Kojonup BESS Project - Collie Changerup Road

TRANSPORT IMPACT ASSESSMENT

81113-948-FLYT-TIA-0005 Rev3

PROJECT	81113-948-FLYT-TIA-0005 Rev3			
TITLE	Kojonup BESS Project - Collie Changerup Road			
Revision	Description	Originator	Review	Date
0	Draft	CAS	CXS/Project	24/10/25
1	Issued	CAS	CXS/Project	12/12/25
2	Reviewed	CAS	CXS/Project	23/03/26
3	Final	CAS	CXS	02/04/26

Contents

1. SUMMARY

Item	Response
Local Government	Shire of Kojonup
Indigenous Land Use Area (ILUA)	Gnaala Karla Booja Aboriginal Corporation (GKB AC) and Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC)
Site Lot(s)	Lots 3194 & 8869 on Deposited Plan 227649
Street Frontage	Collie-Changerup Road and Tunney Road
Development Type(s)	Battery Energy Storage System (BESS) Facility
Local Planning Scheme	Shire of Kojonup Local Planning Scheme No. 3
Access Crossovers	One crossover on Collie-Changerup Road and Tunney Road for inbound and outbound movements
Parking Provision	The final number and location of parking spaces for the operations phase will be determined through detailed design
Vehicle Trips Generated	The daily movement of vehicles to and from Project Area would vary depending on the areas where works would be taking place and the timing of those movements would also vary depending on a range of factors. Some movements may be once a week – for example a skip delivery truck or fuel truck, whereas others may be more frequent such as water trucks (estimated five per day for dust suppression and construction water) or concrete trucks (multiple movements per day depending on stage of construction). For the maximum number of staff on the Project Area during concurrent stages, that is estimated at being 87 therefore daily volumes for light vehicle trips associated with this would be 174 trips if all were single occupancy trips. Truck movements for construction activities would be additional trips to and from the Project Area based on the delivery program. Volume of trips estimated for the construction activities would be catered for on the existing network.

2. INTRODUCTION

2.1 Development Introduction

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Development Application (DA) submitted for the proposed Kojonup Battery Energy Storage System (BESS) (the Project) facility off Collie-Changerup Road (official signposted name although some mapping refers to it as the Darkan-Kojonup Road). The general location of the Project Area, north of Kojonup, is shown in Figure 1.

Figure 1 Location of the Project Area (source: Metromap)

2.2 Transport Impact Assessment

This TIA has been prepared in accordance with the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 4 – Individual Developments). The Guidelines promote a three level assessment process, where the required level of assessment is dependent on the likely level of impact, as follows (and as shown in Figure 2):

- Low impact – less than 10 peak hour trips, no assessment required.
- Moderate impact – between 10 and 100 peak hour trips, Transport Impact Statement required.
- High impact – more than 100 peak hour trips, full Transport Impact Assessment required.

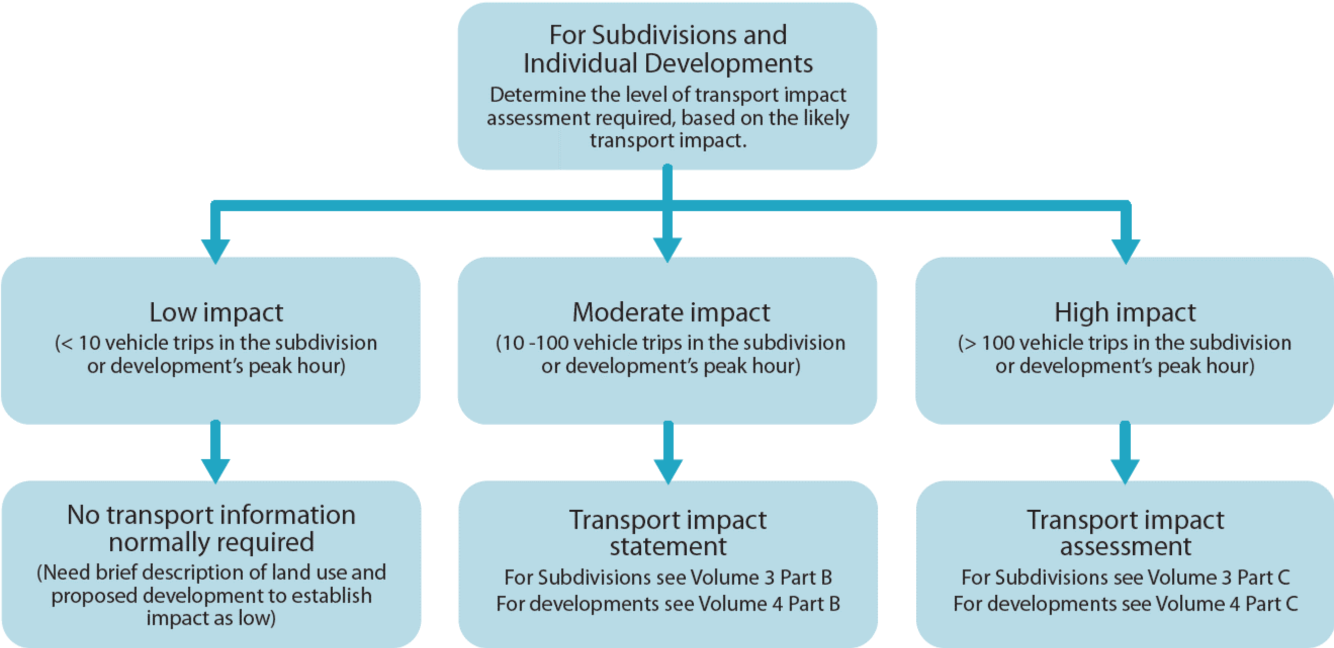

Figure 2 Level of transport impact assessment required (source: WAPC Transport Impact Assessment Guidelines, 2016)

As set out in section 6, the proposed development is a BESS facility which will have a limited volume of vehicle trips associated with its operation however there would be additional traffic volumes associated with the construction stage of the Project.

Traffic volumes attributable to the proposed development has been determined to have a low impact with less than 100 vehicle trips generated by the proposed Project Area even during construction, therefore the required level of assessment is realistically a Transport Impact Statement (TIS). Due to the nature of the development being proposed, specific additional reporting and information has been provided in the assessment whereas other elements of a "typical" TIS have not been addressed as they have no relevance to the development.

2.3 Report Structure

The report is structured as required by the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 4 – Individual Developments), with the following items addressed:

- Development proposals and site context (Section 3)
- Vehicle access and parking (Section 4)
- Provision for service vehicles (Section 5)
- Traffic volumes and vehicle types (Section 6)
- Site specific issues (Section 7)
- Summary (Section 8).

Given the nature of the development and its location within a rural setting, there has been no coverage of elements that are not relevant to this application which includes pedestrian networks, bicycling networks and public transport accessibility.

3. PROPOSED DEVELOPMENT AND SITE CONTEXT

3.1 Development Site Context (Project Area)

The Project Area is located at the intersection of Tunney Road and Collie-Changerup Road in the Shire of Kojonup and as indicated by the South West Aboriginal Land and Sea Council website; it sits on the boundary of the Gnaala Karla Booja Land Use Agreement Area and the Wagyl Kaip Ilua Land Use Agreement Area.

The Project Area, and works associated with the proposed development, is within a Rural zone as set out in the Shire of Kojonup Local Planning Scheme No.3. The Project Area is shown on the LPS map in Figure 3.

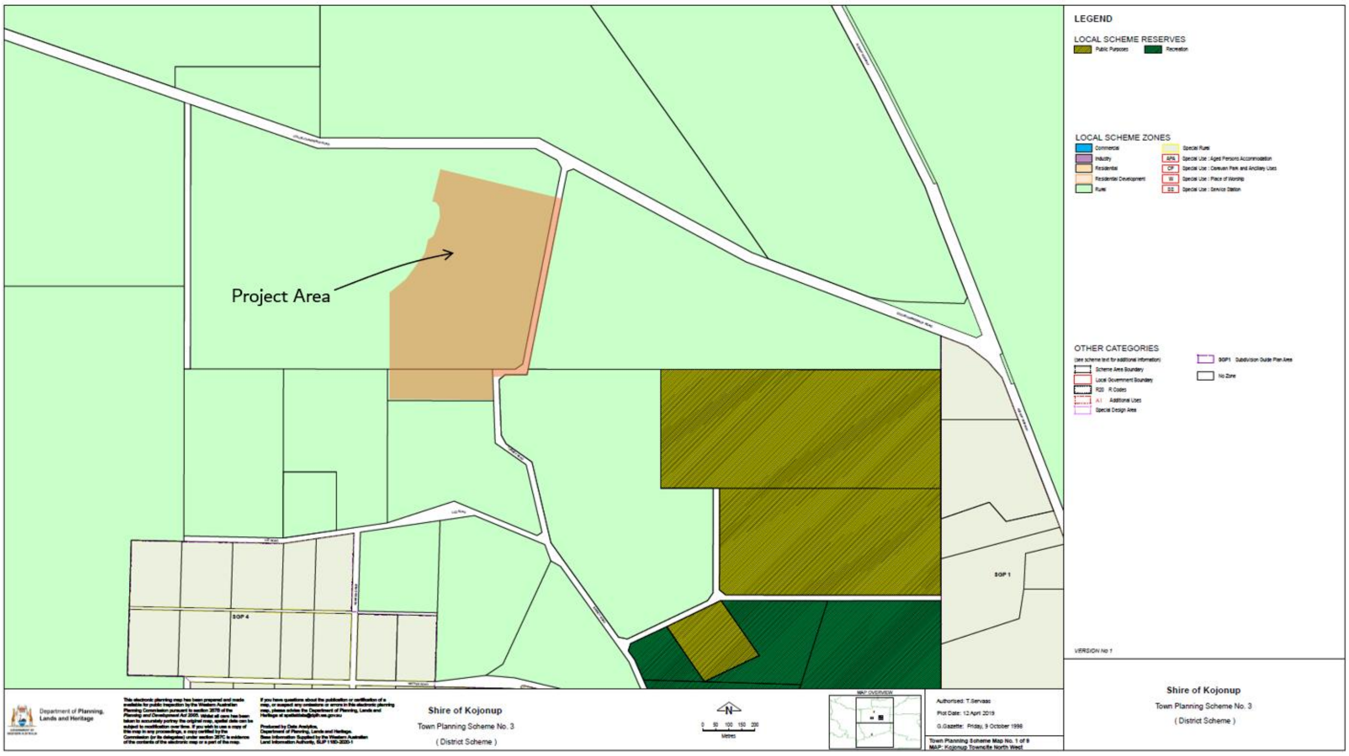

Figure 3 Planning map extract from Shire of Kojonup Local Planning Scheme No.3 (source: WAPC)

The existing site is predominantly used for broadacre agricultural purposes and there is no formed development on the site, with a rural dam sitting to the south of the site. There are existing formed rural crossovers into the paddock on both Collie-Changerup Road and Tunney Road that provide existing access.

The context of the existing site and its surrounds adjacent to Collie-Changerup Road is shown in Figure 4.

Figure 4 Aerial image of site area (source: Metromap)

3.2 Proposed Development

The Project is a BESS, with an indicative installed capacity of up to 800MWh (100 MW x 8 hours), with an indicative permanent disturbance footprint of approximately 3.6 ha.

The Project will include:

- BESS units, inverters and transformers
- Civil and structural works including laying of crushed rock
- Internal access roads and access (and egress) points
- Underground cabling (33 kV) to provide a connection between the battery units and inverters and on-site substation
- On-site substation including transformer to step up from 33 kV to the connection voltage at 132 kV, reactive power support equipment, protection and control devices
- Underground cabling (132 kV) to connect the onsite substation to the existing Kojonup Substation
- Permanent Operations and Maintenance (O&M) Facility
- Water storage (including firefighting water supply and fire water runoff containment / stormwater detention basin)
- A new access point off Collie-Changerup Road (Main Access), and a new access point off Tunney Road (Secondary Access)

- Security fencing
- Car parking
- Landscape mitigation screening, as required
- Business identification signage, at the Main Access point
- Temporary disturbance for construction compound and laydown and work areas.

Additionally, augmentation works will likely be required within the Kojonup Substation site, including installation of high voltage electrical equipment and associated permanent and temporary buildings and works. The orientation of the underground cabling (connecting the onsite substation and the existing Kojonup substation) is not fixed. There are multiple options being considered to connect into the existing substation. This will be confirmed in consultation with Western Power..

The indicative layout of the Project and its proximity to the existing Kojonup Substation is shown in Figure 5. The Project Area is proposed to be accessed via a new access point off Collie-Changerup Road (Main Access), with a secondary access and egress proposed off Tunney Road (Secondary Access).

During construction, the Project Area will be accessed via both the Main Access and Secondary Access. Crossovers would be designed to the relevant Main Roads WA Driveways policy standards and to cater for the turning movements of the design vehicle for the construction stage of the Project.

The final location of the Project infrastructure will be determined once a BESS supplier has been selected and will be in accordance with commitments made within this development application.

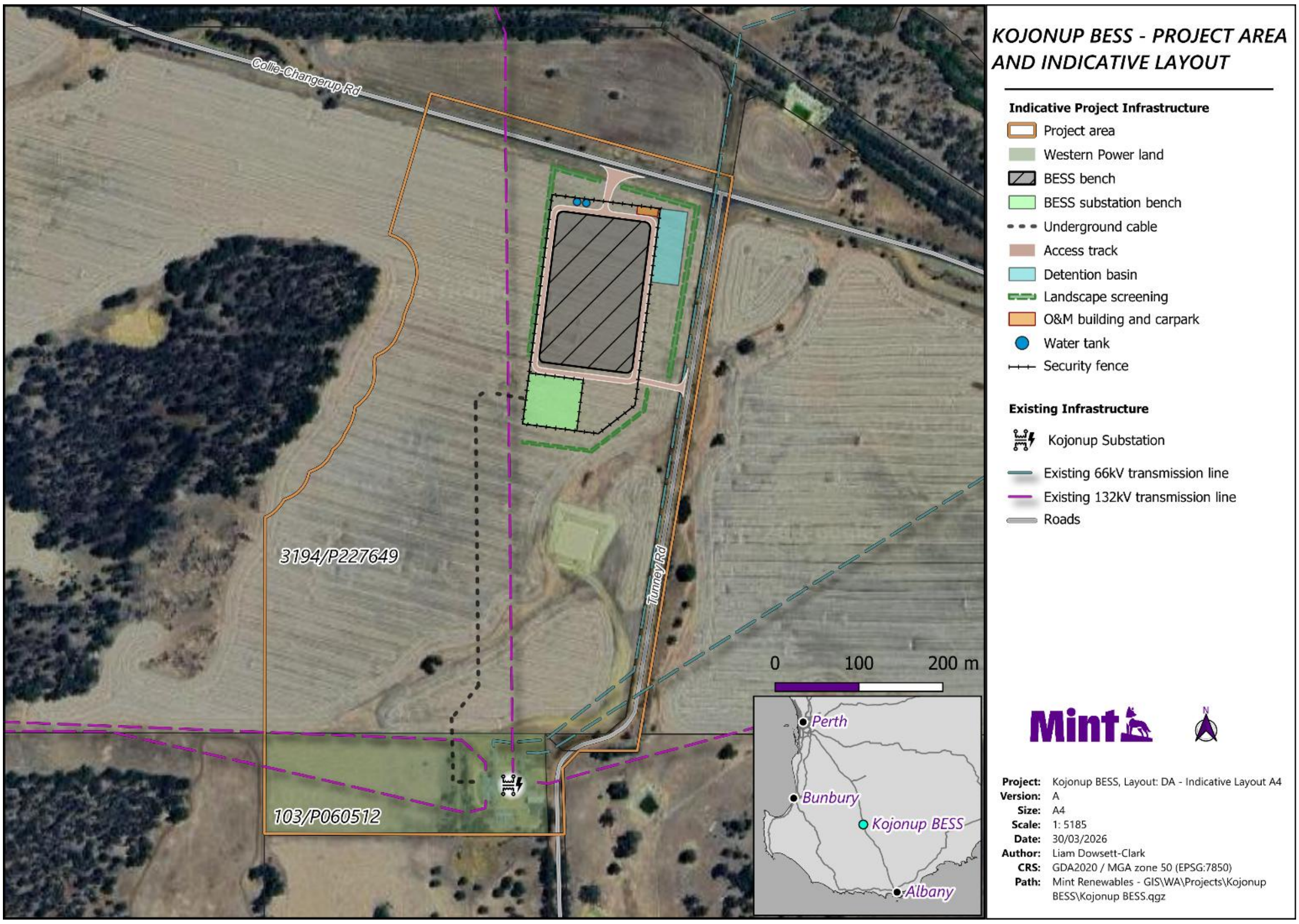

Figure 5 Project Area and Indicative Layout (source: MINT)

4. VEHICLE ACCESS AND PARKING

4.1 Existing Road Network

The road hierarchy surrounding the Project Area is shown in Figure 6 and posted speed limits are shown in Figure 7. The Project Area will have direct access the Collie-Changerup Road, which is classified as a Regional Distributor and Tunney Road which is classified as an Access Road.

Albany Highway is the main north-south Primary Distributor and State Road through the region which lies to the east of the Project Area. That corridor provides access to Kojonup and Albany, with Tunney Road also providing a more local road route through to the Kojonup townsite.

Figure 6 Road hierarchy surrounding the Project Area (source: Planwisely / Main Roads WA)

Collie-Changerup Road is a posted 110km/h highway, as shown in Figure 7. Tunney Road is not posted as a speed limit, therefore given it is outside of an urban area adjacent to the Project Area would have a maximum speed permissible of 110km/h as well.

Given the nature of Tunney Road, being an unsealed rural road with sharp bends and narrowing reserve it would be unlikely that the median speed profile of this section of Tunney Road would approach that limit. Both frontage roads are managed and controlled by the Shire of Kojonup, as shown in Figure 8.

Figure 7 Speed zoning surrounding the Project Area (source: Main Roads WA)

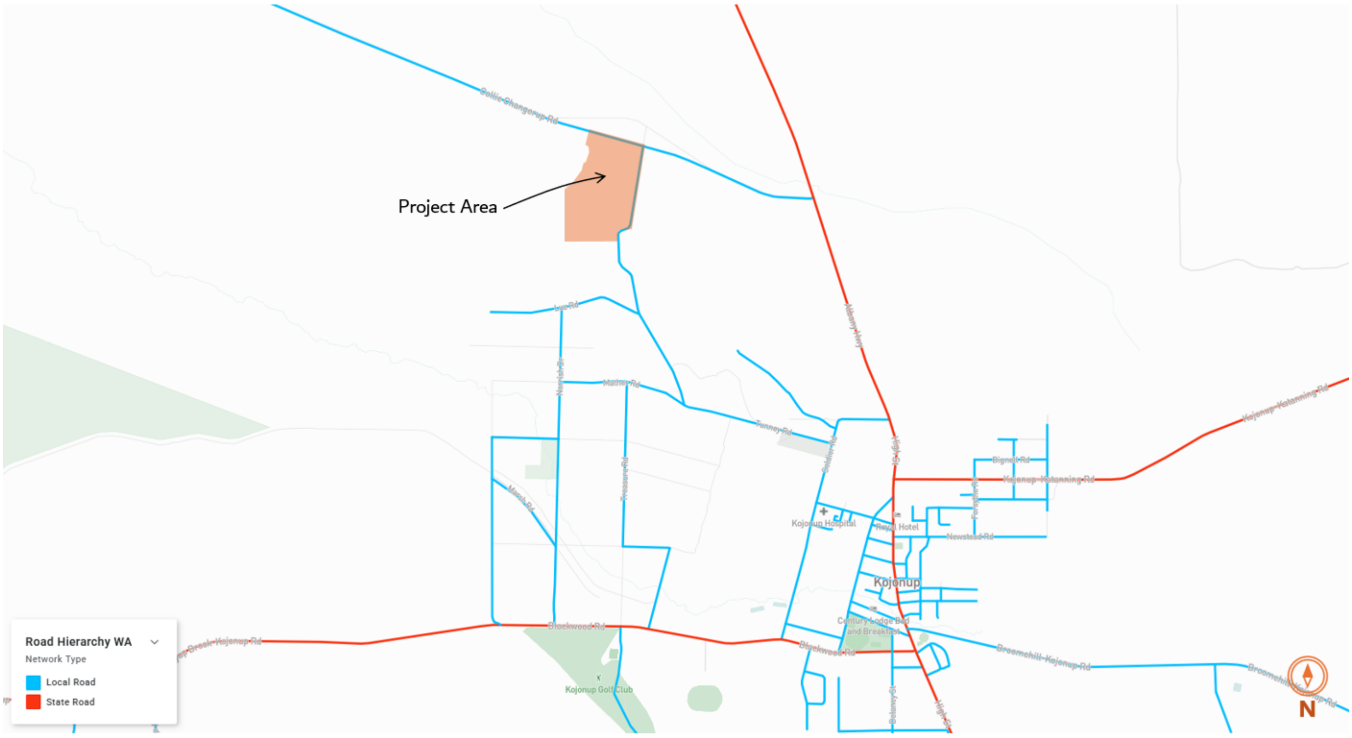

Figure 8 Designation of roads adjacent to Project Area (source: Planwisely / Main Roads WA)

4.2 Street Frontage

The Project Area has direct frontage to both Collie-Changerup Road and Tunney Road. The characteristics of these two roads are set out in the following sections.

4.2.1 Collie-Changerup Road

Collie-Changerup Road runs along the northern boundary of the Project Area and will provide the location of the main crossover associated with the life of the Project. It is classified as a Regional Distributor in the Main Roads WA road hierarchy. The intersection of Albany Highway is approximately 1.6km east of the proposed access point into the Project Area and the Tunney Road intersection is approximately 135m to the east.

The general configuration of Collie-Changerup Road within the road reserve is a minimum of 7m sealed width for the carriageway with unsealed shoulders. There is no kerbing present with drainage being included at the bottom of the batters from the carriageway. There are culverts over crossovers that intersect with Collie-Changerup Road. As shown in Figure 7, it is posted as a 110km/hr road.

The configuration of Collie-Changerup Road corridor adjacent to the Project Area is shown in Figure 9. This illustrates that the road reserve has been realigned to the south, with the historical road reserve of 20m width being replaced with an ungazetted reserve that has allowed for the straightening of the carriageway prior to the intersection of Albany Highway.

This has also meant that the newer alignment of Collie-Changerup Road is not within a reserve that includes any bends or road side vegetation.

The view of Collie-Changerup Road by cross-section near the proposed Project Area access point looking west is shown in Figure 10. The view looking east towards the intersection of Tunney Road is shown in Figure 11.

Figure 9 Collie-Changerup Road reserve and alignment (source: Metromap)

Figure 10 Collie-Changerup Road near Project Area access crossover location looking west (source: Google)

Figure 11 Collie-Changerup Road near Project Area access crossover location looking east (source: Google)

4.2.2 Tunney Road

Tunney Road runs along the eastern boundary of the Project Area. The Project will include a crossover associated with the construction and operational phases of the development which will act as the secondary access point behind the crossover on Collie-Changerup Road. It is classified as an Access Road in the Main Roads WA road hierarchy. Tunney Road intersection is approximately 200m to the east.

The general configuration of Tunney Road within the road reserve is a minimum of 7m unsealed surface for the carriageway with unsealed shoulders. As shown in Figure 7, it is posted as a 110km/hr road outside of urban areas. The configuration of Tunney Road corridor adjacent to the Project Area is shown in Figure 12. The view of Tunney Road by cross-section near the proposed secondary Project Area access point looking north is shown in Figure 13. The view looking east towards the intersection of Tunney Road is shown in Figure 14.

To the south of the Project Area, Tunney Road provides access to the existing electrical sub-station and it ultimately connects to the intersection of Mather Road where it becomes a bituminised surface and provides access through to the Kojonup townsite. The existing access point for the substation may also be used for some traffic purposes during construction however that use would be limited.

Figure 12 Tunney Road alignment (source: Metromap)

Figure 13 Tunney Road near Project Area access crossover location looking north (source: Google)

Figure 14 Tunney Road near Project Area access crossover location looking south (source: Google)

4.3 Restricted Access Vehicle Network

Access to and from the Project Area is provided for both Restricted Access Vehicle (RAV) RAV4 and RAV7 classified vehicles. The highest potential classification for heavy vehicles on the network adjacent to the Project Area is RAV7 along Collie-Changerup Road and RAV4 via Tunney Road, with combinations of trailers and weight shown in Figure 15. The RAV network is shown in Figure 16.

As noted in this assessment, the Project Area is proposed to be accessed via a new access point off Collie-Changerup Road (Main Access), with a secondary access and egress proposed off Tunney Road (Secondary Access). During construction, the Project Area will be access via both the Main Access and Secondary Access. Some limited movements would also be expected during construction via the existing crossover into the Kojonup substation.

Crossovers have been designed by the Project team to the relevant Main Roads WA Driveways policy standards and to cater for the turning movements of the design vehicle for the construction stage of the Project.

RAV Category	RAV Description		Max. Length	Max. Mass	Approved Network
Category 1	1A - Prime Mover, Semi-trailer & Pig Trailer or Dolly; 1B – Prime Mover & Semi-trailer; 1C – Short B-Double	1A / 1C	20 m	50 t	N1
		1B	19 m	48.5 t	
Category 2	2A - Prime Mover, Semi-trailer & Pig Trailer or Dolly; 2B – Prime Mover & Semi-trailer; 2C – B-double; 2D – Short B-Triple; 2E – Car Carrier	2A	27.5 m	66.5 t	N2
		2B	20 m	48.5 t	
		2C	27.5 m	68.5 t	
		2D	27.5 m	88.5 t	
		2E	25 m	48.5 t	
Category 3	3A – A-double		27.5 m	85 t	N3
Category 4	4A – A-double		27.5 m	88.5 t	N4
Category 5	5A – A-Double; 5B – A-Double towing a Dolly; 5C – B-Double towing a Dolly; 5D – B-Triple	5A / 5D	36.5 m	85 t	N5
		5B	27.5 m + Dolly	85 t + Dolly	
		5C	27.5 m + Dolly	68.5 t + Dolly	
Category 6	6A – A-double; 6B – B-Triple; 6C – A-Double towing a Dolly	6A / 6B	36.5 m	88.5 t	N6
		6C	27.5 m + Dolly	88.5 t + Dolly	
Category 7	7A – AB-Triple; 7B – BA-Triple		36.5 m	108.5 t	N7

Figure 15 Tandem Drive Prime Mover Combinations (source: Main Roads WA)

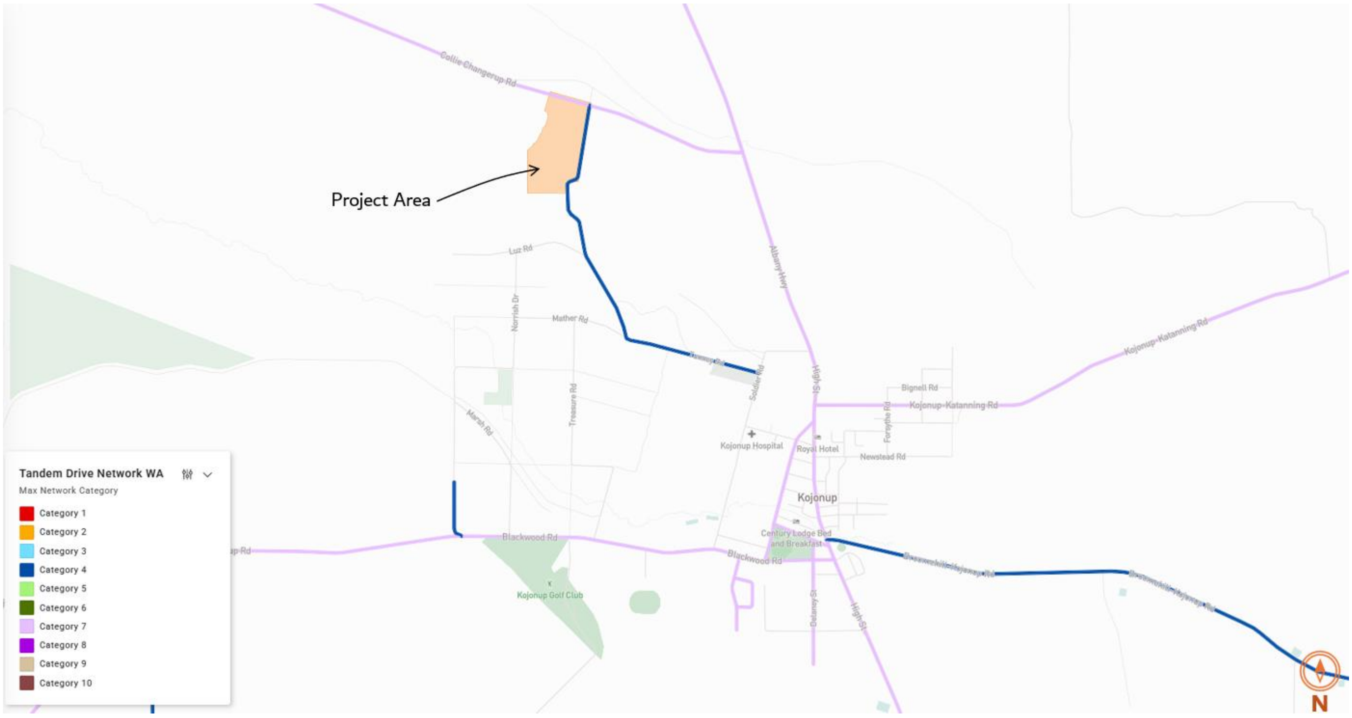

Figure 16 RAV7 network around Project Area (source: Main Roads WA)

The Project will be able to utilise wider RAV network roads to provide access for transportation of equipment and components to the Project Area. The majority of vehicles involved in the Project construction would be restricted to 19m semi-trailers.

Vehicles such as regular length semi-trailers and single unit trucks are as-of-right vehicles that can travel on any part of the WA road network. These vehicles do not require permits and can select any route of travel to and from a construction site.

Deliveries of Project infrastructure (e.g. construction compound and fencing etc. gravel, concrete, crane support equipment, miscellaneous electrical equipment, earthworks import/export and waste disposal) will also occur via as of right vehicles with potential use of B-Double on permitted routes.

The use of low loader vehicles to transport components to the Project is a key consideration. As with other heavy vehicle movements, Main Roads WA classifies each road for use by 8TPA trucks. These are shown in Figure 17. Routes from port being considered for the Project are Network 6 for 8TPA trucks. The last section of all routes into the Project Area along the Collie-Changerup Road is not classified, requiring permits by Main Roads WA to undertake the final 1.6km section into the Project Area.

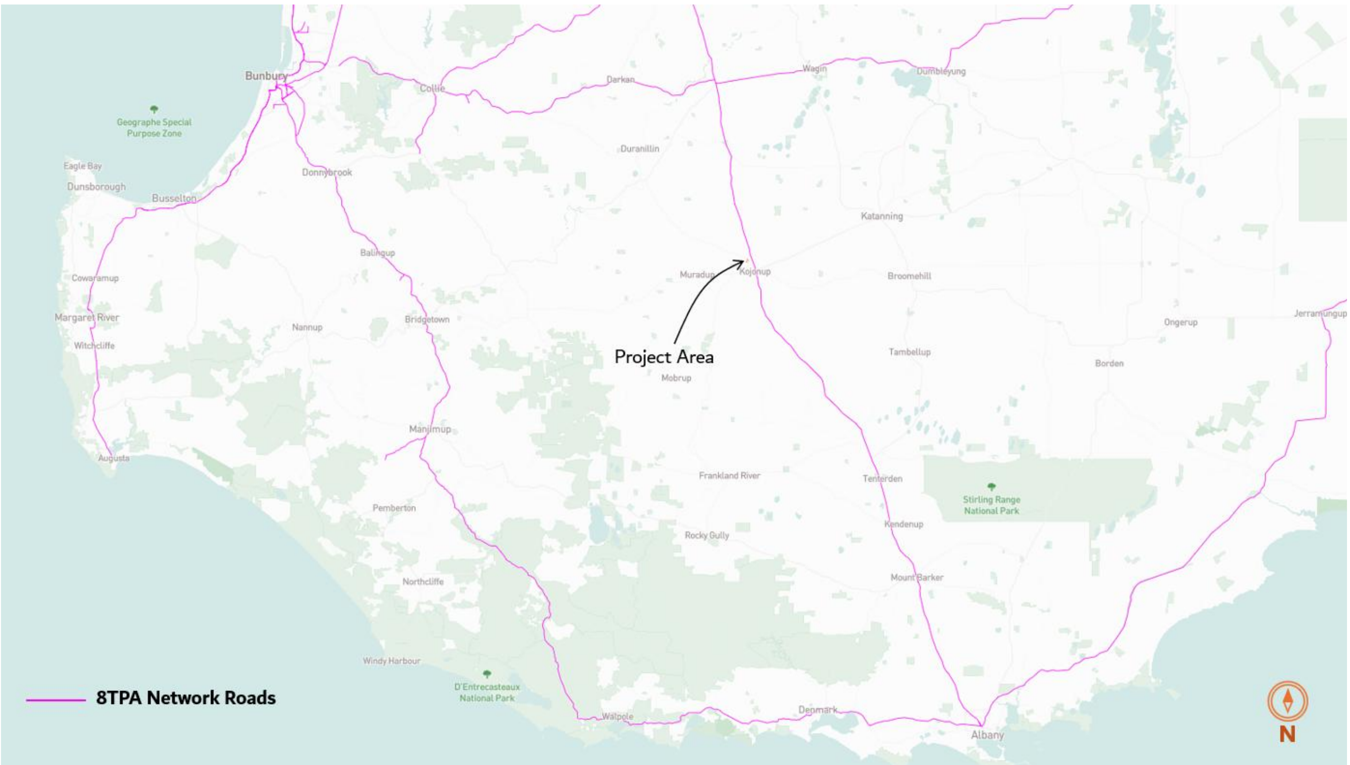

Figure 17 8TPA Network 6 classified roads (source: Main Roads WA)

Throughout the construction stage, there will be a range of heavy vehicle movements associated with different stages of construction and different tasks. These are summarised within Table 1.

The majority of heavy vehicle movements associated with the Project will be As of Right vehicles and B-Double trucks, with some Low Loader movements likely requiring a Class 1 RAV Low Loader Overmass Permit and two Over Sized, Over Mass (OSOM) loads associated with the transformer and Operations Building being classified as OSOM also requiring a permit. They would require submission of a full Traffic Management Plan by the Transport Operator associated with the Project.

Table 1 Types of vehicles used for movements (source: MINT)

Purpose	Truck Configuration	As of Right / RAV / OSOM
Water / Fuel	Truck tanker	As of Right
Skip / Portaloo	Flat bed	As of Right
Office and Site Equipment	Low Loader	RAV / Permit
Earthworks and Materials	Truck and Dog	RAV
Concrete Foundations	$6m^3$ Agitator Truck	As of Right
BESS Units / Inverters	Flat bed	As of Right
Lifting Equipment/ Machinery	Low Loader	RAV / Permit
Transformer	OSOM Low Loader	OSOM
Transformer Equipment	Low Loader / Flat Bed	As of Right / RAV
Operations Building	OSOM Low Loader	OSOM

4.4 Traffic Volumes

Main Roads WA collects traffic count information at all signalised intersections and also collects and collates count information along streets and at non-signalised intersections with current and historical data being made available through https://trafficmap.mainroads.wa.gov.au/map.

There are no Main Roads WA counts sites immediately proximate to the Project Area and there are no counts on any of the surrounding road network. The nearest count site on Albany Highway is South of Robinson Road West and is a 24 hour count site.

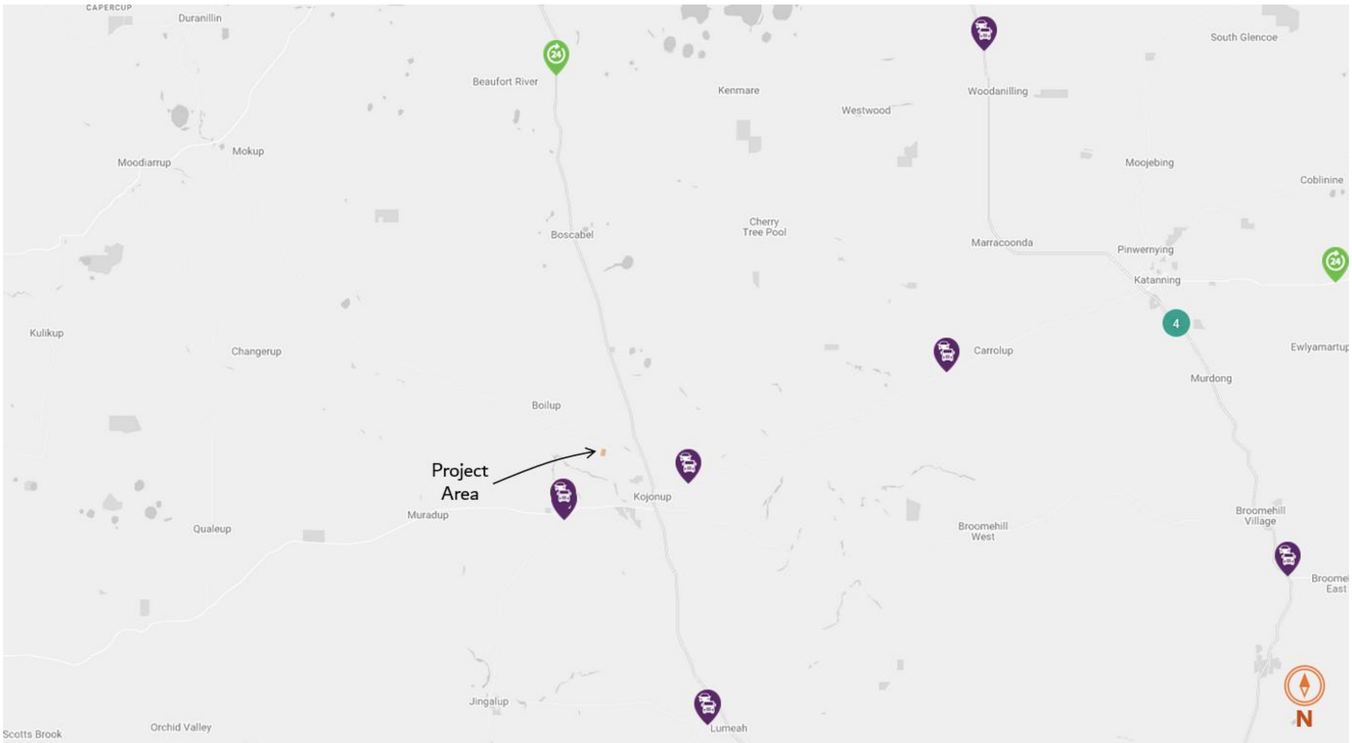

Figure 18 TrafficMap count resources (source: Main Roads WA)

For the purposes of network assessment, the Shire of Kojonup provided the latest traffic count information they had for Collie-Changerup Road which were conducted in November – December in 2020 at a site near the Balloch Road turnoff which is approximately 20km to the west of the Project Area.

The volumetric day counts for light vehicle (LV), heavy vehicle (HV) (Class 3-9) and RAV vehicle (Classes 10-12) movements is set out in Table 2. This shows a median volume of 160 LV, 45 HV and 24 RAV per day for all movements. In general, directional movements could be reflected as 50% of the total based on other nearby volume counts south of Kojonup.

To check these values, hourly count information was examined for the Boyanup Brook – Kojonup Rd site south of Kojonup with the Monday – Friday peak hour movements on that corridor being:

- AM Peak – total 55 vehicles in both directions. The peak volume represented 10.7% of all day recorded movements towards Kojonup and 6.9% of all day recorded movements away from Kojonup
- PM Peak – total 49 vehicles in both directions. The peak volume represented 7.1% of all day recorded movements towards Kojonup and 9.1% of all day recorded movements away from Kojonup.

These patterns reflect movement of people moving towards Kojonup for school and employment or shopping in the morning and then a return trip in the afternoon.

There are no counts available for Tunney Road, with the volumes expected to be extremely low at all times given the rural nature of the road after the intersection of Mather Road.

Table 2 Shire of Kojonup traffic counts - Darkan Road near Balloch Road 2020 (source: Shire of Kojonup)

		LV	HV	RAV	Total	%HV	%RAV
26/11/2020	Thursday	150	53	24	562	9.4%	4.3%
27/11/2020	Friday	247	60	28	566	10.6%	4.9%
28/11/2020	Saturday	181	38	12	477	8.0%	2.5%
29/11/2020	Sunday	201	32	13	485	6.6%	2.7%
30/11/2020	Monday	178	40	21	465	8.6%	4.5%
1/12/2020	Tuesday	135	58	33	581	10.0%	5.7%
2/12/2020	Wednesday	193	131	31	661	19.8%	4.7%
3/12/2020	Thursday	210	57	39	585	9.7%	6.7%
4/12/2020	Friday	184	56	39	485	11.5%	8.0%
5/12/2020	Saturday	158	30	18	408	7.4%	4.4%
6/12/2020	Sunday	151	35	16	202	17.3%	7.9%
7/12/2020	Monday	157	46	26	229	20.1%	11.4%
8/12/2020	Tuesday	130	27	25	182	14.8%	13.7%
9/12/2020	Wednesday	165	49	32	246	19.9%	13.0%
10/12/2020	Thursday	159	55	32	246	22.4%	13.0%
11/12/2020	Friday	200	56	22	278	20.1%	7.9%
12/12/2020	Saturday	147	33	10	190	17.4%	5.3%
13/12/2020	Sunday	190	33	16	239	13.8%	6.7%
14/12/2020	Monday	136	47	19	406	11.6%	4.7%
15/12/2020	Tuesday	143	31	30	410	7.6%	7.3%
16/12/2020	Wednesday	162	26	18	410	6.3%	4.4%
17/12/2020	Thursday	135	44	25	204	1.7%	1.0%
Medians (All Days)		161	45	24	409	11.1%	5.5%
Medians (Weekday)		161	51	27	410	11.1%	6.2%

4.5 Existing Parking and On-Site Vehicle Access

There is no parking on the Project Area. The area has two existing farm gate access points, one to Collie-Changerup Road and the other to Tunney Road. The location of these access points relative to the intersection of the two frontage roads is set out in Figure 19.

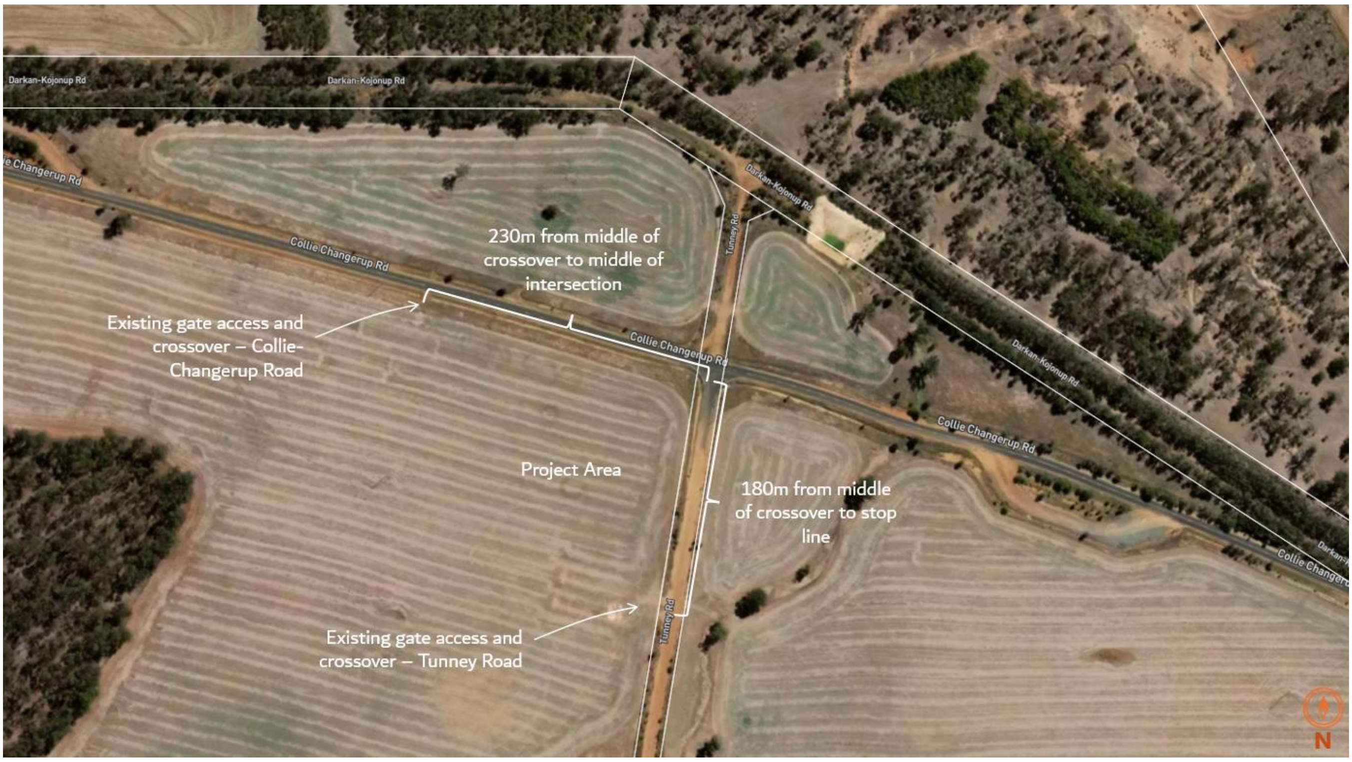

Figure 19 Existing access to Project Area (source: Metromap)

4.6 Proposed Vehicle Access

Crossover locations to be constructed for the Project have been designed to allow for ease of access during the construction stage as well as provide for general operational functionality. This will be achieved through the development of a crossover on Collie-Changerup Road that will allow for turning movements into the Project Area to be set back from the intersection of Tunney Road by around 135m as shown in Figure 20 and the retention of the existing crossover from Tunney Road.

Both crossovers would be fully formed and constructed specific to the requirements of the Shire of Kojonup and Main Roads WA given that both frontage roads are local roads, as shown in Figure 8. The crossover from Collie-Changerup Road would see the construction of a 44m long access track, with the crossover from Tunney Road including an access track of at least 49m in length. Both have clear line of sight to provide for approach sight distances.

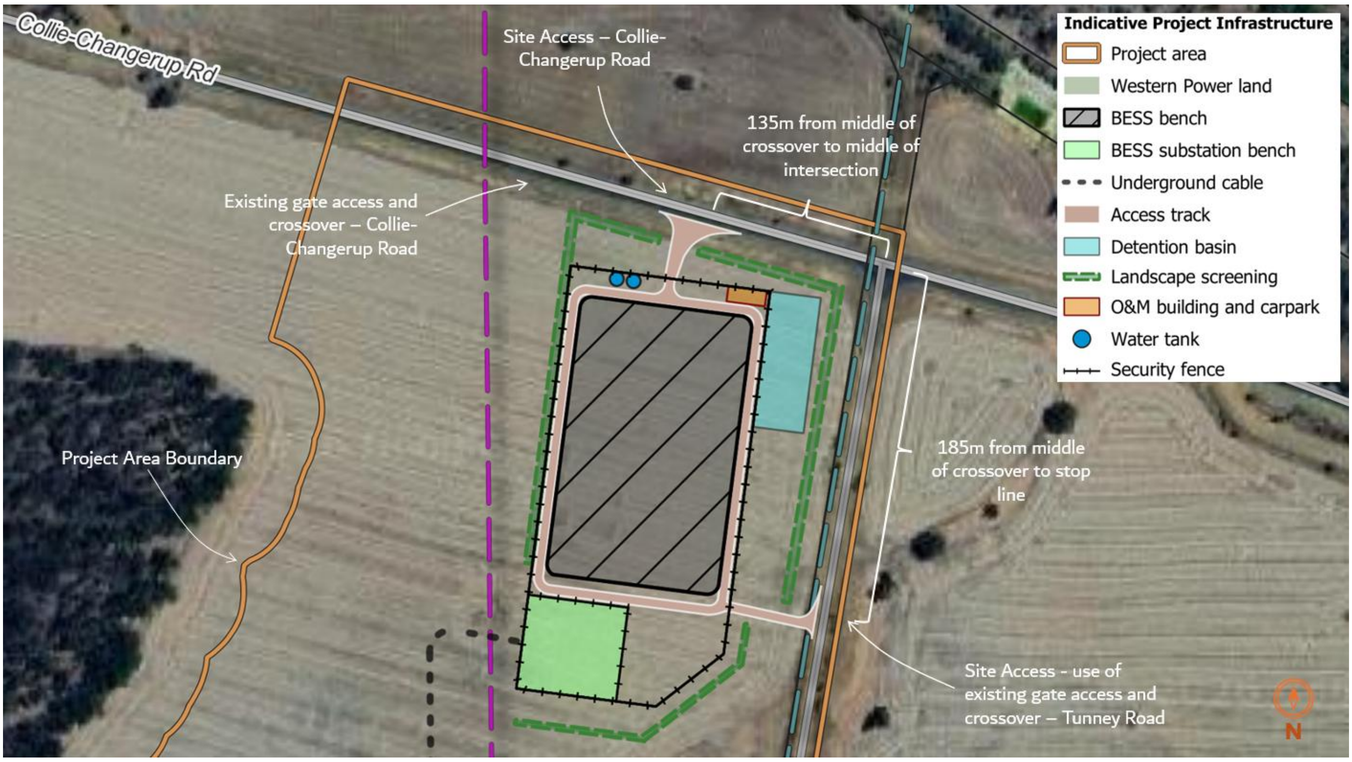

Figure 20 Vehicle access for Project Area (source: MINT)

To inform the application, swept path analysis was completed for the crossover on Collie-Changerup Road for the following vehicle configurations:

- 19m semi-trailer as of right vehicle from both directions
- 27.5m B-Double truck from both directions (largest design vehicle for standard movements).

These are set out in Figure 21 to Figure 23 with the proposed designs of the crossovers shown in Figure 24 and Figure 25. The swept paths have informed the design of the development access points. Movements of OSOM components of the Project – which would be the transformer and on-site operations building – would be completed under a Class 1 RAV Low Loader Overmass Permit and a Traffic Management Plan that would be submitted through the transport operator for the Project.

As set out in this assessment, routes for deliveries via heavy vehicles do exist in the area and between relevant ports. The final route used for this Project will be determined by the proponent, with relevant permits and requirements covered through Main Roads WA Heavy Vehicle Services.

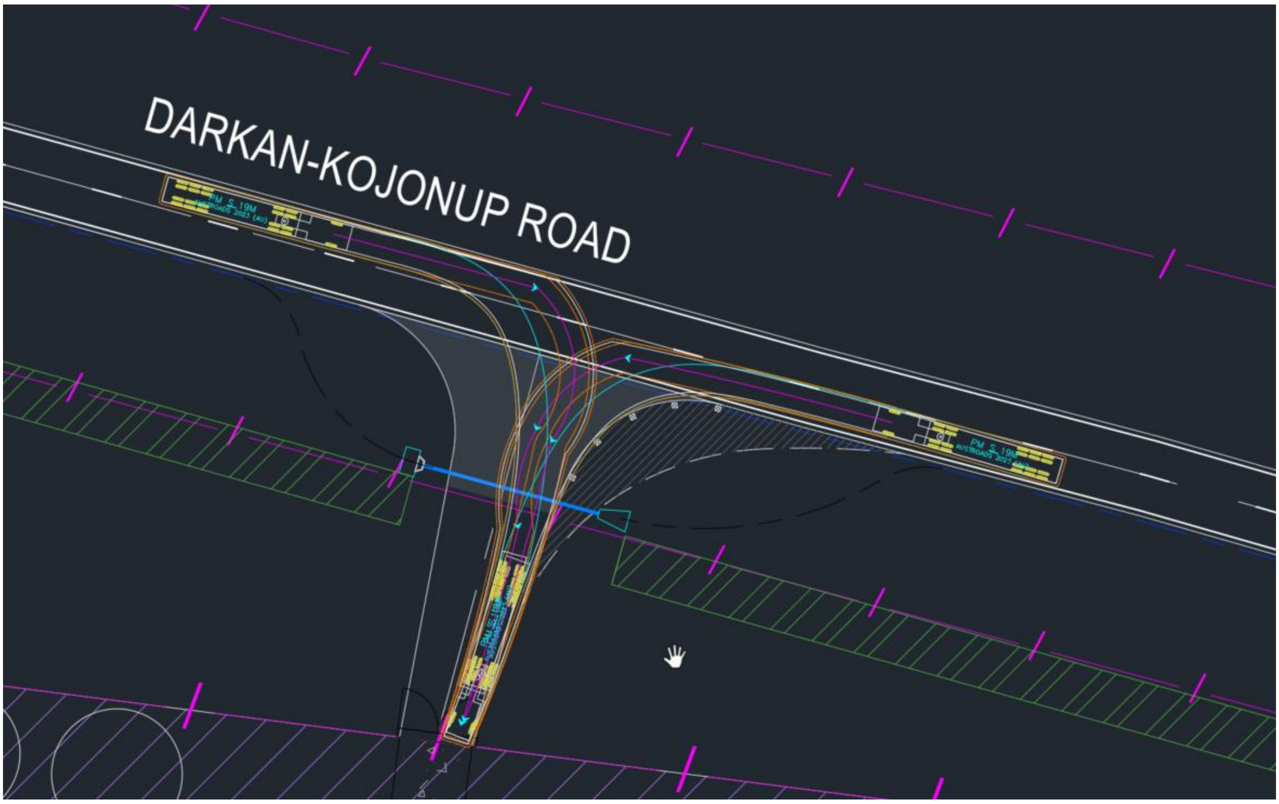

Figure 21 Swept path - 19m semi-trailer as of right vehicle from Collie-Changerup Road (source: Autoturn)

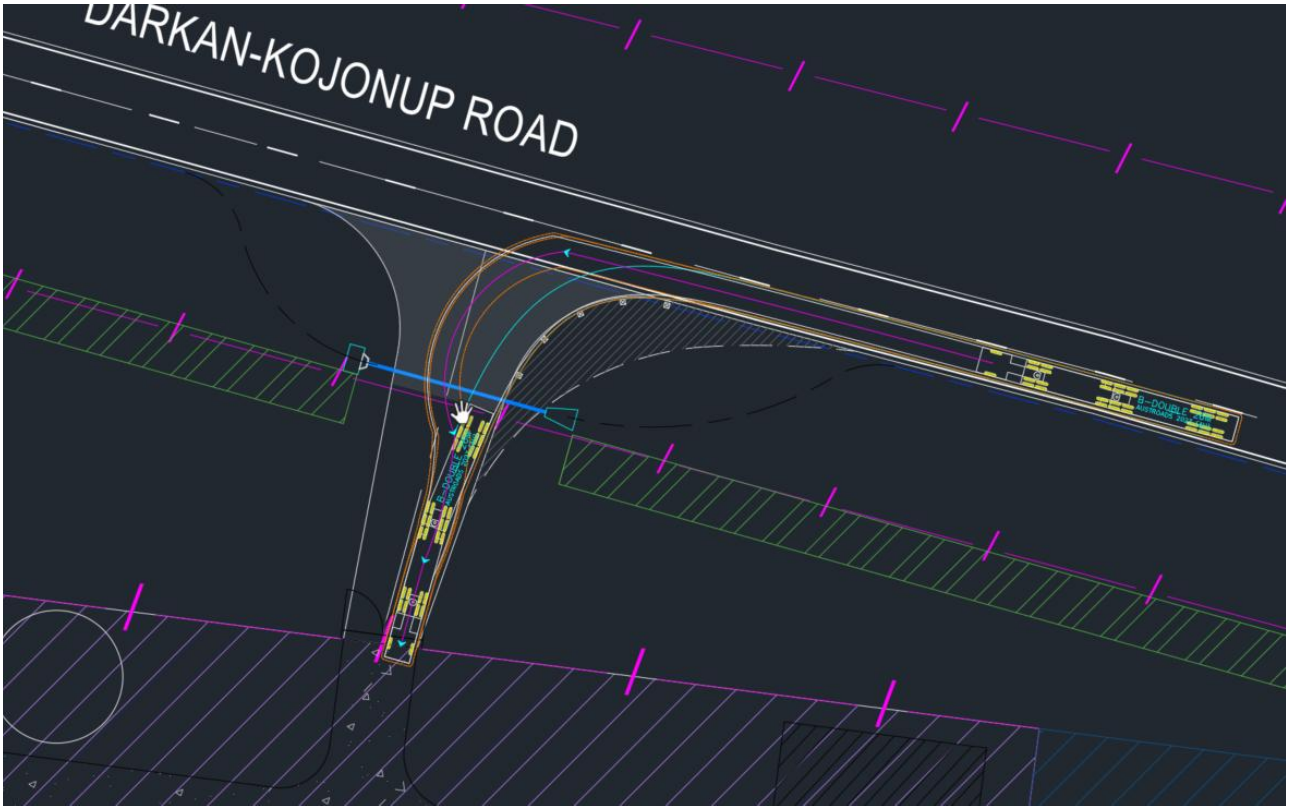

Figure 22 Swept path – 27.5m B-Double vehicle from east along Collie-Changerup Road (source: Autoturn)

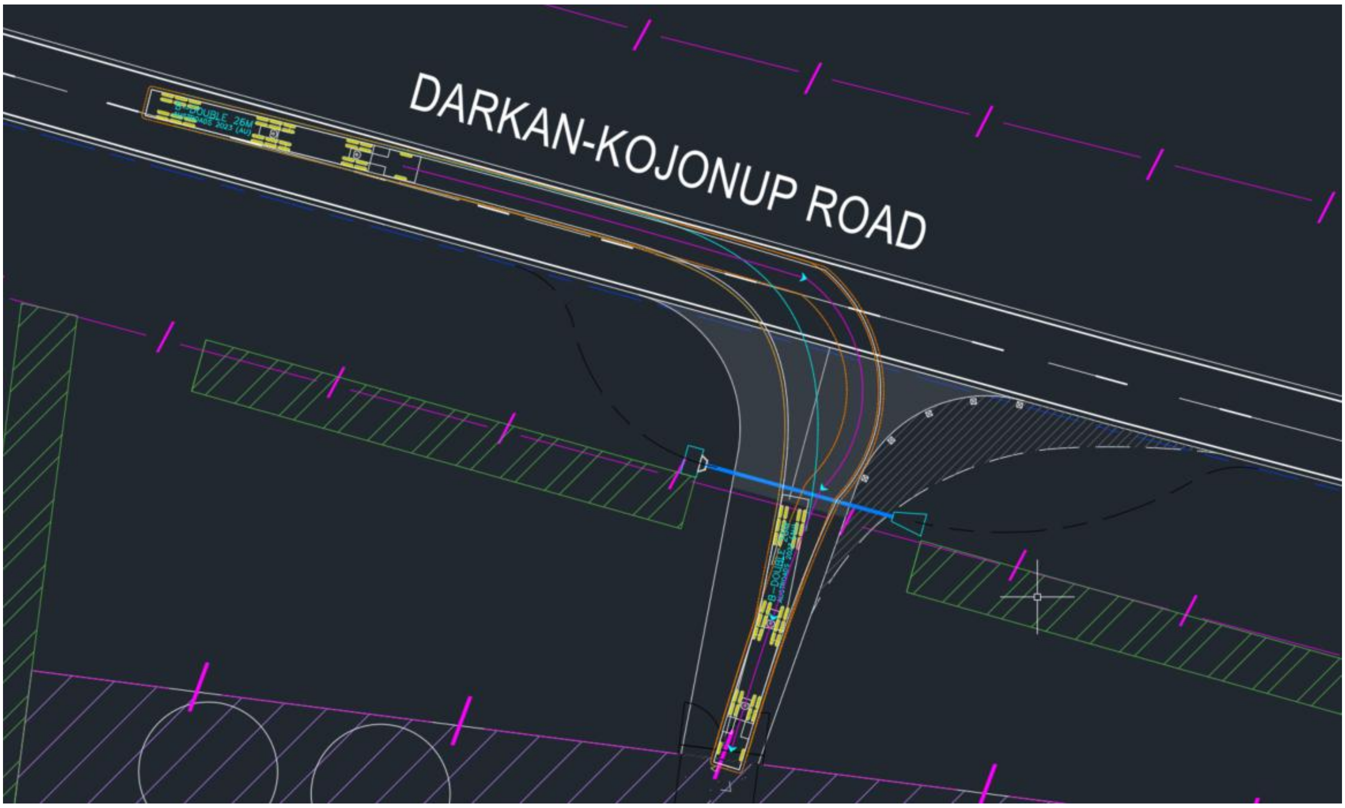

Figure 23 Swept path – 27.5m B-Double vehicle from west along Collie-Changerup Road (source: Autoturn)

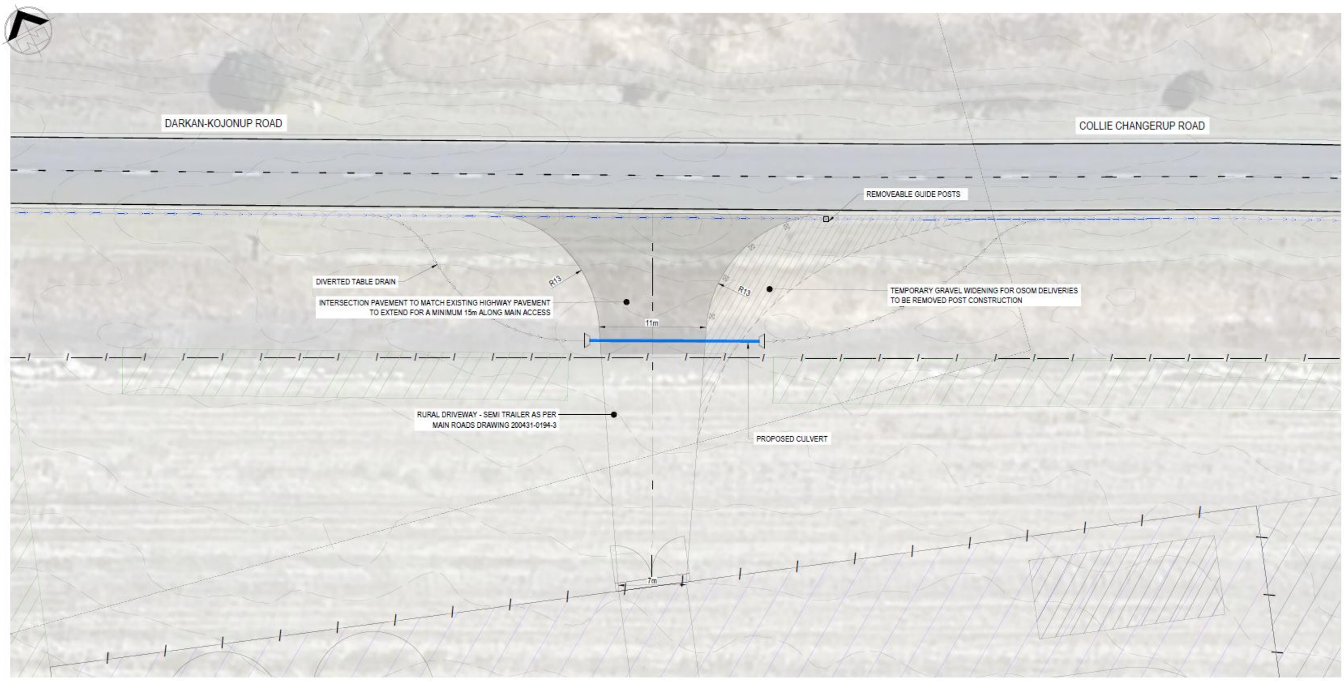

Figure 24 Proposed crossover design for Project Area and Collie-Changerup Road (source: icubed consulting)

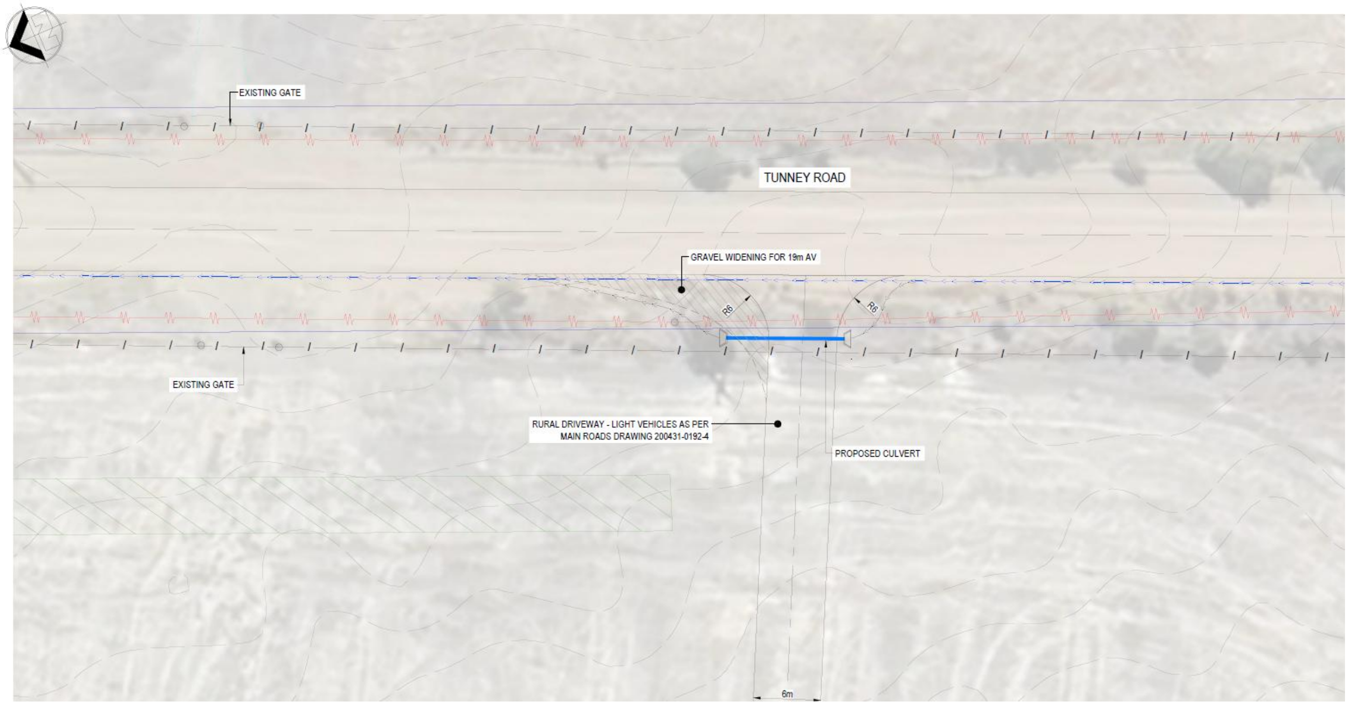

Figure 25 Proposed crossover design for Project Area and Tunney Road (source: icubed consulting)

4.7 Sight Line Analysis

An assessment of the sight lines required for the primary access off Collie-Changerup Road was undertaken given that location would be subject to most Project activity during the construction stage of the Project. The existing approaches along Collie-Changerup Road from the west are shown in Figure 26 and from the east in Figure 27. The area is open broadacre agriculture and there are no built form obstructions.

There is a slight rise to the west of the proposed Project Area access point as noted by the double white lines on approach which start 270m from the access crossover location for the Project Area. The Safe Intersection Sight Distance (SISD) calculation used was:

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)} \qquad 2$$

where

SISD	=	safe intersection sight distance (m)
D_T	=	decision time (sec) = observation time (3 sec) + reaction time (sec) – refer to *AGRD Part 3* (Austroads 2016a) for a guide to values
V	=	operating (85th percentile) speed (km/h)
d	=	coefficient of deceleration – refer to Table 3.3 and AGRD Part 3 for a guide to values
a	=	longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

Figure 26 Collie-Changerup Road approach to Project Area from west (source: Google)


Figure 27 Collie-Changerup Road approach to Project Area from east (source: Google)

Based on an operating speed of 110km/h, decision time of 3 seconds, observation time of 2 seconds and a grade calculated at 3% based on available topographical information, the SISD for cars and trucks on approach from the west is 330m and 365m. This is shown in Figure 28. The SISD on approach from the east using the same inputs, with a 0% grade change is 315m for cars and 348m for trucks as set out in Figure 29.

The approach from the east is clear, with no issues in relation to achieving the SISD, even with any potential obstruction at Tunney Road. The access point to the Project Area will be set back from the carriageway, allowing for appropriate approach distance and ability for turning vehicles to see any oncoming vehicles.

From the west, there is a slight rise in the carriageway, with the SISD calculation reflecting the grade change. Based on the Streetview available, Collie-Changerup Road at that point is evident from the Project Area access point, meaning that oncoming vehicles on the crest should be able to see turning vehicles exiting the Project Area on approach. This configuration should be acceptable, with additional signage on Collie-Changerup Road on approach to the Project Area access point noting the presence of trucks turning or site access could be installed by Main Roads WA on the crest.

Figure 28 SISD for trucks approaching from west on Collie-Changerup Road (source: Metromap)

Figure 29 SISD for trucks approaching from east on Collie-Changerup Road (source: Metromap)

4.8 Proposed Parking

Given the nature of the Project and potential ongoing operational staff, required parking would be located on site and designed to relevant standards if formalised. There are no expectations of any issues relating to provision of space for parking of operational vehicles or construction vehicles given the nature of the Project.

Parking areas would be demarcated and located near the administration areas of the Project construction. During operations, it would be expected that vehicles associated with the Project would be accommodated where required.

5. PROVISION FOR SERVICE VEHICLES

5.1 Service Movements

Access crossovers and internal access ways will be designed to accommodate the design vehicle that will cater for flatbed haulage trucks and as-of-right semi-trailers. Given that, any service vehicle movements associated with the Project would be able to be accommodated.

There would be minimal vehicle movements associated with servicing the Project during the operational stage of the BESS as it would generally be limited movements relating to regular scheduled maintenance.

6. TRAFFIC VOLUMES AND VEHICLE TRIPS

6.1 Assessment Introduction

Renewables Projects and those situated within a rural context do not have the same specific or peak based demands as more urban based development or redevelopment Projects. The considerations relating to these sorts of Projects are more focussed on movement of heavy vehicles, road conditions and suitability of the network to cater for the types of movements being considered.

For the final point, the information in this TIA sets out the network classifications, suitability for heavy vehicle movements and nature of the road network and intersections surrounding the Project. The network is suitable to support a Project of this nature, with only a low level of movements requiring permits from Main Roads WA Heavy Vehicle Services. The requirements for this would be covered within conditions of approval.

For the road conditions and movements, the analysis of sight lines and crossovers within section 4 of this TIA set out the location and form of the proposed site access and the relevant issues associated with that.

This section therefore sets out the general expectations for traffic generation associated with the proposed development and focusses on the overall volumes of movements during the course of the Project.

6.2 Traffic Generation

The overall program for delivery of the Project which will result in traffic generation from the site will be spread over the period of a year. There will be six key elements to the Project delivery program:

- Site establishment
- Civil works – construction
- BESS installation
- Electrical works
- Substation works
- Commissioning.

Traffic movements associated with staff on the Project Area for an average weekday throughout the construction and commissioning stage of the Project would be reflective of staff forecast to be on the Project Area per week as shown in Figure 30.

These movements would form the bulk of passenger vehicle movements to or from the Project Area, with additional potential movements associated with maintenance tasks or staff moving to or from Kojonup during lunch periods or for meetings / other commitments also possible during day time hours.

The overall Project program from site access to complete commissioning of the Project Area is estimated at 55 weeks, just over a year. During that period the construction vehicle volume will vary significantly, with the vast majority of the vehicle movements occurring in a four month period where various stages of the Project works overlap.

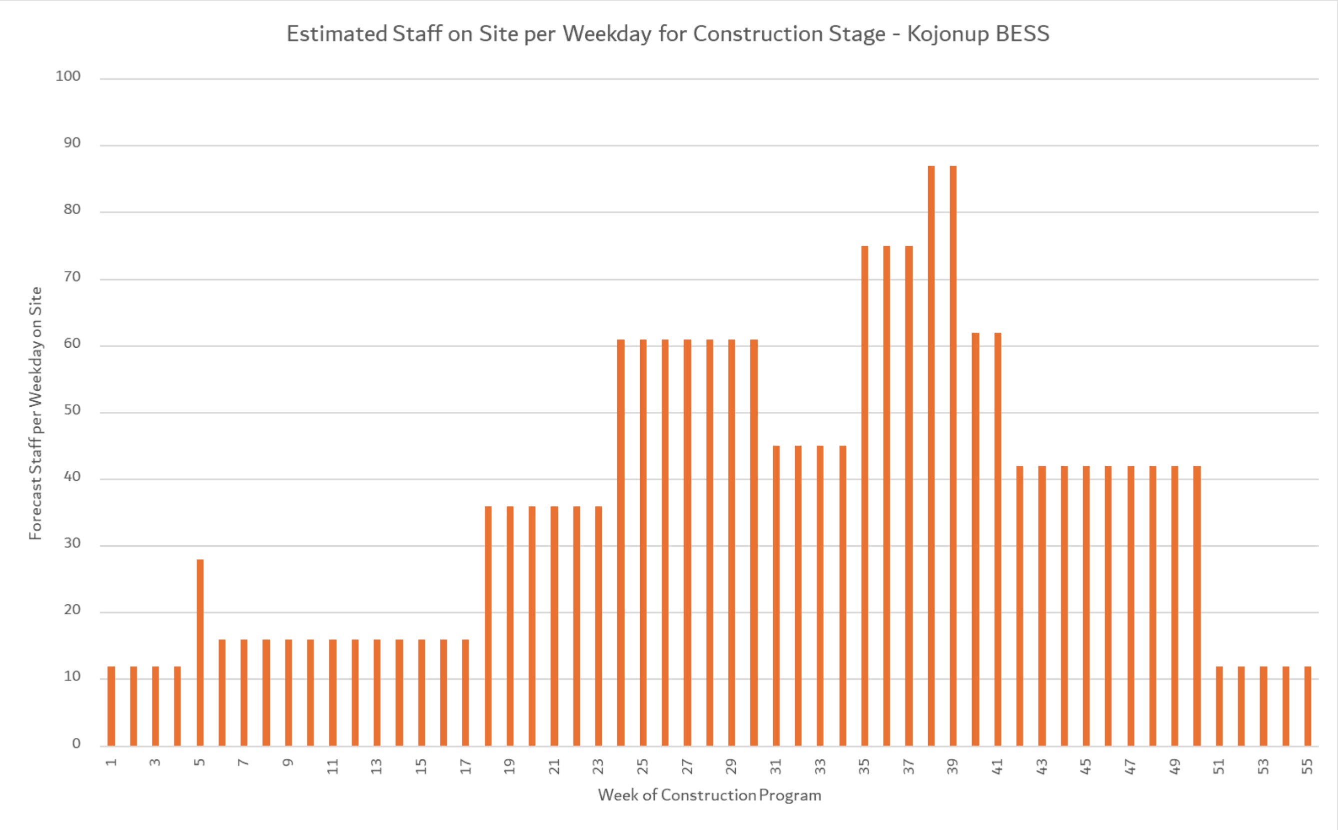

Figure 30 Estimated staff on Project Area per weekday for construction stage - Kojonup BESS (source: MINT)

The Proponent has provided information for each of the Project stages relating to transport, being:

- Site Establishment

Upon appointment of a contractor, there will a period of approximately five weeks where pre construction activities e.g. (like site surveys and visits undertaken by the contractor to establish development protocols). This activity is estimated to have around approximately 12 staff on site with vehicle movements likely limited to light vehicles and less than 20 movements into the area per day.

- Civil Works - construction stages

The initial Project civil works would span a period of approximately 6 months for the Project and overlap the BESS installation and electrical works stages of the Project. Given this overlap, the number of staff on site will fluctuate over the 6 months from approximately 16 to 61 staff on site at any one time.

The initial workforce on site for the first three months is assumed to be approximately 16 personnel, in light vehicles, travelling to and from the Project (towards the site in the AM peak and away from the site in the PM peak). This would then be supplemented with deliveries of equipment and materials that would fluctuate depending on the construction program. This would include:

- Water trucks and skip delivery / removal in tankers or skip truck
- Fuel in a tanker
- Equipment within containers on low loaders
- Earthworks equipment delivery on low loaders
- Materials for construction such as spoil and paving materials in trucks and truck / dog configuration
- Concrete trucks
- Steel delivery on flat bed trucks.

The daily movement of vehicles to and from Project Area would vary depending on the areas where works would be taking place and the timing of those movements would also vary depending on a range of factors.

Some movements may be once a week – for example a skip delivery truck or fuel truck, whereas others may be more frequent such as water trucks (estimated five per day for dust suppression and construction water) or concrete trucks (multiple movements per day depending on stage of construction).

- BESS Installation

The BESS Installation stage is expected to last approximately 4 months and will involve the delivery of materials and installation of the BESS units. This stage would overlap the civil works, electrical works and substation works stages of the Project as there can be sequenced delivery of the BESS units as the civil and preparation works for the slabs associated with the BESS units continues.

This stage includes a total of approximately 168 heavy vehicle trips into and out of the Project Area with flat bed as-of-right trucks to deliver the individual units. In addition, there would be truck movements associated with the inverters, cabling equipment and heavy equipment delivery.

None of these movements would be OSOM and the number of staff on site during this stage would vary between approximately 45 to 87 staff on site – this is the peak of construction and installation activities on site.

- Electrical works

The electrical works stage is forecast to last between approximately 5 and 6 months. Vehicles associated with this stage will reflect the civils stage and largely be made up of LV. With the overlap between the BESS and substation installation stages, the number of staff on site during this six months will fluctuate between approximately 42 and 87 staff.

- Substation works

The substation works will involve wholesale construction of the site required for the substation and transformer ranging from civil and structural works (such as compound construction and electrical installation) through to the delivery of the transformer which would be one of the OSOM movements for this stage. The other OSOM movement would be an operations building for the Project.

Otherwise, overall volumes associated with this task will be lower than other stages of the Project. Given the overlap with the civils, BESS installation and other electrical works on the site, the volume of forecast employees per day during the approximately 6 month period for these works would vary from approximately 36 to 87 per day.

- Commissioning stage

The commissioning stage would be sequentially tied into the completion of the BESS installation and finalisation of works associated with all of the electrical infrastructure and equipment on site.

The volume of staff on site during these works, given overlaps with other stages, would be between approximately 12 and 87. The trips associated with this stage would be LV trips.

In relation to assessments, the WAPC Guidelines notes the following relating to traffic related impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where the development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

Given that the surrounding network is comprised of rural highways with a one-directional flow rate of 1,700 vehicles per hour, the level of existing traffic combined with traffic associated with this Project, would not approach a total of 10% of the capacity, let alone an increase of over 170 vehicles per hour in any direction.

As such, the traffic impact of the Project is not considered significant in terms of volumes, with potential impacts related to traffic movements have been addressed by this TIA.

7. SITE SPECIFIC ISSUES

7.1 Road Safety

The Main Roads WA Crash Reporting system was interrogated for data relating to any road safety or crash issues in the proximity of the Project Area. This can highlight pre-existing or potential issues which need to be addressed specific to the proposed BESS development.

Outputs in the vicinity of the Project Area from the past five years are shown in Figure 31. Within the five year reporting period, there was a single crash proximate to the proposed development, with a driver leaving the road and hitting a tree at 8.00am in the morning.

Given the lack of crashes in the area, this indicates that the network is suitable and that there are no existing safety issues with the interface along Collie-Changerup Road or Tunney Road.

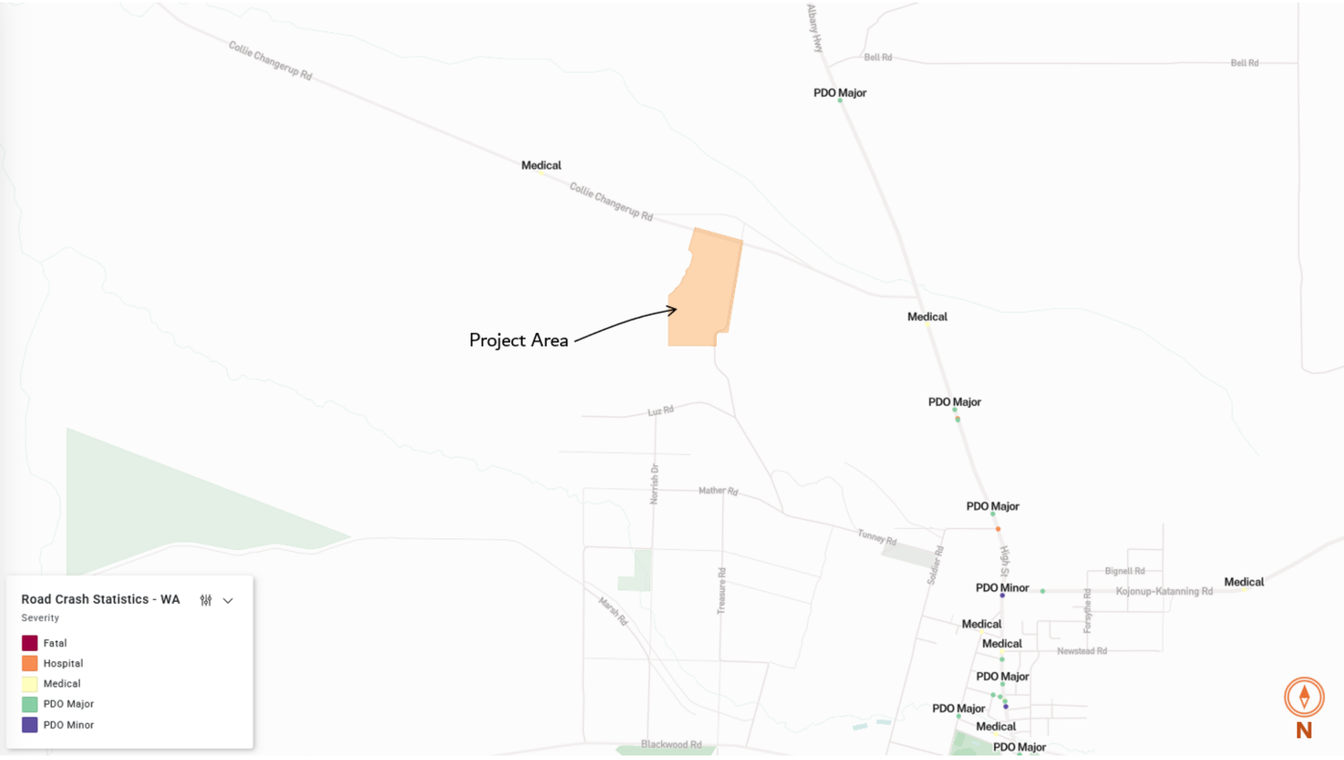

Figure 31 Crash reporting information for network adjacent to Project Area (source: Main Roads WA)

8. SUMMARY

8.1 Proposed Development and Impacts

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Development Application (DA) submitted for the proposed Kojonup Battery Energy Storage System (BESS) (the Project) facility off Collie-Changerup Road.

The Project Area is located at the intersection of Tunney Road and Collie-Changerup Road and as indicated by the South West Aboriginal Land and Sea Council website; it sits on the boundary of the Gnaala Karla Booja Land Use Agreement Area and the Wagyl Kaip Ilua Land Use Agreement Area. The Project, and works associated with the proposed development, is within a Rural zone as set out in the Shire of Kojonup Local Planning Scheme No.3.

The BESS will have a limited volume of vehicle trips associated with its operation. Traffic volumes attributable to construction of the Project has been determined to have a low impact with a focus on site access issues being the key consideration given the majority of the equipment associated with the construction stage will be delivered through as-of-right vehicles.

The overall program for delivery of the Project which will result in traffic generation from the Project will be spread over the period of a year. There will be six key elements to the Project delivery program:

- Site establishment
- Civil works – construction
- BESS installation
- Electrical works
- Substation works
- Commissioning.

The Project will have direct frontage to both Collie-Changerup Road and Tunney Road which provide Restricted Access Vehicle (RAV) network 4 and 7 classification access. Both roads are managed by the Shire of Kojonup. The access point on Collie-Changerup Road will be the primary point of access with the Tunney Road crossover the secondary Project access point. Some vehicle movements will also use the existing Kojonup substation crossover for access however those movements will be limited.

Access crossovers on both roads have been designed to allow for turning vehicles into and out of the development. The immediate area is generally flat and sight lines are unencumbered, with the assessment noting the eastbound approach on Collie-Changerup Road has a slight crest to the east of the proposed Project Area crossover. Warning signage, which could be installed by Main Roads WA, would be proposed for that approach indicating trucks turning ahead.

Traffic volumes associated for the Project would be low in the context of weekday or hourly volumes in this area. No safety issues are evident on the surrounding network immediately adjacent to the Project, with any issues associated with the movement of over size components managed through the design of access into and out of the Project Area, permit controls set out by Main Roads WA and through on-site traffic management.

9. CHECKLIST

ITEM	PROVIDED	COMMENTS/PROPOSALS
Proposed development		
existing land uses	Yes	Agricultural land
proposed land use	Yes	Battery Energy Storage System (BESS)
context with surrounds	Yes	Included
Vehicular access and parking		
access arrangements	Yes	Two crossovers on frontage roads
public, private, disabled parking set down/pick up	Yes	
Service vehicles (non-residential)		
access arrangements	Yes	Discussed, including locations of crossovers
on/off-site loading facilities	Yes	
Service vehicles (residential)		
rubbish collection and emergency vehicle access	Yes	n/a
Hours of operation (non-residential only)		n/a
Traffic volumes		
daily or peak traffic volumes	Yes	Volumes associated with workforce numbers. Overall volumes for some stages will fluctuate
type of vehicles (for example, cars, trucks)	Yes	RAV network issues covered, swept path for access from Collie-Changerup Road shown
Traffic management on frontage streets		Included
Public transport access		
nearest bus/train routes	Yes	n/a
nearest bus stops/train stations	Yes	n/a
pedestrian/cycle links to bus stops/ train station	Yes	n/a

ITEM	PROVIDED	COMMENTS/PROPOSALS
Pedestrian access/facilities		
existing pedestrian facilities within the development (if any)	Yes	n/a
proposed pedestrian facilities within development	Yes	n/a
existing pedestrian facilities on surrounding roads	Yes	n/a
proposals to improve pedestrian access	Yes	n/a
Cycle access/facilities		
existing cycle facilities within the development (if any)	Yes	n/a
proposed cycle facilities within development	Yes	n/a
existing cycle facilities on surrounding roads	Yes	n/a
proposals to improve cycle access	Yes	n/a
Site specific issues		Addressed, including crossover designs
Safety issues		Discussed, crash reporting show no specific issues. Proposed signage for eastbound approach.
identify issues	Yes	Crash reporting examined. No noticeable issues. Safety elements associated with sight lines and vehicle movements discussed.
remedial measures	Yes	Sight lines adequate on straight section of road for crossovers but suggest additional signage or warning signs on approach from west.