

Miriam Vale Battery Energy Storage System (BESS)

Traffic Impact Assessment



14 November 2024

Attexó

Document Control

Document: Project Name: Miriam Vale Battery Energy Storage System
PSA Job Number: 1681
Report Name: Traffic Impact Assessment

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Revision History

VERSION	DATE	DETAILS	AUTHOR	AUTHORISATION
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LIST OF ACRONYMS

AADT	Average Annual Daily Traffic
BAL	Basic Left Turn
BESS	Battery Energy Storage System
CHR	Channelised Right Turn
GFA	Gross Floor Area
GRC	Gladstone Regional Council
GTIA	Guide to Traffic Impact Assessments
LGA	Local Government Area
PEP	Private Energy Partners
PSA	PSA Consulting
RUMP	Road use Management Plan
QLD	Queensland
SISD	Safe Intersection Sight Distance
TARS	Traffic Analysis Report System
TIA	Traffic Impact Assessment
TMR	Queensland Department of Transport and Main Roads

1 INTRODUCTION

PSA Consulting (PSA) has been commissioned to prepare a Traffic Impact Assessment (TIA) to accompany a Development Application for the Miriam Vale Battery Energy Storage System (BESS) and Substation (the Project) under the Gladstone Regional Council (GRC) Planning Scheme, being:

- Development Permit for Material Change of Use for an Undefined Use (BESS); and
- Development Permit for Material Change of use for a Substation.

Private Energy Partners (PEP) is proposing to develop a BESS with a discharge capacity of 500 megawatts (MW) and a Substation.

The proposed development area is shown in Figure 1.

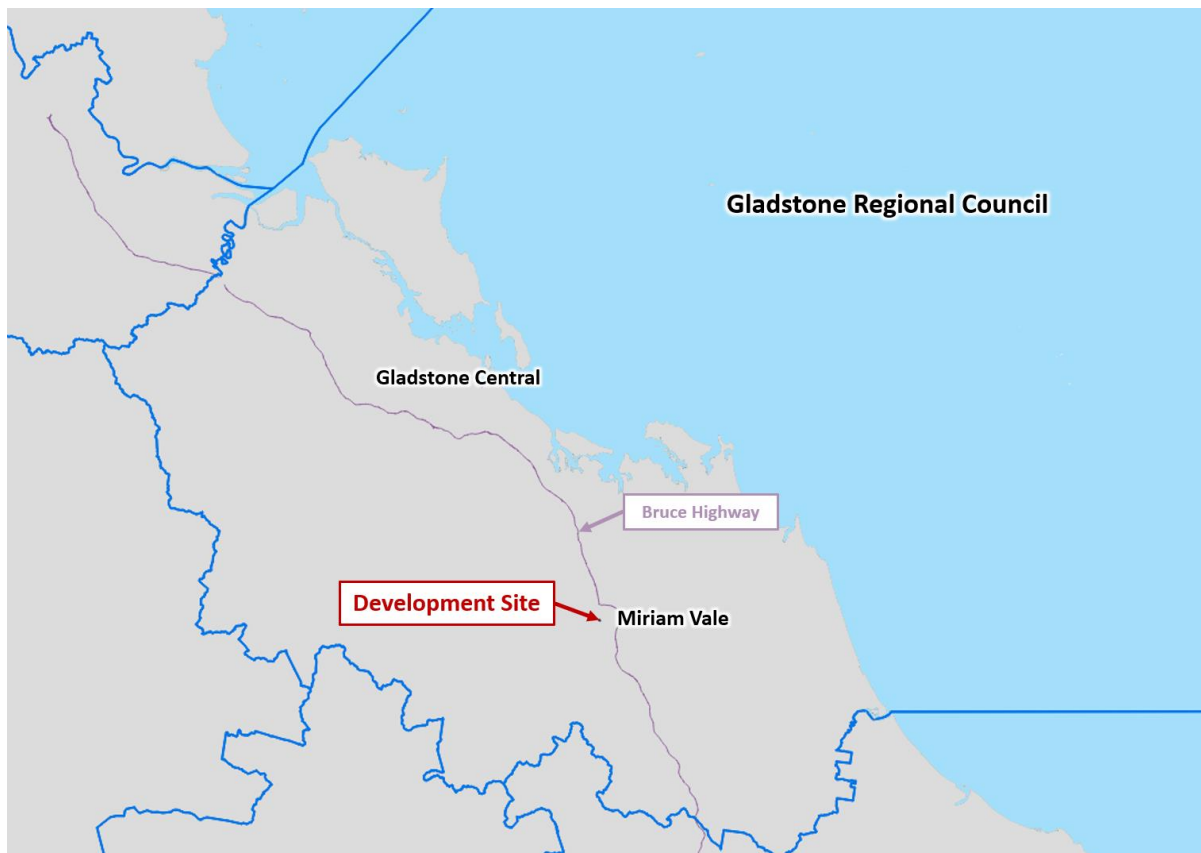


Figure 1: Site Locality Map (Source: Attexo, PSA)

1.1 SCOPE OF REPORT

This report addresses the requirements of the QLD Department of Transport and Main Roads' (TMR) Guide to Traffic Impact Assessments (GTIA) and includes the following sections:

- Existing Conditions;
- Development Details;
- Impact Assessments including:
 - Traffic Impact Assessment;
 - Safety Assessment
 - Site Access Assessment

2 EXISTING CONDITIONS

2.1 EXISTING SITE

The proposed development site is located on Lot 132 on FD32 as shown in Figure 2.



Figure 2: Development Site Overview (Source: Attexo)

The site was historically a plantation of non-endemic Eucalyptus species; however, the site is currently used for grazing and is assumed to be generating negligible traffic volumes.

2.2 ROAD NETWORK

The primary route to the site will be south from Gladstone on the Buce Highway via either Gladstone Benaraby Road or the Dawson Highway. Further south, vehicles will travel to Blackman Gap Road and onto Burgess Road to access the site. Cawthra's Road will only be utilised as an emergency site access and exit only and therefore has not been considered further in this assessment.

Figure 3 illustrates the primary routes for the vehicles travelling to and from the site.



Figure 3: Light Vehicle and Heavy Vehicle Travel Route (Source: Attexo, PSA)

Given that the Bruce Highway is the nearest major state-controlled road to the proposed development site, impacts of the proposed development on the existing operation of this highway form the focus of this assessment.

The proposed development is situated along Burgess Road with access provided via Blackman Gap Road from the Bruce Highway. The immediate surrounding roads are shown in Figure 4.

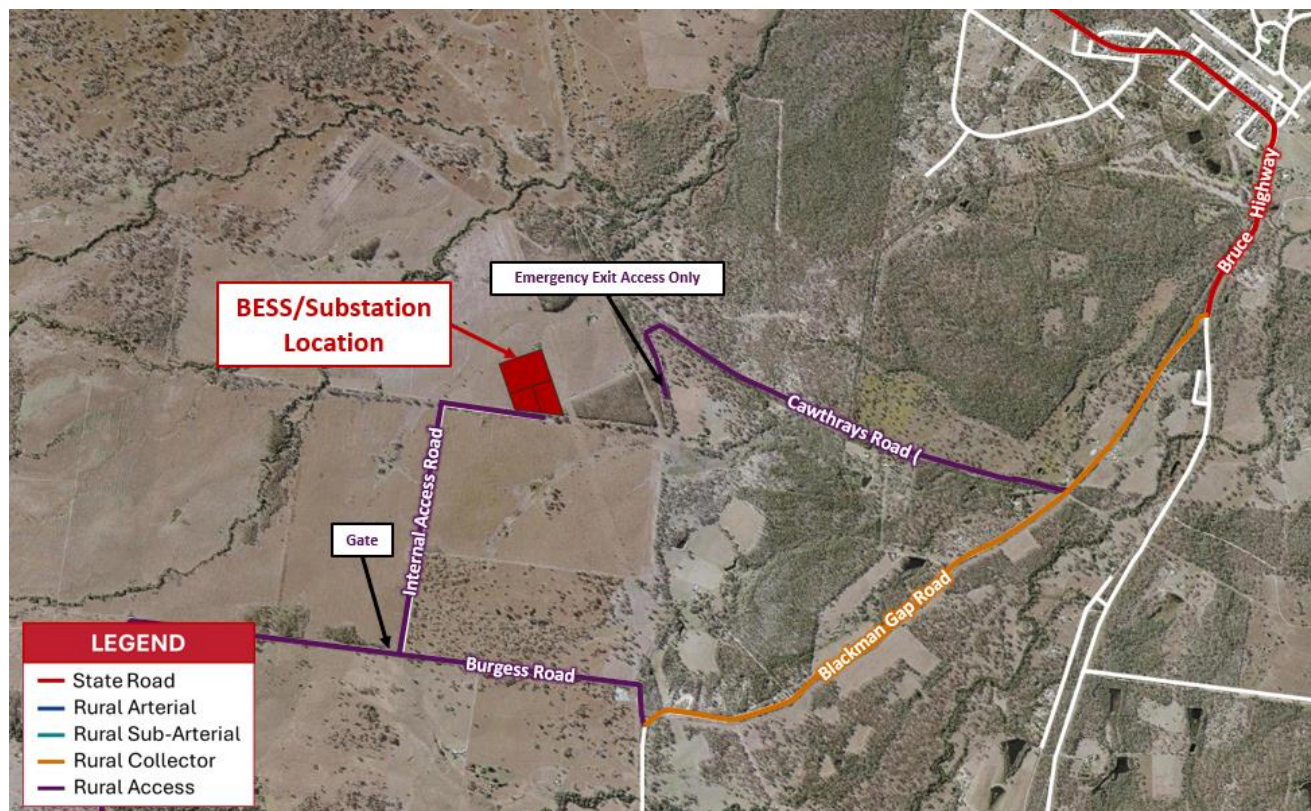


Figure 4: Surrounding Road Network (Source: Attexo, PSA)

Table 1 summarises the surrounding road networks and their characteristics.

Table 1: Surrounding Road Characteristics (Source: Gladstone Regional Council)

ROAD NAME	JURISDICTION	CLASSIFICATION / HIERARCHY	CROSS SECTION / GEOMETRY	POSTED SPEED LIMIT
Bruce Highway	State-Controlled	State Road	Sealed two-lane / two-way divided	80km/hr ^[1] to 100km/hr
Blackman Gap Road	Council-Controlled	Rural Collector	Sealed two-lane / two-way divided	100km/hr
Burgess Road	Council-Controlled	Rural Access	unsealed	Unposted 100km/hr
Cawthrays Road	Council-Controlled	Rural Access	unsealed	Unposted 100km/hr

Note:

1. The Bruce highway varies in posted speed limit depending on the location. 80km/hr is the posted speed limit before exiting the Bruce Highway to enter onto Blackman Gap Road.

2.3 EXISTING ACTIVE AND PUBLIC TRANSPORT NETWORKS

There is no existing active or public transport network in the vicinity, as can be expected due to the site's location and lack of development in the surrounding rural area.

2.4 EXISTING AND FUTURE YEAR BACKGROUND VOLUMES

Traffic surveys were undertaken on Wednesday 4 September 2024 for the Bruce Highway and Blackman Gap Road intersection. Based on the counts undertaken, it was found that the AM peak hour was 7:15am-8:15am and the PM peak hour was 2:00pm-3:00pm. These counts were used to establish the background traffic for the construction (2025) and operational (2027) phases of the development with a conservative compound growth rate of 2%. Given that there is limited development along Burgess Road, the existing background traffic volumes have been assumed to be negligible.

Future background traffic volumes for 2025 (Construction Phase) during the AM and PM peak are shown in Figure 5 and Figure 6 respectively.

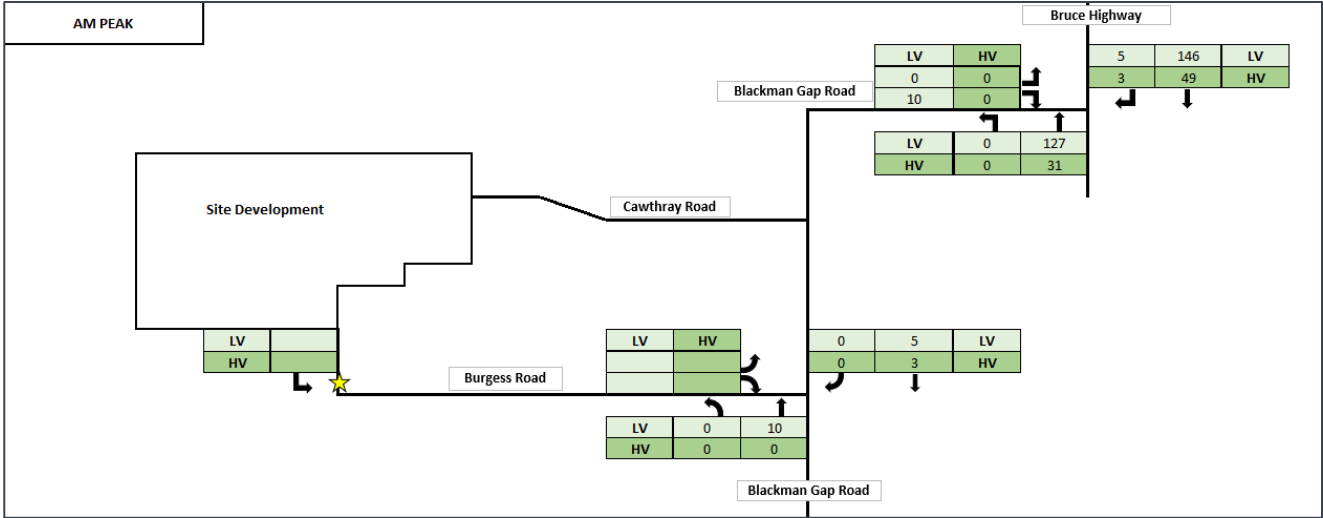


Figure 5: 2025 Background Traffic Volumes – AM Peak Hour (Source: PSA)

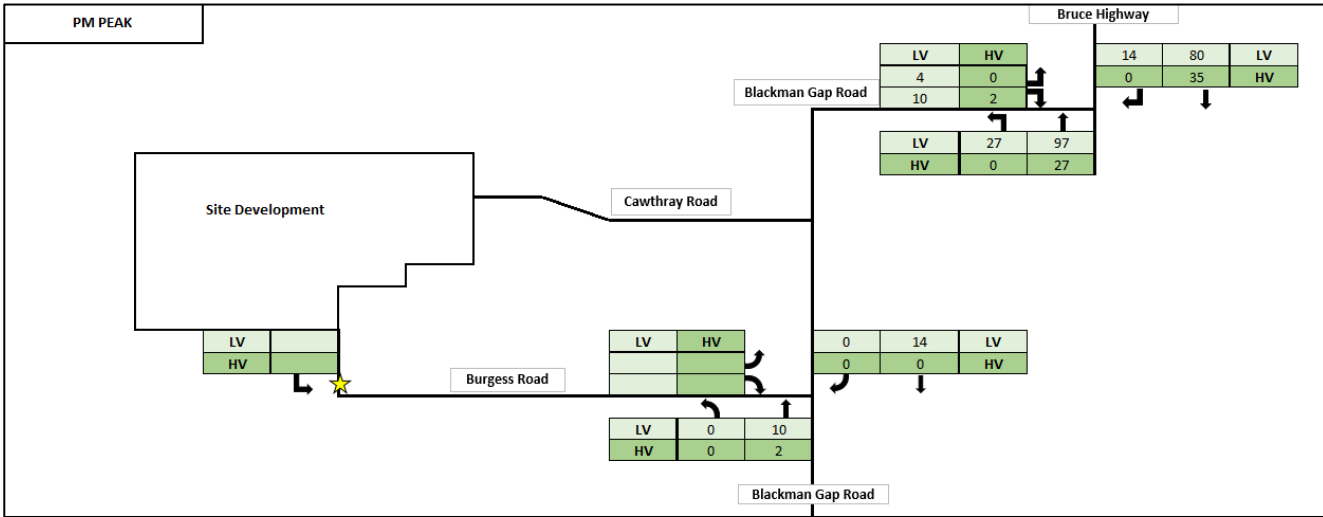


Figure 6: 2025 Background Traffic Volumes – PM Peak Hour (Source: PSA)

Future background traffic volumes for 2027 (Operational Phase) during the AM and PM peak are shown in Figure 7 and Figure 8 respectively.

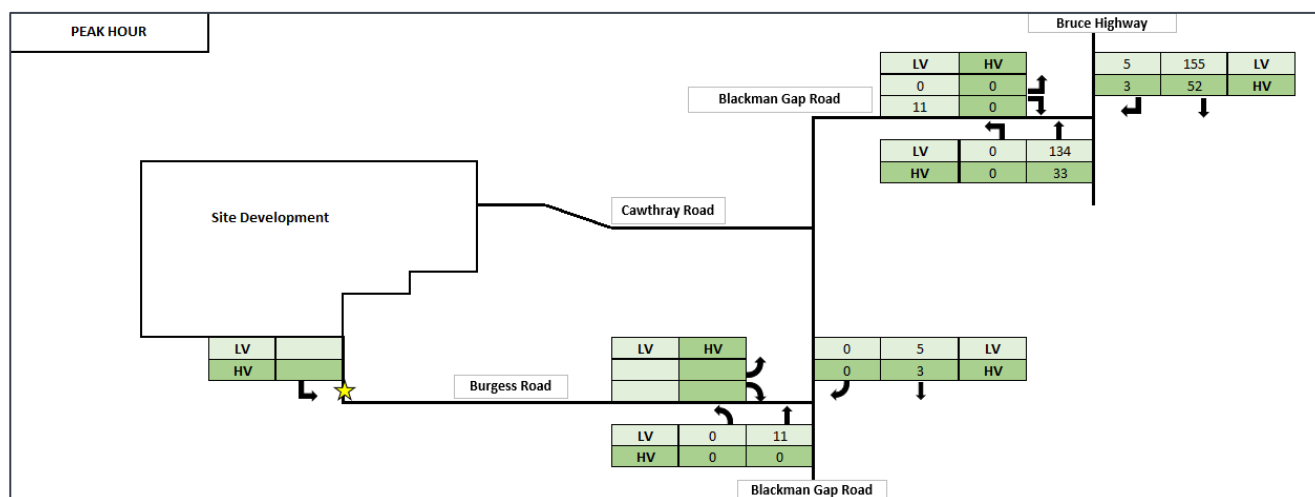
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Figure 8: 2027 Background Traffic Volumes – PM Peak Hour (Source: PSA)

3 DEVELOPMENT PROFILE

3.1 DEVELOPMENT DETAILS

The proposed development involves the construction of a new Battery and Energy Storage System (BESS), Substation and associated infrastructure. The proposed site layout is shown in Figure 9, with full development plans provided in Appendix 1.

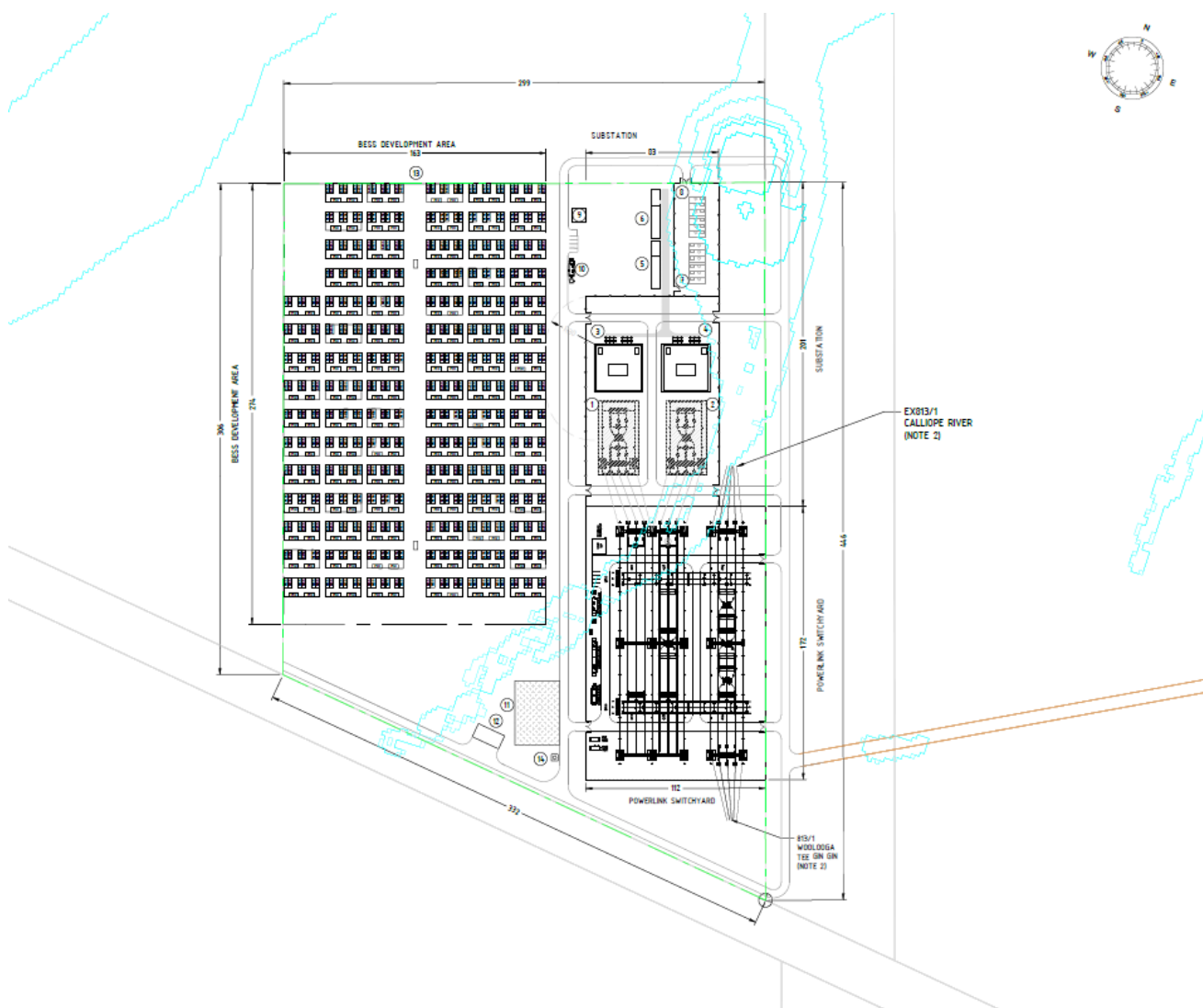


Figure 9: Site Layout (Source: Attexo)

The development has been assumed to be constructed over five stages based on a similar BESS and substation development TIA undertaken by PSA in 2022:

- Mobilisation
- Civil Works
- Electrical Works
- De-Mobilisation
- Testing and Energisation

3.2 DEVELOPMENT TRAFFIC GENERATION AND DISTRIBUTION

Based on a previous assessment undertaken for a similar BESS and substation development, anticipated vehicles requiring access to the development across each stage are shown in Table 2.

Table 2: BESS and Substation Overall Vehicle Generation (Source: PSA)

MOBILISATION	CIVIL WORKS	ELECTRICAL WORKS	DE-MOBILISATION	TESTING AND ENERGISATION
<ul style="list-style-type: none"> Semi-Trailer with site offices and portable amenities block Tilt tray truck with shipping containers Low Loader Semi with EWP's and Telehandler Numerous Light Vehicles Trailers 8x4 	<ul style="list-style-type: none"> Low loader semi's with 15T excavator 3 T excavators x 2 Bobcats Skid Steers Roller Tip Truck Water Truck Numerous Light Vehicles and Trailers (10 – 15 at peak) Grader 	<ul style="list-style-type: none"> Numerous light vehicles and trailers (10 – 15 at peak) Water delivery truck Waste collection trucks Scrap collection trucks Delivery Vehicles and Trucks PLQ Steel delivery trucks PLQ Switchgear delivery trucks PLQ Cable delivery Trucks SF6 Gas Delivery trucks Major Delivery, Transformer (once) 	<ul style="list-style-type: none"> As per mobilisation 	<ul style="list-style-type: none"> Light Vehicles 10-15 at peak

The traffic volumes in the peak hour during construction are expected to include 100 light vehicles and 16 heavy vehicles.

Given the nature of the development, the worse-case scenario is expected to occur during the construction phase and will therefore be the focus of assessment for this report. The operational needs of the site will be lower than the construction phase.

The following assumptions have been made with regards to the split between vehicles entering and exiting the site:

- It is assumed that 100% of light vehicles will enter the site during the AM peak hour and exit during the PM peak hour.
- It is assumed that 50% of heavy vehicles will enter and 50% will exit during each AM and PM peak hour.

This is considered to be a conservative assessment. The complete construction stage traffic generation of the site is shown in Table 3.

Table 3: BESS and Substation Construction Phase Traffic Generation (Source: PSA)

VEHICLE TYPE	AM PEAK HOUR		PM PEAK HOUR		TOTAL DAILY VEHICLE TRIPS
	Vehicle Trips Entering Development	Vehicle Trips Exiting the Development	Vehicle Trips Entering Development	Vehicle Trips Exiting the Development	
Light Vehicles	100	0	0	100	200
Heavy Vehicles	8	8	8	8	32
TOTAL	108	8	8	108	232

As can be seen in Table 3, a total of 200 light vehicles trips and 32 heavy vehicle trips will occur daily during the construction phase.

All development generated traffic has been established to be travelling to and from the north of the development site.

3.3 DEVELOPMENT TRAFFIC TURNING MOVEMENTS

Peak hour traffic turning movements of the BESS and substation have been calculated based on the assumptions previously outlined and are shown in Figure 10 and Figure 11 for the AM and PM peak hour respectively.

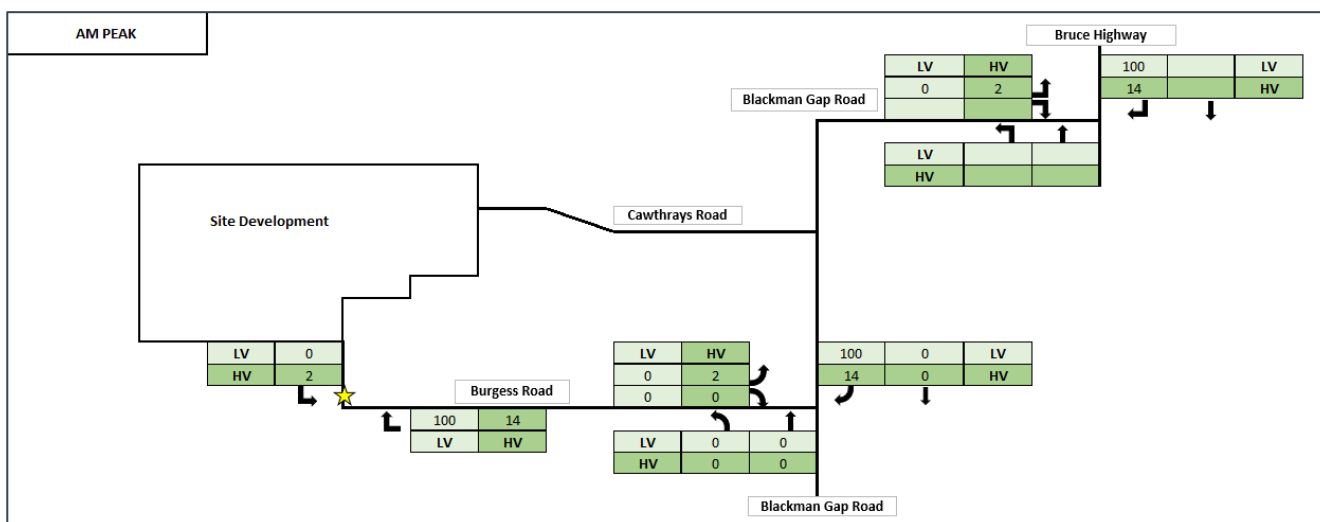


Figure 10: BESS and Substation Traffic Volumes – AM Peak Hour (Source: PSA)

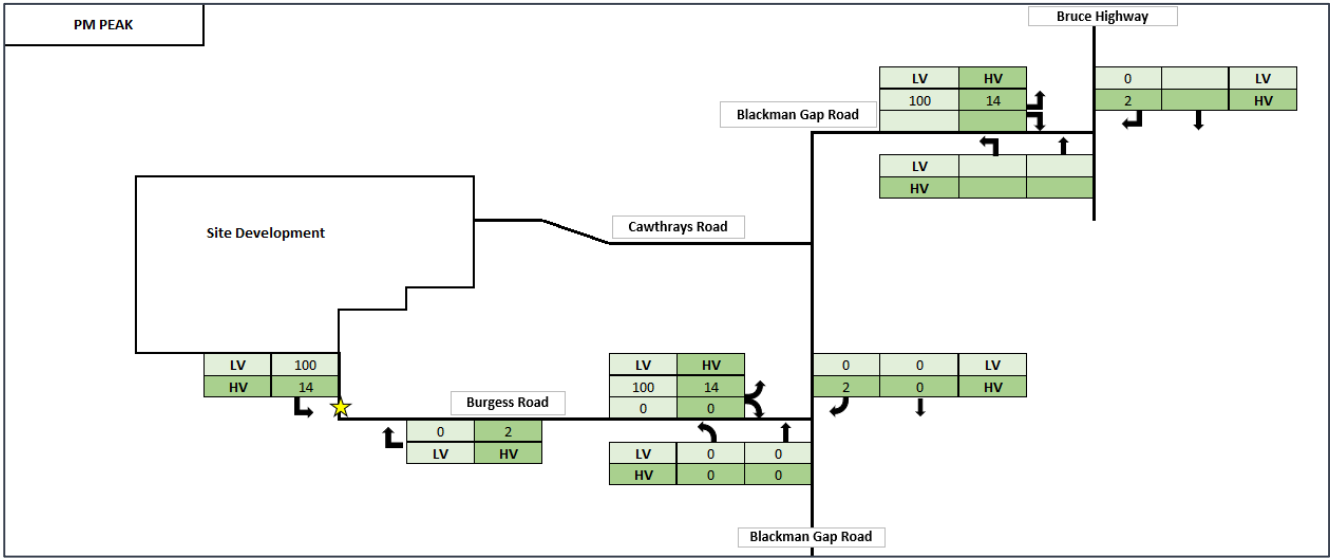


Figure 11: BESS and Substation Traffic Volumes – PM Peak Hour (Source: PSA)

4 IMPACT ASSESSMENT

4.1 ASSESSMENT PARAMETERS

The following development parameters have been adopted for the purpose of this assessment:

- Year of most recent background traffic data: 2019
- Commencement of construction: 2025
- Year of Operation: 2027

4.2 KEY PERFORMANCE FACTORS

Three key measures of performance are generally used when assessing the operations of intersections. These include:

- Level of Service (LOS) and delay;
- Degree of Saturation (DOS) and practical capacity; and
- Queue Length for critical movements.

Allowable thresholds used for this study are defined in the following sections. These thresholds are based on standard practice adopted within Queensland and form the basis of the determination of any deficiencies within the existing road network.

4.2.1 Level of Service and Delay

Levels of Service (LOS) and delay definitions are shown in Table 4. These values are industry accepted thresholds adopted when undertaking analysis in SIDRA.

Table 4: Level of Service and Delay Definitions (Source: SIDRA)

Level of Service	Control Delay per Vehicle in Seconds (d)		
	Signalised Intersection	Roundabout	Unsignalised Intersection
A	$d \leq 10$	$d \leq 10$	$d \leq 10$
B	$10 < d \leq 20$	$10 < d \leq 20$	$10 < d \leq 15$
C	$20 < d \leq 35$	$20 < d \leq 35$	$15 < d \leq 25$
D	$35 < d \leq 55$	$35 < d \leq 50$	$25 < d \leq 35$
E	$55 < d \leq 80$	$50 < d \leq 70$	$35 < d \leq 50$
F	$80 < d$	$70 < d$	$50 < d$

4.2.2 Degree of Saturation

The effect of differing levels of traffic flow on the operating performance of intersections has traditionally been assessed by dividing the intersection volume with its capacity – referred to as the DOS. As traffic volumes approach the capacity of the intersection, the DOS approaches the theoretical capacity of 1. The practical DOS thresholds which have been used for comparison in this study are presented in Table 5. These thresholds were originally published within the Department of TMR's Guidelines for Assessment of Road Impacts of Development (GARID). It is noted that GARID is now superseded by the GTIA which specifies that most intersections have a DOS above these levels and average delay should be used to assist in determining intersection performance.

Intersection Type	Practical degree of saturation
Sign Controlled	0.8
Roundabout	0.85
Signalised Intersection	0.9

The SIDRA queue lengths reported herein are 95th percentile queues. This means that 95% of the time, queue lengths will not exceed the specified queue length. Queue lengths are deemed acceptable if queuing is contained within given storage areas. Where queuing exceeds the short lane capacity, queue lengths can also be deemed acceptable if queues do not impact upon major adjacent conflict points (e.g., an adjacent through lane).

Design traffic volumes have been calculated by adding the background traffic volumes with the development traffic volumes. Figure 12 and Figure 13 illustrates the design traffic volumes during the construction phase in the AM and PM peak hour respectively.



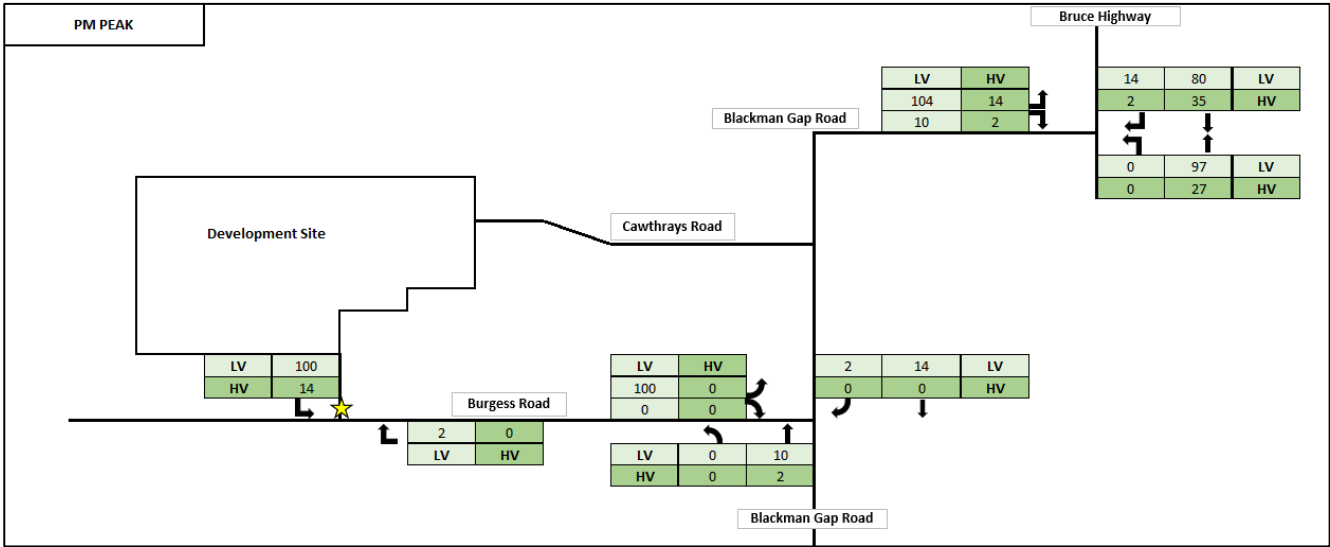


Figure 13: 2025 Design Traffic - PM Peak (Source: PSA)

Figure 14 and Figure 15 illustrates the design traffic volumes during the operational phase in the AM and PM peak hour respectively.

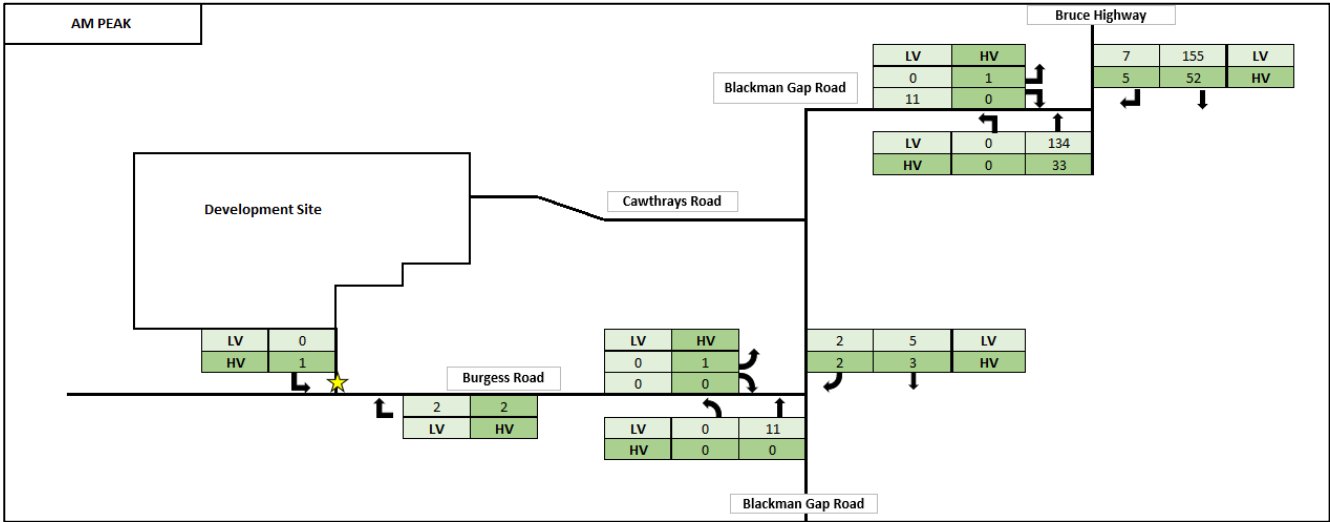


Figure 14: 2027 Design Traffic - AM Peak (Source: PSA)

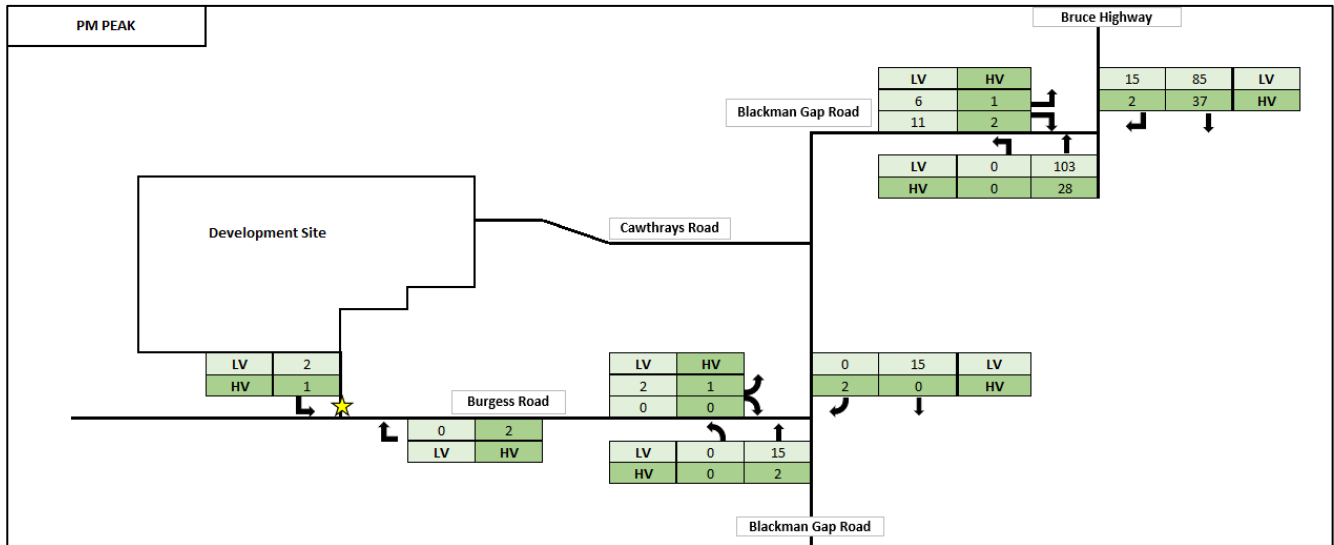


Figure 15: 2027 Design Traffic - PM Peak (Source: PSA)

SIDRA analysis was conducted to assess the impact of the development to the external road network at the Bruce Highway and Blackman Gap Road intersection and the Blackman Gap Road and Burgess Road intersection as seen in Table 6 and Table 7 respectively. Full SIDRA analysis outputs have been attached in Appendix 2.

Table 6: Bruce Highway / Blackman Gap Road - Intersection Analysis (Source: SIDRA)

Scenario	Without Development			With Development		
	DOS	Average Delay	Queue Length	DOS	Average Delay	Queue Length
2025 Construction Phase						
AM Peak	0.122	0.6	1.5	0.122	2.0	0.09
PM Peak	0.076	1.4	1.5	0.192	3.1	0.13
2027 Operational Phase						
AM Peak	0.130	0.7	1.8	0.130	0.5	0.6
PM Peak	0.079	1.5	1.6	0.081	0.9	0.8

Table 7: Blackman Gap Road / Burgess Road - Intersection Analysis (Source: SIDRA)

Scenario	Without Development			With Development		
	DOS	Average Delay	Queue Length	DOS	Average Delay	Queue Length
2025 Construction Phase						
AM Peak	0.006	1.0	0.0	0.076	4.9	2.9
PM Peak	0.010	0.7	0.0	0.066	4.4	1.9
2027 Operational Phase						
AM Peak	0.007	1.0	0.0	0.009	1.6	0.3
PM Peak	0.010	0.6	0.0	0.011	1.2	0.2

The results of the intersection analysis show that the intersections are not expected to be significantly impacted by the addition of the development traffic. Both intersections are expected to operate within allowable Degree of Saturation (DoS) thresholds and the Level of Service is not expected to worsen.

4.4 ROAD SAFETY ASSESSMENT

A road safety assessment has been undertaken for the intersection between Burgess Road and Blackman Gap Road. Risks have been identified and scored in accordance with *Figure 9.2.2 (a) – Safety risk score matrix* from the GTIA which has been reproduced in this report as Figure 16.

		Potential consequence				
		Property only (1)	Minor injury (2)	Medical treatment (3)	Hospitalisation (4)	Fatality (5)
Potential likelihood	Almost certain (5)	M	M	H	H	H
	Likely (4)	M	M	M	H	H
	Moderate (3)	L	M	M	M	H
	Unlikely (2)	L	L	M	M	M
	Rare (1)	L	L	L	M	M

L: Low risk
M: Medium risk
H: High risk

Figure 16: Safety Risk Score Matrix (Source: TMR)

Table 8 shows the risk assessment for the ‘without development’ and ‘with development’ scenarios to determine whether the proposed development worsens the existing safety risk for the site access location.

Table 8: Risk Assessment (Source: TMR)

RISK ITEM	WITHOUT DEVELOPMENT			WITH DEVELOPMENT		
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score
Increased risk of rear-end collision between vehicles travelling southbound on Blackman Gap Road and vehicles turning left into Burgess Road	1	4	L	2	4	L
Increased risk of vehicles from adjacent approach through-left collision between vehicles travelling on Blackman Gap Road and vehicles turning right out of Burgess Road.	1	4	L	2	4	L

As demonstrated by the risk assessment, development of the site will result in a minimal increase in the likelihood of a collision occurring due to an increase in vehicle movements. All identified risks score “Low” for both with and without associated trip generation and will only occur over a short timeframe and will not be ongoing.

4.4.1 Crash History

Based on data available through the QLD Open Data portal, no crashes have occurred within the vicinity of the site within the last 5 years.

5 SITE ACCESS

5.1 PROPOSED DEVELOPMENT SITE ACCESS

The proposed development will be accessed from an internal access road via Burgess Road which is accessible from Blackman Gap Road via the Bruce Highway (as per Figure 4). The BESS site access will be located as per Figure 17.

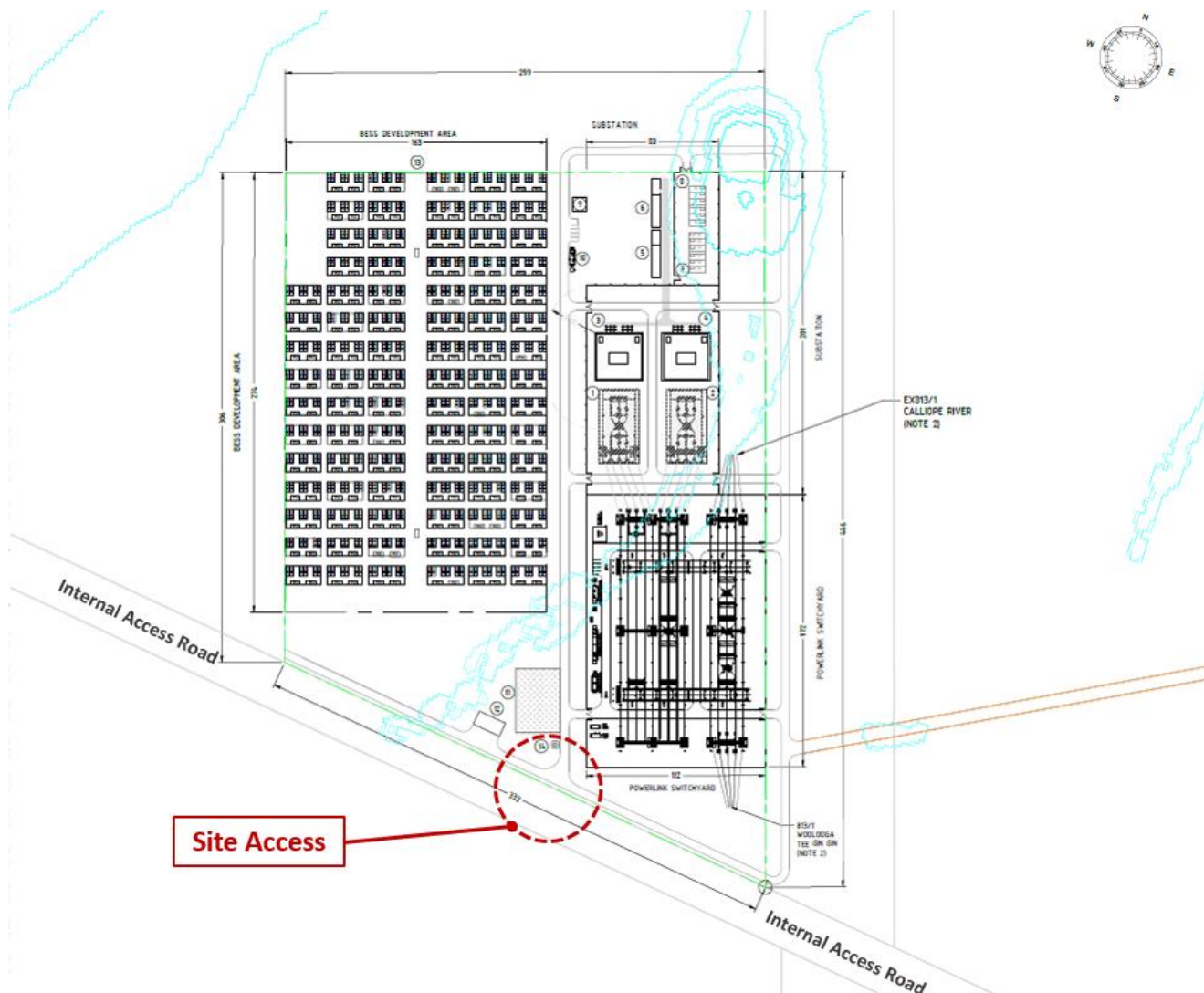


Figure 17: Proposed Site Access (Source: Attexo)

5.2 SIGHT DISTANCE ASSESSMENT

Safe Intersection Sight Distance (SiSD) is to be provided at the site access location of the development. Based on the indicated access point, a desktop assessment of the required sight distance has been undertaken for a design speed of 110km/hr. The relevant sight triangles (showing the required 193m of sight distance) are shown in Figure 18

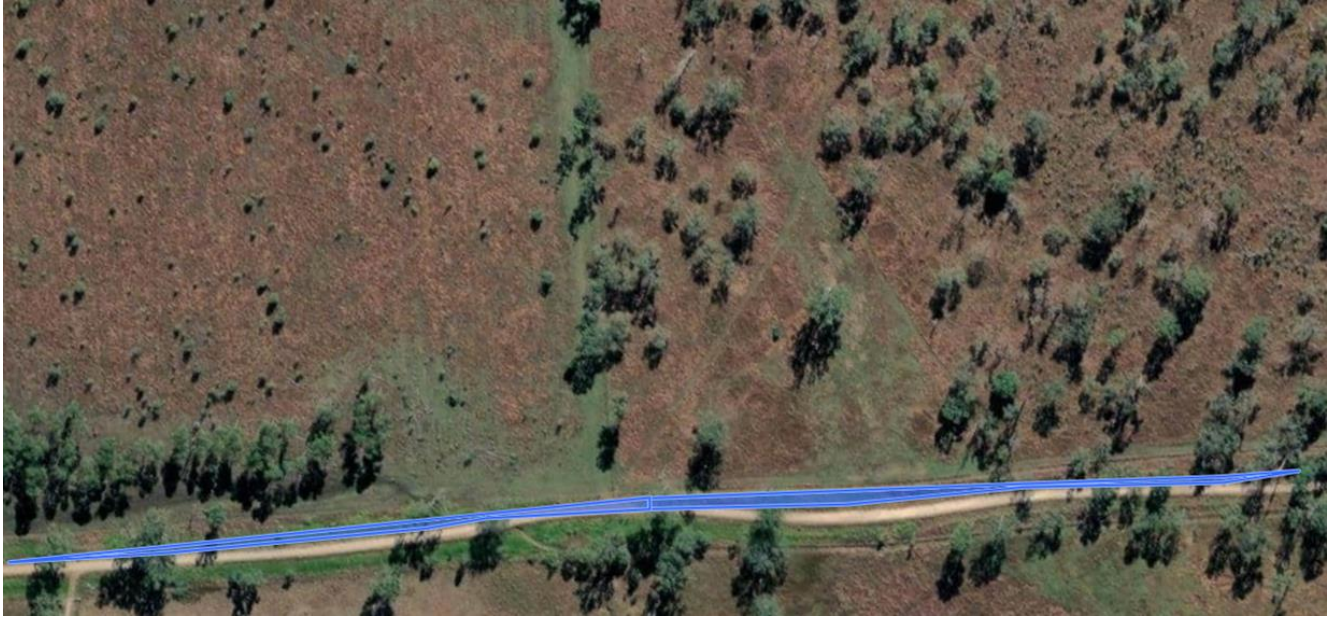


Figure 18: Burgess Road / Site Access Distance Triangles (Source: Nearthmap, PSA)

In the vicinity of the site access driveway, Burgess Road is a mild windy road with minimal changes in elevation and therefore will not impact the sight distance as seen in Figure 19 and Figure 20.



Figure 19: Proposed Site Access Looking Eastbound (Source: Attexo)



Figure 20: Proposed Site Access Looking Westbound (Source: Attexo)

5.2.1 Turn Warrant Assessment

A detailed turn warrants assessment has been undertaken in accordance with the procedure set out in Austroads' Guide to Road Design Part 4: Intersections and Crossings – General. The assessment was conducted for the construction phase of the development based on the traffic volumes previously outlined at the intersection between Blackman Gap Road and Burgess Road. There are currently no additional turning lanes at the intersection. Figure 21 and Figure 22 shows the assessments undertaken for the 2025 AM and the 2025 PM peak hour design traffic volumes respectively.

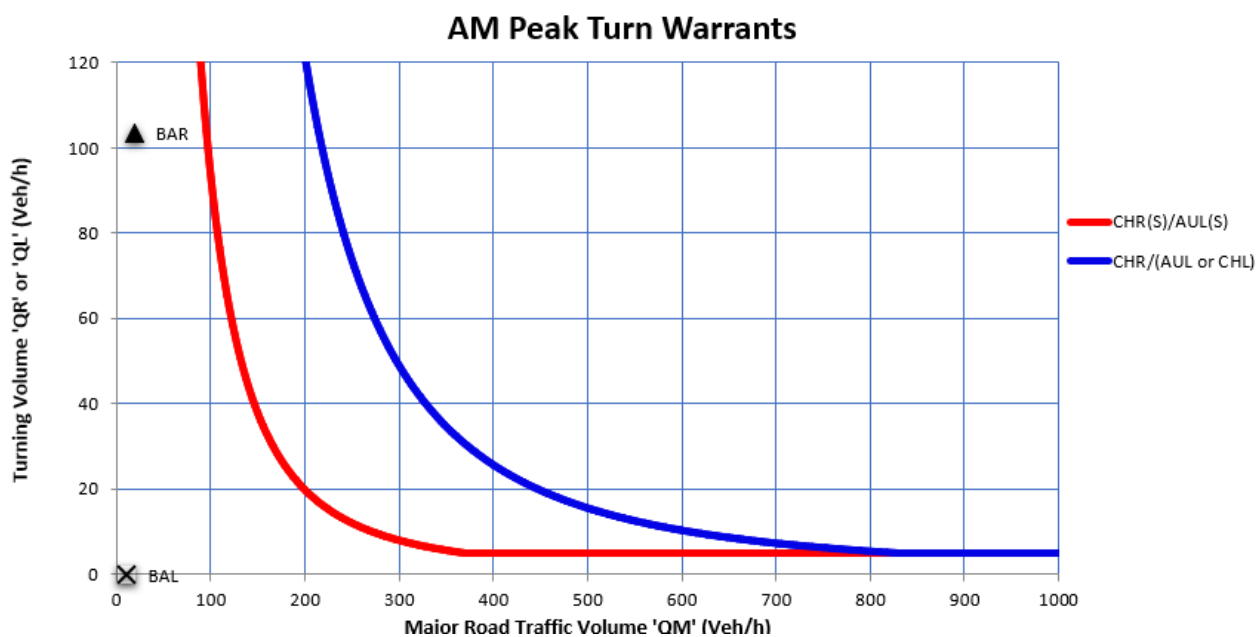


Figure 21: AM Turn Warrant Assessment - Blackman Gap Road/Burgess Road Construction Phase (Source: Austroads, PSA)

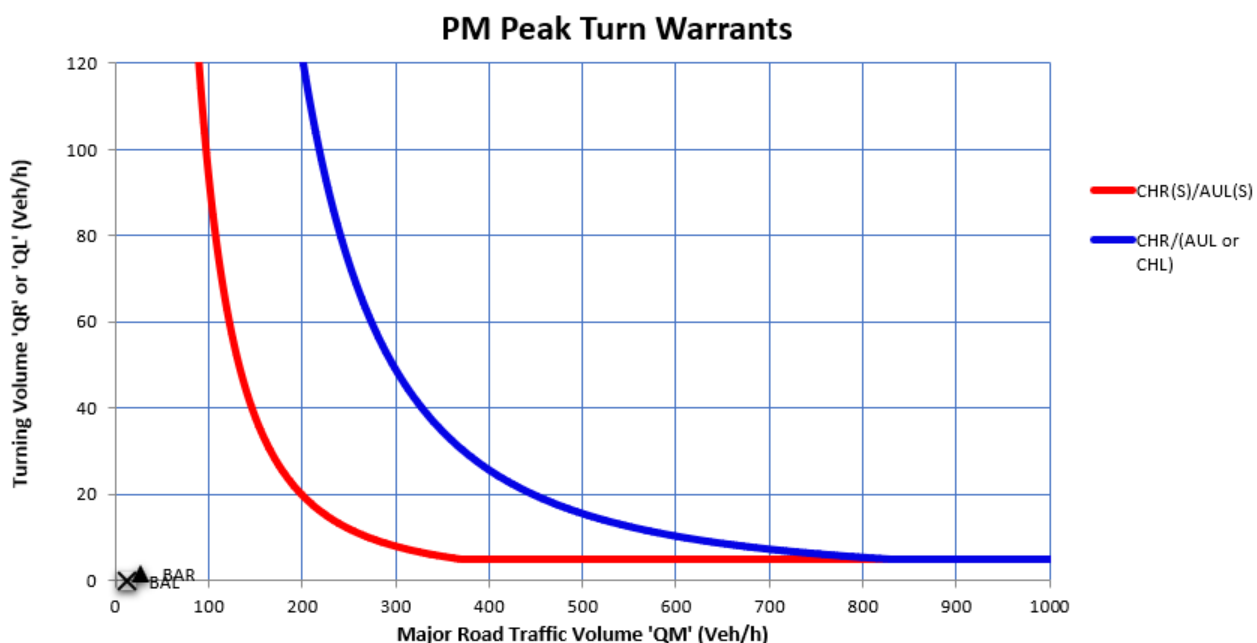


Figure 22: PM Turn Warrant Assessment - Blackman Gap Road/Burgess Road Construction Phase (Source: Austroads, PSA)

As demonstrated by the turn warrant assessment, the design traffic volumes during the construction phase warrant the construction of a Basic Left (BAL) and a Basic Right (BAR) turn treatments. Considering that construction will only occur only a relatively short period of time, it is not considered necessary to construct turning lanes at the intersection. No issues were identified during the safety assessment.

5.2.2 Swept Path Analysis

Swept path analysis has been undertaken for the Blackman Gap Road / Burgess Road intersection as well as the Bruce Highway / Blackman Gap Road intersection. Swept path analysis has been undertaken for a 19m semi-trailer with a 0.3m buffer around the path as this vehicle will be the largest vehicle requiring access to and from the site on a regular basis.

A one-off transformer delivery will be required by a specialist vehicle. Swept path analysis has been undertaken for this vehicle (with a 0.3m buffer) to demonstrate the suitability of the existing road network. Given that the low-loader vehicle required to deliver the transformer will be an Over-Size Over-Mass vehicle, a separate Traffic Management Plan will be required to ensure the vehicle can safely access the development while minimising impact to existing traffic.

Full swept path analysis has been attached in Appendix 3.

Localised widening of Burgess Road at the Blackman Gap Road / Burgess Road intersection should be undertaken to ensure that semi-trailers are able to safely and efficiently manoeuvre through the road network.

5.3 ON-SITE PARKING AND SERVICING REQUIREMENTS

The Gladstone Regional Council Planning Scheme establishes guidelines for on-site parking in connection with various development projects. Specifically, Table SC6.10.2.1- Minimum on-site parking rates outline the car parking requirements based on the land use. The proposed BESS is an Undefined Use, while the Substation is a Substation based on the definitions of the Planning Scheme. Adequate car-parking rates are not provided for these uses so the rates for Major Electricity Infrastructure / Utility Installation have been referenced as they represent similar construction/operational workforce numbers and associated parking requirements. Table 9 highlights the minimum on-site parking rates as required by the planning scheme.

Table 9: Minimum On-Site Parking Rates (Source: GRC)

Development Land Use	Vehicles	Bicycle
Major Electricity Infrastructure / Utility Installation	1 Space per employee plus 1 space for Maintenance vehicle (excluding transmission lines, pipelines, etc.)	1 space per 400m ² GFA (minimum 4 space)

As shown, the site should accommodate parking spaces suitable for the number of staff expected on the site at any one time. Given that the development traffic corresponds to the construction of the facility, it is likely that workers will park in any available area rather than a formalised parking space. Additionally, the likelihood that the development will require servicing post-construction is low. As such, no formal parking is required or has been provided for the development.

5.4 ROAD MANAGEMENT AND UPGRADES

Figure 23 shows an aerial view of the Blackman Gap Road / Burgess Road intersection which shows that Burgess Road is currently an unsealed road.



Figure 23: Blackman Gap Road / Burgess Road Intersection (Source: QLD Globe)

The GRC road hierarchy policy provides the necessary criteria which roads should be designed to base on the road hierarchy. Burgess road is classified as a Local Access Road. The predicted AADT along Burgess Road is assumed to be more than 10vpd but less than 50vpd post-construction and therefore will require to be upgraded to a gravel surface to adhere to the standards.

Rather than undertaking a pavement impact assessment for roads impacted by the development traffic, the developer is proposing to “make good” and rectify any damage or ‘wear and tear’ on the road network in accordance with a Road Use Management Plan (RUMP). The RUMP will be submitted to GRC and will include:

- Pre-construction dilapidation report (prepared by an RPEQ) for Blackman Gap Road, Burgess Road and associated intersections
- Construction program with road usage estimates
- Quarterly road inspections (Undertaken by an RPEQ) during construction, addressing any damage and requirement for maintenance
- Additional inspections during wet weather
- Safety management protocols, including signage, potential speed reduction locations, public transport, and traffic control (including at the Bruce Highway and Blackan Gap Road intersection)

Post-construction, PEP will:

- Prepare a dilapidation assessment (undertaken by an RPEQ) to restore roads to pre-construction standards
- Upgrade Burgess Road (between Blackman Gap Road and the site access) to gravel, with a bond possible submitted to GRC to allow development operations during the upgrade

6 SUMMARY

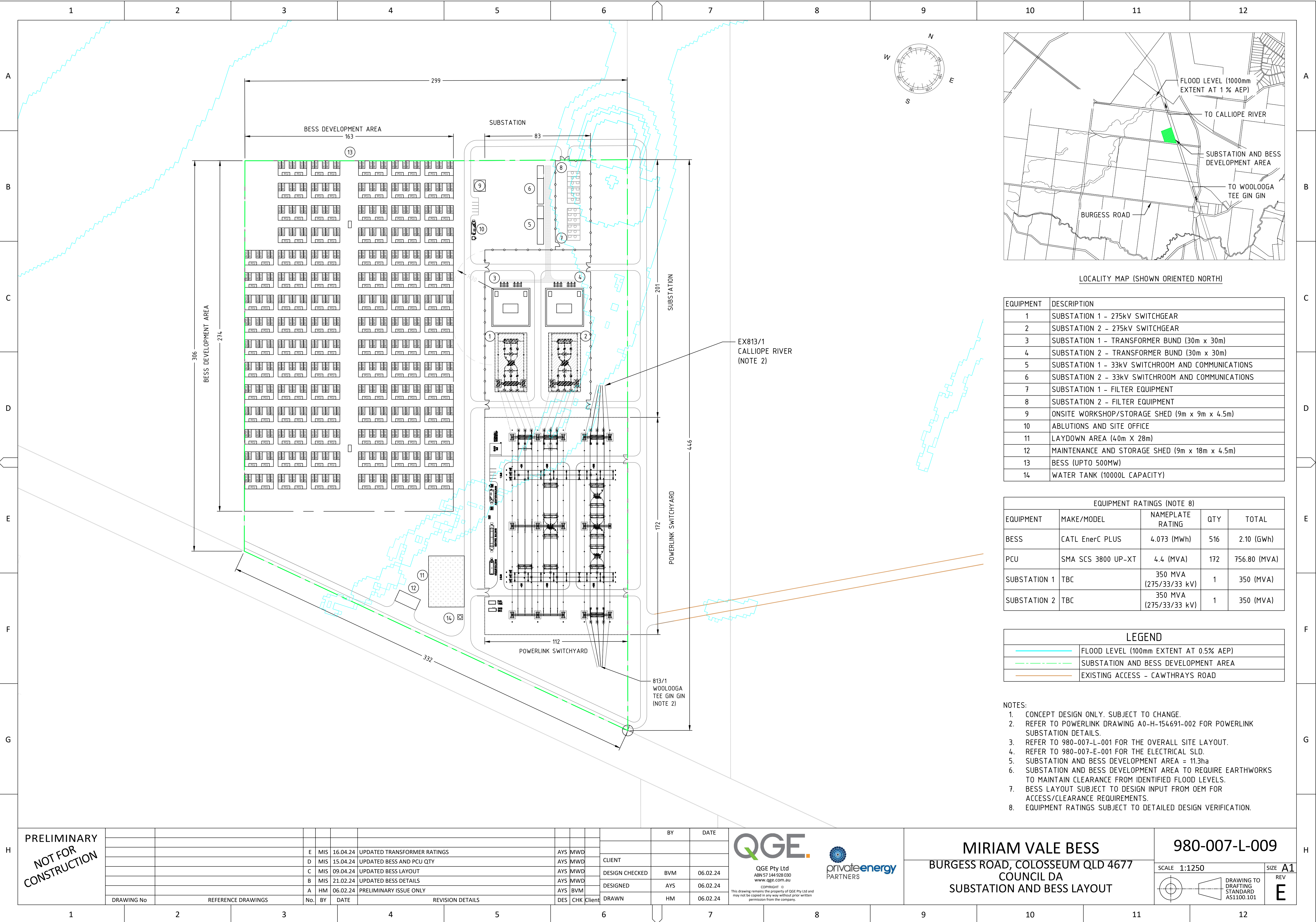
PSA Consulting has been engaged by Attexo on behalf of Private Energy Partners to prepare a TIA to accompany the development application for the proposed Miriam Vale Battery Energy Storage System (BESS).

The findings of the TIA are as follows:

- The primary route which vehicles will travel to and from the site is from either Gladstone Benaraby Road or Dawson Highway to the Bruce Highway and then onto Blackman Gap Road and Burgess Road
- The BESS will involve 100 light vehicles and 16 heavy vehicles travelling to and from the site each day during the construction phase
- Assumptions for the split between vehicles entering and exiting the BESS have been made as follows:
 - It is assumed that 100% of light vehicles will enter the site during the AM peak and exit during the PM peak hour
 - It is assumed that 50% of heavy vehicles will enter and 50% will exit during each AM and PM peak hour
- No discernible impact to the existing operation of the road network is anticipated as a result of the proposed development
- Access to the development will be via Burgess Road / Site Access priority-controlled T-intersection which will be via the Burgess Road / Blackman Gap Road priority-controlled T-intersection
- A Road Use Management Plan (RUMP) will be prepared to address road management and safety
- Burgess Road is proposed to be upgraded to a gravel surface between Blackman Gap Road and the site access location to adhere to standards
- A safety assessment demonstrated that there is no worsening to the safety of the intersection at the Blackman Gap Road and Burgess Road intersection
- Sight distance along Burgess Road is not impacted by the slightly windy road with only minimal changes in elevation
- Workers during the construction of the BESS will most likely park in any available area rather than a formalised parking space and therefore no formal parking is required.

APPENDIX 1: DEVELOPMENT SITE PLANS

AP01



EQUIPMENT	DESCRIPTION
1	SUBSTATION 1 - 275kV SWITCHGEAR
2	SUBSTATION 2 - 275kV SWITCHGEAR
3	SUBSTATION 1 - TRANSFORMER BUND (30m x 30m)
4	SUBSTATION 2 - TRANSFORMER BUND (30m x 30m)
5	SUBSTATION 1 - 33kV SWITCHROOM AND COMMUNICATIONS
6	SUBSTATION 2 - 33kV SWITCHROOM AND COMMUNICATIONS
7	SUBSTATION 1 - FILTER EQUIPMENT
8	SUBSTATION 2 - FILTER EQUIPMENT
9	ONSITE WORKSHOP/STORAGE SHED (9m x 9m x 4.5m)
10	ABLUTIONS AND SITE OFFICE
11	LAYDOWN AREA (40m X 28m)
12	MAINTENANCE AND STORAGE SHED (9m x 18m x 4.5m)
13	BESS (UPTO 500MW)
14	WATER TANK (10000L CAPACITY)

EQUIPMENT RATINGS (NOTE 8)				
EQUIPMENT	MAKE/MODEL	NAMEPLATE RATING	QTY	TOTAL
BESS	CATL EnerC PLUS	4.073 (MWh)	516	2.10 (GWh)
PCU	SMA SCS 3800 UP-XT	4.4 (MVA)	172	756.80 (MVA)
SUBSTATION 1	TBC	350 MVA (275/33/33 kV)	1	350 (MVA)
SUBSTATION 2	TBC	350 MVA (275/33/33 kV)	1	350 (MVA)

LEGEND	
	FLOOD LEVEL (100mm EXTENT AT 0.5% AEP)
	SUBSTATION AND BESS DEVELOPMENT AREA
	EXISTING ACCESS - CAWTHRAYS ROAD

- NOTES:
- CONCEPT DESIGN ONLY. SUBJECT TO CHANGE.
 - REFER TO POWERLINK DRAWING A0-H-154691-002 FOR POWERLINK SUBSTATION DETAILS.
 - REFER TO 980-007-L-001 FOR THE OVERALL SITE LAYOUT.
 - REFER TO 980-007-E-001 FOR THE ELECTRICAL SLD.
 - SUBSTATION AND BESS DEVELOPMENT AREA = 11.3ha
 - SUBSTATION AND BESS DEVELOPMENT AREA TO REQUIRE EARTHWORKS TO MAINTAIN CLEARANCE FROM IDENTIFIED FLOOD LEVELS.
 - BESS LAYOUT SUBJECT TO DESIGN INPUT FROM OEM FOR ACCESS/CLEARANCE REQUIREMENTS.
 - EQUIPMENT RATINGS SUBJECT TO DETAILED DESIGN VERIFICATION.

PRELIMINARY
NOT FOR
CONSTRUCTION

DRAWING No	REFERENCE DRAWINGS	No.	BY	DATE	REVISION DETAILS	DES	CHK	Client	DRAWN	HM	06.02.24
		E	MIS	16.04.24	UPDATED TRANSFORMER RATINGS	AYS	MWD				
		D	MIS	15.04.24	UPDATED BESS AND PCU QTY	AYS	MWD	CLIENT			
		C	MIS	09.04.24	UPDATED BESS LAYOUT	AYS	MWD	DESIGN CHECKED	BVM	06.02.24	
		B	MIS	21.02.24	UPDATED BESS DETAILS	AYS	MWD	DESIGNED	AYS	06.02.24	
		A	HM	06.02.24	PRELIMINARY ISSUE ONLY	AYS	BVM				

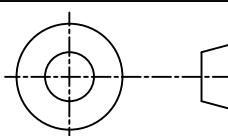
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privateenergy
PARTNERS

MIRIAM VALE BESS
BURGESS ROAD, COLOSSEUM QLD 4677
COUNCIL DA
SUBSTATION AND BESS LAYOUT

980-007-L-009

SCALE 1:1250



SIZE A1
REV E
DRAWING TO
DRAFTING
STANDARD
AS1100.101



Project Layout

- | | | | | | |
|---------------------------------------|---|--------------------------------------|--|-----------------------------|-----------------|
| Burgess Road Access Point | Moderate | Proposed BESS | Proposed Switchyard Development Area | Powerlink Corridor Easement | Lot Type Parcel |
| Local Road | Low | Proposed Internal Access Track | Proposed Laydown Area | OHTL Exclusion Zone | |
| Waterways for Waterway Barrier Works: | Proposed BESS, Substation and Switchyard Area | Proposed Substation Development Area | Proposed Maintenance and Storage Shed Area | Property Boundary | |
| High | | | | | |

MIRIAM VALE BESS

Attexó

REVIEWED: MW

DRAWN: FM

SCALE (A3): 1:12,500

DATE: 17/04/2024

DWG No: PRI-001_018[A]

FIGURE 5-1

APPENDIX 2: SIDRA OUTPUTS

AP02

SITE LAYOUT

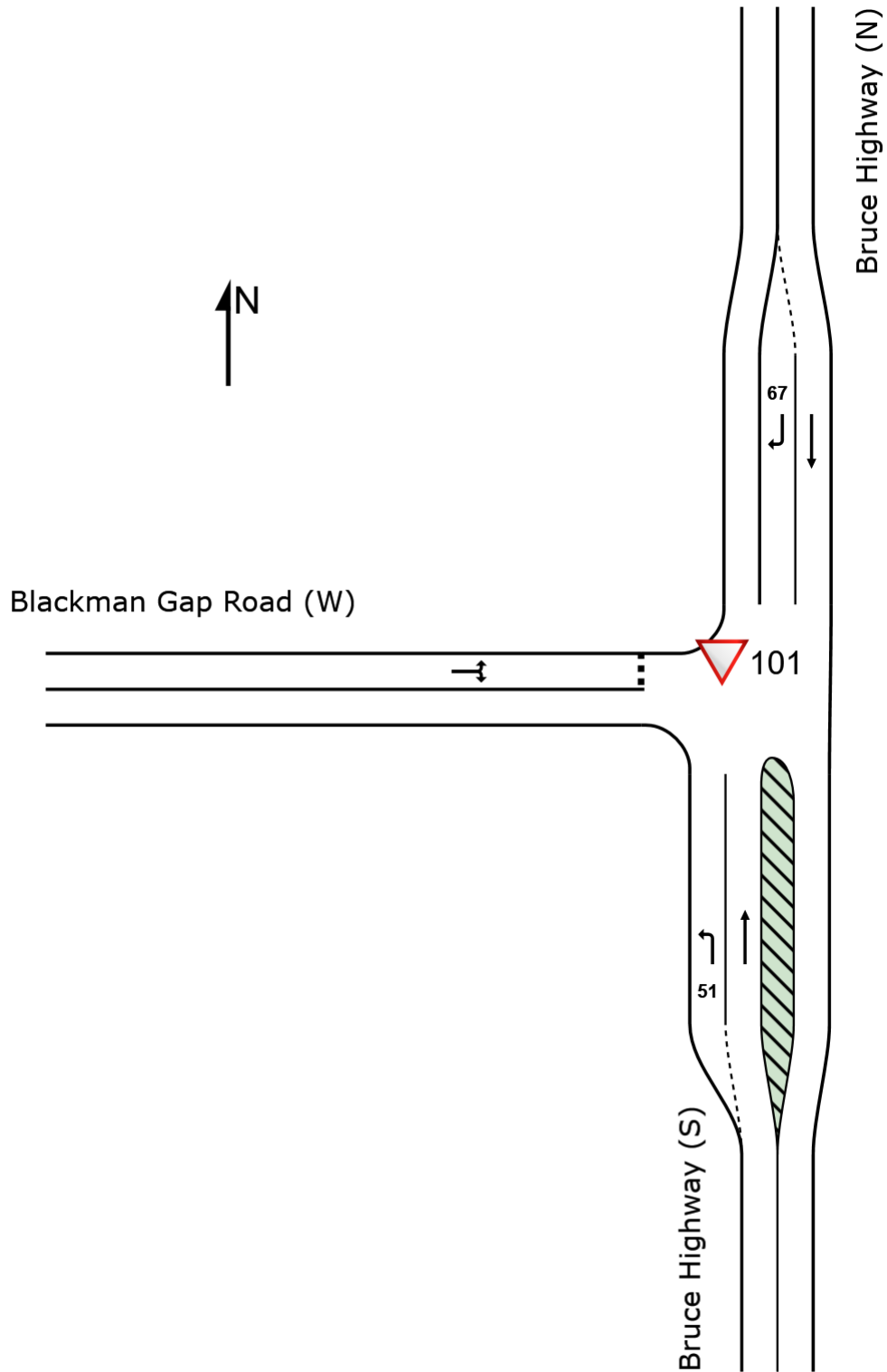
▽ Site: 101 [Bruce Highway / Blackman Gap Road - AM PEAK
(Site Folder: BG 2025)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: PSA CONSULTING (AUSTRALIA) | Licence: NETWORK / FLOATING | Created: Tuesday, 12 November 2024 10:42:40 AM
Project: C:\Volumes\elevate\psa-data1\Working\PSA Projects\1681 - Attexo Miriam Vale Renewable Energy Hub TIA\03 Research & Analysis
\1681_PSA_Miriam Vale BESS TIA_241108_V1.sip9

MOVEMENT SUMMARY

▼ Site: 101 [Bruce Highway / Blackman Gap Road - AM PEAK
(Site Folder: BG 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	166	19.6	166	19.6	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			167	19.5	167	19.5	0.096	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	205	25.1	205	25.1	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	8	37.5	8	37.5	0.009	6.9	LOS A	0.0	0.3	0.31	0.57	0.31	50.2
Approach			214	25.6	214	25.6	0.122	0.3	NA	0.0	0.3	0.01	0.02	0.01	59.5
West: Blackman Gap Road (W)															
10	L2	All MCs	1	0.0	1	0.0	0.036	6.2	LOS A	0.1	1.5	0.56	0.72	0.56	47.9
12	R2	All MCs	12	90.9	12	90.9	0.036	14.4	LOS B	0.1	1.5	0.56	0.72	0.56	45.0
Approach			13	83.3	13	83.3	0.036	13.7	LOS B	0.1	1.5	0.56	0.72	0.56	45.2
All Vehicles			394	24.9	394	24.9	0.122	0.6	NA	0.1	1.5	0.02	0.04	0.02	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101 [Bruce Highway / Blackman Gap Road - PM PEAK
(Site Folder: BG 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	28	0.0	28	0.0	0.015	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	131	21.8	131	21.8	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			159	17.9	159	17.9	0.076	1.0	NA	0.0	0.0	0.00	0.10	0.00	58.6
North: Bruce Highway (N)															
8	T1	All MCs	121	30.4	121	30.4	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	15	0.0	15	0.0	0.012	6.1	LOS A	0.0	0.3	0.27	0.56	0.27	51.9
Approach			136	27.1	136	27.1	0.074	0.7	NA	0.0	0.3	0.03	0.06	0.03	59.0
West: Blackman Gap Road (W)															
10	L2	All MCs	5	80.0	5	80.0	0.036	7.6	LOS A	0.1	1.5	0.44	0.62	0.44	47.3
12	R2	All MCs	13	83.3	13	83.3	0.036	11.3	LOS B	0.1	1.5	0.44	0.62	0.44	47.3
Approach			18	82.4	18	82.4	0.036	10.2	LOS B	0.1	1.5	0.44	0.62	0.44	47.3
All Vehicles			313	25.6	313	25.6	0.076	1.4	NA	0.1	1.5	0.04	0.11	0.04	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101 [Bruce Highway / Blackman Gap Road - AM PEAK
(Site Folder: DES 2025 (Construction Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	166	19.6	166	19.6	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			167	19.5	167	19.5	0.096	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	205	25.1	205	25.1	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	128	13.9	128	13.9	0.116	6.5	LOS A	0.5	3.8	0.31	0.60	0.31	51.2
Approach			334	20.8	334	20.8	0.122	2.5	NA	0.5	3.8	0.12	0.23	0.12	56.2
West: Blackman Gap Road (W)															
10	L2	All MCs	3	66.7	3	66.7	0.032	7.6	LOS A	0.1	1.0	0.52	0.67	0.52	47.1
12	R2	All MCs	13	16.7	13	16.7	0.032	11.6	LOS B	0.1	1.0	0.52	0.67	0.52	48.8
Approach			16	26.7	16	26.7	0.032	10.8	LOS B	0.1	1.0	0.52	0.67	0.52	48.4
All Vehicles			517	20.6	517	20.6	0.122	2.0	NA	0.5	3.8	0.09	0.17	0.09	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101 [Bruce Highway / Blackman Gap Road - PM PEAK
(Site Folder: DES 2025 (Construction Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	131	21.8	131	21.8	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			132	21.6	132	21.6	0.076	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	121	30.4	121	30.4	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	17	12.5	17	12.5	0.014	6.2	LOS A	0.1	0.4	0.25	0.56	0.25	51.4
Approach			138	28.2	138	28.2	0.074	0.8	NA	0.1	0.4	0.03	0.07	0.03	58.8
West: Blackman Gap Road (W)															
10	L2	All MCs	124	88.1	124	88.1	0.192	8.0	LOS A	0.8	9.5	0.35	0.60	0.35	48.3
12	R2	All MCs	13	83.3	13	83.3	0.192	12.1	LOS B	0.8	9.5	0.35	0.60	0.35	48.5
Approach			137	87.7	137	87.7	0.192	8.3	LOS A	0.8	9.5	0.35	0.60	0.35	48.3
All Vehicles			406	46.1	406	46.1	0.192	3.1	NA	0.8	9.5	0.13	0.23	0.13	55.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway / Blackman Gap Road - AM PEAK
(Site Folder: BG 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	176	19.8	176	19.8	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			177	19.6	177	19.6	0.102	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	218	25.1	218	25.1	0.130	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	8	37.5	8	37.5	0.009	7.0	LOS A	0.0	0.3	0.32	0.57	0.32	50.2
Approach			226	25.6	226	25.6	0.130	0.3	NA	0.0	0.3	0.01	0.02	0.01	59.5
West: Blackman Gap Road (W)															
10	L2	All MCs	1	0.0	1	0.0	0.041	6.3	LOS A	0.1	1.8	0.58	0.74	0.58	47.4
12	R2	All MCs	13	91.7	13	91.7	0.041	15.2	LOS C	0.1	1.8	0.58	0.74	0.58	44.5
Approach			14	84.6	14	84.6	0.041	14.6	LOS B	0.1	1.8	0.58	0.74	0.58	44.7
All Vehicles			417	25.0	417	25.0	0.130	0.7	NA	0.1	1.8	0.03	0.04	0.03	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway / Blackman Gap Road - PM PEAK
(Site Folder: BG 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	29	0.0	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	108	0.0	108	0.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			138	0.0	138	0.0	0.056	1.2	NA	0.0	0.0	0.00	0.12	0.00	58.3
North: Bruce Highway (N)															
8	T1	All MCs	128	30.3	128	30.3	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	16	0.0	16	0.0	0.012	5.9	LOS A	0.0	0.3	0.24	0.56	0.24	52.0
Approach			144	27.0	144	27.0	0.079	0.7	NA	0.0	0.3	0.03	0.06	0.03	59.0
West: Blackman Gap Road (W)															
10	L2	All MCs	5	80.0	5	80.0	0.036	7.3	LOS A	0.1	1.6	0.41	0.60	0.41	47.6
12	R2	All MCs	14	84.6	14	84.6	0.036	10.9	LOS B	0.1	1.6	0.41	0.60	0.41	47.4
Approach			19	83.3	19	83.3	0.036	9.9	LOS A	0.1	1.6	0.41	0.60	0.41	47.5
All Vehicles			301	18.2	301	18.2	0.079	1.5	NA	0.1	1.6	0.04	0.12	0.04	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bruce Highway / Blackman Gap Road - AM PEAK
(Site Folder: DES 2027 (Operation Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	176	19.8	176	19.8	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			177	19.6	177	19.6	0.102	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	218	25.1	218	25.1	0.130	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	13	41.7	13	41.7	0.013	7.1	LOS A	0.1	0.5	0.32	0.58	0.32	50.0
Approach			231	26.0	231	26.0	0.130	0.4	NA	0.1	0.5	0.02	0.03	0.02	59.3
West: Blackman Gap Road (W)															
10	L2	All MCs	2	50.0	2	50.0	0.022	7.3	LOS A	0.1	0.6	0.47	0.64	0.47	48.8
12	R2	All MCs	12	0.0	12	0.0	0.022	9.0	LOS A	0.1	0.6	0.47	0.64	0.47	50.6
Approach			14	7.7	14	7.7	0.022	8.8	LOS A	0.1	0.6	0.47	0.64	0.47	50.3
All Vehicles			421	22.8	421	22.8	0.130	0.5	NA	0.1	0.6	0.03	0.04	0.03	59.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101 [Bruce Highway / Blackman Gap Road - PM PEAK
(Site Folder: DES 2027 (Operation Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Bruce Highway (S)															
1	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.9
2	T1	All MCs	138	21.4	138	21.4	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			139	21.2	139	21.2	0.081	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway (N)															
8	T1	All MCs	128	30.3	128	30.3	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	18	11.8	18	11.8	0.015	6.2	LOS A	0.1	0.5	0.26	0.56	0.26	51.4
Approach			146	28.1	146	28.1	0.079	0.8	NA	0.1	0.5	0.03	0.07	0.03	58.8
West: Blackman Gap Road (W)															
10	L2	All MCs	7	14.3	7	14.3	0.028	6.4	LOS A	0.1	0.8	0.37	0.59	0.37	50.9
12	R2	All MCs	14	15.4	14	15.4	0.028	8.4	LOS A	0.1	0.8	0.37	0.59	0.37	50.8
Approach			21	15.0	21	15.0	0.028	7.7	LOS A	0.1	0.8	0.37	0.59	0.37	50.8
All Vehicles			306	24.1	306	24.1	0.081	0.9	NA	0.1	0.8	0.04	0.08	0.04	58.6

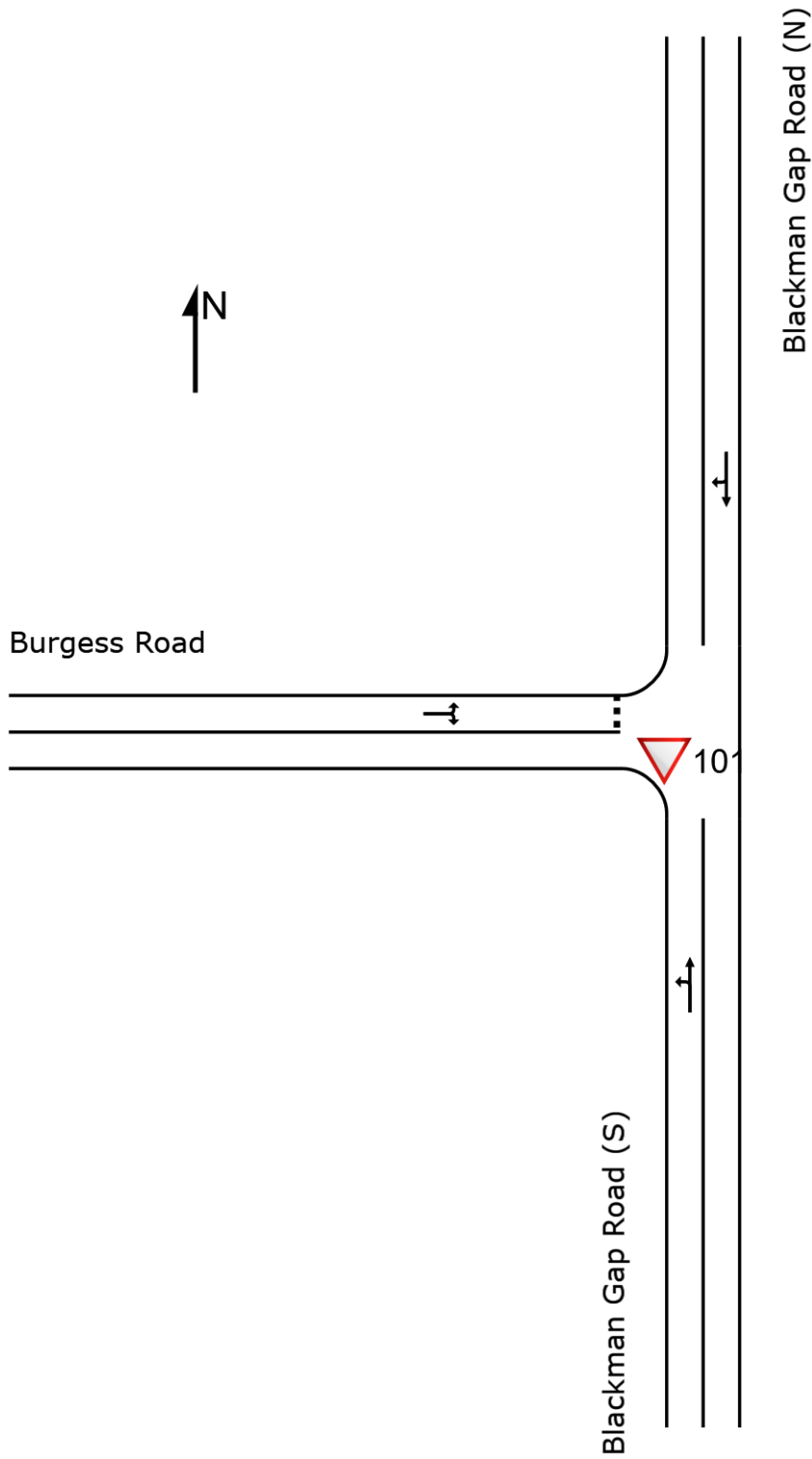
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

▽ Site: 101 [Blackman Gap Road / Burgess Road - AM PEAK
(Site Folder: BG 2025)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: C:\Volumes\elevate\psa-data1\Working\PSA Projects\1681 - Attexo Miriam Vale Renewable Energy Hub TIA\03 Research & Analysis
\1681_PSA_Miriam Vale BESS TIA_241108_V1.sip9

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - AM PEAK
(Site Folder: BG 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
2	T1	All MCs	11	0.0	11	0.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			12	0.0	12	0.0	0.006	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Blackman Gap Road (N)															
8	T1	All MCs	8	37.5	8	37.5	0.006	0.0	LOS A	0.0	0.0	0.01	0.07	0.01	59.1
9	R2	All MCs	1	0.0	1	0.0	0.006	5.4	LOS A	0.0	0.0	0.01	0.07	0.01	56.3
Approach			9	33.3	9	33.3	0.006	0.6	NA	0.0	0.0	0.01	0.07	0.01	58.7
West: Burgess Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.05	0.56	0.05	52.8
12	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.05	0.56	0.05	52.5
Approach			2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.05	0.56	0.05	52.6
All Vehicles			23	13.6	23	13.6	0.006	1.0	NA	0.0	0.0	0.01	0.11	0.01	58.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - PM PEAK
(Site Folder: BG 2025)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.04	0.00	57.2
2	T1	All MCs	17	12.5	17	12.5	0.010	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
Approach			18	11.8	18	11.8	0.010	0.3	NA	0.0	0.0	0.00	0.04	0.00	59.5
North: Blackman Gap Road (N)															
8	T1	All MCs	15	0.0	15	0.0	0.008	0.0	LOS A	0.0	0.0	0.01	0.04	0.01	59.6
9	R2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.0	0.01	0.04	0.01	56.8
Approach			16	0.0	16	0.0	0.008	0.4	NA	0.0	0.0	0.01	0.04	0.01	59.4
West: Burgess Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.07	0.56	0.07	52.7
12	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.07	0.56	0.07	52.4
Approach			2	0.0	2	0.0	0.001	5.6	LOS A	0.0	0.0	0.07	0.56	0.07	52.6
All Vehicles			36	5.9	36	5.9	0.010	0.7	NA	0.0	0.0	0.01	0.07	0.01	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - AM PEAK
(Site Folder: DES 2025 (Construction Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.006	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
2	T1	All MCs	11	0.0	11	0.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			12	0.0	12	0.0	0.006	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Blackman Gap Road (N)															
8	T1	All MCs	8	37.5	8	37.5	0.076	0.0	LOS A	0.4	2.9	0.06	0.54	0.06	55.1
9	R2	All MCs	120	12.3	120	12.3	0.076	5.6	LOS A	0.4	2.9	0.06	0.54	0.06	52.1
Approach			128	13.9	128	13.9	0.076	5.2	NA	0.4	2.9	0.06	0.54	0.06	52.3
West: Burgess Road															
10	L2	All MCs	3	66.7	3	66.7	0.004	6.3	LOS A	0.0	0.1	0.06	0.55	0.06	50.1
12	R2	All MCs	1	0.0	1	0.0	0.004	5.8	LOS A	0.0	0.1	0.06	0.55	0.06	52.5
Approach			4	50.0	4	50.0	0.004	6.2	LOS A	0.0	0.1	0.06	0.55	0.06	50.7
All Vehicles			144	13.9	144	13.9	0.076	4.9	NA	0.4	2.9	0.06	0.50	0.06	52.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - PM PEAK
(Site Folder: DES 2025 (Construction Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
2	T1	All MCs	13	16.7	13	16.7	0.008	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			14	15.4	14	15.4	0.008	0.4	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Blackman Gap Road (N)															
8	T1	All MCs	15	0.0	15	0.0	0.009	0.0	LOS A	0.0	0.1	0.02	0.08	0.02	59.3
9	R2	All MCs	2	0.0	2	0.0	0.009	5.5	LOS A	0.0	0.1	0.02	0.08	0.02	56.5
Approach			17	0.0	17	0.0	0.009	0.7	NA	0.0	0.1	0.02	0.08	0.02	58.9
West: Burgess Road															
10	L2	All MCs	105	0.0	105	0.0	0.066	5.6	LOS A	0.3	1.9	0.06	0.55	0.06	52.7
12	R2	All MCs	1	0.0	1	0.0	0.066	5.5	LOS A	0.3	1.9	0.06	0.55	0.06	52.4
Approach			106	0.0	106	0.0	0.066	5.6	LOS A	0.3	1.9	0.06	0.55	0.06	52.7
All Vehicles			137	1.5	137	1.5	0.066	4.4	NA	0.3	1.9	0.05	0.44	0.05	54.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101 [Blackman Gap Road / Burgess Road - AM PEAK
(Site Folder: BG 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.1
2	T1	All MCs	12	0.0	12	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			13	0.0	13	0.0	0.007	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Blackman Gap Road (N)															
8	T1	All MCs	8	37.5	8	37.5	0.006	0.0	LOS A	0.0	0.0	0.01	0.07	0.01	59.1
9	R2	All MCs	1	0.0	1	0.0	0.006	5.5	LOS A	0.0	0.0	0.01	0.07	0.01	56.3
Approach			9	33.3	9	33.3	0.006	0.6	NA	0.0	0.0	0.01	0.07	0.01	58.7
West: Burgess Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.06	0.56	0.06	52.7
12	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.06	0.56	0.06	52.5
Approach			2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.06	0.56	0.06	52.6
All Vehicles			24	13.0	24	13.0	0.007	1.0	NA	0.0	0.0	0.01	0.10	0.01	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - PM PEAK
(Site Folder: BG 2027)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
2	T1	All MCs	18	11.8	18	11.8	0.010	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			19	11.1	19	11.1	0.010	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
North: Blackman Gap Road (N)															
8	T1	All MCs	16	0.0	16	0.0	0.009	0.0	LOS A	0.0	0.0	0.01	0.04	0.01	59.6
9	R2	All MCs	1	0.0	1	0.0	0.009	5.5	LOS A	0.0	0.0	0.01	0.04	0.01	56.8
Approach			17	0.0	17	0.0	0.009	0.3	NA	0.0	0.0	0.01	0.04	0.01	59.4
West: Burgess Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.08	0.56	0.08	52.7
12	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.08	0.56	0.08	52.4
Approach			2	0.0	2	0.0	0.001	5.6	LOS A	0.0	0.0	0.08	0.56	0.08	52.6
All Vehicles			38	5.6	38	5.6	0.010	0.6	NA	0.0	0.0	0.01	0.06	0.01	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - AM PEAK
(Site Folder: DES 2027 (Operation Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.007	5.5	LOS A	0.0	0.0	0.00	0.05	0.00	57.1
2	T1	All MCs	12	0.0	12	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			13	0.0	13	0.0	0.007	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Blackman Gap Road (N)															
8	T1	All MCs	8	37.5	8	37.5	0.009	0.0	LOS A	0.0	0.3	0.04	0.20	0.04	58.3
9	R2	All MCs	4	50.0	4	50.0	0.009	6.1	LOS A	0.0	0.3	0.04	0.20	0.04	53.2
Approach			13	41.7	13	41.7	0.009	2.0	NA	0.0	0.3	0.04	0.20	0.04	56.5
West: Burgess Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.06	0.56	0.06	52.7
12	R2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.06	0.56	0.06	52.5
Approach			2	0.0	2	0.0	0.001	5.5	LOS A	0.0	0.0	0.06	0.56	0.06	52.6
All Vehicles			27	19.2	27	19.2	0.009	1.6	NA	0.0	0.3	0.02	0.16	0.02	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Blackman Gap Road / Burgess Road - PM PEAK
(Site Folder: DES 2027 (Operation Phase))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Blackman Gap Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.2
2	T1	All MCs	18	11.8	18	11.8	0.010	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			19	11.1	19	11.1	0.010	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
North: Blackman Gap Road (N)															
8	T1	All MCs	16	0.0	16	0.0	0.011	0.0	LOS A	0.0	0.2	0.04	0.10	0.04	59.5
9	R2	All MCs	3	66.7	3	66.7	0.011	6.3	LOS A	0.0	0.2	0.04	0.10	0.04	53.4
Approach			19	11.1	19	11.1	0.011	1.1	NA	0.0	0.2	0.04	0.10	0.04	58.4
West: Burgess Road															
10	L2	All MCs	3	33.3	3	33.3	0.003	6.0	LOS A	0.0	0.1	0.08	0.55	0.08	51.3
12	R2	All MCs	1	0.0	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.08	0.55	0.08	52.4
Approach			4	25.0	4	25.0	0.003	5.9	LOS A	0.0	0.1	0.08	0.55	0.08	51.6
All Vehicles			42	12.5	42	12.5	0.011	1.2	NA	0.0	0.2	0.03	0.12	0.03	58.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX 3: SWEPT PATH ANALYSIS

AP03



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SWEPT PATH ANALYSIS - SEMI-TRAILER EXITING SITE ACCESS
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE	A1	SCALE A3:	1:1000
SCALE		CHECKED BY	T.B
		APPROVED BY	T.B
		PROJECT NO.	1681
		DRAWING NO.	SK01
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SWEPT PATH ANALYSIS - SEMI-TRAILER ENTERING SITE ACCESS
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE	A1	SCALE A3:	1:1000
SCALE		CHECKED BY	T.B
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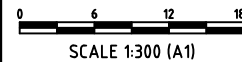
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SWEPT PATH ANALYSIS - SEMI-TRAILER EXITING BLACKMAN GAP ROAD
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE	A1	SCALE A3:	1:600
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		APPROVED BY	T.B
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LOCATION
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE	A1	SCALE A3	1:600
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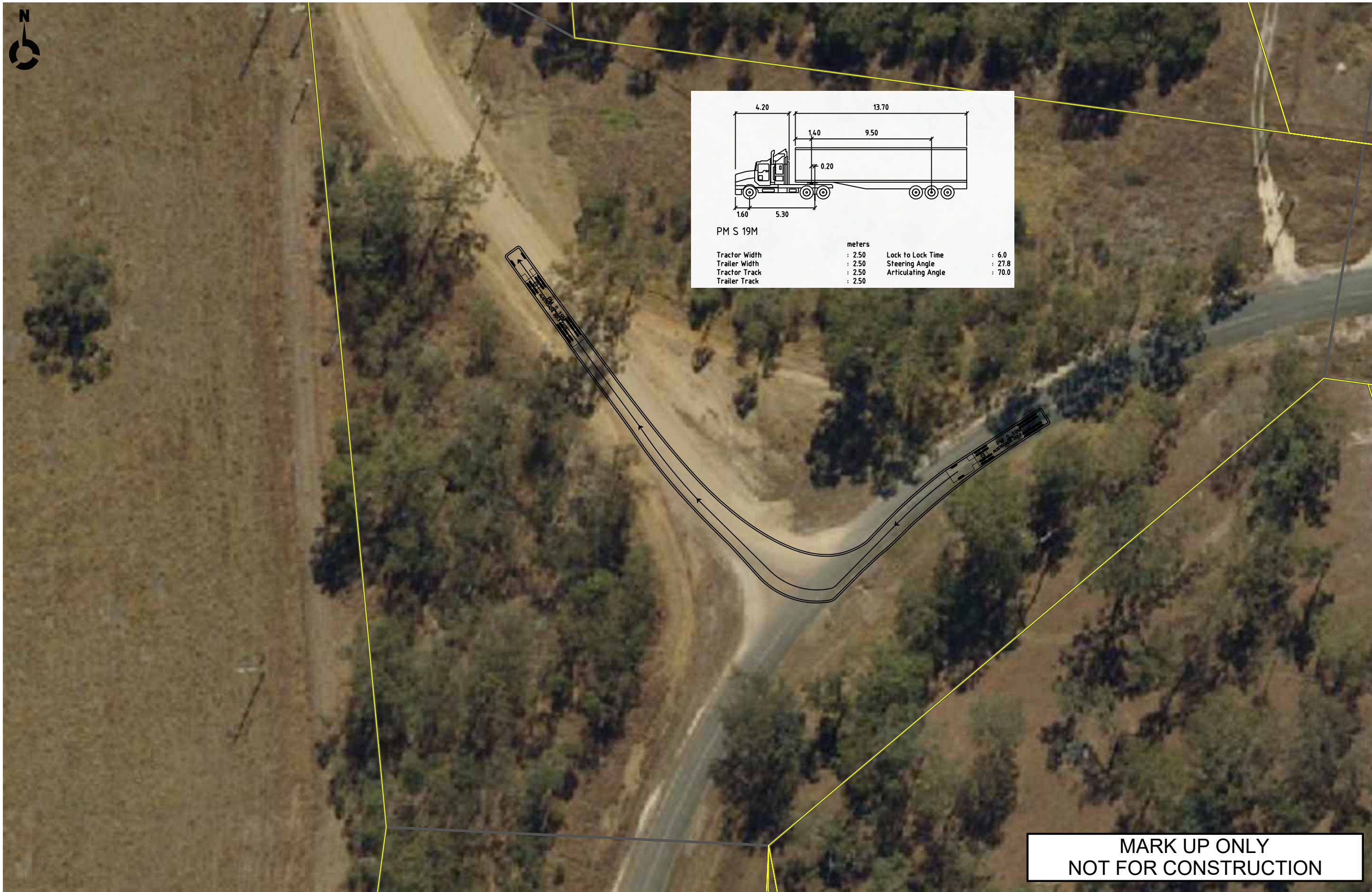
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SWEPT PATH ANALYSIS - SEMI-TRAILER EXITING BURGESS ROAD
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
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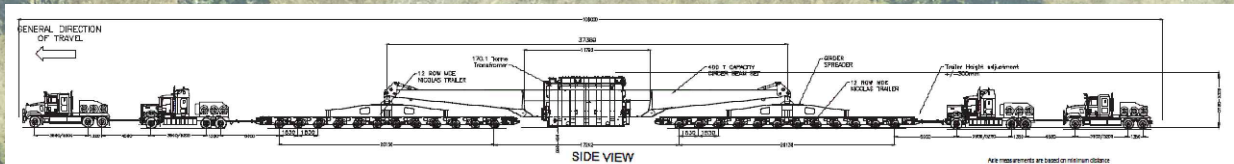
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SWEPT PATH ANALYSIS - SEMI-TRAILER ENTERING BURGESS ROAD
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

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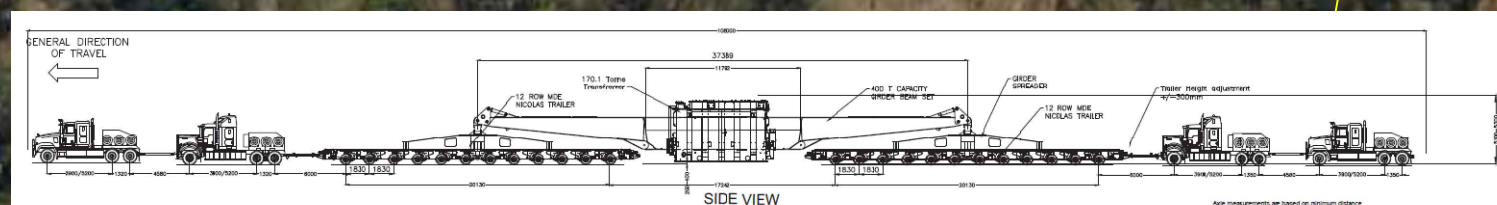
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SWEPT PATH ANALYSIS - BEAM TRANSPORTER ENTERING SITE ACCESS
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BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE	A1	SCALE A3:	1:1000
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		PROJECT NO.	1681
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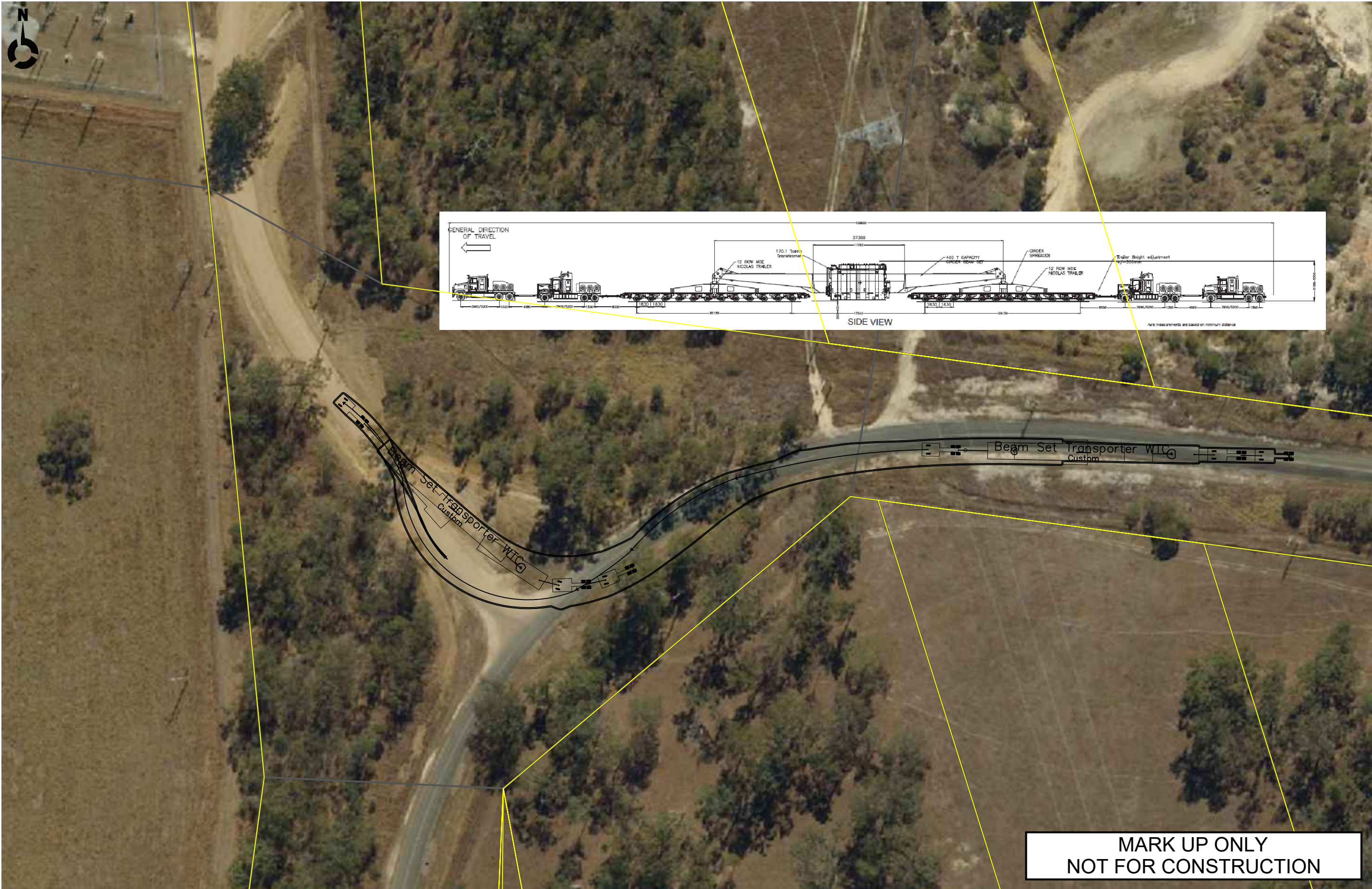
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SWEPT PATH ANALYSIS - BEAM TRANSPORTER ENTERING BLACKMAN GAP ROAD
ATTEXXO
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		1681	SK08	1



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SWEPT PATH ANALYSIS - BEAM TRANSPORTER ENTERING BURGESS ROAD
ATTEXXO
MIRIAM VALE BESS TIA
BURGESS ROAD, COLOSSEUM QLD 4677

DRAWING DATE	NOVEMBER 2024	DRAWN BY	M.M
ORIGINAL SIZE: A1	SCALE A3: 1:1000	CHECKED BY	T.B
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