

# Traffic Impact Assessment

## Mulwala Solar Farm Savernake Road Mulwala, NSW Report May 2018

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## 1. Executive Summary

This Traffic Impact Assessment report (TIAR) provides an assessment of the traffic impacts to support an Environmental Impact Statement (EIS) for the construction of an 80-megawatt solar farm at Mulwala NSW. The proposed Mulwala Solar Farm is considered a State Significant Development and the Secretary's Environmental Assessment Requirements (SEAR) for the Environmental Impact Statement (EIS) must include the following assessments in relation to transport:

- *Transport - including an assessment of the site access route (including Tocumwal Road, Yarrawonga Road, Savernake Road and Melbourne Street), site access point, any potential rail safety issues and likely transport impacts (including peak and average traffic generation) of the development on the capacity and condition of roads (including on any Crown land), a description of the measures that would be implemented to mitigate any impacts during construction, and a description of any proposed road upgrades developed in consultation with the relevant road and rail authorities (if required).*

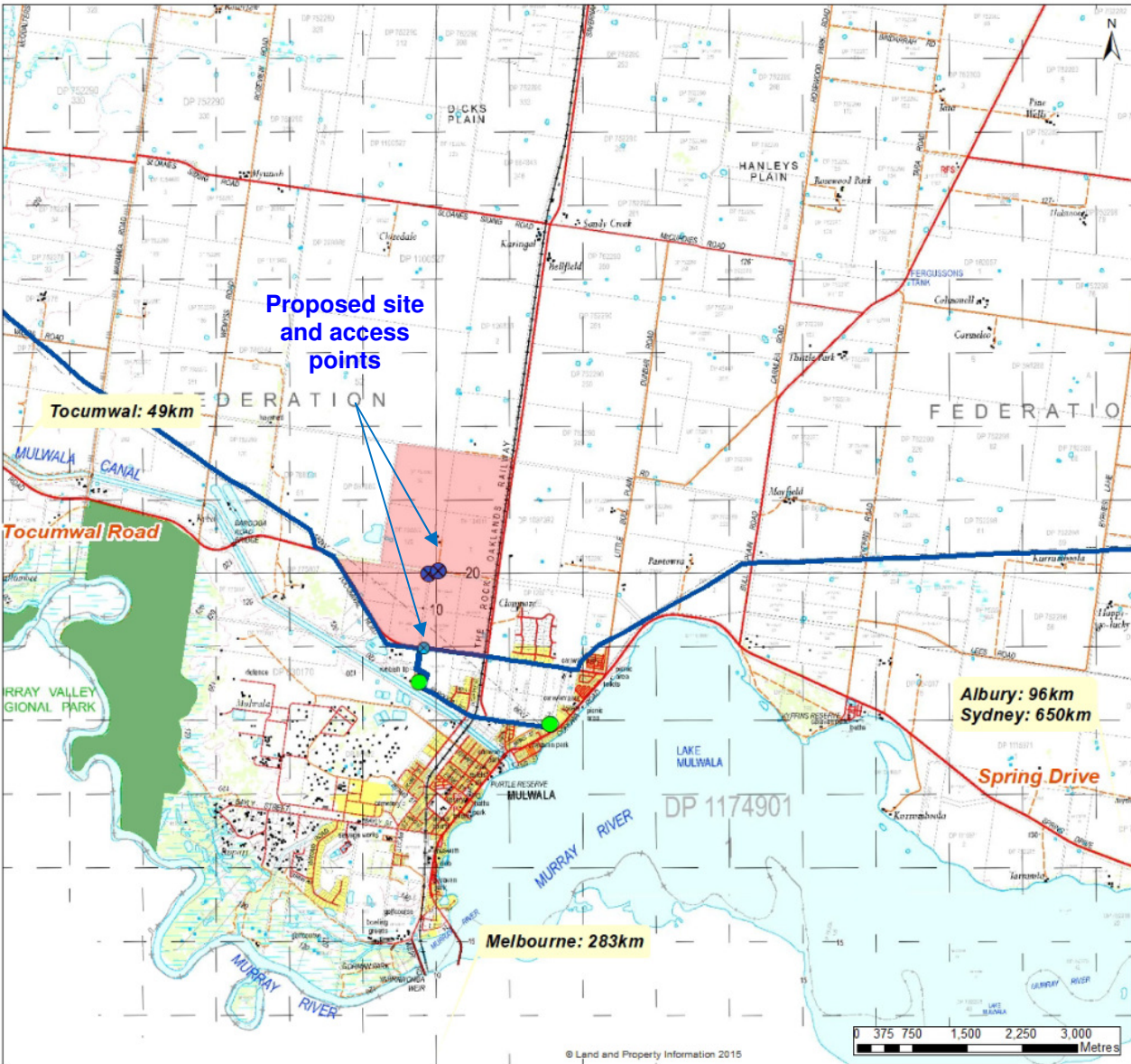
The development site is located at rural property number 255 Lambruck Lane, Mulwala NSW and is located approximately 2 kilometres north of the Mulwala Township, within the Federation Local Government Area and is bounded to the east by Savernake Road and to the south and west by Tocumwal Road. The main access to the development site is via Savernake Road into Lambruck Lane with a minor access to the switching yard from Tocumwal Road. *Refer to Figures 1.1 Locality Plan and 1.2 Site Plan for details.*

This TIAR investigates the traffic impacts of construction and operational vehicle movements along the proposed primary transportation routes and recommends any mitigation measures that are required as a result of the Mulwala Solar Farm development.

It is concluded that the additional peak construction traffic of 39vpd generated by the solar farm development will have a minimal impact on the operations of the intersection of Savernake Road and Lambruck Lane and it will continue operate well within capacity in both the AM and PM peak periods for all movements. In addition, it is also concluded that an additional one light vehicle movement per week at the switching yard access driveway will have an insignificant impact on through traffic on Tocumwal Road.

It is also determined that there will be minimal impact from the solar farm development on the roads identified as the primary transportation routes for construction activities as all primary transportation roads are classified as designated B-double routes and they meet the Austroads standards for road capacity.

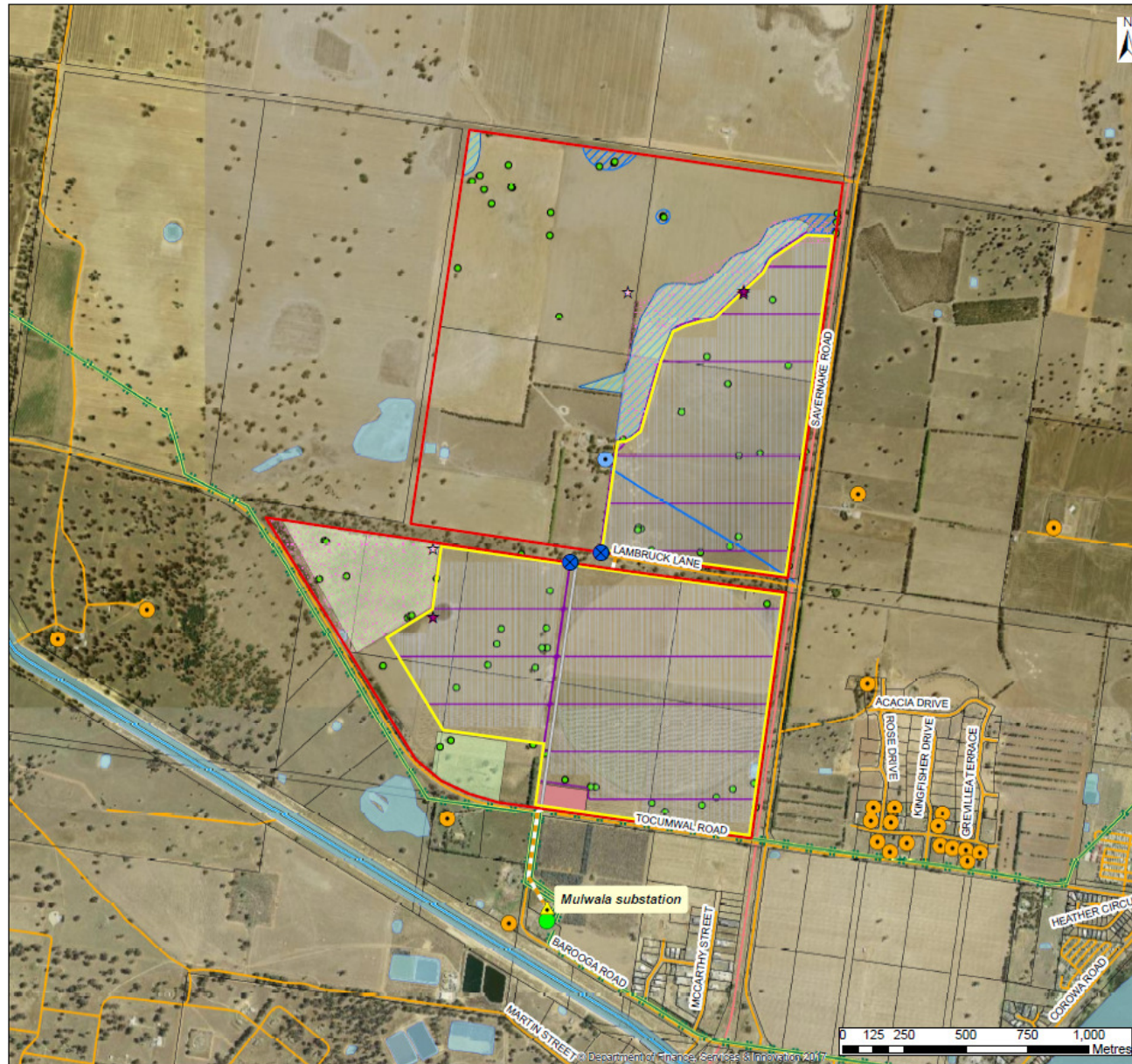
1.1 Locality Plan



PROJECT <b>Mulwala Solar Farm</b>		
MAP TITLE <b>Project location and Access</b>		
Title Info		
<b>LEGEND</b> Project Boundary (Combined Lot Boundary - 420 hectares) Indicative Access Points Indicative Access Points (Switchyard and O&M building only) Substation Essential Energy Transmission Lines		
<b>ESCO</b> Pacific		
<small>DISCLAIMER This plan was prepared for the proposed and tentative use of ESCO Pacific Pty Ltd and its associated entities and is not to be used for any other purpose. The plan is prepared in the form of a draft and is subject to change without notice. The plan is not a guarantee of any kind and is not intended to be relied upon for any purpose. The plan is not a guarantee of any kind and is not intended to be relied upon for any purpose.</small>		
DATE 23/05/2018	SCALE 1:50,000	Page Size A3
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MAP No. MUL_LAY_005_03_Location_Access	REV 03	



## 1.2 Site Plan



PROJECT <b>Mulwala Solar Farm</b>		
MAP TITLE <b>Project Layout</b>		
Title Info Lot 1 in DP100773 - Lots 1-7 in DP134511 Lot 103, 114-116, 125, 132 in DP 752290		
<b>LEGEND</b> <b>Mulwala Solar Farm</b> <div> <div>Project Boundary (Combined Lot Boundary - 420 hectares)</div> <div>Development Footprint (218 hectares)</div> <div>PV Solar Array</div> <div>Site Office, Maintenance Shed, Switchyard and Battery Storage</div> <div>Internal Access Tracks</div> <div>Connection Point</div> <div>Connecting Cable</div> <div>Indicative Access Points</div> <div>Landholder associated with the project</div> <div>Sensitive Receivers</div> </div> <b>Ecological Value</b> <div>Native Vegetation</div> <div>Scattered Trees (within project boundaries)</div> <b>Aboriginal Heritage</b> <div>Aboriginal sensitive area</div> <div>Potential Aboriginal Artefacts to be avoided or salvaged</div> <div>Potential Aboriginal Artefacts to be avoided</div> <b>Hydrology</b> <div>Watercourses</div> <div>Areas subject to inundation</div> <div>Murray Irrigation channel</div> <div>Dam / Water features</div> <b>Others</b> <div>Cadastral Boundaries</div> <div>Essential Energy Substation</div> <div>Essential Energy Transmission Lines</div> <div>Easement (11m wide, variable length)</div> <div>22kV Distribution line (to be relocated or avoided)</div> <div>Roads / Tracks</div> <div>Railway</div>		
<small>DISCLAIMER: This plan was prepared for the purpose and exclusive use of ESCO Pacific Pty Ltd and its subsidiaries and is not to be used for any other purpose. This map is not guaranteed to be free from error or omission. The location of features should not be relied on as exact field locations. Data source: Google Earth</small>		
DATE 21/05/2018	SCALE 1:15,000	Page Size A3
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### 1.3 Primary Transport Routes



## 1.4 Site Characteristics

<b>Address</b>	255 Lambruck Lane, Mulwala NSW
<b>Road Hierarchies Primary Access Roads</b>	<ul style="list-style-type: none"> <li>Lambruck Lane classified as a rural road &amp; Savernake Road with sections classified as rural and urban. Both roads managed by Federation Council.</li> <li>Melbourne Road MR314, Corowa Road MR314, Spring Drive MR314 and Tocumwal Road MR550 are classified as State Roads and are under the management of RMS.</li> </ul> <p>All primary transportation routes are designated B-double routes. <i>Refer to Section 1.3 above.</i></p>
<b>Proposed Use</b>	80-megawatt Solar Farm
<b>Accesses</b>	Main plant areas site frontage onto Lambruck Lane and minor access to switch yard from Tocumwal Road
<b>Existing Traffic volumes and Speed Environment</b>	Refer to Section 3.4 Tables 3.1 and 3.2 of report
<b>Traffic Generation</b>	<p><b>During Peak Construction</b></p> <ul style="list-style-type: none"> <li>156 vehicle movements per week;</li> <li>39 vehicle movements per day;</li> <li>Allow 4 vehicle movements AM and PM peak hour movements</li> </ul> <p><b>During Operations</b></p> <ul style="list-style-type: none"> <li>14 vehicle movements per week;</li> <li>2 movements per day;</li> <li>Allow 2 vehicle movements AM and PM peak hour movements</li> </ul>

## 1.5 Recommendations

- Federation Council concurs with the proposed solar farm development accesses and the use of the primary transportation routes;
- Federation Council concurs with reconstruction works at the intersection of Savernake Road and Lambruck Lane to improve the surface and ensure the safe operations heavy vehicle turning movements;
- Federation Council concurs with the installation of railway crossing warning signage on Savernake Road to improve rail crossing awareness.

## 2. Introduction

ESCO Pacific Pty Ltd is proposing to undertake the development and operation of a 80-megawatt solar farm at Mulwala NSW. The development site is located at rural property number 255 Lambruck Lane, Mulwala NSW and is located approximately 2 kilometres north of the Mulwala Township, within the Federation Local Government Area and is bounded to the east by Savernake Road and to the south and west by Tocumwal Road. The nearest major roads are the Murray Valley Highway located approximately 6 kilometres to the south in Victoria and the Riverina Highway approximately 26 kilometres to the north (Refer to locality Plan in Section 1.1). The main access to the development site is via Savernake Road and Lambruck Lane. Access to the solar plant areas is via Lambruck Lane and the switch yard minor access is from Tocumwal Road. *Refer to Figures 1.1 Locality Plan and 1.2 Site Plan for details.*

The proposed Mulwala Solar Farm is considered a State Significant Development and the SEAR for the EIS must include the following assessments in relation to transport:

- *Transport - including an assessment of the site access route (including Tocumwal Road, Yarrawonga Road, Savernake Road and Melbourne Street), site access point, any potential rail safety issues and likely transport impacts (including peak and average traffic generation) of the development on the capacity and condition of roads (including on any Crown land), a description of the measures that would be implemented to mitigate any impacts during construction, and a description of any proposed road upgrades developed in consultation with the relevant road and rail authorities (if required).*

Peter Meredith Consulting has been engaged to prepare a TIAR investigating the traffic impacts of construction and operational vehicle movements along the proposed site access routes and the wider road network and a description of any mitigation measures that are required as a result of the Mulwala Solar Farm development.

The assessment uses existing traffic flow data obtained from Roads and Maritime Services (RMS) and Federation Council, on-site observations, construction and operational traffic volumes generated by the proposed Mulwala Solar Farm from ESCO Pacific and future traffic growth predictions.

### 2.1 Documentation

The documentation and information provided for this assessment includes:

- Mulwala Solar Farm Preliminary Environmental Assessment – Scoping Report by ESCO Pacific January 2018
- Environmental Assessment Requirements for State Significant Development. Section 78A(8A) of the Environmental Planning and Assessment Act 1979

## 2.2 References

References used in the preparation of this assessment include the following:

- *Roads and Maritime Services (RMS) Guide to Traffic Generating Developments, Version 2.2 October 2002 for traffic generation predictions and Technical Direction TDT 2013/04a Updated Traffic Surveys.*
- *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development*
- *Austroads Guide to Road Design (AGRD) Part 4A: Unsignalised and Signalised Intersections.*
- *RMS supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.*
- *Austroads Guide to Road Design Part 4: Intersections and Crossings - General*
- *Austroads Guide to Road Design Part 6: Roadside Design, Safety and Barriers.*
- *Visual Impact Assessment Mulwala Solar Farm*

## 3. Existing Conditions

The Mulwala Solar Farm development site is located at rural property number 255 Lambruck Lane, Mulwala NSW and is bounded to the east by Savernake Road and to the south and west by Tocumwal Road.

### 3.1 Land Use

The proposed development site shown in Section 1.2 is presently used for agriculture and grazing and comprises flat open paddocks. The secured land tenure is 358 hectares with the area required for the solar farm up to 218 hectares.

A 132 KV transmission power line runs along Tocumwal Road the southwest boundary of the development site and connects into the Mulwala 132 substation located approximately 500 metres south of the development site. The electricity produced by the Mulwala Solar Farm will be fed, via an underground, on-site, high voltage power reticulation system into the Mulwala 132 substation. *Refer to Site Map in Section 1.2.*

### 3.2 Road Network and Transport Routes

The site location has been selected because of the close proximity to the existing electricity grid and sub-station and the locations of the major road network. The major road network is suitable for the transport of project infrastructure and equipment to the site during construction, operations and decommissioning stages, and for the workforce to easily travel from the site during each stage of the project. The following roads have been identified as the primary transportation routes for heavy vehicles involved with the delivery of materials for the construction of the Mulwala Solar Farm.

- Lambruck Lane
- Savernake Road

- Melbourne Road MR314
- Corowa Road MR314
- Spring Drive MR314
- Tocumwal Road MR550

Below is a description of the characteristics of the roads and their suitability as a project transportation route.

### **3.2.1 Lambruck Lane**

Lambruck Lane forms the main access road to the solar farm areas. Lambruck Lane is a formed gravel road running in an east west direction connecting to Savernake Road as a T-junction intersection and is classified as a local rural road under the management of Federation Council. Lambruck Lane is a designated B-double route as all rural roads within the Federation Council area are approved for use by 25 metre B-doubles. Lambruck Lane currently serves as access to the farming property number 255.

Adjacent to the development site Lambruck Lane has a road reserve width of approximately 60m between fence lines and consists of the following characteristics:

- Gravel formation 6 metres wide;
- Shallow table drains;
- Medium density timbered/ grass verges;
- At 29 metres west from the edge of bitumen on Savernake Road, Lambruck Lane crosses The Rock to Oaklands Railway line. The existing gravel pavement on Lambruck Lane is built up to rail level which allows for the smooth crossing of the railway line. *Refer to Photos 1 and 2 for details;*
- At the rail crossing on both approaches the existing warning signage consists of:
  - ‘Railway Crossing’ (R6-25);
  - ‘Stop’ (R1-1);
  - “Look For Trains” (G9-48);
  - on the east bound approach there is a “Look For Trains” (G9-48) attached to a tree;
- At 52 metres west from the edge of bitumen on Savernake Road the existing gated entry and cattle ramp form the entry to Lambruck Lane. Gates are permanently open with a 50km/h urban speed limit sign located approximately 100 metres west of main gate.





**Photo 1: Lambruck Lane looking east bound at main gate and railway crossing**



**Photo 2: Lambruck Lane looking west bound from Saverlake Rd at main gate and railway crossing**



**Photo 3: Typical surface and road reserve of Lambruck Lane looking west bound**





**Photo 4: Lambruck Lane looking north bound at railway crossing showing clear sight distance**



**Photo 5: Lambruck Lane looking south bound at railway crossing showing clear sight distance**

**Conclusion:** As a designated B-double route Lambruck Lane is a suitable site access road for heavy vehicle materials haulage route subject to mitigating intersection treatments at the intersection of Savernake Road and the existing railway crossing. *Refer to Section 6 Impacts and Mitigating Works for more detail.*

### 3.2.2 Savernake Road north of Tocumwal Road MR550

This section of Savernake Road north of Tocumwal Road MR550 runs north south and provides a connection to the Riverina Highway HW20 and to the townships of Savernake, Rennie and Oaklands. This section of Savernake Road connects to Tocumwal Road MR550 as an offset-T-junction and is controlled by give-way signs. This section of Savernake Road is classified as a rural road and is under the management of the Federation Council and serves as the main access road to the development site. Savernake Road is a designated B-double route as all rural roads within the Federation Council area are approved for use by 25 metre B-doubles. Savernake Road is also a designate school bus route.

Adjacent to the development site Savernake Road has a road reserve width of approximately 27 metres and consists of the following characteristics:

- An undivided two-way road with a sealed carriageway width of 6.2 metres;
- Formed gravel shoulders at 2.1 metres with shallow table drains and grass verges;
- Guide post delineation;
- At the intersection with Lambruck Lane on the eastern side an extended 3.8 metres hardstand gravel bus bay area is provided;
- Posted speed limit 100km/h;
- The Rock to Oaklands Railway line runs parallel to the west of this section of Savernake Road approximately 33 metres offset from centre line.



**Photo 6: Savernake Rd at intersection with Lambruck Lane looking north bound showing clear sight distance**





**Photo 7: Savernake Rd at intersection with Lambruck Lane looking south bound showing clear sight distance**



**Photo 8: Typical Savernake Rd looking at south bound approach to offset-T-junction intersection with Tocumwal Rd**



**Photo 9: Savernake Rd looking at south bound approach to offset-T-junction intersection with Tocumwal Rd**

**Conclusion:** This section of Savernake Road is a designated B-double route and is suitable as a heavy vehicle materials haulage route subject to mitigating intersection treatments at the intersection of Lambruck Lane and including the existing railway crossing. *Refer to Section 6 Mitigating Works for more detail.*

### **3.2.3 Savernake Road between Tocumwal Road MR550 and Melbourne Street MR314**

This section of Savernake Road south of Tocumwal Road provides a connection to the townships of Mulwala and Yarrawonga from the outlying rural areas and the new residential subdivisions on the north eastern edges of Mulwala. In addition, this section of Savernake Road provides connections for heavy vehicles to the industrial areas of Mulwala. This section of Savernake Road connects to Tocumwal Road as an offset-T-junction and Melbourne Road as a T-junction and both are controlled by give-way signs and splitter islands. This section of Savernake Road is classified as an urban road and is under the management of the Federation Council and will serve as a primary transportation route to the development site. Savernake Road is a designated B-double route and approved for use by 25 metre/26 metre B-doubles by RMS (*Refer to Figure 1 by RMS below*). Savernake Road is also a designate school bus route.

Savernake Road between Tocumwal Road and the North Street bend consists of the following characteristics:

- An undivided two-way rural type road with a sealed carriageway width of 7.0 metres;
- Sealed shoulders of 0.5 metres and formed gravel shoulders at 0.5 metres with shallow table drains and grass verges;
- Centre line and edge line markings with guide post delineation;
- Posted speed limit 80km/h reducing to 60km/h on the approach to the intersection of Barooga Road;
- Intersection of Savernake Road and Barooga Road is an uncontrolled T-junction with north bound CHR right turn treatments.

Savernake Road between North Street bend and Melbourne Road intersection consists of the following characteristics:

- An undivided two-way urban road with a sealed carriageway width of 13.0 metres between kerbs;
- Posted speed limit is 60km/h;
- Street lighting.



**Photo 10: Typical Savernake Rd looking at north bound approach to offset-T-junction intersection with Tocumwal. Section between Tocumwal Rd and Barooga Rd**



**Photo 11: Typical Savernake Rd looking at south bound approach to T-junction intersection with Barooga Rd/North St**



**Photo 12: Savernake Rd looking north bound approach to intersection with Barooga Rd and Savernake Rd. Savernake Rd turns to the right.**





**Photo 13: Savernake Rd looking at south bound approach to intersection with Melbourne Rd.**

**Conclusion:** This section of Savernake Road is a designated B-double route and is suitable as a heavy vehicle materials haulage route. No traffic mitigating works have been identified.

### **3.2.4 Melbourne Street MR314/Corowa Road MR314 and Spring Drive MR314**

Melbourne Street is the main central business district street in Mulwala and provides connections to the townships of Yarrawonga VIC and Corowa NSW. At the intersection of Savernake Road, Melbourne Street becomes Corowa Road and at the intersection of Tocumwal Road, Corowa Road becomes Spring Drive.

Melbourne Street MR314/Corowa Road MR314 and Spring Drive MR314 are classified as State Roads and are under the management of RMS and will serve as a primary transportation route to the development site. Melbourne Street MR314/Corowa Road MR314 and Spring Drive MR314 are designated B-double routes and approved for use by 25 metre/26 metre B-doubles by RMS (*Refer to Figure 1 by RMS below*). Melbourne Street /Corowa Road and Spring Drive are also a designate local and school bus routes.

Melbourne Street continues into Victoria via the Lake Mulwala Bridge. In Yarrawonga, Melbourne Street is also the main central business district street and connects to the Murray Valley Highway and is classified as a State Road and is under the management of the VicRoads and will serve as a primary transportation route to the development site. Melbourne Street and the Murray Valley Highway are designated B-double routes and approved for use by 25 metre/26 metre B-Doubles by VicRoads (*Refer to Figure 2 by Vic Roads below*).

Melbourne Street between Lake Mulwala Bridge and Savernake Road consists of the following characteristics:

- In Mulwala, Melbourne Street consists of varying widths from 16 metres to 13 metres between kerbs;
- Two-way traffic with travel lanes of 4 metres wide and parallel parking with complete centre, edge and parking line marking delineation;

- Some sections of Melbourne Street are divided by a centre median with decorative street lighting, landscaping and cycle lanes;
- The intersections of Inglis Street and Bayly Street with Melbourne Street are controlled by large roundabouts. A CHR right-turn treatment is provided at the intersection of Melbourne Street and Cypress Drive;
- Pedestrian crossing refuges are located adjacent to Cypress Drive, Mulwala Ski Club and Savernake Road with a marked pedestrian crossing located at the intersection of Melbourne Road and Erne Street;
- The posted speed limit is 60km/h and 40km/h in school zone areas.



**Photo 14: Typical divided section of Melbourne St looking at south bound**



**Photo 15: Melbourne St north bound approach to intersection of Savernake Rd. Truck is exiting Savernake Rd**



Corowa Road between Savernake Road and Tocumwal Road consists of the following characteristics:

- In Mulwala, Corowa Road consists of varying widths from 9 metres seal with gravel shoulders and grass verges with urban driveway connections to single sided kerb sections 12 metres between kerb and edge of seal;
- Two-way traffic with travel lanes of 4.5 metres wide and parallel parking against kerb or on the road verge;
- The posted speed limit is 60km/h with continuous centre line delineation and other associated line markings at intersections.



**Photo 16: Corowa Rd south bound approaching intersection of Savernake Rd**



**Photo 17: Corowa Rd east bound approaching intersection with Spring Dr and Tocumwal Rd**



**Photo 18: Spring Dr West bound approaching intersection with Corowa Rd and Tocumwal Rd**

Spring Drive east of Tocumwal Road consists of the following characteristics:

- An undivided two-way rural type road with a sealed carriageway width of 7.0 metres;
- Sealed shoulders of 0.5 metres and formed gravel shoulders at 3 metres with shallow table drains and grassed and timbered verges;
- Posted speed limit 100km/h with centre line and edge line markings with guide post delineation.

**Conclusion:** Melbourne Street MR314, Corowa Road MR314 and Spring Drive MR314 are designated B-double routes and are suitable as a heavy vehicle materials haulage routes. No traffic mitigating works have been identified.

### **3.2.5 Tocumwal Road MR550**

Tocumwal Road connects to the townships of Tocumwal and Mulwala. On the northern side of Mulwala, Tocumwal Road has connections to Savernake Road and terminates as a T-junction at the intersection of Spring Drive/Corowa Road (*Refer to Photo 17 below*). In addition, Tocumwal Road provides connections of outlying rural areas and the new residential subdivisions on the north eastern edges of Mulwala to the central business districts of Mulwala and Yarrawonga.

Tocumwal Road MR550 is classified as a Regional Road and is under the management of RMS and will serve as a primary transportation route to the development site and a minor operational access to the switching yard driveway. Tocumwal Road MR550 is a designated B-double route and approved for use by 25 metre/26 metre B-doubles by RMS (*Refer to Figure 1 by RMS below*). Tocumwal Road MR550 is also a designate local and school bus route.

Tocumwal Road between Savernake Road and Spring Drive/Corowa Road consists of the following characteristics:

- An undivided two-way rural type road with a sealed carriageway width of 7.0 metres;

- Sealed shoulders of 0.5 metres and formed gravel shoulders with shallow table drains and grass verges;
- Centre line and edge line markings with guide post delineation;
- Posted speed limit 100km/h reducing to 60km/h on the south east approach to the built-up area approximately 2 kilometres from the intersection of Spring Drive/Corowa Road;



**Photo 19: Tocumwal Rd south bound approaching intersection with Corowa Rd and Spring Dr**



**Photo 20: Tocumwal Rd west bound approaching intersection with Savernake Road**





**Photo 21: Tocumwal Rd east bound approaching intersection with Savernake Road**

**Conclusion:** Tocumwal Road MR550 is designated B-double route and is suitable as a heavy vehicle materials haulage route. No traffic mitigating works have been identified.

Figure 1: RMS Restricted Access Vehicle Map for Mulwala

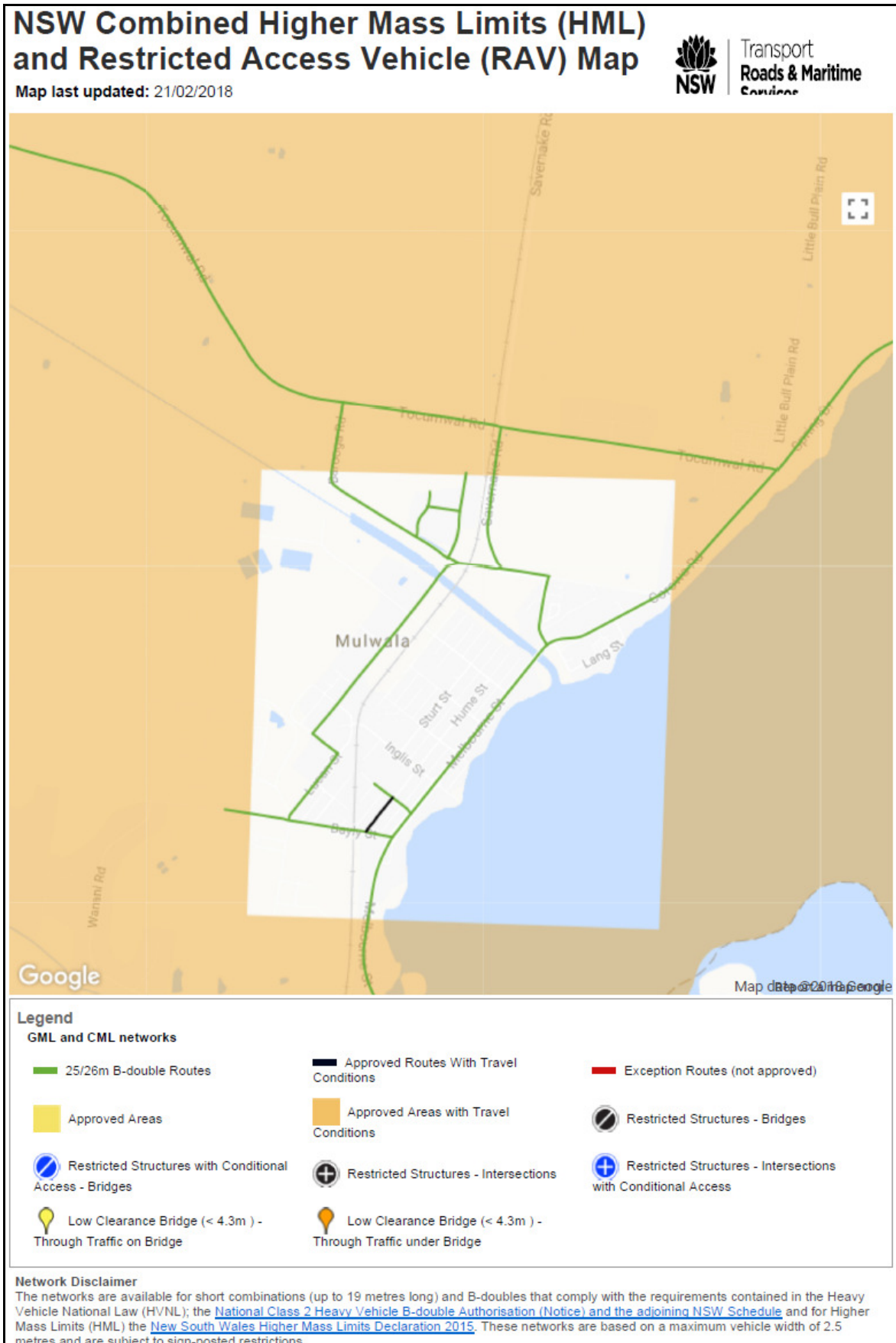
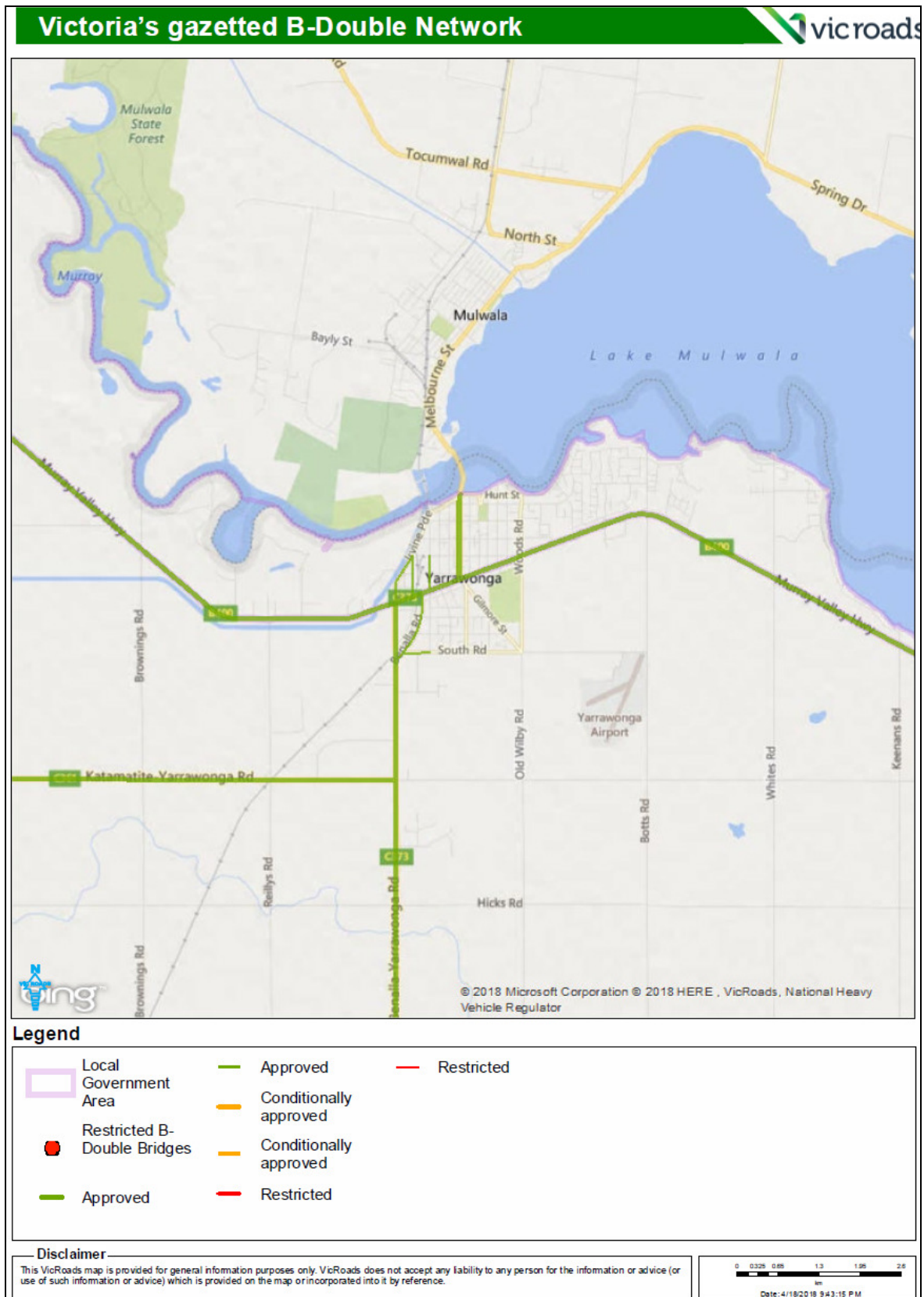


Figure 2: VicRoads B-Double Map for Yarrawonga



### 3.3 Existing Traffic Volumes

Traffic volumes for the RMS classified roads of Melbourne Street, Tocumwal Road and Spring Drive which will be used as the project transportation routes have been sourced from the RMS interactive traffic volume viewer at [www.rms.nsw.gov.au](http://www.rms.nsw.gov.au). A summary of the latest traffic count data for the above roads is shown in Table 3.1 below.

**Table 3.1: RMS Classified Roads ADT AM and PM Peak hour and % Heavy Vehicles traffic volumes**

Location	Year	ADT	AM Peak	PM Peak	% HV
Melbourne Street MR314 (200m South of Cypress Drive)	2017	8,481	1,813	2,723	5.29
Tocumwal Road MR550 (40m west of Savernake Road)	2010	690	174	213	9.42
Spring Drive MR314 (2.5km south of Lees Road)	2010	852	222	263	12.79

In addition, traffic volumes of roads that will be used as the primary transportation routes for the project have been also been sourced from Federation Council. *Refer to Appendix A for copies of the latest traffic count data Location Plans and the results of the traffic counts supplied by the Federation Council.* A summary of the latest traffic count data for the primary transportation roads is shown in Table 3.2 below.

**Table 3.2: Federation Council ADT \*estimated AM and PM Peak hour % Heavy Vehicles traffic volumes and 85<sup>th</sup> Percentile Speed**

Location	Year	ADT	*AM & PM Peak	% HV	85 <sup>th</sup> % speed
Melbourne Street MR314 (between Edward St and Savernake Rd)	2009	4,780	478	7	61
Tocumwal Road MR550 (Between Kingfisher Dr and Spring Dr)	2015	383	38	27	88
Spring Drive MR314 (2.5km south of Lees Road)	2015	1,307	131	19	102
Savernake Road (Between Tocumwal Rd and North St)	2011	886	89	16	81
Corowa Road MR314 (Between Savernake Rd and Tocumwal Rd)	2015	1,880	188	12	67
Savernake Road (North of Tocumwal Rd)	2009	191	19	20	87

**\*Determining AM and PM Peak traffic volumes:** The RMS Traffic Modelling Guidelines Section 9.15.2 Demand Modelling states that: *‘In general, peak hour is assumed to be around 10 per cent of AADT. This varies from city to city depending on the magnitude of the study area, spatial distribution of activities and network congestion...’*



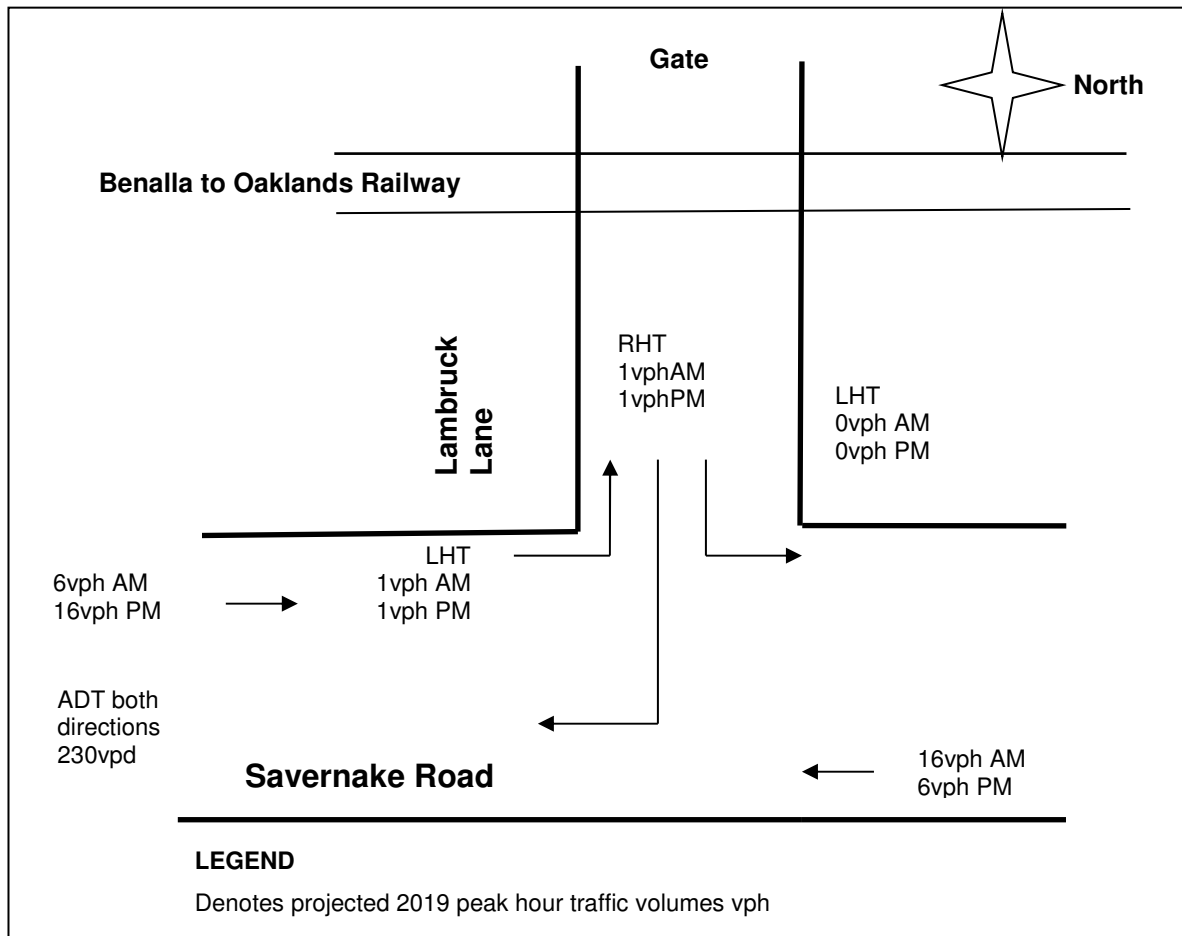
As part of this investigation, peak hour turning movements were calculated at the key access intersection of Savernake Road and Lambruck Lane. These turning movements were calculated using existing traffic data for Savernake Road as shown in Table 3.2.

The following assumptions have been made in determining the existing distribution of traffic:

<b>Assumption</b>	<b>Reasoning</b>
In the AM peak, 70% of traffic generated along Savernake Road will be inbound to Mulwala, and 30% outbound. In the PM peak, the corresponding split will be 30/70.	Industry standard based on RTA Guide to Traffic Generating Developments
Lambruck Lane traffic volumes allow 12 vehicle movements per day and one AM and PM peak hour movement for farming activities	Industry standard based on RTA Guide to Traffic Generating Developments
A standard 2% per annum traffic growth has been applied to the existing volumes for Savernake Road as shown in Table 3.2 to allow for the increase in background traffic volumes arising from general increases across the network. This has been calculated to year 2019 (The year of full development of the proposed Solar Farm).	Industry standard based The RMS Traffic Modelling Guidelines

A summary of the existing turning movements for the intersection are shown in Figure 3.1 below.

**Figure 3.1: Projected 2019 ADT, AM and PM peak traffic flows at the intersection of the Savernake Road and Lambruck Lane**



An analysis of the low traffic volumes at the intersection demonstrates the intersection will operate well within capacity in both the AM and PM peak periods for all movements with minimal delays.

### 3.4 Road Capacity Standards

#### 3.5.1 Lane Capacity

Road width design standards for high volume (urban) and low volume (rural) roads are defined by the *Austroads Guide to Road Design Part 3: Geometric Design* and are based on daily traffic volumes. The current design standards applicable to the proposed primary transportation routes are presented below in Table 3.3.

**Table 3.3 Daily Volumes of Primary Transportation Routes and Corresponding Design Standard**

Daily Traffic	Austroads Design Standard	Relevant Roads	Meets design Volume Standard
1-150	Rural Road. Traffic lanes 3.7m (1x3.7m)	Lambruck Lane (gravel)	Yes
150-500	Rural Road. Traffic lanes 6.2m (2 x 3.1m)	Savernake Road	Yes
<20,000	Urban Road. Traffic lanes 4.2-4.5m locations where motorists and cyclists use the same lane. Divided by raised median	Melbourne Road MR314	Yes
1,000-3,000	Urban Road. Traffic lanes 4.2-4.5m locations where motorists and cyclists use the same lane	Corowa Road MR314	Yes
1,000-3,000	Rural Road. Traffic lanes 7.0m (2 x 3.5m)	Spring Drive MR314	Yes
1,000-3,000	Rural Road. Traffic lanes 7.0m (2 x 3.5m)	Tocumwal Road MR550	Yes

The primary transportation routes have acceptable road cross sections which meet the Austroads road design standard for the daily traffic volumes using each route. In most cases there is also a margin of extra traffic capacity to accommodate any daily traffic increases, without requiring any increase to the design standard of the route.

### 3.5 Public Transport

The identified primary transportation routes are all school bus routes. Thomson's currently operates the Mulwala to Yarrawonga public bus routes, Monday to Saturday on Melbourne Road.

## 4. Proposed Development

### 4.1 Site Construction

ESCO Pacific Pty Ltd is proposing to develop and operate an 80-megawatt solar farm at Mulwala NSW consisting of the following key infrastructure elements:

- Land area approximately 215 hectares
- Main access is from Lambruck Lane via constructed 7m wide gravel road to main gate and a minor access to the switch yard is from Tocumwal Road
- installation of solar panels in regular arrays
- metal mounting structures
- above ground and underground DC cabling (low voltage)
- central inverters, step up transformers, and switchgear (PCUs)
- battery storage area
- underground AC cabling that would run from the PCUs to the solar substation (high voltage)
- a main step-up transformer and associated equipment
- perimeter safety fencing and security system
- supervisory control and data acquisition (SCADA) control systems
- site office and staff amenities
- maintenance shed
- permanent staff and contractor car parking area
- permanent all-weather site access (6 m wide) from Lambruck Lane
- internal vehicle access tracks (4 metres) leading to solar arrays and PCUs
- temporary site compound, lay-down area, and equipment storage areas during construction.
- monitoring systems, and electrical protection systems.

### Construction Equipment

Construction equipment required for the establishment of the solar farm will be limited to heavy machinery and plant generally used across the wider construction industry.

- 1 x Truck and dog for civil works;
- 1 x D6 dozer or equivalent for levelling and road development;
- 1 x 24 tonne excavator for earthworks
- 1 x grader for road development and levelling activities
- 1 x mulcher for the mulching and re-use of vegetation material onsite;
- 1 x 7 tonne vibrating roller for road construction
- 1 x front end loader for the movement and loading of soil and aggregate materials;
- 1 x water cart for road construction and dust suppression;
- 1 x piling rig for installing PV piles;
- 1 x Franna crane for the lifting of loads, erection of steel, and movement of heavy plant;
- 2 x trenchers for the installation of underground conduits and cabling;

- 1 x portable generator for temporary site power;
- Hand power tools and equipment.

### Construction Schedule

The construction of the Mulwala Solar Farm is expected to take up to 8 months, which each construction aspect and duration detailed below in Table 4.1.

**Table 4.1 Construction Schedule**

Activity	Month							
	1	2	3	4	5	6	7	8
Site Preparation and Establishment								
Civil Works (roads & drainage)								
Installation of PV piles, support structures, and trackers								
Installation of PV panels								
Cabling of PV Strings								
Installation of Central Inverters								
Installation of Underground Cabling from Central Inverters								
Installation of switch equipment, Step up Transformer, and Site Office								
Connection to Transmission Line								
Commissioning								

Construction activities at the site would occur from 7am to 6pm Monday to Friday and from 8 am to 1 pm on Saturdays. No construction activities would occur on Sundays or public holidays.

It is anticipated that construction activities would staggered over an 8-month period which will allow for the gradual development and commissioning of the facility.

### Workforce

The anticipated 150 workers will be required during construction and four operational staff posted at the solar facility to manage the site activities and to support routine plant operations and maintenance after completion.

## Traffic

Traffic generation volumes during the construction of the solar farm have been determined using the indicative construction traffic movements as shown in Table 4.2 below.

It is anticipated that the average **traffic generation during the construction** phase will peak during month five with 156 vehicle movements per week (13 heavy vehicle + 26 light vehicles x 4 weeks), or 39 movements per day (13+26). Construction traffic will be generated from the following sources:

- Light vehicle movements for construction workers;
- Delivery of high voltage equipment, PV components, and related construction materials;
- Delivery of construction materials for the permanent site office, switch yard, and maintenance buildings;
- Delivery of temporary construction worker toilets, lunchrooms, and site office;
- Mobilisation and de-mobilisation of heavy plant and equipment; and
- Delivery of aggregates and concrete for civil works.

In addition, it is expected that during the non-peak construction periods (months 1-4 and 7-8) the average traffic vehicle generation is expected to peak at 24 movements per day (8 heavy vehicles + 16 light vehicles). At least 10 oversized vehicles will be required during construction stage.

It is anticipated that the average **traffic generation during operations** will peak at 14 movements per week, or less than two movements per day.

**Table 4.2 Indicative Construction Traffic Movements**

Monthly Construction Traffic - Heavy Vehicles									
Material Delivery	1	2	3	4	5	6	7	8	9
Modules (40' Container)					129	129	129	129	
Inverter Stations (40' Container)				10	10	10	10		
Tracking System (40' Container)		84	84	84	84	84			
33kV Switchgear + O&M Facilities (Oversized)					3				
132kV Transformer (Oversized)							1		
Balance of System (40' Container)	18	18	18	18	18	18	18	18	
Civil Construction (Semi-trailer)		27	27	27	27				
Construction Plants (Semi-trailer)	8	8	8	8	8	8	8	8	
<b>Total Heavy Vehicle Movements</b>	<b>26</b>	<b>137</b>	<b>137</b>	<b>147</b>	<b>279</b>	<b>249</b>	<b>166</b>	<b>155</b>	
<b>Average Daily Heavy Vehicle Movements</b>	<b>2</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>13</b>	<b>12</b>	<b>8</b>	<b>8</b>	

Monthly Construction Traffic - Light Vehicles									
Construction Labour	1	2	3	4	5	6	7	8	9
<b>Total Light Vehicle Movements</b>	<b>54</b>	<b>282</b>	<b>282</b>	<b>303</b>	<b>574</b>	<b>512</b>	<b>342</b>	<b>319</b>	
<b>Average Daily Light Vehicle Movements</b>	<b>2</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>26</b>	<b>23</b>	<b>16</b>	<b>15</b>	

Refer to Mulwala Solar Farm Project Information document for more details.

## 4.2 Site Decommissioning

### Infrastructure Removal

At the end of Mulwala solar farm's operational life of 40 years the development area would be decommissioned. During decommissioning, all above ground infrastructure would be removed. Key elements of Project decommissioning would include:

- Disconnection of the solar farm from the Essential Energy connection point at the Substation;

- PV modules would be disconnected and removed, including the mounting posts, mounting frames, and trackers. Materials would be sorted and packaged for removal from the site for recycling or reuse. Much of the solar array panels would be recyclable;
- All buildings and equipment would be removed and materials recycled, wherever possible;
- Steel columns and cabling would be removed and recycled;
- Fencing would be removed (unless requested otherwise by the land owner); and
- Commencement of site rehabilitation and re-instatement of
- Monitoring and mitigation measures.

### **Site rehabilitation**

Site rehabilitation would involve firstly the removal of all infrastructure as detailed above. Following infrastructure removal the following would be undertaken to re-instate the site for agricultural activities, including:

- Removal of gravel from internal tracks and roads;
- Removal of any concrete and foundations;
- Deep ripping of any compacted areas to allow for the infiltration of water and to allow for cropping activities;
- Re-establishment of groundcover in any areas where cropping is not to occur to ensure the stabilisation of soil resources;
- Use of groundcover species that are compatible with the existing species composition; and
- Establishment of suitable erosion and sediment control.

### **Traffic**

It is anticipated that traffic generation and types of vehicles used for the decommissioning will be similar to and no greater than traffic generation for construction. It is expected that the decommissioning period will be shorter than construction. will Refer to details of construction traffic in Section 4.1 above.

It is anticipated that the average **traffic generation during decommissioning** will peak at 150 movements per week, or 23 movements per day.

## **5. Future Traffic Growth and Analysis**

### **5.1 Existing Traffic Growth**

A standard 2% per annum traffic growth has been applied to the existing volumes shown in Tables 3.1 and 3.2 to allow for the increase in background traffic volumes arising from general increases across the network. This has been calculated to year 2019 (The year of full development of the proposed Solar Farm). *Refer to Figure 5.1 below.*

### **5.2 Traffic Generation by Proposed Development**

Traffic generation levels for the proposed solar farm are established using the rates suggested above in Table 4.2 Indicative Construction Traffic Movements. Traffic generation rates are as follows:



### During Construction

- 156 vehicle movements per week during peak construction via Savernake Road and Lambruck Lane;
- 39 vehicle movements per day;
- Allow four vehicle movements for AM and PM peak hour movements (10% of daily traffic).  
*Refer to Section 3.3 \*Determining AM and PM Peak traffic volumes.*

### During Operations

- 14 vehicle movements per week via Savernake Road and Lambruck Lane;
- Two movements per day;
- Allow two vehicle movements AM and PM peak hour movements
- Allow one vehicle per week via the access driveway at the switching yard on Tocumwal Road.

### During Decommissioning

It is anticipated that traffic generation for the decommissioning will be no greater than traffic generation for construction:

- 156 vehicle movements per week;
- 39 vehicle movements per day;
- Allow four vehicle movements AM and PM peak hour movements

## 5.3 Traffic Distribution and Analysis

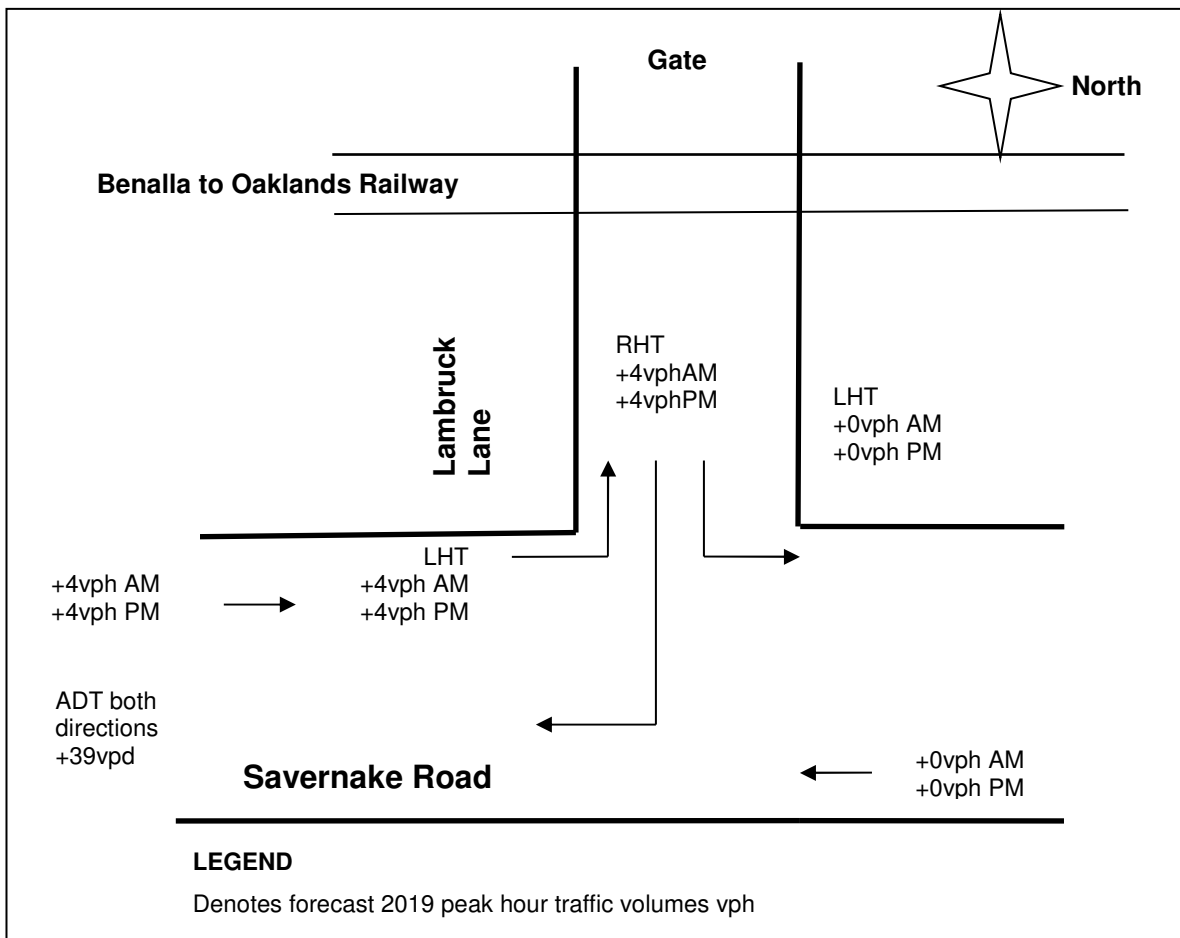
It is anticipated that traffic generated by the solar farm development will be distributed throughout the existing road network depending on origin/destination and route choices of delivery, construction and operational traffic. This can be estimated by assessing likely origins and destinations based on existing traffic flows on the primary transportation routes.

It is assumed that at the majority of **construction, operation and decommissioning traffic** will arrive at the site (Lambruck Lane) from the south following a north bound travel direction using the primary transportation routes via the intersection of Savernake Road and Lambruck Lane. In addition, during the **operational phase** it is assumed that one vehicle per week will access the switch yard driveway from Tocumwal Road. *Refer to Section 1.3 for the map of the Primary Transport Routes.*

This assumption has been used to determine the additional traffic likely to be generated at the key intersection of Savernake Road and Lambruck Lane.

A summary of the additional turning movements for the intersection of Savernake Road and Lambruck Lane are shown in Figure 5.1 below.

**Figure 5.1: Forecast 2019 ADT, AM and PM peak traffic flows at the intersection of the Savernake Road and Lambruck Lane**



## 6. Impacts & Mitigating Works

The impacts of the proposed solar farm development are primarily related to the increase in heavy vehicle movements delivering materials for construction, the day to day operations of construction personnel and the removal of materials during the decommissioning phase at the following locations:

- On the existing road network, mainly related to the primary transportation routes;
- At the existing T-junction intersection of Savernake Road and Lambruck Lane primarily related to the increase in heavy vehicle turning traffic volumes generated by the construction traffic;
- At the proposed switching yard access driveway on Tocumwal Road; and
- The Benalla to Oaklands railway line primarily related to the increase in construction traffic crossing the existing railway line to access the construction site on Lambruck Lane.

The impacts are quantified below and appropriate mitigating works are recommended, if required.

## 6.1 Sight Distance

### Savernake Road

The existing speed limit for Savernake Road at the intersection of Lambruck Lane is 100km/h. The minimum safe intersection sight distance (SISD) as set out in the *Austrroads Guide to Road Design Part 4A: Section 3 Sight Distance, Table 3.2* for a design speed of 100km/h is 262 metres for a reaction time of 2.5 seconds. These criteria are satisfied at the existing T-junction intersection in both directions with measured inter-visible sight distances of over 350 metres in both directions. *Refer to Photos 6 and 7.*

### Tocumwal Road Switching Yard Access Driveway

The existing speed limit for Tocumwal Road at the proposed switching yard access driveway is 80km/h. The minimum safe intersection sight distance (SISD) as set out in the *Austrroads Guide to Road Design Part 4A: Section 3 Sight Distance, Table 3.2* for a design speed of 80km/h is 181 metres for a reaction time of 2.0 seconds. These criteria are satisfied at the proposed switching yard access driveway junction with Tocumwal Road with measured inter-visible sight distances of over 250 metres in both directions. *Refer to Photos 22 and 23 below.*

### Benalla to Oaklands Railway Line

The minimum stopping sight distance (SSD) as set out in the *Australian Standard 1742 Part 7: Railway Crossing, Figure D2 Stop and Start up visibility at passive control railway crossing* for a B-double vehicle with a design speed of 60km/h is 117 metres for a reaction time of 2.5 seconds. These criteria are satisfied at the existing railway crossing on Lambruck Lane in both directions and on both sides with measured sight distances of over 700 metres. *Refer to Photos 4 and 5.*



**Photo 22: Tocumwal Rd at proposed location of switching yard access driveway looking east bound showing clear sight distance**



**Photo 23: Tocumwal Rd at proposed location of switching yard access driveway looking west bound showing clear sight distance**

## **6.2 Primary Transportation Routes**

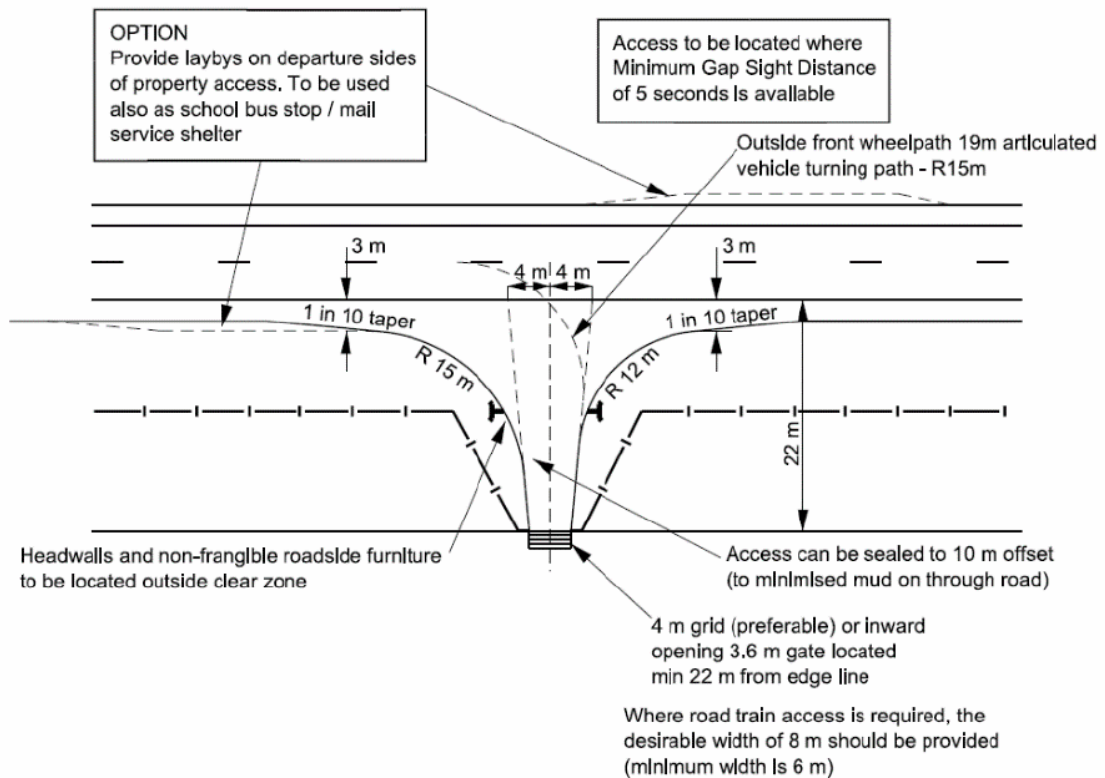
The impact of the solar farm development on the roads identified as the primary transportation routes for the delivery of construction materials, the day to day access by construction personnel and the decommissioning is considered minimal. All primary transportation roads are designated B-double routes and meet the Austroads standards for road capacity and it is determined that the existing carriageway widths, signage/delineation and intersection treatments (roundabouts, CHR's, offset T-junctions and give way conditions) will more than satisfactorily cope with the minor increase of 23 vehicle movements per day of construction traffic. *Refer to Section 3.2 Road Network and Transport Routes and Section 3.5 Road Capacity Standards for more details.*

## **6.3 Intersection of Savernake Road and Lambruck Lane**

An examination of the addition construction traffic volumes at the intersection demonstrates the intersection will continue operate well within capacity in both the AM and PM peak periods for all movements with minimal delays. *Refer to Figure 5.1 for additional traffic volumes.*

However, to ensure traffic safety and to allow for heavy vehicles turning at the intersection of Lambruck Lane, the gravel road connection should at a minimum be sealed and reconstructed in accordance with *Austroads Guide to Road Design Part 4: Intersections and Crossings - General Figure 7.4*. This treatment allows for articulated vehicles and the left-in/left-out dual access for single unit trucks. A minimum sealed width of 8 metres should be provided at the railway crossing to allow for the safe two-way passing of larger vehicles.

**Figure 7.4: Example of a rural property access specifically designed for articulated vehicles**



*Note: Minimum requirement for a single carriageway with design AADT < 2000 or minimum requirement for dual carriageway left-in-left-out access for single unit truck. Where AADT > 1000 and access is required for a semi-trailer then use the layout.*

*Source: Department of Main Roads (2006)<sup>10</sup>.*

In addition, the increase in construction traffic using the intersection and crossing over the railway line warrants the provision of additional railway crossing warning signage on both the Savernake Road approaches to the intersection. Additional railway crossing warning signage on Savernake Road should be installed in accordance with *Australian Standard 1742 Part 7: Railway Crossing, Figure 4.10 Railway crossing on side road controlled by stop signs (passive control)* as shown below.





- 1 If more than one track, the TRACKS sign, W7-2-2, is added to the assembly.
- 2 Stop lines (see Clause 3.3) are required on sealed roads at crossings controlled by STOP signs.
- 3 The barrier line (see Clause 3.5) extends from the crossing to the through road.
- 4 If the intersection itself requires an intersection warning sign in accordance with AS 1742.2 it will be placed at this position. The crossing on side road diagrammatic sign is required only if the intersection itself requires an intersection warning sign in accordance with AS 1742.2. The various alternatives and uses for these signs are described in Clause 2.2.6.
- 5 If this distance is less than 50 m, the advance signs are placed as shown. If the distance is greater than 50 m but less than  $(50 + A)$  m, sign W3-1 is placed in the side road 50 m from the crossing, with assembly RX-4 only on the through road. If the distance is greater than  $(50 + A)$  m, all signs are placed in the side road in accordance with Figure 4.4.
- 6 If this distance is 25 m or less, an additional assembly RX-2 may be required (see Clause 4.4.1).
- 7 This dimension is measured from the point at which turns into the side road are completed. A single continuous line over this length may be substituted for the two-way barrier line.
- 8 Advance warning of the railway crossing is not required on this approach.

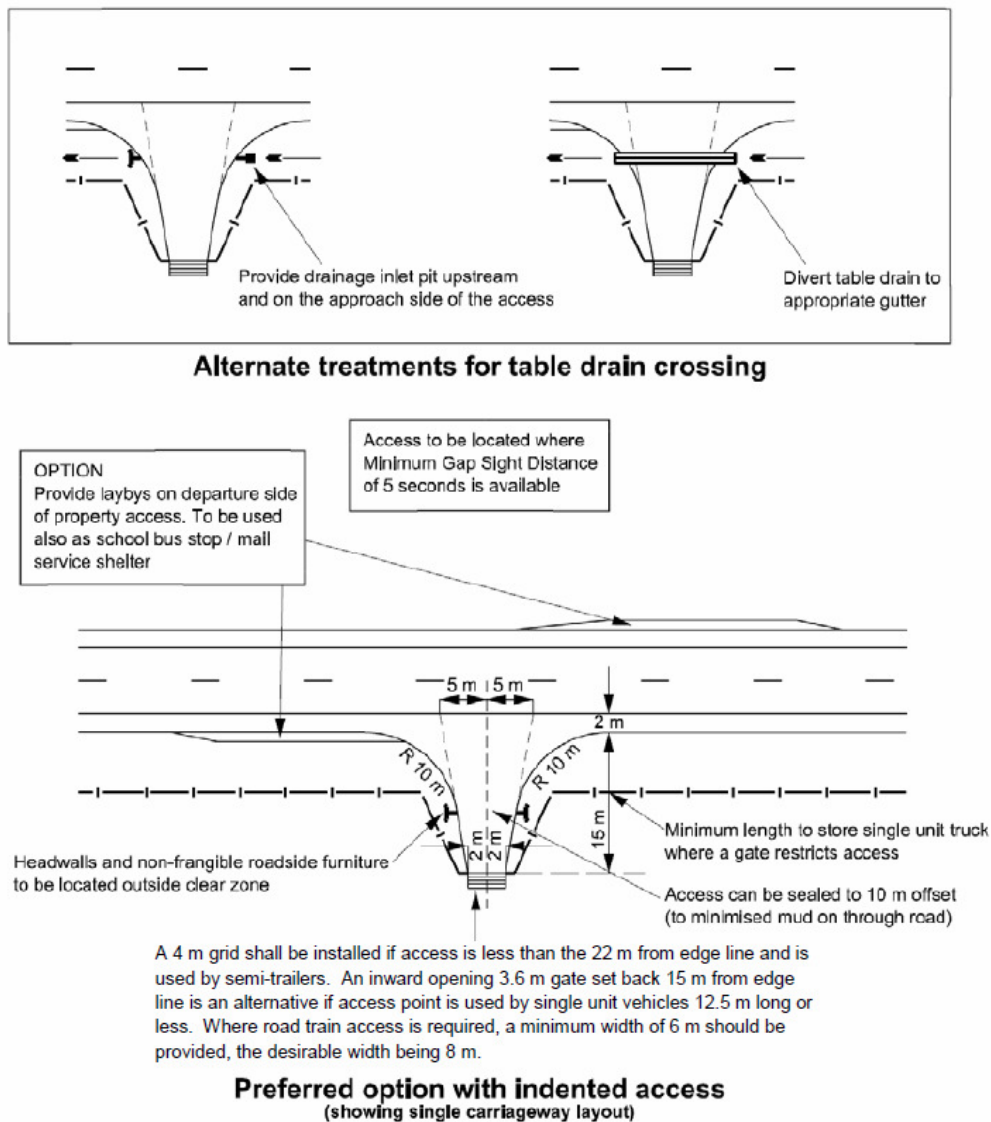
FIGURE 4.10 RAILWAY CROSSING ON A SIDE ROAD CONTROLLED BY STOP SIGNS (PASSIVE CONTROL)

Construction of the sites 7m wide gravel access driveways that are to be provide to the land parcels north and south of Lambruck Lane should be constructed in accordance (similar to) with *Austrroads Guide to Road Design Part 4: Intersections and Crossings – General Figure 7.4*.as shown in Section 6.3 above. Sealing of the driveway connection to Lambruck Lane is determined not to be necessary in this situation.

## 6.5 Tocumwal Road Switching Yard Access Driveway

The estimated movement of one light vehicle per week at the switching yard access driveway will have an insignificant impact on through traffic on Tocumwal Road. However, to ensure traffic safety and to allow for the occasional single unit truck movement the access driveway should be constructed in accordance with *Austrroads Guide to Road Design Part 4: Intersections and Crossings – General Figure 7.2 as shown below*

**Figure 7.2: Example of a layout of a rural property access – single or dual carriageway (conditional)**



## 6.6 The Benalla-Oaklands Railway Line

The Benalla-Oaklands railway line operates on a seasonal basis and its busiest period of operation is during grain harvests. Train movements are approximately one train per week during harvest.

The railway crossing is classified as a stopping and start up railway crossing with passive control treatments. The existing signage at the crossing is in accordance with *Australian Standard 1742 Part 7: Railway Crossing, Figure 4.10 Railway crossing on side road controlled by stop signs (passive control)* as shown above.

The Australian Rail Track Corporation (ARTC) has been contacted with no response in regards to any intended works on the railway line.

The existing gravel pavement on Lambruck Lane is built up to rail level which allows for the smooth crossing of the railway line. *Refer to Photos 1 and 2 for details.* Existing vehicle movements over the railway line include cars, farm machinery; and semi-trailer and B-double stock trucks. It is anticipated that the existing railway crossing will withstand the increase in heavy vehicle traffic during the construction phase of the solar farm.

## 6.7 Traffic Management Plan

A Construction Traffic Management Plan, which will utilise Austroads and RMS guidelines will be developed for all roads adjacent to the site including the intersection of Savernake Road and Lambruck Lane. The Construction Traffic Management Plan shall be produced in accordance with RMS Traffic Control at Worksites 2010 after an appropriate risk assessment has been carried out.

In addition to compliance with RMS standards, the Construction Traffic Management Plan should address periodic grading and dust control along Lambruck Lane. Temporary traffic control arrangements may be required at the intersection of Savernake Road and Lambruck Lane and the site access intersections with Lambruck Lane during the peak stages of construction traffic activity and on days when deliveries by oversize vehicles may be required.

## 6.8 Solar Panel Reflection and Glare Affecting Traffic Safety

Data from the Mulwala sun path has been utilised to develop the mechanical behaviour of the proposed solar panels as shown in Figure 6.1 below. *Refer to the Visual Impact Assessment Section 6 Reflectivity Assessment for more detail.*

Figure 6.1 Mechanical Behaviour of the Mechanical Behaviour of the Proposal, highlights the angle of the solar panels with respect to the time of day. The solar panels would remain at a stationary and constant 45-degree angle from sunrise (first light) at approximately 6:00am, until about 9:00am when the solar panels will begin to move and follow the path of the sun. Likewise, from approximately 4:30pm until sunset (last light) the solar panels will remain at a constant -45-degree angle. Considering that the solar panels will remain at a static 45-degree angle in the mornings and

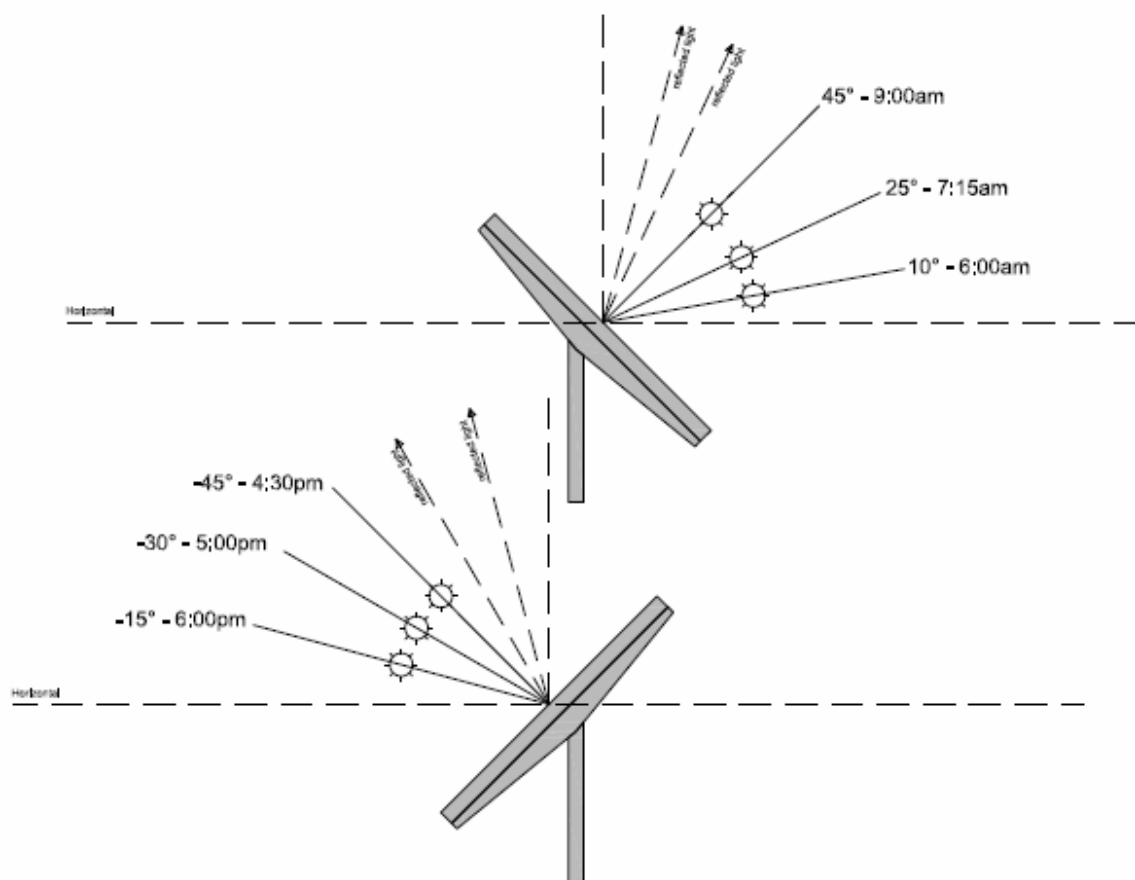


afternoons, the resulting specular glare is likely to have a **negligible** influence on motorists travelling towards the solar farm, and any glare would reflect in an opposing direction away from the receptor.

The potential for glare associated with non-concentrating photovoltaic systems which do not involve mirrors or lenses is relatively limited. Photovoltaic solar panels are designed to absorb the highest amount of solar energy possible to generate the maximum amount of electricity.

This results in negligible glare, reflecting as little as 2% of the sunlight received (Spaven Consulting 2011).

**Figure 6.1: Mechanical Behaviour of the Proposal**



There are additional, necessary solar farm infrastructure that may cause glare or reflections depending on the sun angle. These include:

- Steel array mounting structures - array mounting would be steel or aluminium.
- Temporary site offices, sheds, containerised inverter stations.
- The on-site substation.
- Perimeter fencing.
- Permanent staff amenities.

This infrastructure would be relatively dispersed and **unlikely** to present a glare or reflectivity hazard to motorists.

## 7. Conclusions and Recommendations

### It is concluded that:

- The additional peak construction traffic of 39vpd generated by the solar farm development will have a minimal impact on the operations of the intersection of Savernake Road and Lambruck Lane and it will continue operate well within capacity in both the AM and PM peak periods for all movements;
- An additional one vehicle movement per week at the switching yard access driveway will have an insignificant impact on through traffic on Tocumwal Road;
- Sight distance criteria is satisfied at all access intersections and driveways;
- The sealing and widening and turning movement improvements on the existing gravel section of Lambruck Lane at the intersection of Savernake Road will ensure the safe operations of heavy vehicles at the intersection;
- There will be minimal impact from the solar farm development on the roads identified as the primary transportation routes for construction activities because all primary transportation roads are designated B-double routes and they meet the Austroads Standards for road capacity;
- The increase in construction traffic using the intersection of Savernake Road and Lambruck Lane and crossing the railway line warrants additional railway crossing warning signage on Savernake Road to improve rail crossing awareness;
- The glare and reflection from the solar farm infrastructure will have a negligible influence on motorists and no adverse effect on traffic safety.

### It is recommended that:

- Federation Council concurs with the proposed solar farm development accesses and the use of the primary transportation routes;
- Federation Council concurs with reconstruction works at the intersection of Savernake Road and Lambruck Lane to improve the surface and ensure the safe operations heavy vehicle turning movements;
- Federation Council concurs with the installation of railway crossing warning signage on Savernake Road to improve rail crossing awareness.

## Appendix A

RMS Traffic Data obtained from traffic viewer [www.rms.nsw.gov.au](http://www.rms.nsw.gov.au)

A1: Melbourne Street Mulwala at northern side of Mulwala/Yarrowonga Bridge

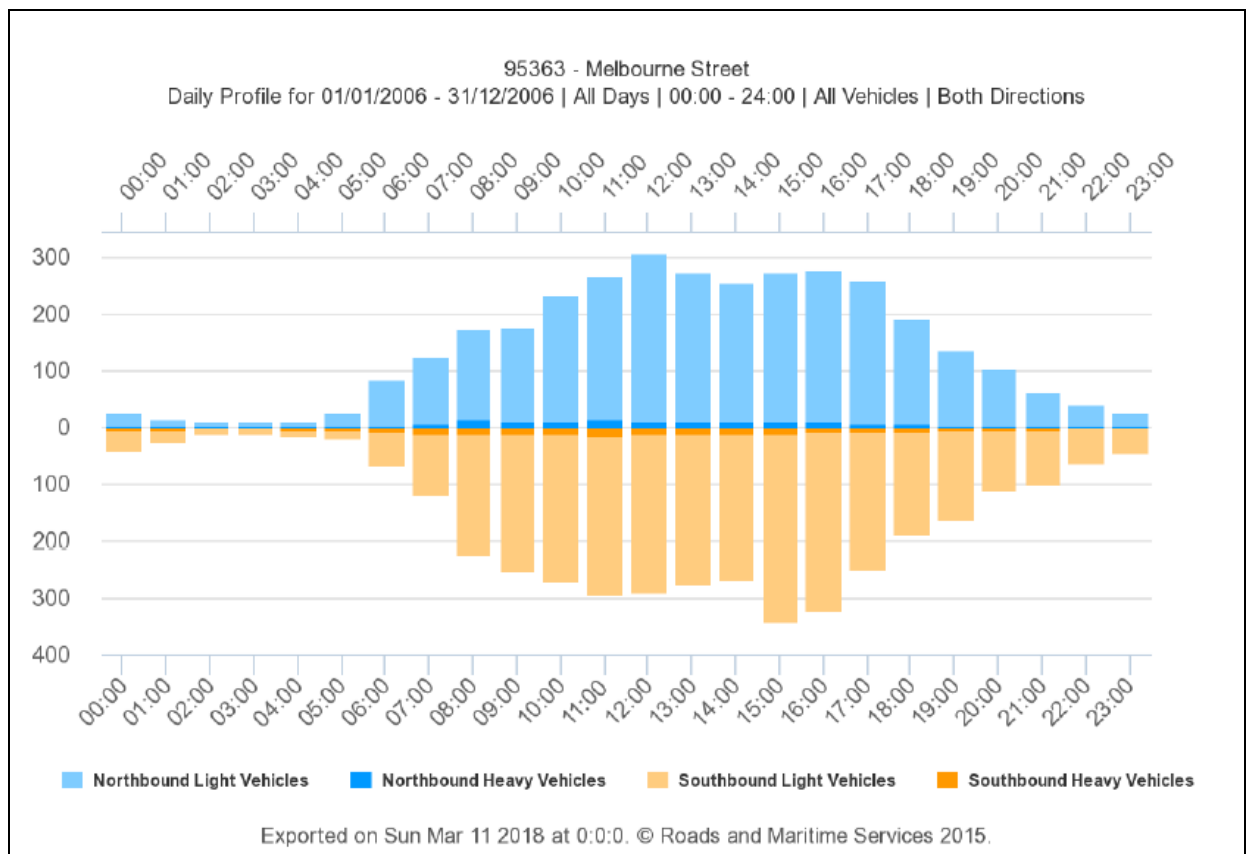
A2: Tocumwal Road west of Savernake Road

A3: Spring Drive 2.5km south of Lees Road

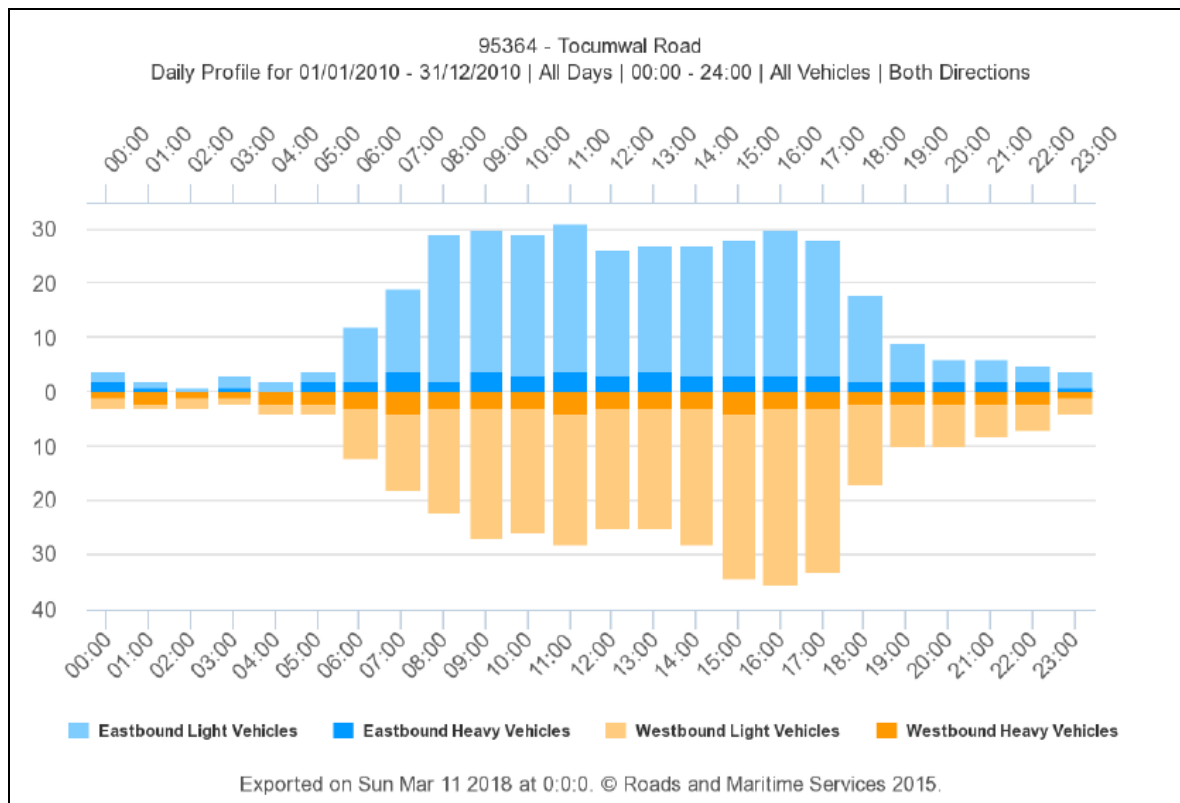
Federation Council Traffic Data Plan

A4: Latest traffic data plans 1 and 2

### A1: Melbourne Street Mulwala at northern side of Mulwala/Yarrowonga Bridge

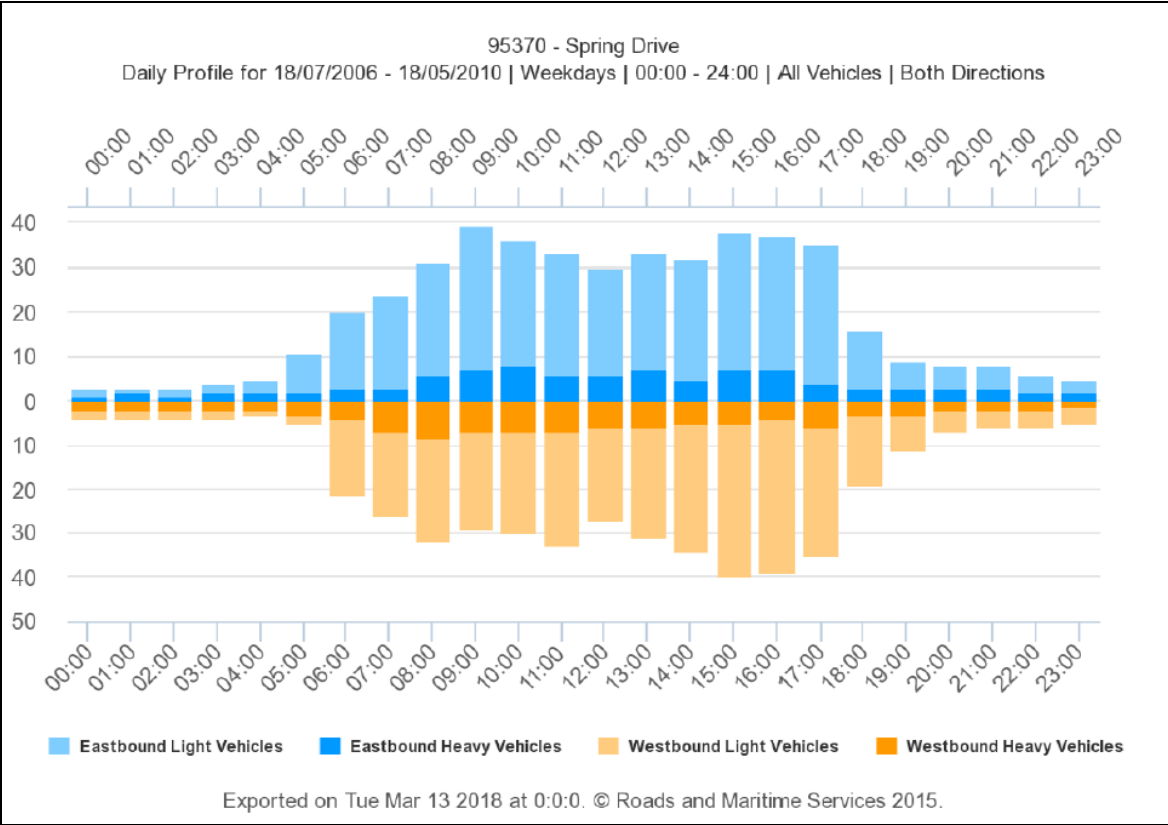


## A2: Tocumwal Road west of Savernake Road



## A3: Spring Drive 2.5km south of Lees Road





## A4: Federation Council Latest traffic data plan (1)



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### Important Notice

This map is not a precise survey document. Accurate locations can only be determined by a survey on the ground.

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Date: 4/04/2018 10:45 AM

Scale: 1:10000 at A3

Projection: GDA94 / MGA zone 55

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## A4: Federation Council Latest traffic data plan (2)



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Date: 4/04/2018 10:46 AM  
Scale: 1:4000 at A3  
Projection: GDA94 / MGA zone 55

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