellent sight distances at the intersection no formal treatment would be considered warranted.

4.3 Heavy Vehicle Routes

With reference to sections below, it is expected that the transportation of solar panels and other key materials and equipment will be undertaken using B-Doubles and articulated vehicles. These vehicles are expected to be General Access Vehicles (GAVs), i.e. vehicles that are not restricted from using the general road network (other than where a specific restriction is in place).

In this regard, there are a number of GAV and Restricted Access Vehicle (RAV) restrictions within the local road network, including:

- Localised heavy vehicle restrictions in the Newell Highway through the West Wyalong and Wyalong town centres between Boundary Street and Showground Road, with heavy vehicles instead directed to the recently completed West Wyalong Heavy Vehicle Bypass route.
- A 25m B-Double (over 50t) limit in Clear Ridge Road from Newell Highway to Blow Clear Road (north of Blands Lane).
- A restriction on RAVs in Slee Street between North Street and Clear Ridge Road.

Figure 15 below shows the special conditions relating to the use of the Newell Highway through Wyalong and West Wyalong, while **Figure 16** shows the special conditions relating to the use of Clear Ridge Road.

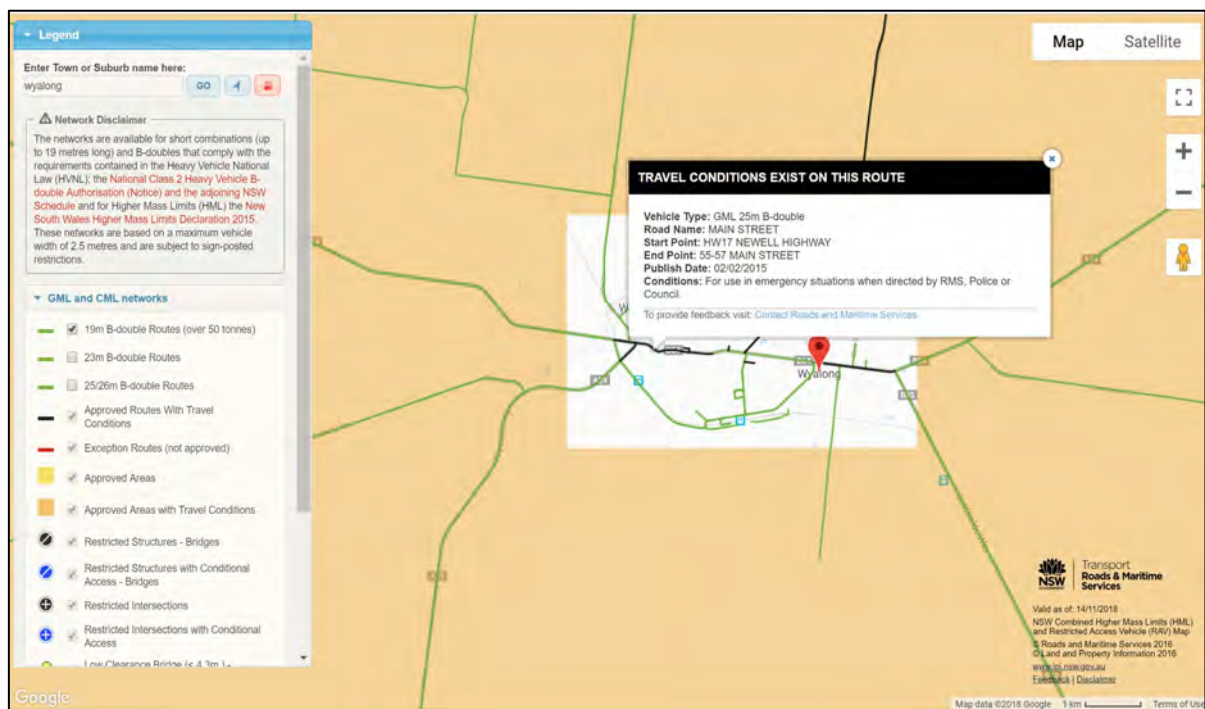


Figure 15: RMS RAV Routes and Newell Highway Special Conditions

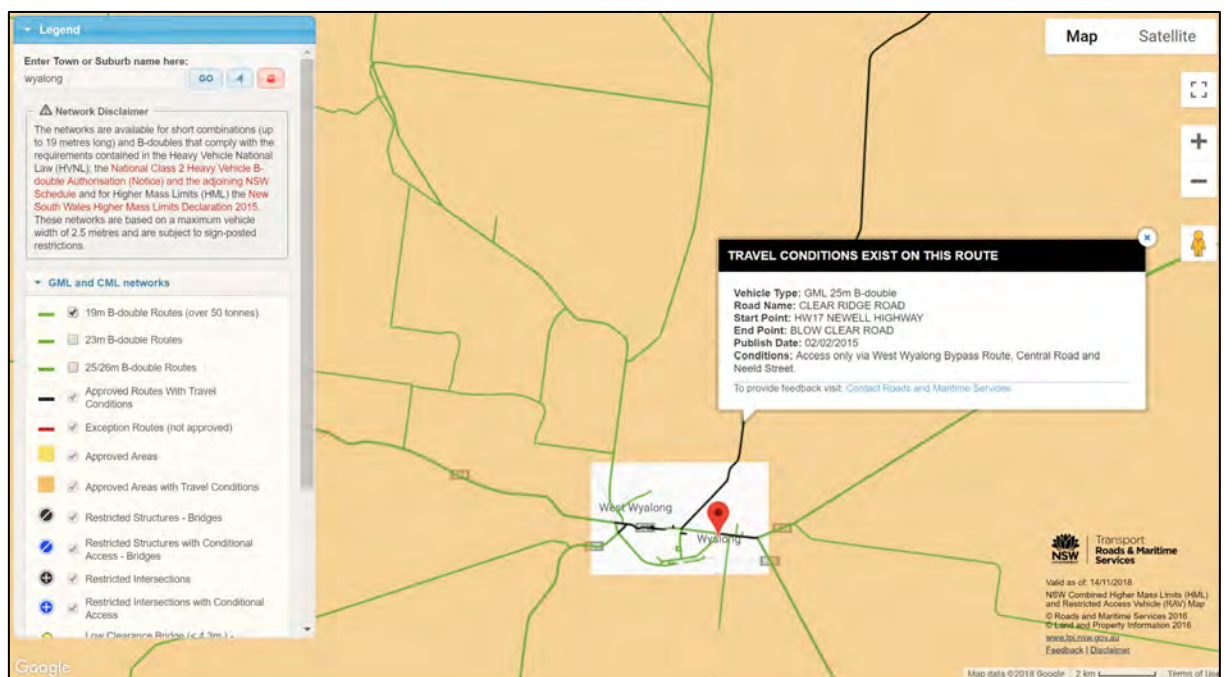


Figure 16: RMS RAV Routes and Clear Ridge Road Special Conditions

4.4 Existing Traffic Flows

4.4.1 2018 Traffic Counter Surveys

On behalf of Ason Group, Council installed a number of Automatic Tube Counters (counters) in key roads providing access to the Site; these include the following locations:

- Newell Highway west of Bodells Lane;
- Bodells Lane north of Newell Highway;
- Clear Ridge Road south of Blands Lane; and
- Blands Lane east of Clear Ridge Road.

The survey data is summarised in sections below and in **Appendix A**; Council has also been provided with an electronic copy of all counter data.

4.4.2 November 2018 Intersection Spot-Surveys

To supplement the counter surveys, Ason Group also conducted sample surveys at the key intersections in November 2018. The results of these surveys are summarised in figures below.

4.4.3 RMS Count Station Data

The RMS operates a Permanent Classifier (Count) Station at the following locations:

- Count Station T0253: Newell Highway south of Mid Western Highway at Caragabal; and
- Count Station 6143: Newell Highway west of Goldfields Highway, West Wyalong.

The data available for the count stations has also been referenced when reviewing the (Council) counter data.

4.4.4 Existing Network Flows

With reference to the 2018 counter and spot surveys, and to the RMS Count Station data, **Figure 17** provides a summary of existing daily traffic flows across the local road network, while **Figure 18** and **Figure 19** provide a summary of movement counts at the key intersections during the existing AM and PM peak hours respectively.

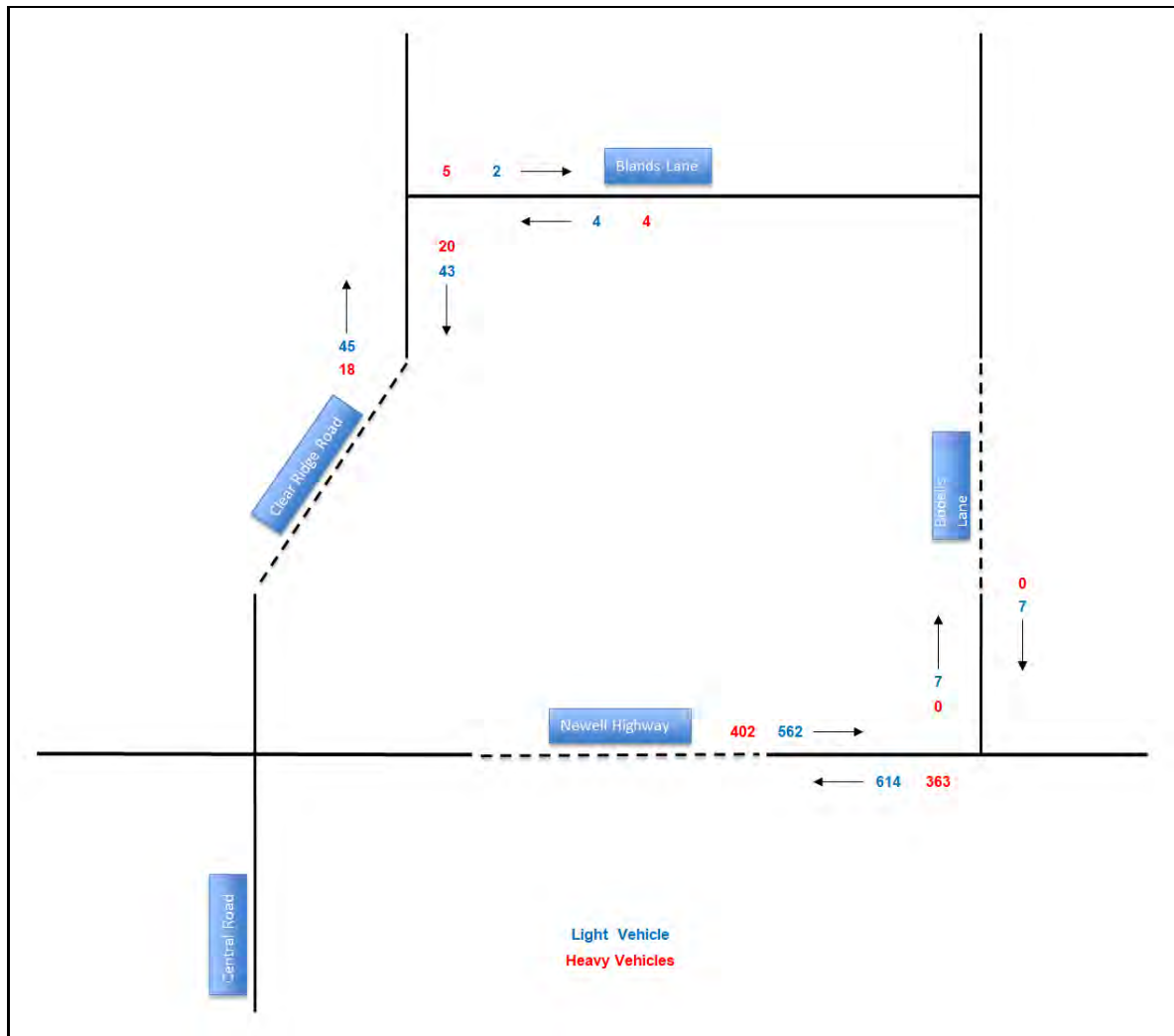


Figure 17: Existing Daily Traffic Flows

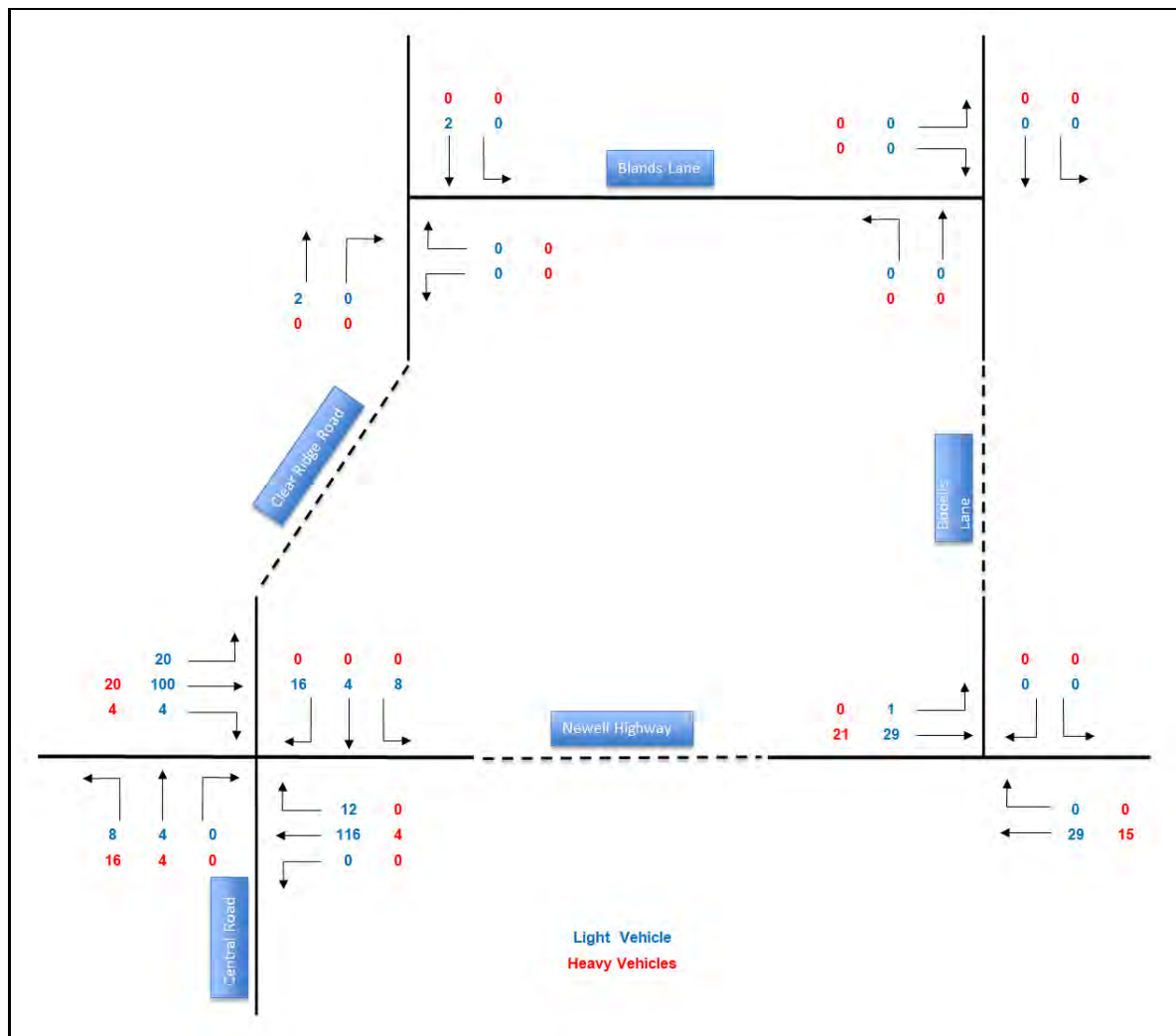


Figure 18: Existing AM Peak Hour Intersection Flows

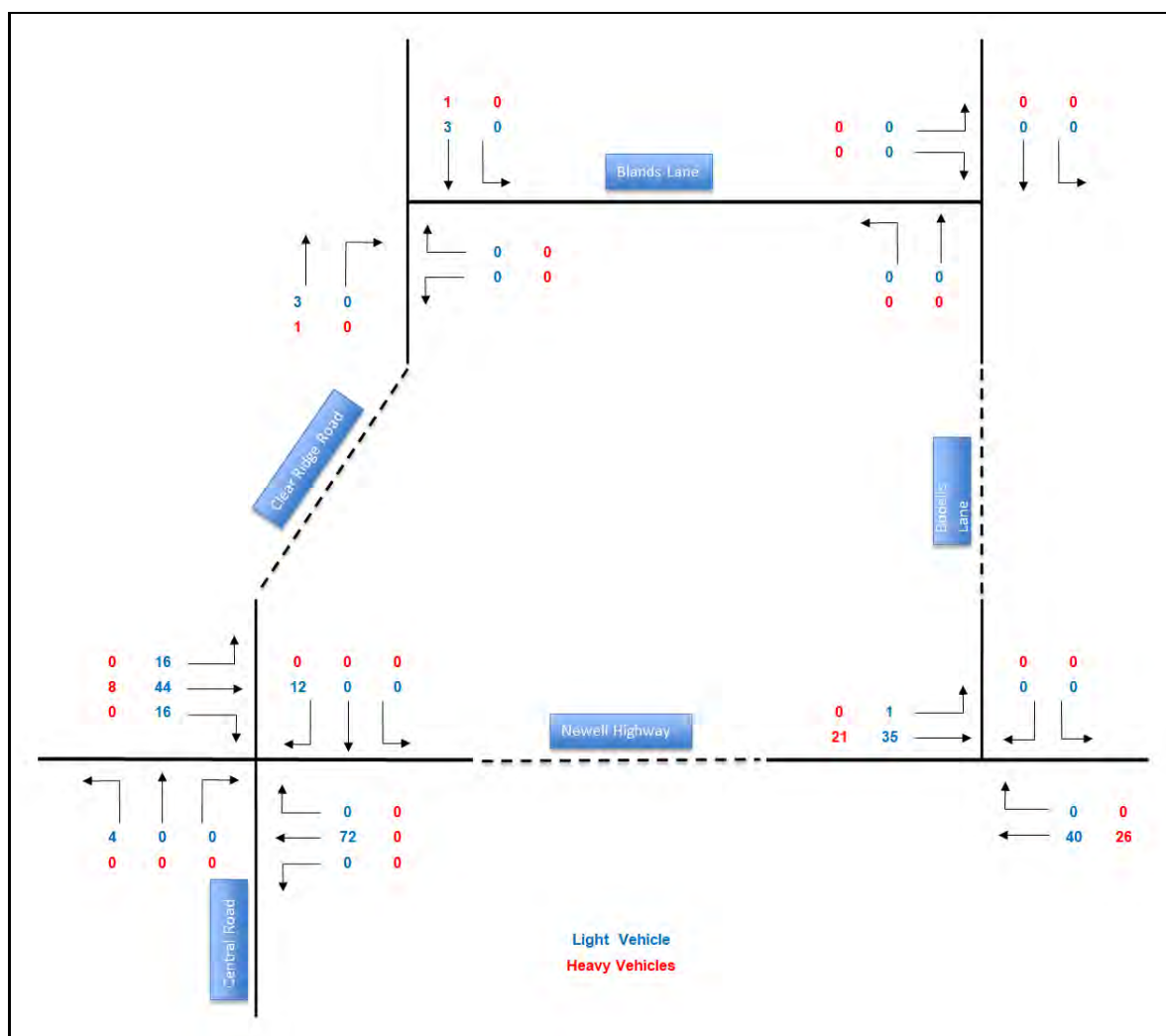


Figure 19: Existing PM Peak Hour Intersection Flows

4.5 Existing Road Network Operations

4.5.1 Level of Service Criteria

The performance of the key roads can be determined with reference to Section 4 of the RMS Guide, which provides criteria for Level of Service (LoS), which are outlined below. It is noted that these LoS criteria are valid for the assessment of both urban and rural roads:

- LoS A:** This, the top level is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.

- **LoS B:** This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.
- **LoS C:** This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
- **LoS D:** This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
- **LoS E:** This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam.
- **LoS F:** This service level is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs and queuing and delays result.

4.5.2 Level of Service: Urban Roads

The performance of the key roads within Wyalong (under 50km/h conditions) can be determined with reference to Table 4.4 of the RMS Guide, which provides the following criteria for peak hour flows (per direction):

Table 2: Urban Road Peak Hour Flows Level of Service

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source: RMS Guide

With reference to the traffic survey data, both the Newell Highway and Clear Ridge Road within Wyalong currently at LoS A.

4.5.3 Level of Service: Rural Roads

The performance of the key sealed roads outside of Wyalong (>100km/h conditions) can be determined with reference to Table 4.5 of the RMS Guide, which provides the following criteria for peak flows (per direction):

Table 3: Rural Road Peak Hour Flows Level of Service

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

Source: RMS Guide

The RMS Guide also states:

The data for Table 4.5 assumes the following criteria:

- A two-lane rural road, with
 - Level Terrain: 20% no overtaking
 - Rolling Terrain: 40% no overtaking
 - Mountainous Terrain: 60% no overtaking.
- 3.7 m traffic lane width with side clearances of at least 2m.
- A 60/40 directional split of traffic.

With reference to the traffic survey data, both the Newell Highway and Clear Ridge Road outside of Wyalong currently operate at LoS B, though given that the flows in both roads are well below the minimum LoS B totals, each would generally be considered to operate at a LoS A.

4.5.4 Unsealed Road Capacities

When considering the operation of unsealed roads – and specifically Blands Lane and Bodells Lane - standard RMS LoS parameters are not available. As such, Ason Group has referenced the ARRB URM, which provides general capacity thresholds for unsealed roads and as such provides guidance in regard to the suitability of these unsealed lane to accommodate construction traffic.

Table 4 provides a summary of the general profile of different types of unsealed roads, while **Figure 19** provides an illustration of each type of unsealed road.

Table 4: ARRB USM Unsealed Road Classes

Road class	Class type	Service function description	Road type description
4A	Main road > 150 ADT	This type of road is used for major movements between population centres and connection to adjacent areas. High traffic volumes occur and the road can carry large vehicles.	<ul style="list-style-type: none"> All weather road predominantly two-lane and unsealed. Can be sealed if economically justified Operating speed standard of 50–80 km/h according to terrain Minimum carriageway width is 7 m
4B	Minor road 150–50 ADT	This type of road is used for connection between local centres of population and links to the primary network. Roads may or may not be sealed depending on the importance and function of the road.	<ul style="list-style-type: none"> All weather two-lane road formed and gravelled or single-lane sealed road with gravel shoulders Operating speed standard of 30–70 km/h according to terrain Minimum carriageway width is 5.5 m.
4C	Access road 50–10 ADT	Provides access to low use areas or individual rural property sites and forest areas. Caters for low travel speed and a range of vehicles and may be seasonally closed.	<ul style="list-style-type: none"> Substantially a single lane two-way generally dry-weather, formed (natural materials) track/road Operating speeds standard of < 20–40 km/h according to terrain Minimum carriageway width is 4 m May be restricted to four-wheel drive vehicles
4D	Tracks < 10 ADT	Provides primarily for four-wheel drive vehicles. Mainly used for fire protection purposes, management access and limited recreational activities.	<ul style="list-style-type: none"> Predominantly a single-lane two-way earth track (unformed) at or near the natural surface level Predominantly not conforming to any geometric design standards Minimum cleared width is 3 m

Source: ARRB URM



Figure 20: ARRB URM Road Classes

Source: ARRB URM

The ARRB USM also provides the following:

Unsealed roads in the majority of cases are either one-lane two-way roads or two-lane two-way roads...

For roads with low traffic volumes <150vpd, AustRoads suggests that a single lane two-way operation is adequate as there is a low probability of vehicles meeting and the few passing manoeuvres can be undertaken at reduced speeds using the shoulders. Providing there is sufficient sight distance these manoeuvres can be performed without hazard and the overall loss in efficiency brought about by reduced speeds when vehicles cross will be small. It is not cost effective to widen the carriageway in such circumstances and a basic width of 5.5m will normally suffice. For two large vehicles passing with a legal width of 2.5m, a 5.5m carriageway will allow a 0.5m clearance between vehicles.

With reference to the ARRB URM, both Blands Lane and Bodells Lane would generally be classed as Class 4B minor roads. With reference to the traffic survey data, both Blands Lane and Bodells Lane would currently operate well below their target traffic flows limits.

4.5.5 Operation of Key Intersections

With reference to the AM and PM peak hour traffic flows provided in **Figure 18** and **Figure 19** respectively, it is immediately apparent that the key intersections all operate with essentially no delays and with very significant spare capacity.

4.6 Future Traffic Flows – Sub-Regional Projects

Given the limited timeframe of construction (9 - 12 months) there is no expectation of 'background' traffic flows increasing in the local road network further to standard average annual traffic growth prior to the construction commencing.

In addition, Ason Group has undertaken a desktop review of projects within the sub-region which have the potential to generate additional trips to the local network providing access to the Site. With reference to the DP&E Major Project Register, the following sub-regional projects were identified:

- **Wyalong Solar Farm:** This site is located north of the Newell Highway west of Bodells Lane, with proposed access to be provided via a new intersection (Priority with BAR/BAL treatments) at the Newell Highway. The construction of the Wyalong Solar Farm is estimated to generate up to 46 vehicle movements per day during construction, and then 2 vehicle trips per day once operational; with reference to **Section 5** below, this is a near identical construction trip generation estimate as has been determined for the Proposal. It is noted that the majority of the Wyalong Solar Farm construction trips would be through trips at the key Site access intersection of Newell Highway / Bodells Lane which, as previously discussed, already provides appropriate ancillary right turn infrastructure.
- **Cowal Gold Mine:** This site lies to the immediate north of the Site, and has been the subject of numerous Modifications providing for extensions of operations and staff increases. It is our understanding the maximum (traffic generating) capacity of this Site is as per existing (surveyed) conditions, i.e. there is no expectation that the site would generate additional traffic to Clear Ridge Road than is currently generated.

No other sub-regional or regional developments are expected to generate any significant level of traffic to the road network providing key access for the Site during the construction period.

4.7 Crash Data

Other than minor tow-away accidents, there have been a number of significant crashes in the local road network over the past 5 years which are summarised below.

Table 5: Summary Crash Data

Location	Year	Conditions	RUM Code	RUM Type	Severity of Crash
Newell west of Clear Ridge	2013	Daylight	40	U-Turn	Moderate Injury
Newell at Centenary	2014	Dawn	10	Cross-Traffic	Fatality
Newell west of Clear Ridge	2014	Daylight	81	Run-Off Road	Moderate Injury
Newell north of Bodells	2014	Dawn	73	Off-Road Hit Object	Moderate Injury
Newell north of Bodells	2015	Daylight	20	Head-On	Fatality
Newell north of Bodells	2016	Daylight	20	Head-On	Serious Injury
Newell at Centenary	2017	Daylight	32	Rear-End	Serious Injury

Source: Transport for NSW

Importantly, the data indicates that there have been no accidents in Clear Ridge Road, Blands Lane or Bodells Lane; nor at any of the key Site access intersections, and particularly at the intersection of Newell Highway / Bodells Lane, a reflection of the (good) standard of this intersection's design.

5 Construction Traffic Impact Assessment

5.1 Construction Schedule

Based on information provided to Ason Group by Lightsource, the construction of the solar farm is expected to be completed over approximately 9 - 12 months. A summary of the different characteristics of each stage of construction is provided in **Table 6**, and detailed further in sections below.

Table 6: Solar Farm Construction Schedule

Construction Stage	Timeframe	Peak Daily Staff	Peak Daily Vehicles
Stage 1 Site Preparation & Earthworks	2 months	60 per day	10 light vehicles 4 shuttle buses 10 trucks
Stage 2 Solar Farm & Sub-Station Site Infrastructure Transport & Construction	3 - 4 months	300 per day	10 light vehicles 20 shuttle buses 25 trucks
Stage 3 Solar Farm & Sub-Station Construction	3 – 6 months	300 per day	10 light vehicles 20 shuttle buses 10 trucks

Source: Lightsource

5.2 Construction Vehicle Access Routes

As previously discussed, the majority of construction vehicles will use the designated access route via Newell Highway (east) - Bodells Lane – Blands Lane for trips between the Site and the regional road network. A small number of construction truck trips (such as material supplies) may be generated from the south; these vehicles would use the West Wyalong Heavy Vehicle Bypass for trips between the Newell Highway (south) and Clear Ridge Road.

Construction staff residing in West Wyalong, Wyalong or other sub-regional centres to the east of the Site would be transported in shuttle buses and also use the Newell Highway (east) - Bodells Lane – Blands Lane route, while those residing in centres to the south during the construction stage would also use shuttle buses but utilise the Newell Highway (west) - Clear Ridge Road – Blands Lane route to the Site.

These construction vehicle routes would be formalised in a future Construction Traffic Management Plan (CTMP), and are shown in the figures below.



Figure 21: Construction Vehicle Access Route 1: To/From the East

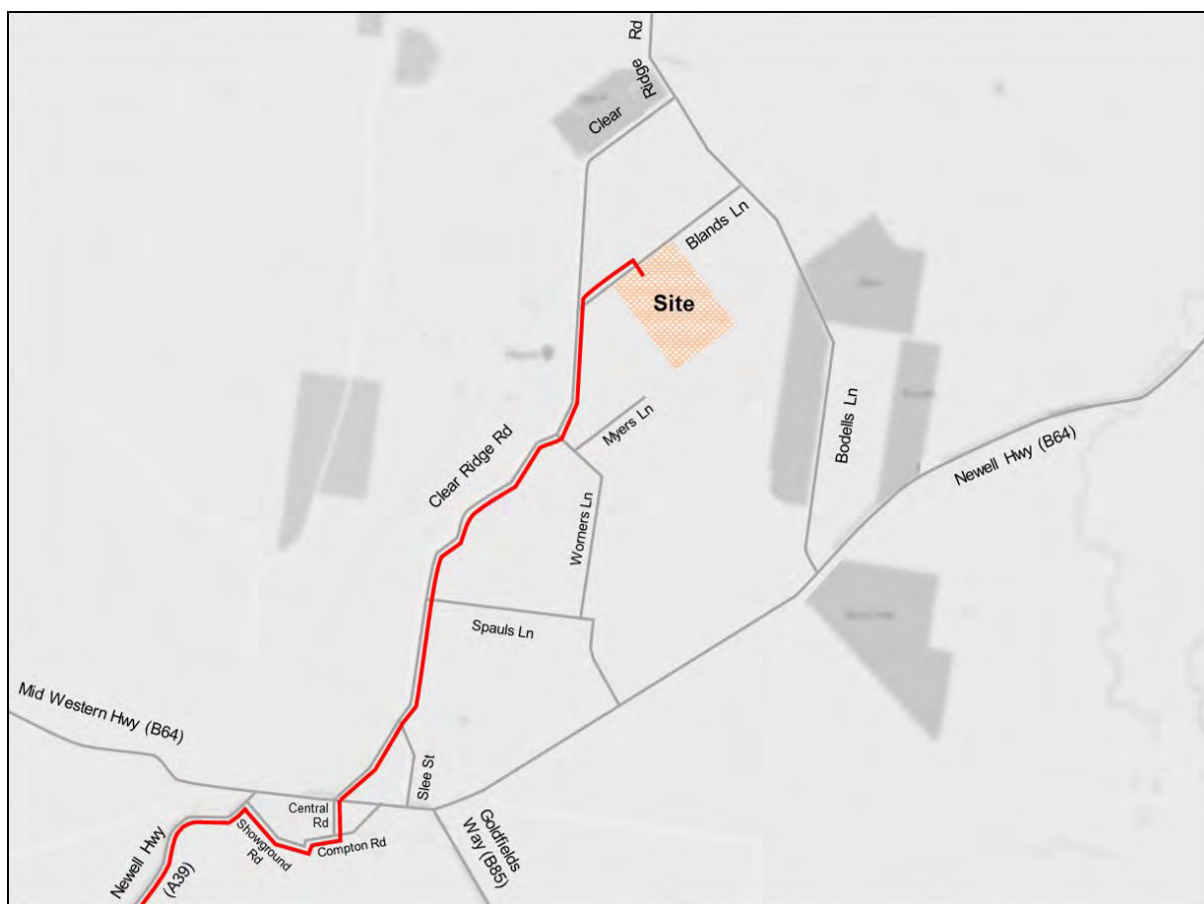


Figure 22: Construction Vehicle Access Route 2: To/From the South via Bypass



Figure 23: Construction Vehicle Access Route 3: To/From the South via Newell Highway

With reference to the assessment of potential construction traffic impacts below; and to the Draft CTMP provided in **Section 6**, it is important to note the following in regard to the proposed use of Blands Lane and Bodells Lane for the majority of construction vehicles:

- Based on on-site observations, both lanes provide an appropriate width (minimum 5.5m) under normal conditions; however, it is apparent that drainage is poor in some locations (particularly along Blands Lane) such that the available carriageway is reduced such that two vehicles could not pass each other.
- The availability of appropriate carriageway width and surface is important to ensure that the construction task can be undertaken as efficiently and sustainably as possible, and of course it is critical to maintain suitable conditions for residents.
- As such, it is proposed that the Project Manager be accompanied by representatives of Council to undertake an inspection of local road conditions prior to any construction commencing. Should any remedial work be required, Lightsource would then consult with Council in regard to the appropriate means by which such works could be completed, noting that these roads are maintained (in general) by Council, and that as such it is expected that any such work could be completed by Council.

5.3 Stage 1 Construction Traffic Profile

5.3.1 Stage 1 Construction Staff

During Stage 1 construction, up to 60 staff would be employed on-site. These staff are expected to be accommodated in Wyalong and West Wyalong and perhaps 1 other sub-regional centres (such as Forbes or Temora), and be transported by up to 4 shuttle buses to and from the Site each day.

If, to provide a worst-case assessment, it is considered that these shuttle buses would generate both an arrival trip and departure trip in each of the Site peak hours, it is estimated that during Stage 1 construction staff would generate:

- Up to 8 shuttle bus trips during the AM Site peak hour, expected to be in the hour prior to 7:00am for a 7:00am shift start;
- Up to 8 shuttle bus trips during the PM Site peak hour, expected to be after 6:00pm following a 6:00pm shift end; and
- Up to 16 shuttle bus trips per day.

5.3.2 Stage 1 Construction Additional Light Vehicle Trips

Based on all available information, specialist contractors and construction visitor are expected to generate no more than 10 light vehicle trips per day, with up to 2 light vehicle trips generated during the AM and PM Site peak hours.

5.3.3 Stage 1 Construction Trucks

During Stage 1 construction, trucks will transport equipment and materials such as aggregate and concrete to the Site on a daily basis. Based on information provided by Lightsource, up to 10 trucks would visit the Site each day during Stage 1, generating a total of 20 truck trips per day; these would be a mix of B-Doubles, articulated vehicle and concrete trucks.

Few if any of these trips are expected to be generated in the AM or PM Site peak periods.

5.3.4 Stage 1 Construction Stage Traffic Generation Summary

With reference to sections above, **Table 7** provides a summary of the estimated traffic generation of the Site during the Stage 1 construction period, with a breakdown to vehicle type and access route between the Site and the sub-regional road network.

Table 7: Stage 1 Construction Traffic Generation

Arrival/Departure Direction	Vehicle Route	Vehicle Type	Site Peak Hour Vehicle Trips	Daily Vehicle Trips
East	Newell (east) – Bodells - Blands	B-Double, Articulated, Concrete, Shuttle Bus, Light Vehicles	2 light vehicle trips 8 shuttle bus trips 2 truck trips	8 light vehicle trips 16 shuttle bus trips 18 truck trips
South	Newell (south) – Showground – Central – Clear Ridge - Blands	B-Double, Articulated, Concrete		2 truck trips
South	Newell (west) – Clear Ridge - Bodells	Shuttle Bus, Light Vehicles		2 light vehicle trips

5.4 Stage 2 Construction Traffic Profile

5.4.1 Stage 2 Construction Staff

During Stage 2 construction, up to 300 staff would be employed on-site. Stage 2 construction staff are expected to be accommodated in Wyalong and perhaps an additional 2 – 3 sub-regional centres, and require transport by up to 20 shuttle buses to and from the Site each day. Considering again a worst-case scenario where shuttle buses generate both an arrival trip and departure trip during the Site peak hours, it is estimated that during Stage 2 construction staff would generate:

- Up to 40 shuttle bus trips during the AM Site peak hour, expected to be in the hour prior to 7:00am for a 7:00am shift start;
- Up to 40 shuttle bus trips during the PM Site peak hour, expected to be after 6:00pm following a 6:00pm shift end; and
- Up to 80 shuttle bus trips per day.

5.4.2 Stage 2 Construction Contractor & Visitor Trips

Based on all available information, Project managers, specialist contractors and construction visitor are expected to generate no more than 10 light vehicle trips per day, with up to 2 light vehicle trips generated during the AM and PM Site peak hours.

5.4.3 Stage 2 Construction Trucks

During the Stage 2 construction period, trucks will transport key materials and equipment to the Site on a daily basis, including:

- **Solar Panels:** As previously discussed, solar panels will be transport in shipping containers to the Site from Port Botany. Information provided Lightsource suggests the majority of containers will be transported by (GAV) articulated vehicles and by B-Doubles, and that up to 600 vehicles will be required to transport the solar panels to the Site over the Stage 2 construction period, generating some 1,200 truck trips.
- **Additional Truck Trips:** Based on information provided by Lightsource, and further to a review of similar projects across NSW, the following additional truck trips would be generated during the Stage 2 construction period:
 - Approximately 600 B-Doubles (or 1,200 trips) transporting tracking horizontals;
 - Approximately 300 B-Doubles (or 600 trips) transporting Upright Piles;
 - Approximately 200 B-Doubles/articulated vehicle transport additional equipment and materials.

In total, during the Stage 2 construction period it is estimated that the Site could generate approximately 3,400 trucks. Noting that the primary transport task is expected to be undertaken over approximately 3 months (during the broader 4-month Stage 2 construction period) only; and that construction will occur 5.5 days per week; it is estimated that the peak daily truck demand during the Stage 2 construction period would be up to 25 trucks per day, or 50 truck trips per day. Only a small number of construction truck trips are expected to occur during the Site peak hours.

5.4.4 Construction Stage 2 Trip Generation Summary

With reference to sections above, **Table 8** provides a summary of the estimated traffic generation of the Site during the Stage 2 construction period, with a breakdown to vehicle type and access route between the Site and the sub-regional road network.

Table 8: Stage 2 Construction Traffic Generation

Arrival/Departure Direction	Vehicle Route	Vehicle Type	Site Peak Hour Vehicle Trips	Daily Vehicle Trips
East	Newell (east) – Bodells - Blands	B-Double, Articulated, Concrete, Shuttle Bus, Light Vehicles	2 light vehicle trips 32 shuttle bus trips 4 truck trips	8 light vehicle trips 64 shuttle bus trips 44 truck trips
South	Newell (south) – Showground – Central – Clear Ridge - Blands	B-Double, Articulated, Concrete		6 truck trips
South	Newell (west) – Clear Ridge - Bodells	Shuttle Bus, Light Vehicles	8 shuttle bus trips	2 light vehicle trips 16 shuttle bus trips

5.5 Stage 3 Construction Traffic Profile

5.5.1 Stage 3 Construction Staff

During Stage 3 construction, up to 300 staff would be employed on-site. Again, Stage 3 construction staff are expected to be accommodated in Wyalong and perhaps an additional 2 – 3 sub-regional centres, and require transported by up to 20 shuttle buses to and from the Site each day. As such, during Stage 3 construction staff would generate:

- Up to 40 shuttle bus trips during the AM Site peak hour, expected to be in the hour prior to 7:00am for a 7:00am shift start;
- Up to 40 shuttle bus trips during the PM Site peak hour, expected to be after 6:00pm following a 6:00pm shift end; and
- Up to 80 shuttle bus trips per day.

5.5.2 Stage 3 Construction Contractor & Visitor Trips

Based on all available information, Project managers, specialist contractors and construction visitor are expected to generate no more than 10 light vehicle trips per day during Stage 3, with up to 2 light vehicle trips generated during the AM and AM peak hours.

5.5.3 Stage 3 Construction Trucks

During Stage 3 construction, trucks will transport equipment and materials to the Site on a daily basis, but in much fewer numbers than during Stage 2. Based on information provided by Lightsource, up to 10 trucks would visit the Site each day during Stage 2, generating a total of 20 truck trips per day; these would be a mix of B-Doubles and articulated vehicles.

Few if any of these trips are expected to be generated in the AM or PM Site peak periods.

5.5.4 Construction Stage 3 Trip Generation Summary

With reference to sections above, **Table 9** provides a summary of the estimated traffic generation of the Site during the Stage 2 construction period, with a breakdown to vehicle type and access route between the Site and the sub-regional road network.

Table 9: Stage 3 Construction Traffic Generation

Arrival/Departure Direction	Vehicle Route	Vehicle Type	Site Peak Hour Vehicle Trips	Daily Vehicle Trips
East	Newell (east) – Bodells - Blands	B-Double, Articulated, Concrete, Shuttle Bus, Light Vehicles	2 light vehicle trips 32 shuttle bus trips 2 truck trips	8 light vehicle trips 64 shuttle bus trips 16 truck trips
South	Newell (south) – Showground – Central – Clear Ridge - Blands	B-Double, Articulated, Concrete		4 truck trips
South	Newell (west) – Clear Ridge - Bodells	Shuttle Bus, Light Vehicles	8 shuttle bus trips	2 light vehicle trips 16 shuttle bus trips

5.6 Peak Construction Trip Generation & Assignment

5.6.1 Peak Construction Trip Generation

With reference to sections above, the peak trip generation of the Site will occur during the Stage 2 construction period, where the Site is estimated to generate:

- Up to 140 vehicle trips per day; and
- Up to 46 vehicle trips in the AM and PM Site peak hours.

5.6.2 Trip Distribution

With reference to sections above, the majority of trips will utilise the Newell Highway (east) – Bodells Lane – Blands Lane route, with only a small number of trips generated to/from the south via either the Newell Highway (west) – Clear Ridge Road – Blands Lane route (light vehicles and shuttle buses) or the Newell Highway (south) – West Wyalong Heavy Vehicle Bypass – Clear Ridge Road – Blands Lane route (trucks).

5.6.3 Construction Traffic Flow Assignment

The figures below provide a summary of the peak daily and peak hour traffic flows that would be generated to the road network during the peak Stage 2 construction period.

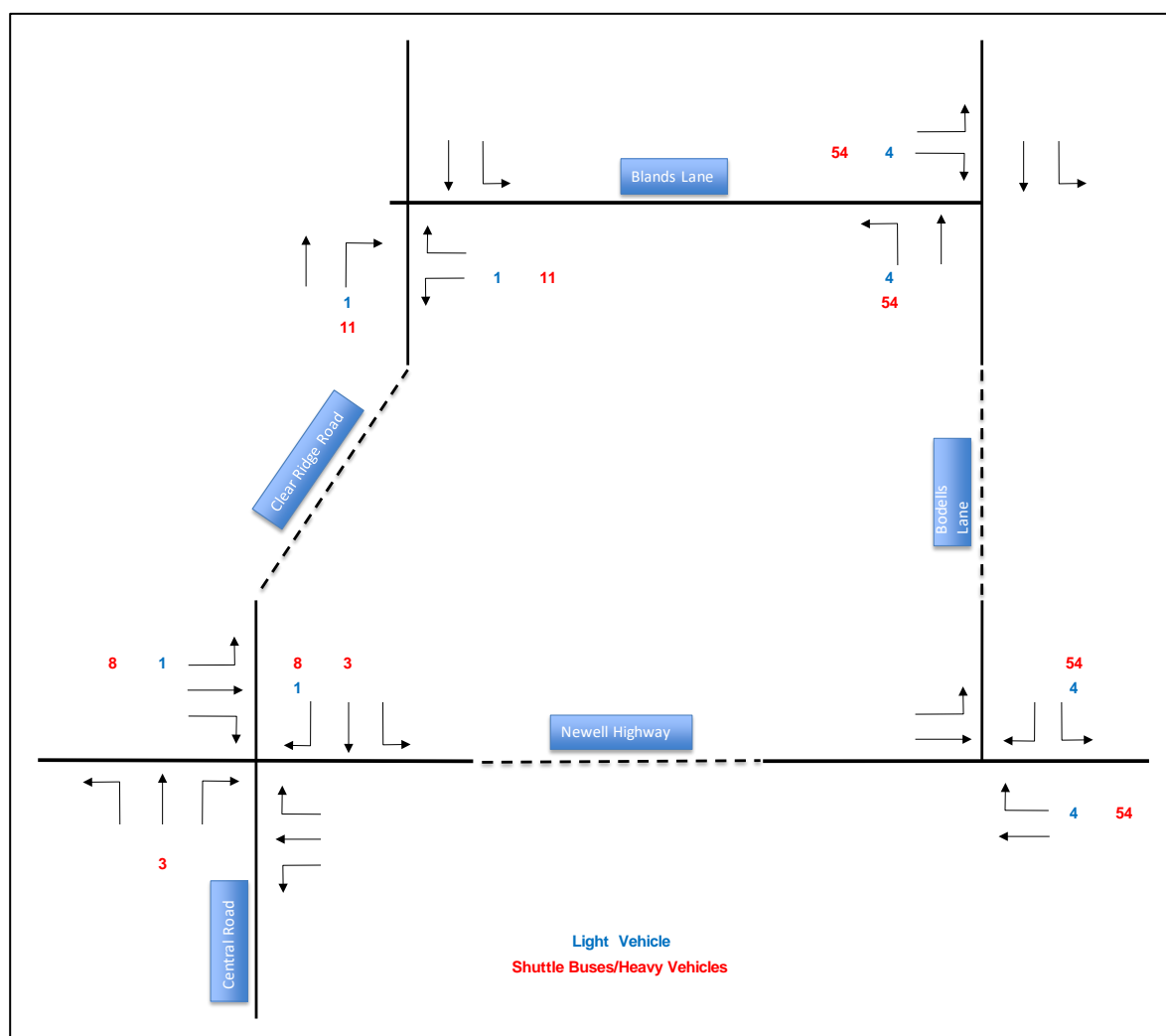


Figure 24: Peak Stage 2 Construction Daily Vehicle Trips

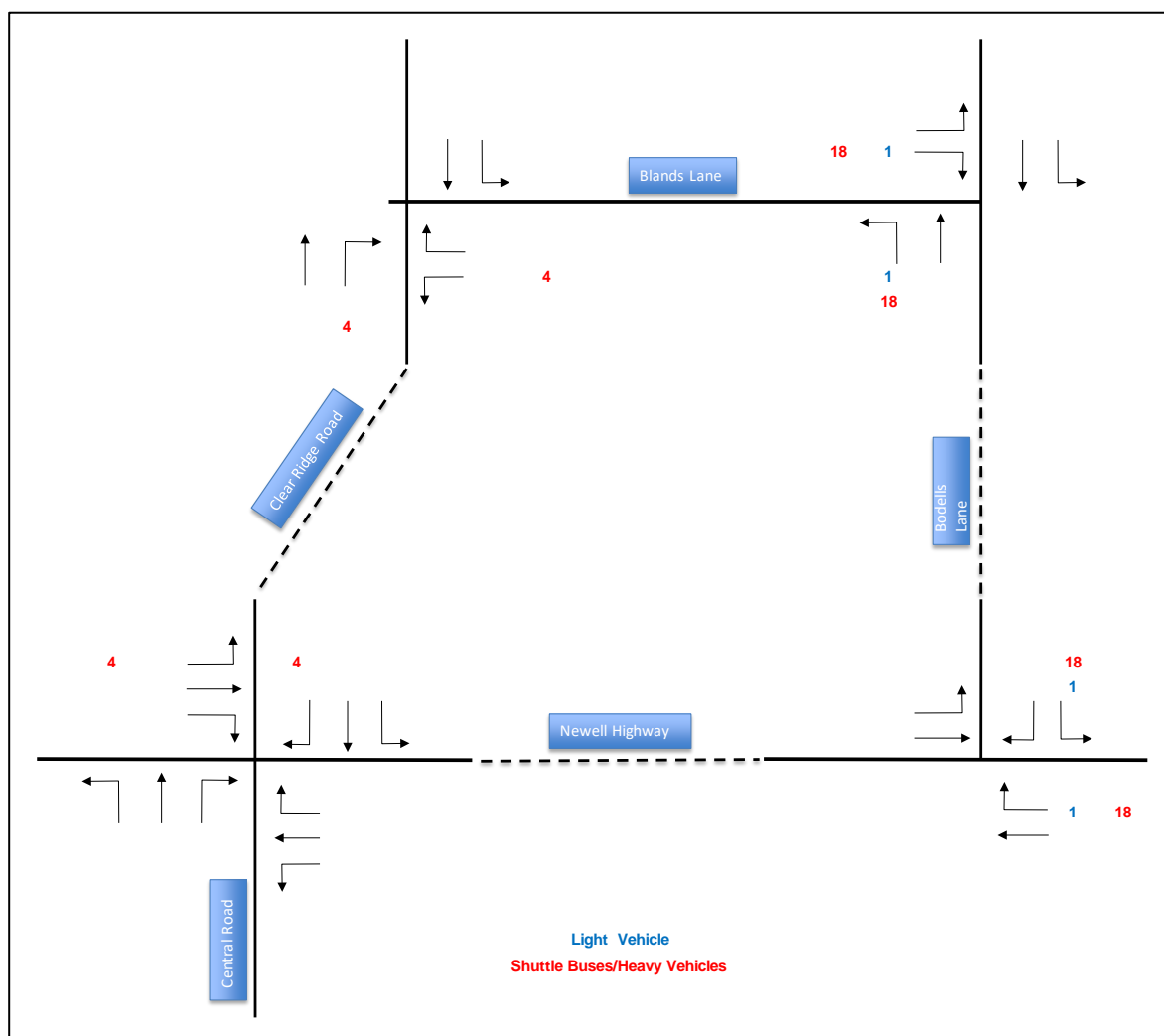


Figure 25: Peak Stage 2 Construction AM and PM Site Peak Hour Vehicle Trips

5.7 Construction Traffic Impacts – Levels of Service

5.7.1 Level of Service – Urban Roads

With reference to the RMS Guide, the additional flows generated during the Stage 2 construction period would have little if any impact on the existing LoS or general operations of the Newell Highway and Clear Ridge Road within Wyalong.

5.7.2 Level of Service – Rural Roads

With reference to the RMS Guide, the additional flows generated during the Stage 2 construction period would have little if any impact on the existing LoS or general operations of the Newell Highway and Clear Ridge Road outside of Wyalong.

5.7.3 Unsealed Road Capacity

With reference to the ARRB USM, the additional flows generated during the Stage 2 construction period would have little if any impact on the existing general operations Blands Lane and Bodells Lan, with total traffic flows remaining below the nominal Type 4B unsealed road capacity limits.

5.7.4 Level of Service at Key Intersections

With reference to the additional flows generated during the Stage 2 construction period, and existing traffic flows as reported in Section 4.4, the additional trips generated to the key intersections providing access to the Site would not compromise the good levels of service observed at these intersections. It is noted that background testing of the intersection of Newell Highway / Bodells Lane (using the SIDRA model) indicates that the intersection would continue to operate at a LoS A, with virtually no delays and – with specific reference to the auxiliary right turn lane – with very minimal queue lengths.

5.7.5 Road Conditions Monitoring

As previously discussed, observations of the local road network indicate that parts of the unsealed carriageway in Blands Lane are subject to flooding, which in turn can restrict the available carriageway width to essentially a single traffic lane. While the traffic volumes in these roads are minimal (even during the peak Stage 2 construction period) it is important that the existing conditions – i.e. width in both lanes to accommodate two-way traffic – are maintained through (and then after) the construction period.

As such, it is proposed that:

- Prior to construction commencing, the Project Manager will meet with Council's Assets Manager (or like) to inventory the existing local road conditions, and particularly the unsealed sections of Blands Lane and Bodells Lane.
- While it is our understanding that Council is responsible for maintaining (grading) these unsealed roads, damaged sections of road where an appropriate width for two-way traffic is not available; or where the carriageway is not suitable to accommodate the weight of construction trucks; would not appropriately provide for the traffic generation of the Site during the construction period. Should such sections be identified, it is expected that Lightsource would consult with Council in regard to the most efficient and sustainable measures by which to remediate such sections of road.
- At the end of the construction period, the Project Manager would again meet with Council's Asset Manager to ensure that conditions in the local roads are commensurate with existing (pre-constructions) conditions; should remediation be required as a result of the construction, it is again expected that Lightsource would consult with Council in regard to the most efficient and sustainable measures by which to remediate such sections of road.

5.8 Construction Traffic Conclusions

Based on our detailed assessment, it is concluded that the construction of the solar farm would have no significant impacts on the local road network. In summary:

- Even during the peak period of construction (Stage 2) the total traffic generation of the Site is very moderate, estimated at 140 daily vehicle trips and up to 46 AM and PM Site peak hour trips.
- These Stage 2 peak flows would be generated over a period of approximately 3 - 4 months only, while the total construction of the project would be completed in 9 - 12 months.
- The introduction of these construction flows – even during the peak Stage 2 construction period - would not alter the existing levels of service in the key roads or at key intersections providing access to the Site.
- The introduction of these construction flows – even during the peak Stage 2 construction period - would not warrant the upgrade of any minor intersections.
- Appropriate management conditions can be introduced to ensure that Blands Lane and Bodells Lane are maintained to an appropriate standard throughout and after the construction period.

6 Draft Construction Traffic Management Plan

It is expected that a detailed CTMP will be required as a Condition of Consent further to project approval. For the purposes of this TIA, this Draft CTMP outlines the general management strategies expected to be employed during the construction period.

6.1 Proposed Work Hours

It is expected that construction works will be undertaken during standard construction work hours, which are likely to be as follows:

- Monday to Friday: 7:00am – 6:00pm
- Saturday: 7:00am – 1:00pm
- Sunday & Public Holidays: No work

Provisions are also required for works to be undertaken outside these standard hours where:

- A delivery is required outside these hours by the Police or other Authorities;
- It is required in an emergency to avoid the loss of life, damage to property and / or to prevent environmental harm and
- A Variation is approved in advance in writing by the appropriate Authority.

Finally, the potential exists for night works to be undertaken to minimise disruption to traffic (or other). While such works are unlikely, if they are required they would only commence further to appropriate approval from the relevant Authority.

6.2 Construction Vehicle Access Routes

All construction vehicles will be required to use the following routes:

- For all light vehicles, shuttle buses and truck trips arriving from/departing to the east, the route via Newell Highway – Bodells Lane – Blands Lane (Route 1 per **Figure 21**).
- For all trucks arriving from/departing to the south, the route via Newell Highway (south) – West Wyalong Heavy Vehicle Bypass – Clear Ridge Road – Blands Lane (Route 2 per **Figure 22**).
- For all light vehicles and shuttle buses arriving from/departing to the south, the route via Newell Highway (west) - Clear Ridge Road - Blands Lane (Route 3 per **Figure 23**).

6.3 Route Maintenance

Acknowledging that the construction phase has the potential to impact on the condition of local roads – and specifically the unsealed Blands Lane and Bodells Lane - it is proposed that:

- Prior to construction commencing, the Project Manager will meet with Council's Assets Manager (or like) to inventory the existing condition of Blands Lane and Bodells Lane.
- Should sections of these roads be identified where two-way carriageway width or poor surface conditions would not appropriately provide for two-way traffic flow and/or construction vehicles, Lightsource would consult with Council in regard to the most efficient and sustainable measures by which to remediate such sections of road.
- At the end of the construction period, the Project Manager would again meet with Council's Asset Manager to ensure that conditions in the local roads are commensurate with existing conditions; should remediation be required as a result of the construction, Lightsource would consult with Council in regard to the most efficient and sustainable measures by which to remediate such sections of road.

6.4 Contractor Parking

On-site parking for all construction staff, shuttle buses and trucks will be provided throughout the construction works. The location of parking areas, and the number of spaces, is expected to vary through the different construction stages, though overall demand even during peak construction periods is expected to be very moderate given the use of shuttle buses for transporting construction staff to and from the Site.

Perhaps most importantly, all parking would be provided on-site at all times.

7 Operational Traffic Assessment

7.1 Operational Traffic Generation

Once the solar farm is operational, it will generate little traffic on a daily basis. Scheduled maintenance works are expected to be undertaken each month, but given the small number of staff required for such work, the average trip generation of the Site during these periods is expected to be less than 4 vehicle trips per day.

These additional trips would utilise the same routes as determined for use during the construction period, noting that should maintenance trucks be required, they would travel only via the designated construction truck routes.

7.2 Operational Traffic Impacts

Clearly, the traffic generation of the Site once the solar farm is operational is minimal and would have no impact on the operation of the local road network.

7.3 Staff Parking

All staff parking will be provided on-site in appropriately designated parking areas, which will be designed with reference to the appropriate Australian Standards.

8 Conclusions

The key findings of this Traffic Impact Assessment are:

- The SSDA provides for the construction and operation of a solar farm at 228 – 230 Blands Lane, Wyalong.
- The peak period of traffic generation associated with the project will be during construction, which is estimated to be completed over 9 - 12 months. During this construction period:
 - All construction vehicles will use dedicated construction routes between the Site and the regional road network at the Newell Highway. The primary access route between the Site and the Newell Highway will be via Blands Lane and Bodells Lane.
 - During the peak Stage 2 construction period, estimated at approximately 3 - 4 months, the Site will generate up to 46 vehicle trips per hour during the Site peak periods and up to 140 vehicle trips per day.
 - The introduction of these peak Stage 2 construction trips would have no significant impact on the operation or capacity of key local roads and intersections providing access to the Site.
 - Appropriate mechanisms can be established to monitor the condition of the unsealed roads providing access to the Site – Blands Lane and Bodells Lane – such as to provide suitable carriageway conditions throughout and after the construction period.
 - Once operational, the Site would generate only a very minor number of trips associated with occasional maintenance requirements.
 - All light vehicle, shuttle bus and truck parking through both the construction and operational phases will be provided on-site.
 - A Construction Traffic Management Plan will be formalised prior to construction.

In summary, the Proposal is supportable on traffic planning grounds and will not result in any adverse impacts on the surrounding road network.

Appendix A

Traffic Survey Results

Newell Highway east of Bodells Lane Classified Vehicle Counts & Speeds - 5 Day Average Northbound	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean Speed	85th% Speed
	0000	3	0	0	0	0	0	0	0	2	10	0	0	100	-
	0100	1	0	0	0	0	0	0	0	1	7	0	0	99	-
	0200	3	0	0	0	0	0	0	0	1	6	0	0	97	-
	0300	3	0	2	0	0	0	0	0	2	10	0	0	98	-
	0400	3	0	2	0	0	0	0	0	1	7	0	0	101	-
	0500	6	1	1	0	0	0	0	0	2	9	0	0	98	109
	0600	15	2	3	1	0	0	0	1	4	8	0	0	101	109
	0700	26	3	5	0	0	0	0	1	4	11	0	0	105	114
	0800	28	6	4	0	0	0	0	1	6	12	1	0	103	112
	0900	36	7	4	1	0	1	2	1	4	14	1	0	100	109
	1000	36	6	5	1	0	0	1	0	5	15	0	0	103	111
	1100	44	6	4	0	0	0	1	1	6	13	0	0	102	111
	1200	44	6	4	1	0	1	1	1	5	15	1	0	103	110
	1300	42	7	3	1	1	0	1	1	3	13	0	0	102	111
	1400	43	7	4	0	0	1	1	0	3	12	0	0	101	110
	1500	38	7	4	1	0	1	0	1	5	11	0	0	104	112
	1600	37	5	3	1	1	0	1	1	2	12	0	0	102	109
	1700	32	2	2	0	0	0	0	1	5	12	0	0	104	111
	1800	25	2	3	0	0	0	0	0	6	12	0	0	103	111
	1900	13	1	1	0	0	1	0	1	6	12	0	0	102	108
	2000	11	1	1	0	0	0	0	1	4	12	0	0	99	102
	2100	8	1	1	1	0	0	0	0	4	14	0	0	100	104
	2200	7	1	1	1	0	0	1	0	4	14	0	0	97	102
	2300	3	1	0	0	0	0	0	0	5	9	0	0	98	102
	07-19	412	79	52	8	2	3	16	12	41	112	4	0	102	111
	06-22	447	86	54	9	2	5	17	15	69	167	4	0	102	110
	06-00	454	89	54	10	2	6	18	16	78	196	5	0	102	110
	00-00	470	92	58	12	2	7	18	16	78	206	5	0	102	110

Newell Highway east of Bodells Lane Classified Vehicle Counts & Speed - 5 Day Average Southbound	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
	0000	4	0	0	0	0	0	0	0	0	5	0	0	97	114
	0100	1	0	0	0	0	0	0	0	0	2	0	0	96	-
	0200	4	0	0	0	0	0	0	0	0	3	0	0	97	-
	0300	3	0	0	0	0	0	0	0	0	1	0	0	94	-
	0400	4	0	0	0	0	0	0	0	1	4	0	0	101	107
	0500	5	1	1	0	0	0	0	0	1	2	0	0	102	-
	0600	12	1	2	0	0	0	0	0	2	3	0	0	102	112
	0700	26	2	4	0	0	0	0	1	5	5	0	0	101	109
	0800	36	7	4	1	0	1	1	0	4	10	0	0	106	115
	0900	38	5	5	1	0	1	1	1	7	10	0	0	98	109
	1000	43	6	4	0	0	0	2	0	7	13	0	0	101	109
	1100	49	7	4	1	0	0	1	1	7	14	0	0	101	109
	1200	44	9	5	0	0	0	0	1	8	17	1	0	101	111
	1300	40	6	3	2	0	0	1	1	5	18	0	0	101	110
	1400	40	6	4	1	0	1	1	1	7	18	0	0	98	108
	1500	38	5	3	0	0	0	1	0	6	17	0	0	104	112
	1600	35	5	3	0	1	1	0	1	7	11	0	0	102	111
	1700	36	4	3	1	0	0	1	1	5	16	0	0	104	112
	1800	30	2	2	1	0	0	0	0	3	14	0	0	99	110
	1900	16	1	3	0	0	0	0	1	2	11	0	0	101	110
	2000	15	1	0	0	0	0	0	0	3	9	0	0	100	110
	2100	10	1	1	0	0	0	0	0	2	7	0	0	101	108
	2200	9	1	0	0	0	0	0	0	2	10	0	0	101	103
	2300	4	0	0	0	0	0	0	1	1	7	0	0	97	111
	07-19	454	70	37	5	0	3	6	4	50	155	7	1	101	110
	06-22	501	77	46	6	0	4	6	5	64	179	7	1	101	110
	06-00	508	77	47	7	0	4	7	5	66	192	7	1	101	110
	00-00	533	81	49	7	0	4	7	6	70	212	7	1	101	110

	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
Clear Ridge Road south of Blands Lane Classified Vehicle Counts & Speeds - 5 Day Average Northbound	0000	0	0	0	0	0	0	0	0	0	0	0	0	101	-
	0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0600	1	0	0	0	0	0	0	0	0	0	0	0	88	-
	0700	2	0	0	0	0	0	0	0	0	0	0	0	95	-
	0800	2	0	0	0	0	0	0	0	0	0	0	0	100	-
	0900	2	0	0	0	0	0	0	0	1	0	0	0	89	-
	1000	1	0	0	0	0	0	0	0	0	0	0	0	-	-
	1100	2	0	0	0	0	0	0	0	1	0	0	0	63	-
	1200	2	0	0	0	0	0	0	0	0	0	0	0	36	-
	1300	1	0	0	0	0	0	0	0	0	0	0	0	94	-
	1400	2	0	0	0	0	0	0	0	0	0	0	0	60	-
	1500	2	0	1	0	0	0	0	0	0	0	0	0	79	-
	1600	2	1	0	0	0	0	0	0	0	0	0	0	95	-
	1700	3	0	0	0	0	0	0	0	1	0	0	0	92	-
	1800	2	0	0	0	0	0	0	0	1	0	0	0	85	-
	1900	1	0	0	0	0	0	0	0	0	0	0	0	66	-
	2000	1	0	0	0	0	0	0	0	0	0	0	0	107	-
	2100	2	0	0	0	0	0	0	0	0	0	0	0	85	-
	2200	1	0	0	0	0	0	0	0	0	0	0	0	-	-
	2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	07-19	34	3	3	1	0	0	0	0	8	2	0	0	80	107
	06-22	41	3	4	1	1	0	0	0	9	3	0	0	81	107
	06-00	41	3	4	1	1	0	0	0	9	3	0	0	81	107
	00-00	42	3	4	1	1	0	0	0	9	3	0	0	81	107

	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
Clear Ridge Road south of Blands Lane Classified Vehicle Counts & Speeds - 5 Day Average Southbound	0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0400	1	0	0	0	0	0	0	0	0	0	0	0	80	-
	0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0600	1	0	0	0	0	0	0	0	0	0	0	0	105	-
	0700	2	0	0	0	0	0	0	0	0	0	0	0	91	-
	0800	2	0	1	0	0	0	0	0	1	0	0	0	92	-
	0900	1	0	0	0	0	0	0	0	0	0	0	0	102	-
	1000	1	0	0	0	0	0	0	0	0	0	0	0	109	-
	1100	2	0	0	0	0	0	0	0	0	0	0	0	73	-
	1200	3	0	1	0	0	0	0	0	0	0	0	0	77	-
	1300	2	0	1	0	0	0	0	0	0	0	0	0	93	-
	1400	3	0	0	0	0	0	0	0	0	0	0	0	73	-
	1500	2	0	1	0	0	0	0	0	0	0	0	0	89	-
	1600	2	0	0	0	0	0	0	0	0	0	0	0	100	-
	1700	3	0	0	0	0	0	0	0	0	0	0	0	94	-
	1800	3	0	0	0	0	0	0	0	0	0	0	0	89	-
	1900	2	0	0	0	0	0	0	0	0	0	0	0	95	-
	2000	1	0	0	0	0	0	0	0	0	0	0	0	77	-
	2100	0	0	0	0	0	0	0	0	0	0	0	0	52	-
	2200	0	0	0	0	0	0	0	0	0	0	0	0	100	-
	2300	0	0	0	0	0	0	0	0	0	0	0	0	70	-
	07-19	31	3	5	0	2	0	0	0	10	3	0	0	88	112
	06-22	37	3	5	0	2	0	0	0	10	3	0	0	88	111
	06-00	39	3	5	0	2	0	0	0	10	3	0	0	88	111
	00-00	40	3	5	0	2	0	0	0	10	3	0	0	87	111

Blands Lane east of Clear Ridge Road Classified Vehicle Counts & Speeds - 5 Day Average Eastbound	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
	0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0700	0	0	0	0	0	0	0	0	0	0	0	0	95	-
	0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0900	0	0	0	0	0	0	0	0	1	0	0	0	89	-
	1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	1100	0	0	0	0	0	0	0	0	0	0	0	0	92	-
	1200	0	0	0	0	0	0	0	0	0	0	0	0	91	-
	1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	1400	0	0	0	0	0	0	0	0	0	0	0	0	90	-
	1500	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	1600	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	1700	0	0	0	0	0	0	0	0	0	0	0	0	95	-
	1800	1	0	0	0	0	0	0	0	0	0	0	0	86	-
	1900	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	07-19	2.2	0.2	0.8	0	0	0	0	0	2.4	1	0	0	90	95
	06-22	2.2	0.2	0.8	0	0	0	0	0	2.6	1.2	0	0	89	94
	06-00	2.2	0.2	0.8	0	0	0	0	0	2.6	1.2	0	0	89	94
	00-00	2.2	0.2	0.8	0	0	0	0	0	2.6	1.2	0	0	89	94

Blands Lane east of Clear Ridge Road Classified Vehicle Counts & Speeds - 5 Day Average Westbound	Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
	0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	0700	0	0	0	0	0	0	0	0	0	0	0	0	95	-
	0800	1	0	0	0	0	0	0	0	1	0	0	0	-	-
	0900	0	0	0	0	0	0	0	0	0	0	0	0	89	-
	1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	1100	0	0	0	0	0	0	0	0	0	0	0	0	92	-
	1200	0	0	0	0	0	0	0	0	0	0	0	0	91	-
	1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	1400	1	0	0	0	0	0	0	0	0	0	0	0	90	-
	1500	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	1600	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	1700	0	0	0	0	0	0	0	0	0	0	0	0	95	-
	1800	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	1900	0	0	0	0	0	0	0	0	0	0	0	0	86	-
	2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	07-19	3.2	0.2	0.4	0	0	0	0	0	2.6	1	0	0	90	95
	06-22	3.6	0.2	0.4	0	0	0	0	0	2.6	1	0	0	89	94
	06-00	3.8	0.2	0.4	0	0	0	0	0	2.6	1	0	0	89	94
	00-00	3.8	0.2	0.4	0	0	0	0	0	2.6	1	0	0	89	94

Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	1	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	1	0	0	0	0	0	0	0	0	0	-	-
0800	1	0	0	0	0	0	0	0	0	0	0	0	67	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	74	-
1100	1	0	0	0	0	0	0	0	0	0	0	0	67	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	1	0	0	0	0	0	0	0	0	0	0	0	67	-
1400	1	0	0	0	0	0	0	0	0	0	0	0	68	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	55	-
1600	1	0	0	0	0	0	0	0	0	0	0	0	63	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	57	-
1800	1	0	0	0	0	0	0	0	0	0	0	0	64	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	66	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	6	1	0	0	0	0	0	0	1	0	0	0	59	-
06-22	7	1	0	0	0	0	0	0	1	0	0	0	60	-
06-00	7	1	0	0	0	0	0	0	1	0	0	0	60	-
00-00	7	1	0	0	0	0	0	0	1	0	0	0	60	-

Time [--]	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Mean	Vpp
0000	0	0	0	0	0	0	0	0	0	0	0	0	59	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	1	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	70	-
1000	1	0	0	0	0	0	0	0	0	0	0	0	96	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	55	-
1400	1	0	0	0	0	0	0	0	0	0	0	0	69	-
1500	1	0	0	0	0	0	0	0	0	0	0	0	51	-
1600	1	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	1	0	0	0	0	0	0	0	0	0	0	0	58	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	73	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	58	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	6	0	1	0	0	0	0	0	0	0	0	0	68	-
06-22	7	0	1	0	0	0	0	0	0	0	0	0	66	-
06-00	7	0	1	0	0	0	0	0	0	0	0	0	66	-
00-00	7	0	2	0	0	0	0	0	0	0	0	0	66	-