



PRELIMINARY

TRAFFIC IMPACT ASSESSMENT

PROPOSED CATTLE CREEK WIND FARM & BESS

Prepared for
ATTEXO GROUP PTY LTD

9 JULY 2026

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	7
1.1	Background	7
1.2	General Scope of Assessment.....	7
1.3	Limits of Report.....	8
1.4	Source of Background Information	8
1.5	Legislative framework.....	9
1.9	Assessment Against SDAP State Code 23 and State Code 27	9
1.6	Road Jurisdiction.....	11
1.7	Stakeholder Engagement.....	13
1.8	Community Consultation	13
2.0	PROJECT AREA & PROJECT CHARACTERISTICS	14
2.1	Project Area Location.....	14
2.2	Project Layout	16
2.3	Construction Staging.....	16
2.4	Typical Haulage Vehicles	19
2.5	Haulage Routes	20
2.6	Construction Workforce	21
2.7	Vehicle Access.....	21
2.8	Project Area Facilities.....	21
3.0	road network	23
3.1	General	23
3.2	OSOM Route Options.....	23
3.3	Road characteristics.....	25
3.4	Traffic Volumes	27
3.5	General Road Network Performance.....	29
3.6	General Pavement Conditions	29
3.7	Road Crash History.....	30
3.8	Road Network Constraints	30
3.9	School Bus Services	31
4.0	PROJECT TRAFFIC	32
4.1	Construction Workforce and Accommodation	32
4.2	Heavy Vehicle Payload Assumptions	32
4.3	Traffic Distribution	32
4.4	Traffic Generation Summary.....	32
5.0	ROAD NETWORK IMPACT (TRAFFIC OPERATIONS).....	38
5.1	General	38
5.2	Moonie Highway	39
5.3	Cecil Plains–Moonie Road (West of the Project Area - Link I)	39
5.4	Cecil Plains–Moonie Road (East of the Project Area - Link J).....	40
5.5	Intersection Impacts	40
5.6	Works Required to Accommodate Over-Sized Vehicles	42
6.0	ROAD NETWORK IMPACTS (PAVEMENT)	43
6.1	Scope.....	43
6.2	Background Traffic Loads.....	43
6.3	Estimated Vehicle Axle Loads	43
6.4	Extent of Impact.....	47
6.5	Calculated Contribution under GTIA.....	47
6.6	Cecil Plains – Moonie Road	47

7.0	PROJECT AREA ACCESS ARRANGEMENTS	48
7.1	Form of Access	48
7.2	Sight Distance	49
8.0	ROAD SAFETY ASSESSMENT	50
8.1	Required scope (GTIA)	50
8.2	Observed Road Safety Deficiencies.....	50
8.3	Road Crash Data.....	52
8.4	Potential Risks.....	54
8.5	Mitigation Measures.....	55
9.0	GENERAL TRAFFIC MANAGEMENT REQUIREMENTS.....	56
9.1	Duration of Parallel Works.....	56
9.2	Estimated Traffic Volumes During Parallel Works	56
9.3	Traffic Management required to Facilitate Parallel Works.....	56
9.4	Blasting	57
10.0	SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS	58
APPENDICES		60
	APPENDIX A – TRAFFIC IMPACT ASSESSMENT CERTIFICATION	61

LIST OF FIGURES

Figure 1.1	State Controlled Roads Surrounding the Project Area
Figure 2.1	Approximate Location of Project Area
Figure 2.2	Proposed Project Layout
Figure 2.3	Proposed Options for OSOM Haulage Routes
Figure 3.1	Traffic Volumes (TMR Traffic Census 2021)
Figure 4.1	Key Map (Road Sections)
Figure 5.1	Percentage Impact of Construction Traffic upon Road Links
Figure 5.2	Austrroads Part 3 Table 4.5 (Single Carriageway Rural Road Widths)
Figure 6.1	Pavement Load Values (6 Axle AV, Truck + Dog, OSOM Tower Sections 1–4)
Figure 6.2	Pavement Load Values (OSOM Tower Sections 5, 6 and Blade)
Figure 6.3	Pavement Load Values (OSOM Nacelle, Generator Segments and Hub)
Figure 7.1	Required Minimum Access Intersection Layout
Figure 8.1	Location of Horizontal Alignment Constraints (Toowoomba–Cecil Plains Road, Norwin)
Figure 8.2	Recorded Road Crash Locations (2021–2026)

LIST OF TABLES

Table 1.1	Jurisdiction of Various Road Sections
Table 1.2	State Code 27 Transport PO Alignment
Table 2.1	Project Area Property List and Size
Table 2.2	Summary of Indicative Construction Staging
Table 2.3	Over-Size Over-Mass (OSOM) Vehicle Characteristics
Table 3.1	OSOM Route Options
Table 3.2	General Roadway Characteristics between Port of Brisbane and Project Area
Table 3.3	Configuration of Intersections between the Port of Brisbane and Project Area
Table 3.4	Summary of Existing Traffic Volumes on Surrounding Roads
Table 3.5	General Road Pavement Condition Along the Identified OSOM Route Network
Table 4.1	Estimated Material Quantities and Resultant Heavy Vehicle Trip Generation
Table 4.2	Projected Monthly Construction Heavy Vehicle Movements
Table 4.3	Projected Monthly Construction Heavy Vehicle Movements (Continued)
Table 4.4	Estimate of Total Vehicle Movements during 32-Month Construction Period (Excluding OSOM)
Table 4.5	Average Daily and Peak Daily Vehicle Movements during Construction
Table 5.1	Over-Size Over-Mass (OSOM) Vehicle Characteristics
Table 6.1	Standard SAR Values (Source: GTIA)
Table 6.2	Summary of Calculated Pavement Impact Contributions
Table 8.1	Road Crash Locations (2021–2026)

LIST OF ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC
AV	ARTICULATED VEHICLE
AUL TYPE	AUSTROADS TYPE AUL AUXILIARY LEFT TURN TREATMENT TYPE
AUR	AUSTROADS TYPE AUR AUXILIARY RIGHT TURN TREATMENT
BAL	AUSTROADS TYPE BAL BASIC LEFT TURN TREATMENT
BAR	AUSTROADS TYPE BAR BASIC RIGHT TURN TREATMENT
BESS	BATTERY ENERGY STORAGE SYSTEM
CHL	AUSTROADS TYPE CHL CHANNELISED LEFT TURN TREATMENT
CHR	AUSTROADS TYPE CHR CHANNELISED RIGHT TURN TREATMENT
DSDMIS	DEPT OF STATE DEVELOPMENT, M'FACTURING, INFRASTRUCTURE AND PLANNING
EIS -	ENVIRONMENTAL IMPACT STATEMENT
ESA	EQUIVALENT STANDARD AXLE
GTIA	GUIDE TO TRAFFIC IMPACT ASSESSMENT (2017)
HRV	HEAVY RIGID VEHICLE
HV	HEAVY VEHICLE
NHVR	NATIONAL HEAVY VEHICLE REGULATOR
OSOM	OVER SIZED OVER MASS VEHICLES
PIA	PAVEMENT IMPACT ASSESSMENT
QPS	QUEENSLAND POLICE SERVICE
RMP	TRAFFIC MANAGEMENT PLAN
RTE	RYTENSKILD TRAFFIC ENGINEERING
RPEQ	REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND
SAR	STANDARD AXLE REPETITION
SCR	STATE CONTROLLED ROAD
SIDRA	INTERSECTION MODELLING SOFTWARE
SISD	SAFE INTERSECTION SIGHT DISTANCE
TIA	TRAFFIC IMPACT ASSESSMENT
TMP	TRAFFIC MANAGEMENT PLAN
TMR	DEPARTMENT OF TRANSPORT AND MAIN ROADS
TRC	TOOWOOMBA REGIONAL COUNCIL
VPD	VEHICLES MOVEMENTS PER DAY
VPH	VEHICLES MOVEMENTS PER HOUR
WDRC	WESTERN DOWNS REGIONAL COUNCIL

1.0 INTRODUCTION

1.1 Background

Rytenskild Traffic Engineering (RTE) has been engaged by Attexo Group Pty Ltd to prepare a Traffic Impact Assessment (TIA) for the proposed Cattle Creek Wind Farm & BESS being developed by RWE Cattle Creek Onshore Wind Pty Ltd.

The project is located within the Western Downs and Toowoomba Regional Council areas, approximately 25 km west of Cecil Plains and 65 km south-west of Dalby. It comprises a utility-scale wind farm development incorporating up to 135 wind turbine generators (WTGs), a Battery Energy Storage System (BESS) with an anticipated capacity of up to 450MW, and associated infrastructure. The Project Area spans twelve lots of predominantly undulating rural land currently used for grazing.

This report is a preliminary Traffic Impact Assessment and has been prepared in conjunction with the Preliminary Route Assessment Report. The assessment has been prepared in accordance with the Queensland State Development Assessment Provisions (SDAP), State Code 23 and State Code 27 planning guidelines for wind farm and BESS development.

This TIA is focused on the Project access assessment and traffic generation during the construction phase and is assessed against the following:

- State Development Assessment Provisions Supporting Guideline Development in a State-controlled Road Environment Version 1.0 (2023);
- State Code 1: Development in a State-controlled Road Environment (State Code 1 V3.5);
- State Code 23: Wind Farm Development (State Code 23 V3.5);
- State Code 27: Battery Storage Facility Development (State Code 27 V3.5);
- The Planning Guideline to State Code 23 (July 2025);
- The Planning Guideline to State Code 27 (July 2025);
- Toowoomba Regional Council (TRC) Planning Scheme V28.0; and
- Western Downs Planning Scheme 2017 incorporating Major Amendment No. 2 (effective 28 July 2025).

1.2 General Scope of Assessment

The following tasks have been carried out during the preparation of this Traffic Impact Assessment:

- Assessment of the existing local and State – controlled road network in the local and regional area. This has included manual / visual inspections of each road, review of background traffic information available from local or state Authorities, and compilation of traffic volume data.
- A review of the construction process and phases that will generate significant traffic volumes on the surrounding road network.
- Identification of suitable haulage routes through consultation with the proponent and the appointed contractors and suppliers.
- An assessment of the likely heavy vehicle traffic generation of each construction phase and its distribution throughout the surrounding road network.
- Analysis of the traffic movements and pavement impacts on the surrounding road network.
- Identification of any required intersection upgrade works as a consequence of construction traffic.
- Identification of any road safety hazards and required mitigation of traffic management measures to be implemented.
- Analysis of pavement impacts, considering base pavement loads and the short – term impact of the construction activities.

A baseline case (i.e. without the project) has been established to determine the potential impact of the project. However, unlike a typical scenario where the impacts of a project would be examined for 10 years post commencement of use, this report focuses on the construction phase of the project as it is during this phase where a significant traffic impact would occur.

The traffic generation associated with the Project during its operational phase is expected to be low, with typically no more than 10 – 30 staff members on-site at any given time and minimal visitor traffic.

In accordance with the TMR Guide to Traffic Impact Assessment (GTIA), detailed operational analysis is generally warranted where development traffic is expected to result in a material change to road network performance, capacity, safety or pavement loading. The forecast operational traffic volumes represent less than 5% of traffic volumes on the surrounding State-controlled and local road network and are substantially lower than construction phase traffic volumes.

As such, the development is not expected to have any material impact on the operation of the surrounding road network, intersection performance, road safety, or pavement condition.

1.3 Limits of Report

This report has been prepared based on preliminary project information available at the time of assessment, including indicative wind turbine layouts, Battery Energy Storage System (BESS) infrastructure, construction methodologies, traffic generation assumptions and potential haulage routes. As the Project remains in the planning phase, a number of design elements, contractor arrangements, turbine supplier selections, haulage methodologies and route requirements are yet to be finalised.

Accordingly, the findings and recommendations contained within this report should be regarded as indicative and subject to further review. Detailed transport assessments, route surveys, pavement impact assessments, swept path analyses, traffic management plans and infrastructure upgrade requirements will be refined and updated prior to construction once detailed design information and final haulage arrangements become available.

1.4 Source of Background Information

The following data sources have been utilised in the preparation of this assessment:

- Data summarising the expected construction and operational phase activities, traffic movements and timings for the Project traffic have been provided by the proponent.
- Background traffic data for the relevant sections of the State-Controlled road network has been sourced from the Department of Transport and Main Roads (TMR). This includes traffic counts, historical road crash statistics, and road pavement data.
- Numerous inspections of the surrounding road network carried out by RTE.
- Consultation with TMR:
 - There has been ongoing consultation with TMR throughout the application process as evidenced by the numerous letters received from the Department in relation to the TIA report.
 - TMR has provided input background traffic data and pavement data.

1.5 Legislative framework

This assessment has been carried out in the context of the following legislation:

- Transport Infrastructure Act 1994;
- Transport Infrastructure (State-controlled Roads) Regulation 2023;
- Transport Operations (Road Use Management) Act 1995;
- Department of Transport and Main Roads (TMR) Guide to Traffic Impact Assessment (2017);
- State Development Assessment Provisions (SDAP) State Code 1: Development in a State-controlled Road Environment (Version 3.5);
- State Development Assessment Provisions (SDAP) State Code 23: Wind Farm Development (Version 3.5);
- State Development Assessment Provisions (SDAP) State Code 27: Battery Storage Facility Development (Version 3.5);
- Planning Guideline to State Code 23: Wind Farm Development (July 2025);
- Planning Guideline to State Code 27: Battery Storage Facility Development (July 2025);
- State Planning Policy (SPP) (December 2023);
- Toowoomba Regional Council Planning Scheme Version 28; and
- Western Downs Planning Scheme 2017 incorporating Major Amendment No. 2 (effective 28 July 2025).

1.9 Assessment Against SDAP State Code 23 and State Code 27

This Traffic Impact Assessment has been prepared with consideration of the transport-related Performance Outcomes (POs) contained within State Code 23: Wind Farm Development (Version 3.5) and State Code 27: Battery Storage Facility Development (Version 3.5).

The following table identifies the applicable Performance Outcomes, their relevance to this report, and the location within the report where each outcome is addressed.

The assessment demonstrates that the proposed Wind Farm and Battery Energy Storage System (BESS) can be accommodated on the surrounding road network without adversely impacting the safety, function or efficiency of the transport network. Appropriate access arrangements, traffic management measures and any required road infrastructure upgrades have been identified to ensure compliance with the intent of the relevant Performance Outcomes of State Code 23 and State Code 27.

Table 1.2 – State Code 23 and State Code 27 Transport Performance Outcome Alignment

PO	Requirement	Relevance to PRA	Where Addressed
PO23 (SC23)	Wind farm development maintains the safe and efficient operation of the transport network.	Assessment of turbine component haulage, construction traffic and network impacts.	Section 3.2 (Traffic Generation), Section 3.6 (Network Performance), Section 4.4 (Pavement Impacts)
PO24 (SC23)	Safe and practical access arrangements are provided for wind farm construction and operation.	Assessment of access arrangements and heavy vehicle movements associated with wind farm construction.	Section 2.5 (Access Strategy), Section 3.7 (Haul Route Assessment), Section 4.3 (Intersection Assessment)
PO24 (SC27) / Equivalent PO in SC23	Transport networks not adversely impacted	Assesses network efficiency and condition impacts from OSOM movements	Sections 3.2 (Traffic Generation), 3.6 (Network Impacts), 4.4 (Pavement Impact Assessment)
PO25 (SC27) / Equivalent PO in SC23	Transport safety not compromised	Ensures safe OSOM movements and intersection operations	Section 4.1 (Road Safety Review), Section 4.3 (Intersection & Swept Path Assessment)
PO26 (SC27) / Equivalent PO in SC23	Required transport upgrades delivered	Identifies intersection works, floodway modifications, and clearing requirements	Table 4.1 (Recommended Mitigation Measures), Section 4.2 (Infrastructure Requirements)
PO27 (SC27)	Safe, viable and practical OSOM route demonstrated	Core purpose of report – route feasibility assessment	Entire report (Sections 2 – 4), Summary Section 5
PO28 (SC27)	Safe and efficient Project Area access provided	Confirms final access via Cecil Plains–Moonie Road and tie-in geometry	Section 2.5 (Project Area Access), Section 4.3 (Swept Path Analysis)

1.6 Road Jurisdiction

The Project Area is located within Western Downs Regional and Toowoomba Regional Council areas. Traffic generated by the project will travel throughout the following local Government areas and TMR regions:

- Toowoomba Regional Council;
- Western Downs Regional Council;
- TMR – Metropolitan District; and
- TMR – South West Downs region.

State controlled roads within the Western Downs Regional Council area (and east to Ipswich) are managed by the Downs South West District (Toowoomba office). State controlled roads in the area surrounding the Project Area are shown in Figure 1.1.

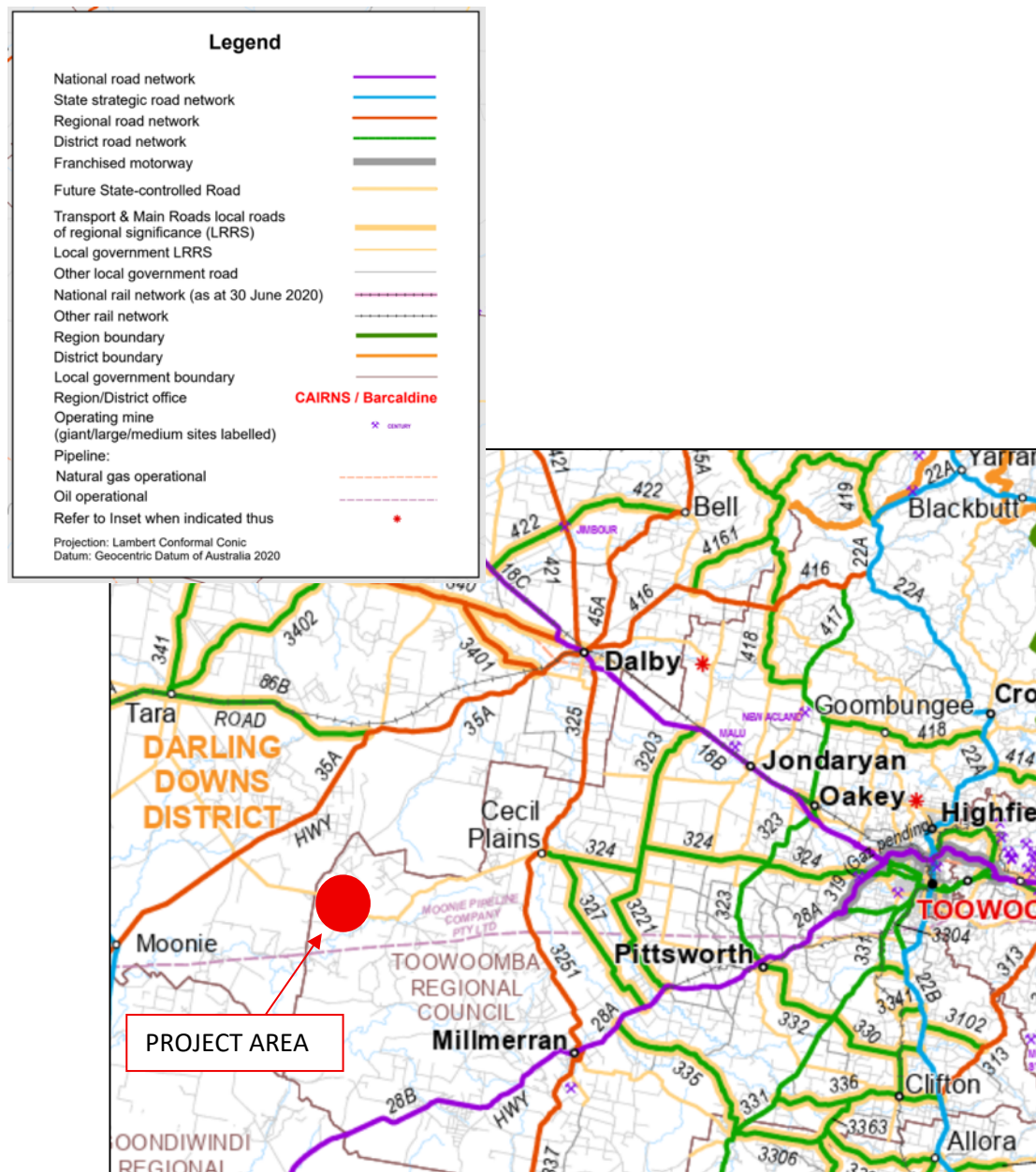


FIGURE 1.1 – STATE CONTROLLED ROADS SURROUNDING THE PROJECT AREA

The Gateway Motorway and Logan Motorway form part of the go via network, which is operated by Transurban Queensland.

The Port of Brisbane Authority has jurisdiction over Port Drive and other access roads around the Port.

Toowoomba Regional Council is responsible for local roads within the Toowoomba Regional Council (TRC) area that connect to the Warrego Highway, while Western Downs Regional Council (WDRC) is responsible for local roads within the Western Downs LGA that connect to the Warrego Highway. WDRC also manages the Cecil Plains – Moonie Road.

Jurisdictions for the various roads considered to be relevant to this study are shown in Table 1.1.

Table 1.1 – Jurisdiction of Various Road Sections

Road	Section	Jurisdiction	Proposed use
Port Drive	Entire length	Port of Brisbane Authority	OSOM vehicles
Port of Bris Mway	Entire length	TMR – Metro	OSOM vehicles
Gateway Mway	Port Bris – Logan Mway	TMR – Metro	OSOM vehicles, and general construction traffic
Logan Mway	Gateway – Ipswich Mway	TMR – Metro	OSOM vehicles, and general construction traffic
Ipswich Mway	Logan Mway – Warrego Hwy	TMR – Metro	OSOM vehicles, and general construction traffic
Warrego Hwy	Ipswich - Marburg	TMR – Metro	OSOM vehicles, and general construction traffic
Warrego Hwy	Marburg – Withcott	TMR – Downs SW	OSOM vehicles, and general construction traffic
Toowoomba Bypass	Withcott - Charlton	TMR – Downs SW	OSOM vehicles, and general construction traffic
Warrego Hwy	Charlton - Dalby	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic
Moonie Hwy	Dalby – Cecil Plains Road intersection	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic
Toowoomba – Cecil Plains Road	Wellcamp – Cecil Plains	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic
Cecil Plains – Moonie Road	Moonie Hwy int – Cecil Plains	WDRC & TRC	Possibly OSOM vehicles, and general construction traffic
Dalby – Cecil Plains Road	Dalby to Cecil Plains	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic
Pampas – Horrane Road	Pampas to Horrane	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic
Gore Highway	Athol to Pampas	TMR – Downs SW	Possibly OSOM vehicles, and general construction traffic

Stage 1 – Project Area establishment, sub station earthworks, internal road construction (initial works only)

Stage 2 – Internal road construction, delivery of wind turbine components, sub-station construction, tower foundation construction, wind turbine structure assembly.

1.7 Stakeholder Engagement

In accordance with the requirements of State Code 23 and State Code 27, consideration has been given to the need for engagement with key stakeholders involved in the planning, assessment and delivery of transport-related aspects of the Project.

Relevant stakeholders may include, but are not limited to:

- Local government traffic and infrastructure representatives responsible for the affected road network;
- Regional officers from TMR, particularly in relation to state-controlled roads and OSOM movements;
- Queensland Rail, where haulage routes intersect or interface with rail infrastructure; and
- Specialist heavy haulage and OSOM transport providers involved in route planning and delivery logistics.

At the preliminary assessment stage, stakeholder consultation has been identified as a requirement for progression into detailed design and route finalisation. Any necessary engagement will be undertaken as part of the next phase of project development to confirm route suitability, identify constraints, and agree on any required mitigation measures.

1.8 Community Consultation

The project will be supported by an overarching Community and Stakeholder Engagement Plan outlining consultation requirements and timing.

The project is expected to result in a low to moderate increase in traffic on the surrounding road network during construction, with some roads such as Cecil Plains–Moonie Road experiencing a more noticeable temporary increase during peak periods. These impacts will be short-term and managed through standard traffic management measures and advance notification to road users. A standalone road use engagement strategy has therefore not been prepared.

Notification of impacts to public roads will be provided through the project's existing communication channels, including the Project Area and email newsletter/works notifications. These notifications will outline any temporary disruptions, including road works, line marking changes, or periods of oversize or overmass vehicle movements.

Traffic management measures will be implemented in accordance with the relevant Traffic Management Plans, and may include signage, barriers, traffic controllers, and Variable Message Sign (VMS) boards, as appropriate. These measures will ensure road users are informed of impacts even where they are not directly subscribed to project updates.

Additional communication channels may be established in response to community feedback or as required during project delivery. A project hotline will also be available for enquiries or to discuss specific circumstances relating to traffic impacts.

2.0 PROJECT AREA & PROJECT CHARACTERISTICS

2.1 Project Area Location

The proposed development is a utility-scale wind farm and BESS located approximately 25 kilometres west of Cecil Plains and approximately 65 kilometres south-west of Dalby, within the Toowoomba Regional Council and Western Downs Regional Council local government areas. The Project Area is approximately 20,000 hectares (ha) and comprises rural land predominantly used for grazing.

The Project Area is located within the Toowoomba Regional Council (TRC) and Western Downs Regional Council (WDRC) local government areas and is zoned Rural under both planning schemes. The Project Area comprises the following lots and road reserves, as summarised in Table 2.1.

Table 2.1 – Project Area Lot Schedule

Property Description	Approximate Property Size (ha)
2DY452	4,699
27CP882781	2,407
2DY831	3,014
1RP174414	2,050
16SP201705	1,020
15SP201705	1,032
3RP174414	824
2RP174414	1,177
8DY247	965
9DY247	966
22DY800	1,028
21DY218	1,041
Road Reserve	183
Total	20,404

The Project Area is situated within a predominantly rural area characterised by grazing land and broadacre agricultural use. The surrounding road network primarily services rural properties, agricultural freight, and regional traffic movements. The nearest township is Cecil Plains, located approximately 25 km east of the Project Area, which provides the closest concentration of residential and community services.

The location of the Project Area is shown in Figure 2.1 below.

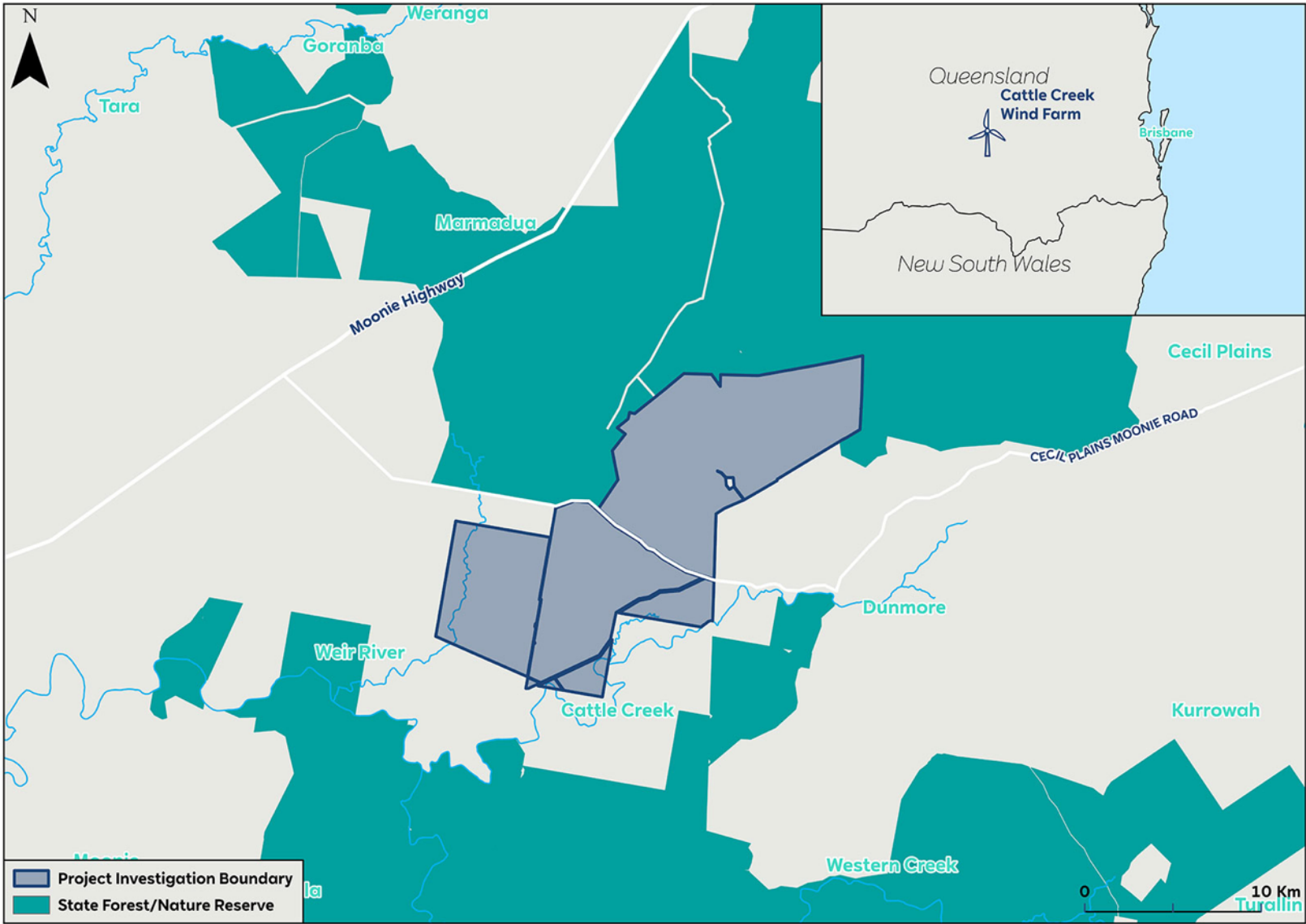


FIGURE 2.1 – LOCATION OF PROJECT AREA

2.2 Project Layout

The proposal comprises a utility-scale renewable energy development consisting of up to 135 wind turbine generators (WTGs), a Battery Energy Storage System (BESS) with an anticipated capacity of up to 450 MW, collector substations, switching infrastructure, transmission connections, temporary construction facilities, internal access tracks and associated supporting infrastructure distributed across the Project Area.

Access to the Project Area is proposed via six access points from Cecil Plains–Moonie Road. Internal access roads will extend throughout the Project Area to provide access to individual turbine locations, BESS infrastructure, and associated facilities.

The Proposed Development consists of the construction, operation, maintenance, and decommissioning of up to 135 WTGs, a Battery Energy Storage System (BESS), and ancillary infrastructure (supporting infrastructure) comprising:

- WTG foundations, crane hardstands, crane boom laydown areas, blade laydown areas, and rotor assembly areas;
- A Battery Energy Storage System (BESS) facility comprising approximately 376 battery units, 94 medium voltage (MV) transformers and two main high voltage (HV) substations;
- Access tracks, including:
 - New and upgraded tracks within the Project Area, generally comprising a nominal range of 5.5m – 10m wide permanent access tracks, and a maximum 50 – 95m wide cleared corridor for Oversize Overmass (OSOM) vehicles;
- Low voltage (LV) and medium voltage (MV) underground cabling, as well as MV and high voltage (HV) overhead transmission lines;
- Three internal collector substations;
- A switching station adjacent to the existing 330 kV Powerlink transmission line. This infrastructure has been included within the Disturbance Footprint, allowing clearing and associated impacts to be assessed as part of the Proposed Development (noting that the switching station will be constructed, owned and operated by Powerlink);
- Up to six permanent meteorological masts;
- Construction compounds and laydown areas;
- Washdown areas;
- Operational and maintenance facilities; and
- A construction workers' accommodation facility.

Further, the Proposed Development may include the following additional infrastructure:

- Up to four concrete batching plants;
- Borrow pits; and
- Communications towers.

2.3 Construction Staging

It is anticipated that construction staging will occur generally in accordance with the schedule shown in Table 2.2 – Summary Of Indicative Construction Staging.

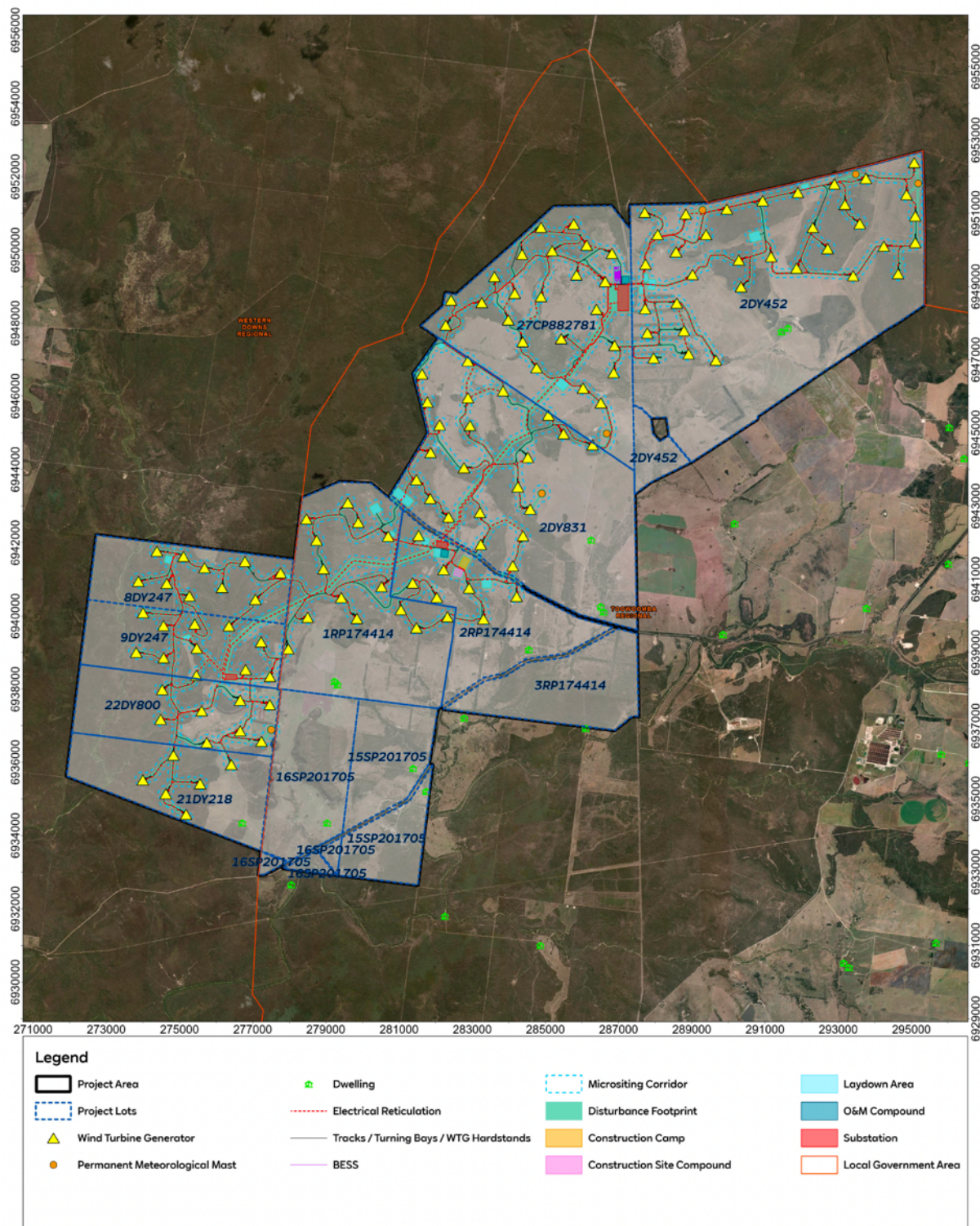


FIGURE 2.2 – PROJECT LAYOUT

TABLE 2.2 – SUMMARY OF INDICATIVE CONSTRUCTION STAGING

	Jan-28	Feb-28	Mar-28	Apr-28	May-28	Jun-28	Jul-28	Aug-28	Sep-28	Oct-28	Nov-28	Dec-28	Jan-29	Feb-29	Mar-29	Apr-29	May-29	Jun-29	Jul-29	Aug-29	Sep-29	Oct-29	Nov-29	Dec-29	Jan-30	Feb-30	Mar-30	Apr-30	May-30	Jun-30	Jul-30	Aug-30
Site Establishment																																
Civil Works																																
Electrical Works																																
WTG Delivery																																
Commissioning and Demobilisation																																

Notes

- (1) Prior to commencing construction activity, all Project Area access points connecting to Cecil Plains – Moonie Road will be designed and constructed in accordance with the Council requirements.

All accesses will be designed to accommodate construction traffic, including over-dimensional and over-size over-mass (OSOM) turbine delivery vehicles, where applicable. Standard rural property access treatments are not anticipated to be sufficient for OSOM movements and intersection treatments may require upgrade beyond standard TMR rural driveway templates.

- (2) The construction and commissioning program will extend over approximately 32 months, with workers generally operating on a Bus in / Bus out roster.
- (3) The indicative construction staging and haulage schedule is preliminary only and subject to refinement through detailed design development, contractor procurement, stakeholder consultation, and ongoing engagement with the Department of Transport and Main Roads, Queensland Police Service, relevant local authorities and affected landowners. Timing, sequencing and construction methodologies may therefore vary as the project progresses.

It is anticipated that turbine components will be transported over a nine-month period; however, this is subject to negotiation with TMR and the Queensland Police Service, including any required permits for OSOM movements and associated road network constraints.

2.4 Typical Haulage Vehicles

Examples of the types of vehicle configurations that will be used to haul over -sized turbine components, and other primary haulage activities will be shown in the Transport Management Plan. It is noted that the configuration of some of the vehicles may change, depending on the appointed contractor. Final vehicle configurations will be documented in the Transport Management Plan (TMP), and Route Survey to be prepared by the appointed contractor.

A summary of the various vehicle configurations adopted for this assessment, is provided as Table 2.3.

Table 2.3 – Over-Sized Over Mass (OSOM) Vehicle Characteristics

Haulage Item	No. of deliveries	Overall Length (m)	Overall Width (m)	Height (m)	GVM (tonnes)	Vehicle Type (Updated)
Tower section 1	135	39.5	5.9	6.6	85	Prime Mover + Low Loader Dolly + Jinker
Tower section 2	135	44.5	5.9	6.6	86	Prime Mover + Low Loader Dolly + Jinker
Tower section 3	135	27.5	5.55	6.6	85	Prime Mover + Low Loader + Dolly
Tower section 4	135	33.4	5.0	6.6	90	Prime Mover + Low Loader + Dolly
Tower section 5	135	38.0	5.0	6.6	90	Prime Mover + Low Loader + Dolly
Tower section 6	135	40.8	5.0	6.4	79	Prime Mover + Low Loader + Dolly
Tower section 7	135	39.0	4.2	5.6	68	Prime Mover + Semi-Trailer / Drop Deck
Blade	405	89.2	4.3	5.5	52.5	Prime Mover + Extendable Steerable Jinker (Steerable Bogie)
Generator segment 1	135	30.5	5.2	4.8	167	Prime Mover + Multi-Axle Platform (Platform Trailer)
Generator segment 2	135	30.5	5.2	4.8	167	Prime Mover + Multi-Axle Platform (Platform Trailer)
Hub	135	26.6	4.4	5.5	75	Prime Mover + Low Loader
Nacelle	135	36.6	4.9	5.9	86	Prime Mover + 4x8 Dolly + 4x8 Jinker (Drop Deck)
BESS battery units	376	12–14	2.5–3.0	3.0–3.5	30–45	Prime Mover + Extendable Platform Trailer
MV transformers	94	8–12	3.0–4.0	3.0–4.0	up to 100	Prime Mover + Multi-Axle Platform Trailer
HV substation equipment	2	Subject to final design	Subject to final design	Subject to final design	up to 200	Prime Mover + Heavy Duty Hydraulic Platform Trailer
Transformer (wind farm / grid connection)	1 – 5	8.8	4.0	4.6	187	Prime Mover + Heavy Duty Hydraulic Platform Trailer

The above haulage vehicle characteristics are indicative only and are based on typical equipment currently used in utility-scale wind farm and battery energy storage developments. The BESS configuration adopted for this assessment comprises approximately 376 battery units, 94 medium voltage (MV) transformers and two main high voltage (HV) substations. Final vehicle configurations, delivery sequencing, and haulage requirements will be confirmed by the appointed contractor following detailed design, procurement, and route verification.

2.5 Haulage Routes

A Preliminary Route Assessment has been undertaken for the Project to identify suitable haulage routes for both Over Size Over Mass (OSOM) vehicles and general construction traffic. In accordance with the assessment approach adopted, four OSOM route options (Options A, B, C and D) have been identified between the Port of Brisbane and the Project Area. These options are presented and assessed in the Preliminary Route Assessment and are intended to provide flexibility for delivery of wind turbine and BESS components, subject to final turbine selection and construction methodology.

It is noted that OSOM vehicles will be restricted to nominated haulage routes, whereas general construction vehicles will utilise the most efficient and appropriate road network between regional centres and the Project Area, typically via Cecil Plains–Moonie Road and surrounding State and local road corridors.

The key OSOM route options are summarised as follows, and shown in Figure 2.3:

- Option A – via the Warrego Highway to Dalby, and then the Moonie Highway to the Cecil Plains–Moonie Road, to the Project Area;
- Option B – via the Warrego Highway to Dalby, and then the Dalby – Cecil Plains Road to Cecil Plains, connecting to Project Area via Cecil Plains–Moonie Road;
- Option C – via Toowoomba Cecil Plains Road to Cecil Plains, connecting to Project Area via Cecil Plains–Moonie Road;
- Option D – via the Gore Highway to Pampas, Pampas – Horrane Road to Cecil Plains, connecting to Project Area via Cecil Plains–Moonie Road.

General heavy vehicle movements (non-OSOM) associated with construction materials, equipment, and supplies are expected to utilise the most direct routes from regional centres such as Toowoomba and Dalby to the Project Area, without restriction to the nominated OSOM corridors.

For assessment purposes within this TIA, each OSOM route option has been considered separately, with corresponding traffic generation and network impact assessments prepared for each scenario. General construction traffic volumes remain consistent across all scenarios, with only OSOM movements varying between route options.

A schematic overview of the primary road network from regional centres (including Toowoomba and Dalby) to the Project Area is provided to illustrate the overall freight and access framework. Detailed Port of Brisbane to regional centre movements are addressed within the Preliminary Route Assessment and swept path analysis and are not duplicated in detail within this TIA.

It is anticipated that the majority of construction workforce accommodation will be provided on-site, with an allowance of approximately 10% of workers travelling from nearby population centres such as Toowoomba and Dalby.

2.6 Construction Workforce

The size of the construction workforce will vary throughout the construction period, with workforce numbers expected to peak during the turbine installation phase. The construction workforce will progressively ramp up and reduce in accordance with the construction program.

2.7 Vehicle Access

It is proposed that access to the Project Area will be gained via six locations along the Cecil Plains–Moonie Road. The layout and required geometry of these access points is discussed further in Section 9.

2.8 Project Area Facilities

Project Area facilities will include :

- Project Area offices and amenities;
- Car parking for construction staff and contractors;
- Internal construction laydown areas.

Temporary construction laydown and stockpile areas will also be established throughout the Project Area as required to support construction activities.

Internal roadways will be provided linking the various components of the Project Area.

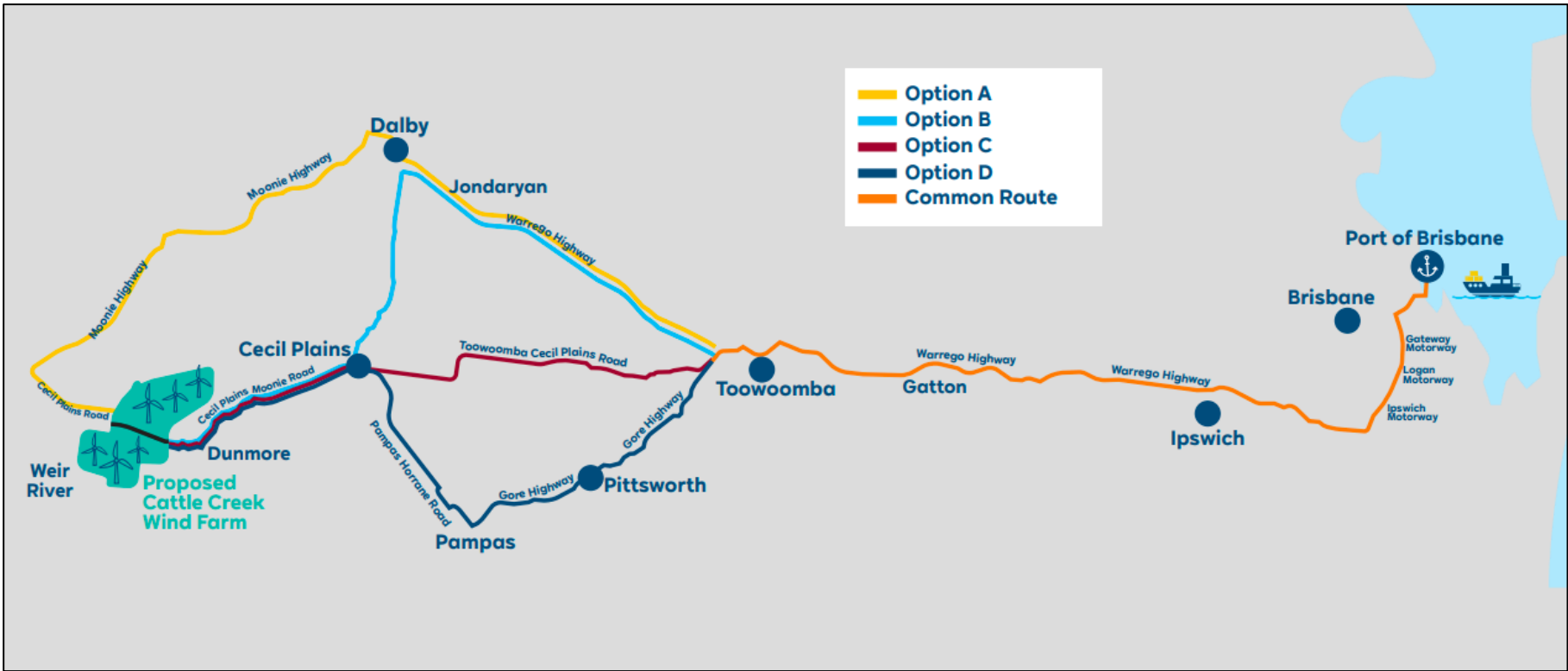


FIGURE 2.3 – PROPOSED OPTIONS FOR OSOM HAULAGE ROUTES

3.0 ROAD NETWORK

3.1 General

A Preliminary Route Assessment has been undertaken to inform the development of the OSOM haulage options. The assessment:

- identifies intersections and interchanges with potential swept path constraints;
- provides an overview of bridge, culvert and floodway constraints along each haulage route;
- provides a review of the geometric suitability of the corridor for OSOM vehicles; and
- identifies potential upgrade or mitigation measures required to facilitate OSOM movements.

A separate Preliminary Route Assessment Report has been prepared in conjunction with this TIA. The Route Assessment Report provides detailed swept path analysis, intersection assessments, and constraint identification for OSOM vehicle movements along the identified OSOM route options from Charlton to the Project Area.

The State and Local Controlled Road (SLCR) network represents the point at which the common haulage route terminates and where the OSOM transport route options diverge to access the Project Area. From this Charlton onward, multiple route options are considered to accommodate turbine and BESS delivery requirements and associated road network constraints. Refer to Figure 2.3 for the location of the SLCR transition point and the commencement of the alternative OSOM route options.

3.2 OSOM Route Options

Four (4) OSOM route options have been developed from Charlton to the Project Area to assess network constraints, floodway crossings, and suitability for the transport of wind turbine components and Battery Energy Storage System (BESS) infrastructure.

The OSOM task includes wind turbine components, transformers, BESS containers and associated electrical equipment, and other oversized items required for substations and supporting infrastructure.

The final route will be confirmed in consultation with the appointed haulage contractor following detailed route survey and permitting requirements.

The OSOM route options under investigation are summarised in Table 3.1.

Table 3.1 – OSOM Route Options

Option	Key Roads	Distance (km)
A	Warrego Hwy (Toowoomba–Dalby); Moonie Hwy; Cecil Plains – Moonie Rd	178 (346 incl. common)
B	Warrego Hwy (Toowoomba–Dalby); Dalby – Cecil Plains Rd; Taylor St; Cecil Plains – Moonie Rd	152 (320 incl. common)
C	Warrego Hwy; Gore Hwy; Toowoomba – Cecil Plains Rd; Taylor St; Cecil Plains – Moonie Rd	115 (283 incl. common)
D	Warrego Hwy; Gore Hwy; Pampas – Horrane Rd; Toowoomba – Cecil Plains Rd; Taylor St; Cecil Plains – Moonie Rd	141 (309 incl. common)

3.3 Road characteristics

General roadway characteristics for the road between the Port of Brisbane and the Project Area are shown in Table 3.2.

Table 3.2 – General roadway characteristics between Port of Brisbane and Project Area

Road	Description	Est AADT
Port Drive	two lane access road providing local access to the Port of Brisbane	10,000
Port of Brisbane Motorway	State-controlled motorway standard road (4 lanes)	20,000
Gateway Motorway	State-controlled motorway standard road (6–8 lanes)	50,000
Logan Motorway	State-controlled motorway standard road (4 lanes)	40,000
Ipswich Motorway	State-controlled motorway standard road (4 lanes)	40,000
Warrego Highway (Ipswich–Toowoomba)	State-controlled highway standard road (4–6 lanes)	20,000 - 30,000
Warrego Highway (through Toowoomba)	State-controlled urban road (4 lanes)	20,000
Warrego Highway (Toowoomba–Dalby)	State-controlled rural highway (2–4 lanes)	3,500 – 15,000
Moonie Highway	State-controlled rural highway providing east–west regional connectivity between Dalby and St George	1,000–2,500
Cecil Plains–Moonie Road	Local road, two lane rural cross section	< 500
Dalby–Cecil Plains Road	State-controlled rural road providing for movement between Dalby and Cecil Plains	1,000
Taylor Street (Cecil Plains)	Local government road providing access through Cecil Plains township and connecting to Cecil Plains–Moonie Road	1,000
Toowoomba–Cecil Plains Road	State-controlled rural road providing connectivity between the Warrego Highway and Cecil Plains	2,000
Pampas–Horrane Road	State-controlled rural road providing connectivity between the Gore Highway and Cecil Plains	< 500
Gore Highway	State-controlled rural highway forming a key north–south freight and regional corridor between Toowoomba and Goondiwindi	6,000

The general configuration of intersections is described in Table 3.3.

Table 3.3 – Configuration of Intersections between the Port of Brisbane and Project Area

Intersection:	Layouts / Control:	Other Comments
Port of Brisbane / Gateway Motorway	Grade separated interchange	Port precinct access
Port of Brisbane Motorway / Gateway Motorway (Murarrie)	Grade separated interchange	Major motorway-to-motorway connection
Ipswich Motorway / Brisbane Road (Goodna)	At-grade intersection (signalised)	Urban arterial connection
Warrego Highway / Moonie Highway (Dalby)	At-grade intersection (signalised)	Major regional transition point
Warrego Highway / Gore Highway (Charlton)	At-grade intersection (signalised)	Key western corridor split
Toowoomba Bypass / Toowoomba Cecil Plains Road (Charlton)	Grade separated interchange (signalised)	Access to Cecil Plains corridor
Gore Highway / Pampas–Horrane Road (Pampas)	At-grade intersection (Priority-controlled)	Rural connector
Warrego Highway / Dalby – Cecil Plains Road (Dalby)	At-grade intersection (Priority-controlled)	Local/state road interface
Cecil Plains – Moonie Road / Moonie Highway (Cecil Plains)	At-grade intersection (Priority-controlled)	Rural junction
Cecil Plains – Moonie Road / Dalby Cecil Plains Road (Cattle Creek)	At-grade intersection (Priority-controlled)	Cross-catchment connection

3.4 Traffic Volumes

Background traffic volumes for the relevant road sections in the area have been sourced from TMR. Traffic data, and summarised in Table 3.4 and Figure 3.1.

While historical 10-year growth rates for several sections have been variable, a conservative 2% per annum compound growth rate has been applied to the 2021 recorded data to estimate predicted 2026 volumes.

Table 3.4 – Summary of existing traffic volumes on surrounding roads

Road	Location	AADT	Vehicle Type (%)		
			Trucks + Buses	Artic Veh	Road Trains
			Class 1B	Class 1C	Class 1D
Warrego Highway	1.35km West of Jondaryan Park (PPS)	6762	12.45%	5.51%	10.04%
Toowoomba - Cecil Plains Road	200m East of Berghofer Rd	2230	13.01%	3.25%	3.59%
Gore Highway	Southbrook (WIM ANPR)	5350	8.26%	4.58%	10.88%
Gore Highway	230m West of Pampas-Horrane Rd	3664	7.77%	5.51%	20.01%
Pampas Horrane Road	1.4km North of Gore Hwy	103	12.43%	4.43%	24.25%
Dalby - Cecil Plains Road	150m South of Ruth Rd	715	18.93%	4.97%	9.43%
Moonie Highway	120m East of Kupunn Road	2972	7.79%	4.47%	8.49%
Moonie Highway*	120m East of Kupunn Road	2972	7.79%	4.47%	8.49%
Cecil Plains–Moonie Road	Western end	110	5%**	5%**	5%**
Cecil Plains–Moonie Road	Eastern end	110	5%**	5%**	5%**

**Estimated to be consistent with Section G volumes*

***Estimated heavy vehicle volumes*

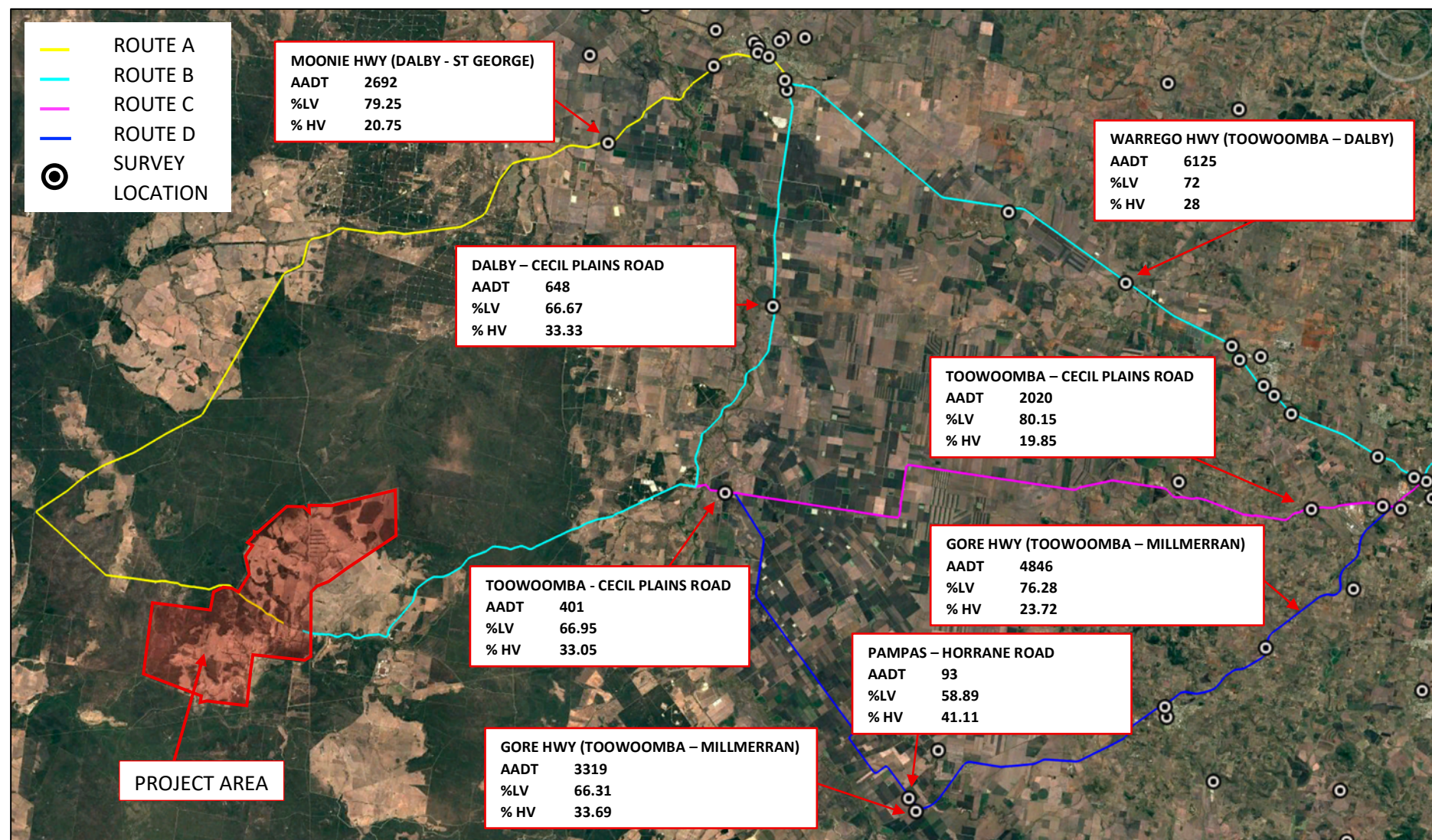


FIGURE 3.1 – TRAFFIC VOLUMES (TMR TRAFFIC CENSUS 2021)

3.5 General Road Network Performance

The road network within and surrounding the Project Area generally operates under low traffic volumes consistent with a rural environment. Traffic volumes on the primary roads surrounding the Project Area, including Cecil Plains–Moonie Road, Toowoomba–Cecil Plains Road, Dalby–Cecil Plains Road and Pampas–Horrane Road, are generally less than 1,500 vehicles per day and operate at Level of Service A conditions (i.e. free flowing with minimal delay).

The local rural road network currently experiences limited congestion, with delays generally restricted to short-duration peak periods associated with commuter, agricultural and school traffic movements through local townships such as Cecil Plains. Based on site inspections and available traffic data, the surrounding road network has substantial spare operational capacity outside of these isolated peak periods.

The roads between Charlton and the Project Area also generally operate at a good level of service during both daytime and night-time periods. Some congestion occurs through the Toowoomba urban area during commuter peak periods; however, these conditions are temporary and, while OSOM transport operations may result in some intermittent impacts to traffic flow through urban areas during delivery periods, such movements would generally be scheduled outside peak traffic periods and managed under approved traffic control arrangements where required.

The Warrego Highway, Gore Highway and associated regional freight corridors currently accommodate significant heavy vehicle activity and provide an appropriate strategic freight connection to the Project Area. While some temporary delays may occur due to ongoing road works and maintenance activities within the broader regional network, these are not expected to materially affect overall project traffic operations.

3.6 General Pavement Conditions

General pavement conditions have been observed and are described in Table 3.5 below.

Table 3.5 – General Road Pavement Condition Along the Identified OSOM Route Network

Road	General Condition
Warrego Highway	Good, no significant defects
Toowoomba–Cecil Plains Road	Generally good, with some sections exhibiting edge degradation associated with heavy agricultural vehicle movements
Cecil Plains–Moonie Road	Good
Pampas–Horrane Road	Generally good, with some sections exhibiting edge degradation associated with heavy agricultural vehicle movements
Moonie Highway	Good
Gore Highway	Good

3.7 Road Crash History

A review of road crash history within the study area has been undertaken and is discussed in Section 8.3 – Road Crash Data of this report.

3.8 Road Network Constraints

Road network constraints are discussed in detail in the Route Assessment Report. However, in general, the following constraints have been identified across the study route:

- **Bridge load and structural restrictions, particularly:**
 - Condamine River Bridge at Cecil Plains on the Toowoomba-Cecil Plains Road, which is restricted to regulation mass;
 - Oakey Creek Bridge (approximately 11 km south of Dalby on the Dalby-Cecil Plains Road), which is also restricted to regulation mass.
- **Route termination points for higher mass and restricted vehicle classes**, where Higher Mass Limits (HML) and One Tonne Mass Transfer (1TMT) networks terminate prior to the Project Area, particularly at or near key bridge structures, limiting continuous heavy haulage access for certain configurations.
- **Local road network limitations**, including sections of unsealed or lower-standard roads (e.g. Kumbarilla Lane and surrounding collector roads), which present constraints for repeated heavy vehicle and OSOM movements in terms of pavement strength, width and maintainability.
- **Floodway constraints along Cecil Plains-Moonie Road**, particularly east of the Project Area where multiple floodways are located. These floodways may require modification or upgrade to safely accommodate OSOM vehicle passage;
- **Intersection and access constraints on local roads**, where OSOM movements require:
 - Temporary hardstand widening and shoulder strengthening at intersections (e.g. Pampas-Horrane Road, Dalby-Cecil Plains Road, and Moonie Highway intersections); and
 - Vegetation clearing and geometric adjustments to accommodate swept path requirements for OSOM vehicles.

These constraints will be addressed through concept-level mitigation measures identified in the Route Assessment Report, including potential intersection and floodway upgrades. Detailed design, construction staging, and transport management requirements will be confirmed following selection of the final haulage route in consultation with the appointed haulage contractor.

3.9 School Bus Services

A number of roads within the wider study corridor are used by school bus services operating between surrounding rural localities and nearby township schools. Within the vicinity of the Project Area, school bus movements are primarily associated with services operating to and from Dalby, Pittsworth, and surrounding rural catchments accessed via the Dalby – Cecil Plains Road, Warrego Highway, and adjoining local road networks.

Key schools within the broader catchment of the study corridor include:

- Dalby State School;
- Dalby South State School;
- Dalby State High School;
- Pittsworth State School;
- Pittsworth State High School;
- Cecil Plains State School.

School bus operations in these rural areas typically involve dispersed pick-up and drop-off movements along state and council-controlled roads rather than formalised bus stop infrastructure.

Whilst the daily volume of heavy vehicles travelling to and from the Project Area on each road will be relatively low (less than five vehicle movements per hour on any individual road), the various school bus services and schools will be advised of the truck patterns and schedule as part of the community consultation plan. The Proponent will liaise with the school bus operators and project heavy vehicle operators to understand their movements and avoid potential conflicts where possible. This requirement is to be addressed through construction staging and traffic management controls and is to be conditioned and resolved as part of the Construction Traffic Management Plan (CTMP) during the construction management planning phase.

As part of the CTMP, contact will be made with local schools to gather information regarding school bus operations.

4.0 PROJECT TRAFFIC

4.1 Construction Workforce and Accommodation

The construction workforce is expected to peak during the turbine installation phase, with the majority of personnel accommodated on-site. It is assumed that all workers not accommodated on-site will travel to and from the Project Area via private vehicle or shuttle bus. A nominal allowance has been adopted for specialist contractors and off-Project Area management personnel, resulting in an estimated 5 return movements per day (10 total movements).

4.2 Heavy Vehicle Payload Assumptions

Heavy vehicle (HV) movements have been calculated based on the material requirements for up to 135 wind turbine generators. Payload assumptions adopted for the assessment are summarised in Table 4.1 – Estimated Material Quantities and Resultant Heavy Vehicle Trip Generation, and are consistent with the Pavement Impact Assessment (PIA) Practice Note.

4.3 Traffic Distribution

Project-related traffic will be distributed across the state-controlled network based on the location of quarries, concrete batching plants, and the Port of Brisbane.

- 85% via Toowoomba – Cecil Plains Road: Assumed principal corridor for OSOM turbine components and bulk civil materials from the Toowoomba/Charlton logistics precinct, subject to final route confirmation and permitting requirements;
- 5% via Moonie Highway: Local supply route from the South-West;
- 5% via Dalby-Cecil Plains Road: Local service route from Dalby;
- 5% via Pampas-Horrane Road: Minor local service route.

4.4 Traffic Generation Summary

Traffic generation estimates have been prepared based on the construction program, material quantities, and payload assumptions outlined in Table 4.1 – Estimated Material Quantities and Resultant Heavy Vehicle Trip Generation. Traffic volumes shown are those that are expected to occur during daytime periods, when impacts on road network operations and the community is critical. OSOM vehicle movement have been excluded from the table as they will primarily occur during nighttime periods. These movements have been assessed separately in the Preliminary Route Assessment Report due to their unique operational requirements.

Tables 4.1 – 4.5 provide a detailed breakdown of the estimated 22,152 heavy vehicle movements (non-OSOM) and the corresponding daily impacts across the identified road sections.

The estimates shown in Table 4.1 – Estimated Material Quantities and Resultant Heavy Vehicle Trip Generation are indicative as material sources and other project details are still to be confirmed.

Each BESS component has conservatively been assumed to require one vehicle movement per unit for assessment purposes. The current BESS configuration adopted for this assessment comprises approximately 376 battery units, 94 MV transformers and two main HV substations. This represents a conservative transport assumption and does not account for potential optimisation of transport configurations, combined loads, or alternative delivery methodologies that may be confirmed during detailed design.

Table 4.1 – Estimated material quantities and resultant heavy vehicle trip generation

Item	Sub-item	Ref Phase	Quantity		No.	Unit / rate	Total	Unit	Vehicle	Load capacity		No. loads
			No.	Unit						Total	Unit	
Concrete - Foundation Blinding Layer	Concrete volume	F	135	turbines	130	m3	17550					
	Sand		135	turbines	860	kg/m3	15093	tonnes	6 axle semi, various HV	30	tonnes	503
	Aggregate		135	turbines	1060	kg/m3	18603	tonnes	6 axle semi, various HV	30	tonnes	620
	Cement		135	turbines	350	kg/m3	6142.5	tonnes	6 axle semi, various HV	30	tonnes	205
Concrete - Foundation	Concrete volume	F	135	turbines	850	m3	114750					
	Sand		135	turbines	860	kg/m3	98685	tonnes	6 axle semi, various HV	30	tonnes	3290
	Aggregate		135	turbines	1060	kg/m3	121635	tonnes	6 axle semi, various HV	30	tonnes	4055
	Cement		135	turbines	350	kg/m3	40162.5	tonnes	6 axle semi, various HV	30	tonnes	1339
Water	Concrete		132300	m3 concrete	0.25	Kilo-litres	33075	Kilo-litres	6 axle semi, various HV	15	Kilo-litres	2205
	Site consumption	J(15), J(10), K(65), N(10)	830	days	25	Kl / day	20750	Kilo-litres	6 axle semi, various HV	15	Kilo-litres	1383
	Other (20% imported, 80% site won)	H(80), M(20)	350	days	150	Kl / day	52500	Kilo-litres	6 axle semi, various HV	15	Kilo-litres	700
Quarry rock (20% imported, 80% site won)	Site compound bench, substation bench, other benches, initial access tracks	A(70), D(30)					9000	tonnes	Truck and dog, various HV	18	tonnes	100
Reinforcing steel		F	135	turbines	108	tonnes / turbine	14580	tonnes	6 axle semi, various HV	30	tonnes	486
Pre-cast concrete		F	135	turbines	10	tonnes / turbine	1350	tonnes	6 axle semi, various HV	30	tonnes	45
Electrical Cable Drum Delivery		H							6 axle semi, various HV	100	deliveries	100
Construction plant		G					150	Various	6 axle semi, various HV	150	deliveries	150
Site buildings etc		C					40	Various	6 axle semi, various HV	1	piece	40
Concrete batch plant and rock crusher		D					30	Various	6 axle semi, various HV	1	piece	30
OHL works	Conductor, poles, insulators	H							6 axle semi, various HV		deliveries	150
	Water and local materials								6 axle semi, various HV		deliveries	1000
Turbine components	Tower sections 1-4	I	135	turbines	4	sections	540	sections	OSOM	1	sections	540
	Tower sections 5-6		135	turbines	2	sections	270	sections	OSOM	1	sections	270
	Blades		135	turbines	3	blades	405	blades	OSOM	1	blades	405
	Nacelle		135	turbines	1	nacelle	135	nacelle	OSOM	1	nacelle	135
	Generator segments		135	turbines	2	generator	270	generator	OSOM	1	generator	270
	Hub		135	turbines	1	hub	135	hub	OSOM	1	hub	135
Drainage Items Delivery		E				deliveries			6 axle semi, various HV	147	deliveries	147
Conduit Delivery		H				deliveries			6 axle semi, various HV	147	deliveries	147
Cable trench sand delivery		H				deliveries			6 axle semi, various HV	1908	deliveries	1908
Fuel Delivery		J(5), K(90), N(5)				deliveries			6 axle semi, various HV	200	deliveries	200
Civil Mobilisation		D				deliveries			6 axle semi, various HV	100	deliveries	100
Civil Demobilisation		E(80), N(20)				deliveries			6 axle semi, various HV	100	deliveries	100
Electrical Mobilisation		D				deliveries			6 axle semi, various HV	50	deliveries	50
Electrical Demobilisation		L				deliveries			6 axle semi, various HV	50	deliveries	50
Electrical Cable Drum Delivery		H				deliveries			6 axle semi, various HV	80	deliveries	80
Substation		A				deliveries			6 axle semi, various HV	300	deliveries	300
Substation - OSOM		A				deliveries			OSOM	15	deliveries	15
Container Deliveries		C				deliveries			6 axle semi	300	deliveries	300
Container Returns						deliveries			6 axle semi	300	deliveries	300
Crane Mobilisation		E				deliveries			6 axle semi & oversize	150	deliveries	150
Crane Demobilisation		E				deliveries			6 axle semi & oversize	150	deliveries	150
BESS Main Power Transformers		H			2	units	2	OSOM		1	piece	2
MV Transformers					94	units	94	6 axle semi, various HV		1	piece	94
Inverter Skid Containers					94	units	94	6 axle semi, various HV		94	deliveries	94
Battery Container Units					376	units	376	6 axle semi, various HV		376	deliveries	376
RMUs / Switchgear Skids					94	units	94	6 axle semi, various HV		1	piece	94
Control / PCS Buildings					2	units	2	6 axle semi, various HV		1	piece	2
Total												22813

Table 4.2 – Projected Monthly Construction Heavy Vehicle Movements

Component	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16
Substation Bench and Road (Road base)	96	96	96	96												
Substation Bench and Road (Water)	52	52	52	52												
Site facilities establishment	320	320														
Establish Quarry site and batch plant					70	70	70									
Access roads and crane hardstands			20	20	20	20	46	46	46	46	46	46	46	46	20	20
Wind turbine foundations					637	637	637	1115	1115	1115	1115	1115	1115	1115	1115	637
O & M Facility																
Various electrical works (incl. BESS)								145	145	145	145	313	313	313	313	313
Wind turbine parts transport										66	66	66	66	137	137	137
Wind turbine prep and pre-assembly											6	6	6	6	13	13
Wind turbine erection													54	54	54	94
Mech and electrical completion																
Testing and commissioning																
Site management	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total	473	473	173	173	732	732	759	1312	1312	1378	1383	1551	1605	1676	1657	1220

Table 4.3 – Projected Monthly Construction Heavy Vehicle Movements (Continued)

Component	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30	Month 31	Month 32	TOTAL
Substation Bench and Road (Road base)																	385
Substation Bench and Road (Water)																	208
Site facilities establishment																	640
Establish Quarry site and batch plant																	210
Access roads and crane hardstands	20	20															527
Wind turbine foundations	637	637															12747
O & M Facility				15	15	15	20	20	20	15	15	15					150
Various electrical works (incl. BESS)	313	313	313	313	313	313	145	145	145	145							4606
Wind turbine parts transport	137	137	137	137	137	137	66	66	66	66							1755
Wind turbine prep and pre-assembly	13	13	13	13	13	13	6	6	6	6							148
Wind turbine erection	94	94	94	94	94	94	94	54	54	54							1079
Mech and electrical completion				4	4	4	4	4	4	4	4	4	4	4	4	4	50
Testing and commissioning				11	11	11	11	11	11	11	11	11	11	11	11	11	140
Site management	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	168
Total	1220	1220	562	592	592	592	351	310	310	305	35	35	20	20	20	20	22814

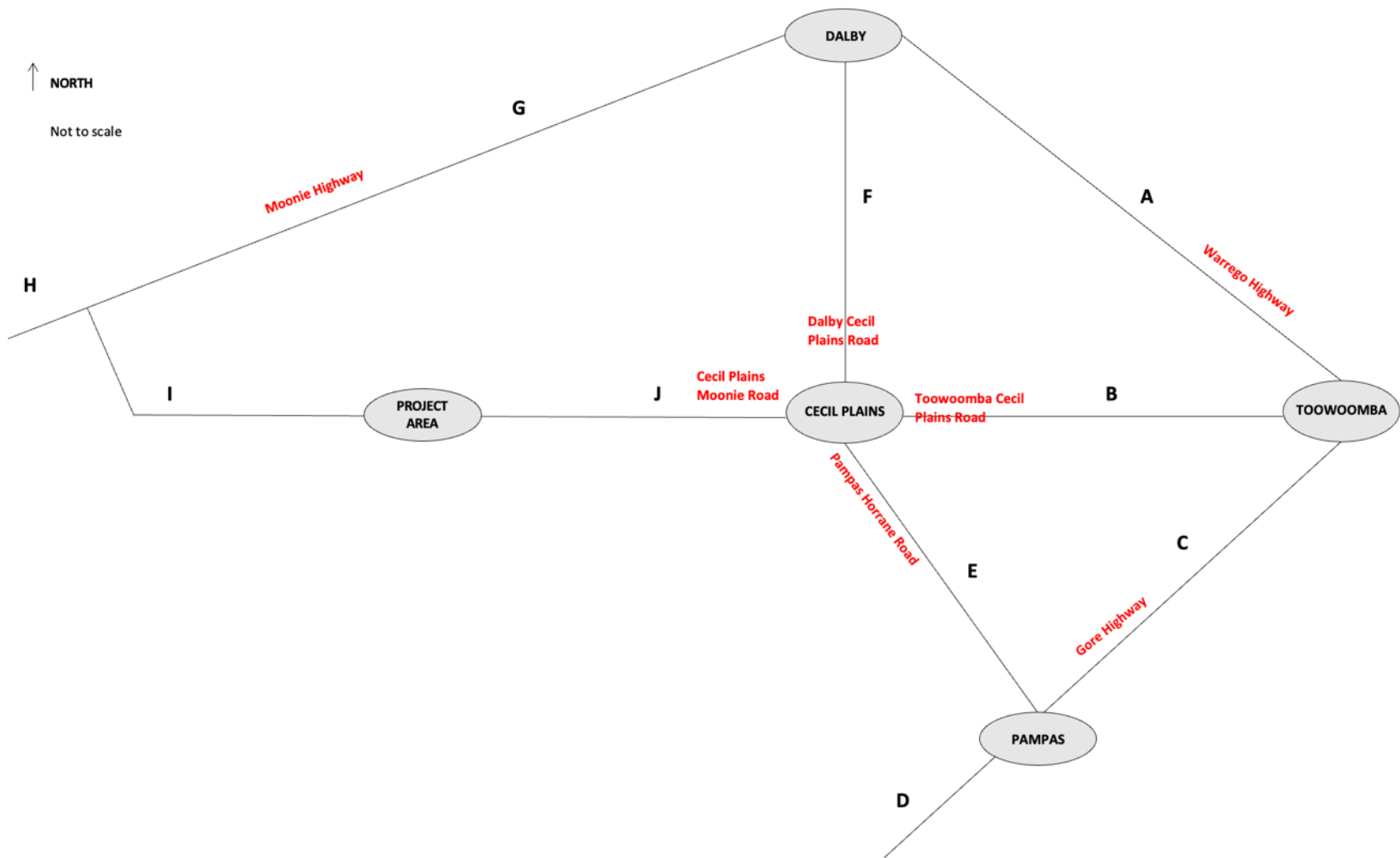


FIGURE 4.1 – KEY MAP (ROAD SECTIONS)

Table 4.4 – Estimate of total vehicle movements during 32-month construction period (Excluding OSOM)
(refer to Key Map in Figure 5.1)

Road Section	Miscel. deliveries (6 axle AV)	Project Area & Camp Establish. (6 axle AV)	Turbine Footings (6 axle AV)	Access Roads etc (Truck+Dog)	Construction / Substations (6 axle AV)	Project Area Demobilisation (6 axle AV)	Workers Private car	Total
A	0	0	0	0	0	0	0	0
B	4043	1674	10835	85	958	305	3536	21435
C	238	98	637	5	56	18	208	1261
D	238	98	637	5	56	18	208	1261
E	0	0	0	0	0	0	0	0
F	238	98	637	5	56	18	208	1261
G	238	98	637	5	56	18	208	1261
H	0	0	0	0	0	0	0	0
I	238	98	637	5	56	18	208	1261
J	4519	1871	12109	95	1071	340	3952	23957

Notes:

- Excluding OSOM:** This table represents general construction traffic, including civil materials, water, foundation concrete, and electrical infrastructure. It excludes the OSOM movements required for turbine components, which are addressed separately in Section 5.6 and within the Preliminary Route Assessment.
- Worker Private Car Generation:** Assumes on-site worker accommodation is the primary residence. Private car movements are based on 5 cars per work day (6 days per week).
- Heavy Vehicle (HV) Traffic Distribution:** All project-related heavy vehicle movements (excluding OSOM vehicles) are expected to distribute as follows:
 - 85% via Toowoomba-Cecil Plains Road (Toowoomba/Charlton);
 - 5% via Moonie Highway (Dalby);
 - 5% via Dalby–Cecil Plains Road;
 - 5% via Pampas-Horrane Road (Pampas).
- The traffic distribution percentages are based on preliminary routing assumptions only. These will be reviewed and updated following confirmation of the preferred OSOM route through detailed haulage planning and consultation with the appointed contractor.

TABLE 4.5 – AVERAGE DAILY AND PEAK DAILY VEHICLE MOVEMENTS DURING CONSTRUCTION (REFER TO KEY MAP IN FIGURE 4.1)

Average daily movements (6 days per week over 32 months)

Road Section	Miscel. deliveries (6 axle AV)	Project Area & Camp Establish. (6 axle AV)	Turbine Foundations (6 axle AV)	Access Roads etc (Truck+Dog)	Construction / Substations (6 axle AV)	Project Area Demobilisation (6 axle AV)	Workers Private car	Total
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
B	4.86	2.01	13.03	0.10	1.15	0.37	4.25	26
C	0.29	0.12	0.77	0.01	0.07	0.02	0.25	2
D	0.29	0.12	0.77	0.01	0.07	0.02	0.25	2
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
F	0.29	0.12	0.77	0.01	0.07	0.02	0.25	2
G	0.29	0.12	0.77	0.01	0.07	0.02	0.25	2
H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
I	0.29	0.12	0.77	0.01	0.07	0.02	0.25	2
J	5.44	2.25	14.57	0.11	1.29	0.41	4.75	29

Estimated peak daily movements (during peak periods of construction activity)

Road Section	Miscel. deliveries (6 axle AV)	Project Area & Camp Establish. (6 axle AV)	Turbine Foundations (6 axle AV)	Access Roads etc (Truck+Dog)	Construction / Substations (6 axle AV)	Project Area Demobilisation (6 axle AV)	Workers Private car	Total
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
B	9.73	4.03	26.06	0.20	2.31	0.73	8.51	52
C	0.57	0.24	1.53	0.01	0.14	0.04	0.50	3
D	0.57	0.24	1.53	0.01	0.14	0.04	0.50	3
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
F	0.57	0.24	1.53	0.01	0.14	0.04	0.50	3
G	0.57	0.24	1.53	0.01	0.14	0.04	0.50	3
H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
I	0.57	0.24	1.53	0.01	0.14	0.04	0.50	3
J	10.87	4.50	29.13	0.23	2.58	0.82	9.51	58

5.0 ROAD NETWORK IMPACT (TRAFFIC OPERATIONS)

5.1 General

As shown in Section 5, the project will generate relatively low traffic volumes across the surrounding road network, consistent with the rural nature of the study area. The resultant traffic volumes on each road section are expected to remain within acceptable operational capacity in accordance with Austroads guidance.

Daily traffic increases are generally minor across most network links, typically representing low absolute changes in vehicle movements. The highest relative increase occurs on Section J (Cecil Plains–Moonie Road), where baseline traffic volumes are low; however, the actual increase in daily vehicle movements remains modest in absolute terms and is largely associated with peak construction periods.

The assessment of traffic impacts has been undertaken having regard to the TMR Guide to Traffic Impact Assessment (GTIA) and Austroads guidance. For rural roads, increases in traffic volumes below approximately 5% of existing traffic volumes are generally considered to have negligible operational impacts, while increases exceeding 5% warrant further consideration of operational and pavement impacts.

As demonstrated in Figure 5.1, only Cecil Plains–Moonie Road exceeds the 5% threshold. However, even on this road section, total forecast traffic volumes remain well within the practical operating capacity of a two-lane rural road and do not trigger a requirement for intersection capacity upgrades or detailed operational modelling.

Road Section	Existing AADT	Project AADT (construction)	% Impact
A	6762	0	0.0%
B	2230	22	1.0%
C	5350	1	0.0%
D	3664	1	0.0%
E	103	0	0.0%
F	715	1	0.2%
G	2972	1	0.0%
H	2972	0	0.0%
I	110	1	1.2%
J	110	25	22.3%

FIGURE 5.1 – PERCENTAGE IMPACT OF CONSTRUCTION TRAFFIC UPON ROAD LINKS (INCL HEAVY VEHICLES AND WORKER PRIVATE VEHICLES) Refer to Key Map in Fig 4.1

The physical impact and management of OSOM vehicles is subject to the final route selection between the Port of Brisbane and the Project Area. Because a haulage contractor has not yet been appointed, this assessment maintains four potential OSOM route options (A – D).

The detailed geometric constraints, swept path analyses, and required mitigation measures for each of these four options are documented in the separate Preliminary Route Assessment Report. Once a preferred route is selected by the contractor, a final Traffic Management Plan (TMP) and Road-use Management Plan (RMP) will be developed to formalise the specific escort and permit requirements for those sections.

The impact of increased traffic upon the operation of rural roads such as the Cecil Plains–Moonie Road has been assessed in the context of Austroads Guide to Road Design Part 3, and particularly Table 4.5, which is provided below.

Table 4.5: Single carriageway rural road widths (m)

Element	Design AADT				
	1–150	150–500	500–1000	1000–3000	> 3000
Traffic lanes ⁽¹⁾	3.7 (1 x 3.7)	6.2 (2 x 3.1)	6.2–7.0 (2 x 3.1/3.5)	7.0 (2 x 3.5)	7.0 (2 x 3.5)
Total shoulder	2.5	1.5	1.5	2.0	2.5
Minimum shoulder seal (2),(3),(4),(5),(6)	0	0.5	0.5	1.0	1.5
Total carriageway	8.7	9.2	9.2–10.0	11.0	12.0

- 1 Traffic lane widths include centrelines but are exclusive of edge-lines.
- 2 Where significant numbers of cyclists use the roadway, consideration should be given to fully sealing the shoulders. Suggest use of a maximum size 10 mm seal within a 20 km radius of towns.
- 3 Wider shoulder seals may be appropriate depending on requirements for maintenance costs, soil and climatic conditions or to accommodate the tracked width requirements for Large Combination Vehicles.
- 4 Short lengths of wider shoulder seal or lay-bys to be provided at suitable locations to provide for discretionary stops.
- 5 Full width shoulder seals may be appropriate adjacent to safety barriers and on the high side of superelevation.
- 6 A minimum 7.0 m seal should be provided on designated heavy vehicle routes (or where the AADT contains more than 15% heavy vehicles).

FIGURE 5.2 – AUSTROADS PART 3 TABLE 4.5 (SINGLE CARRIAGEWAY RURAL ROAD WIDTHS)

5.2 Moonie Highway

The Moonie Highway serves as a key arterial link between Dalby and Moonie. It currently carries approximately 2,972 vehicles per day (vpd) near Dalby.

The construction phase will impact this section differently depending on the final route selection for OSOM components:

- General Construction Traffic: Small volumes of specialised deliveries (Ref H) may originate from the south/west via the Moonie Highway, however majority of general construction traffic is expected to utilise Route C.
- OSOM Options: Option A utilises the Moonie Highway to access Cecil Plains–Moonie Road from Dalby. The impact of Option A would be limited to the 1,755 turbine component deliveries and 15 substation OSOM loads, which will occur in concentrated waves over the construction period.

The highway provides a high-quality sealed pavement (~7-8m width). However, the separate Preliminary Route Assessment Report identifies specific geometric constraints, primarily vertical "sag" curves and drainage culverts, that would require temporary mitigation.

5.3 Cecil Plains–Moonie Road (West of the Project Area - Link I)

The western portion of Cecil Plains–Moonie Road, identified as Link I, is a potential haulage route for OSOM vehicles under route Option A. Cecil Plains–Moonie Road currently carries approximately 110 vehicles per day (vpd).

General construction traffic is not expected to utilise this road section. Consequently, Link I will not be subject to sustained increases in daily traffic volumes. The volume impact is limited to the intermittent transit of specialised OSOM components if Option A is formally selected.

5.4 Cecil Plains–Moonie Road (East of the Project Area - Link J)

Link J serves as the primary access link for all standard heavy vehicles, including Articulated Vehicles (AVs) and Truck and Dog combinations. Unlike Link I, the traffic volumes on this section are a functional requirement of the construction phase, independent of the final OSOM route choice.

The traffic impact on Link J is not uniform across the 32-month construction period. Based on the development traffic split, the project generates a total of 23,112 heavy vehicle loads, with a marked intensity during the middle third of the schedule.

- **Average Construction Volume:** Over the full 32-month duration, the project adds an average of 25 vehicles per day (vpd), representing a 22.6% increase over the baseline AADT of 110 vpd.
- **Peak Period Intensity:** The maximum traffic generation occurs between Month 13 and Month 14, reaching 1,696 loads. This peak is driven primarily by wind turbine foundation works and concurrent electrical works (including BESS components).
- **Peak Daily Volume:** During this peak window, daily project-generated movements (including return trips) are estimated at 115 vpd, resulting in a total combined volume of 225 vpd (a 104% increase over baseline).

While this represents a noticeable increase relative to the low existing baseline traffic volume on Link J, the resulting total traffic volumes remain consistent with the functional classification of Cecil Plains–Moonie Road as a rural arterial/collector route servicing agricultural and regional freight movements.

The assessment considers both absolute and relative changes in traffic demand. In this context, the road continues to operate well within typical rural road capacity ranges, with no requirement identified for capacity augmentation or intersection upgrades based on Austroads rural road performance criteria. The increase is temporary in nature and is limited to the construction phase only.

5.5 Intersection Impacts

Various intersections will be impacted by traffic generated during the construction phase. In terms of intersection operations, the volume of traffic generated will generally be very low on the higher-order State-controlled network (Warrego and Gore Highways). Consideration of these major intersections is primarily required in relation to the specific requirements for OSOM vehicles, which are detailed in the separate Preliminary Route Assessment Report.

In terms of traffic operations, the impact of project-generated traffic is most relevant for the low-volume intersections and transitions along the Toowoomba – Cecil Plains Road and the Cecil Plains–Moonie Road. Comments in relation to these impacts are provided as follows:

- Warrego Highway / Moonie Highway (Route A OSOM): Project traffic for Route A will generally only impact the left-turn movement from the Warrego Highway to the Moonie Highway and the converse right-turn movement. As there is currently no dedicated left-turn slip lane provided on the Warrego Highway at this location, the transit of turbine blades will require temporary management measures. This may include the temporary removal of roadside furniture, pavement reinforcement of the shoulder, and intermittent traffic holding to allow for the unconventional swept path of OSOM trailers.
- Moonie Highway / Cecil Plains–Moonie Road corridor: This corridor accommodates the primary distribution of general construction traffic accessing the Project Area. While traffic volumes increase during peak construction periods, the additional demand is dispersed across multiple vehicle types and time periods, and remains within the functional capacity of the rural highway network. No intersection capacity constraints are anticipated under construction traffic conditions.
- Warrego Highway / Dalby Cecil Plains Road (Route B OSOM): This functions as a key priority-controlled junction. The geometrical layout is considered satisfactory for the standard construction vehicles. For OSOM movements, the separate Preliminary Route Assessment report identifies that the existing turning radii can accommodate turbine components without significant encroachment, though intermittent traffic holding may be required during delivery windows.
- Dalby–Cecil Plains Road / Taylor Street (Route B OSOM): This intersection represents a key transition point between the higher-order state-controlled network and the local township road network within Cecil Plains. While generally suitable for standard construction traffic, OSOM movements may require temporary traffic management measures, including short-duration traffic control or holding, temporary removal of light pole infrastructure and other roadside furniture, to accommodate swept path requirements and ensure safe passage through the township approach.
- Pampas Horrane Road / Toowoomba – Cecil Plains Road (Route D OSOM): This functions as a four-way priority-controlled intersection. The swept path analysis indicates that the OSOM units do not significantly impact the existing intersection geometry. No specific geometric or structural upgrades are warranted for this junction.
- Project Area Access Points (Cecil Plains–Moonie Road): Access to the Project Area is provided via six (6) proposed points. These junctions currently comprise basic property turn treatments. Pavement widening or strengthening may be required at specific access points to accommodate the horizontal and vertical curves necessary for OSOM deliveries and to ensure wheel tracks are contained to a sealed or reinforced surface. The proposed Project Area access layouts will be constructed to comply with TMR specifications for rural property accesses.

5.6 Works Required to Accommodate Over-Sized Vehicles

Wind turbine components will be transported from the Port of Brisbane to the Project Area via the nominated OSOM routes. Given the dimensions of the Nordex N175 components – specifically the 86.4m blades and 6.6m high tower sections – these vehicles will operate under strict NHVR permits, generally traveling during night-time periods with Queensland Police and pilot escorts. Detailed scheduling and convoy management will be addressed in the Road Use Management Plan (RUMP).

In addition to wind turbine components, OSOM movements will also be required for major electrical infrastructure associated with the Project, including transformers and Battery Energy Storage System (BESS) components. These items typically comprise heavy, wide-load electrical equipment requiring similar escort arrangements, permit approvals, and route verification as turbine components.

RTE has carried out a Preliminary Route Assessment (PRA) for the passage of OSOM vehicles between the Port of Brisbane and the Project Area, and investigates the four OSOM haulage options. Swept path analysis was carried out in order to assess each haulage option and their associated intersections.

The analysis identifies specific constraints, including road furniture and signage, which will require temporary removal to facilitate passage. Additionally, targeted vegetation clearing and minor earthworks are required at identified horizontal curves to accommodate the tracking of the blade trailers. The specific protocols for these works, including the reinstatement of assets, will be submitted to the relevant road authorities (TMR, WDRC & TRC) as part of the appointed haulage contractor's Transport Management Plan (TMP).

Table 5.1 – Over-Sized Over Mass (OSOM) Vehicle Characteristics

Haulage Item	No. of deliveries	Overall Length(m)	Overall Width(m)	Height(m) from ground	GVM (tonnes)	Vehicle
Base	135	46.43	5.9	6.1	85	4x8 bookend
Mid Tower 1	135	50.23	5.9	6.1	85	4x8 bookend
Mid Tower 2	135	51.24	5.9	6.1	86	3x8 bookend
Mid Tower 3	135	27.85	5.55	6.1	85	3x8 bookend
Mid Tower 4	135	28.55	5.0	6.1	90	3x8 bookend
Mid Tower 5	135	28.96	5.0	6.1	90	3x8 bookend
Mid Tower 6	135	41.72	5.0	5.5	79	2x8 jinker
Top	135	42.3	4.2	5.5	68	2x8 jinker
Blade	405	99.96	4.3	5.21	52.5	Extendable trailer
Drivetrain	135	30.0	5.2	4.51	167	8x8 platform
Hub	135	27.58	4.4	4.84	75	4x4 low loader
Nacelle	135	29.96	4.9	5.1	86	2x Prime movers / 8x8 platform
Transformer	1 – 5	30.0	5.2	5.6	187	14x8 jinker
Battery containers	840	containerised	2.5	4.5	HV	6 axle semi
Inverter skids	72	containerised	2.5	4.5	HV	6 axle semi
RMUs / switchgear skids	18	containerised	2.5	4.5	OSOM	low loader
Control / PCS buildings	6	modular	variable	variable	OSOM	low loader

The above OSOM vehicle characteristics are indicative only and are based on typical equipment currently used in utility-scale wind farm and battery energy storage developments. Final vehicle configurations, delivery sequencing, and haulage requirements will be confirmed by the appointed contractor following detailed design, procurement, and route verification.

6.0 ROAD NETWORK IMPACTS (PAVEMENT)

6.1 Scope

An analysis of pavement impacts has been carried out for the surrounding State controlled road network. The pavement impact assessment has been undertaken in accordance with the Guide to Traffic Impact Assessment (GTIA) Practice Note: Pavement Impact Assessment (December 2018), using Standard Axle Repetitions and associated marginal cost of pavement damage. Marginal Cost values for road wear have been obtained from TMR's Road Asset Management section.

In accordance with the GTIA, pavement impact mitigation is required for any road sections where the development traffic (during construction and operation) exceeds 5% of the background equivalent SARs.

6.2 Background Traffic Loads

In accordance with the Pavement Impact Assessment Practice Note, a value of 3.2 SAR4 / HV has been adopted for State controlled roads.

6.3 Estimated Vehicle Axle Loads

In accordance with the Pavement Impact Assessment (PIA) Practice Note, the SAR4, SAR5 and SAR12 values shown in Table 6.1 have been applied for the development generated heavy vehicles. Calculations for the various heavy vehicle combinations are shown in Figures 6.1 – 6.3. It is noted that the values adopted for the loaded vehicles are conservative (high) as they assume that each vehicle is carrying the maximum legal payload.

Table 6.1 – Standard SAR values (source: GTIA)

	Axle Group Type	SAST	SADT	TAST	TADT	TRDT	QADT
	Axles	SINGLE	SINGLE	TANDEM	TANDEM	TRI	QUAD
	Tyres	SINGLE	DUAL	SINGLE	DUAL	DUAL	DUAL
	Legal loading (tonnes)	6.000	9.000	11.000	16.500	20.000	27.000
	Base load / SAR4	5.400	8.200	9.200	13.800	18.500	22.500
Unloaded	Axle group load (tonnes)	4.500	4.000	7.500	5.000	6.500	7.900
	SAR4 or ESAs	0.482	0.057	0.442	0.017	0.015	0.015
	SAR5	0.402	0.028	0.360	0.006	0.005	0.005
	SAR12	0.112	0.000	0.086	0.000	0.000	0.000
Loaded	Axle group load (tonnes)	6.000	9.000	11.000	16.500	20.000	27.000
	SAR4 or ESAs	1.524	1.451	2.044	2.044	1.366	2.074
	SAR5	1.694	1.593	2.444	2.444	1.477	2.488
	SAR12	3.541	3.056	8.536	8.536	2.549	8.916
Payload		1.500	5.000	3.500	11.500	13.500	19.100

COMPONENT :

Various deliveries

Vehicle:	6 AXLE SEMI TRAILER	○	○ ○	○ ○ ○														Total	Unit
	Axles	SINGLE	TANDEM																
	Tyres	SINGLE	DUAL																
	Legal loading (tonnes)	6.000	16.500															42.500	tonne
	Base load per SAR4	5.400	13.800																
Unloaded	Axle group load (tonnes)	4.500	5.000															16.000	tonne
	SAR4 or ESAs	0.482	0.017															0.515	SAR
	SAR5	0.402	0.006															0.413	SAR
	SAR12	0.112	0.000															0.112	SAR
	Axle group load (tonnes)	6.000	16.500															42.500	tonne
Loaded	SAR4 or ESAs	1.524	2.044															4.934	SAR
	SAR5	1.694	2.444															5.614	SAR
	SAR12	3.541	8.536															14.625	SAR
	Payload	1.500	11.500															16.500	tonnes

COMPONENT :

Various material

Vehicle:	TRUCK (CLASS 5) AND 4 AXLE DOG	○	○	○ ○	○ ○	○ ○												Total	Unit
	Axles	SINGLE	SINGLE	TANDEM	TANDEM	TANDEM													
	Tyres	SINGLE	SINGLE	DUAL	DUAL	DUAL													
	Legal loading (tonnes)	6.000	6.000	16.500	16.500	16.500												61.500	tonne
	Base load per SAR4	5.400	5.400	13.800	13.800	13.800													
Unloaded	Axle group load (tonnes)	4.500	4.500	5.000	5.000	5.000												24.000	tonne
	SAR4 or ESAs	0.482	0.482	0.017	0.017	0.017												1.016	SAR
	SAR5	0.402	0.006	0.006	0.006	0.006												0.822	SAR
	SAR12	0.112	0.112	0.000	0.000	0.000												0.224	SAR
	Axle group load (tonnes)	6.000	6.000	16.500	16.500	16.500												61.500	tonne
Loaded	SAR4 or ESAs	1.524	1.524	2.044	2.044	2.044												9.179	SAR
	SAR5	1.694	1.694	2.444	2.444	2.444												10.718	SAR
	SAR12	3.541	3.541	8.536	8.536	8.536												32.690	SAR
	Payload	1.500	1.500	11.500	11.500	11.500												37.500	tonnes

COMPONENT :

Tower sections 1 and 2

Vehicle:	TRUCK AND 8X8 PLATFORM	○	○ ○	○	○	○	○	○	○	○	○							Total	Unit
	Axles	SINGLE	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW								
	Tyres	SINGLE	DUAL	8	8	8	8	8	8	8	8								
	Legal loading (tonnes)	6.000	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000							166.500	tonne
	Base load per SAR4	5.400	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400								
Unloaded	Axle group load (tonnes)	6.250	10.500	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000							56.750	tonne
	SAR4 or ESAs	1.795	0.335	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009							2.199	SAR
	SAR5	2.077	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							2.332	SAR
	SAR12	5.779	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							5.816	SAR
	Axle group load (tonnes)	6.250	18.400	14.638	14.638	14.638	14.638	14.638	14.638	14.638	14.638							141.750	tonne
Loaded	SAR4 or ESAs	1.795	3.160	0.635	0.635	0.635	0.635	0.635	0.635	0.635	0.635							10.032	SAR
	SAR5	2.077	4.214	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566							10.822	SAR
	SAR12	5.779	31.569	0.256	0.256	0.256	0.256	0.256	0.256	0.256	0.256							39.392	SAR
	Payload	1.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500							121.000	tonnes

COMPONENT :

Tower sections 3 and 4

Vehicle:	TRUCK AND 8X8 PLATFORM(ext)	○	○ ○	○	○	○	○	○	○	○	○							Total	Unit
	Axles	SINGLE	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW								
	Tyres	SINGLE	DUAL	8	8	8	8	8	8	8	8								
	Legal loading (tonnes)	6.000	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000							166.500	tonne
	Base load per SAR4	5.400	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400								
Unloaded	Axle group load (tonnes)	6.250	10.500	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000							56.750	tonne
	SAR4 or ESAs	1.795	0.335	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009							2.199	SAR
	SAR5	2.077	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							2.332	SAR
	SAR12	5.779	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							5.816	SAR
	Axle group load (tonnes)	6.250	18.400	13.763	13.763	13.763	13.763	13.763	13.763	13.763	13.763							134.750	tonne
Loaded	SAR4 or ESAs	1.795	3.160	0.496	0.496	0.496	0.496	0.496	0.496	0.496	0.496							8.922	SAR
	SAR5	2.077	4.214	0.416	0.416	0.416	0.416	0.416	0.416	0.416	0.416							9.620	SAR
	SAR12	5.779	31.569	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122							38.324	SAR
	Payload	1.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500							121.000	tonnes

FIGURE 6.1- PAVEMENT LOAD VALUES (6 AXLE AV, TRUCK + DOG, OSOM TOWER SECTIONS 1-4)

COMPONENT : 

Tower section 5

Vehicle:	TRUCK + 2X8 DOLLY + 4X8 JINKER													Total	Unit
Axles	SINGLE	TANDEM													
Tyres	SINGLE	DUAL			ROW 8	ROW 8		ROW 8	ROW 8	ROW 8	ROW 8				
Legal loading (tonnes)	6.000	16.500			18.000	18.000		18.000	18.000	18.000	18.000			130.500	tonne
Base load per SAR4	5.400	13.800			16.400	16.400		16.400	16.400	16.400	16.400				
Unloaded															
Axle group load (tonnes)	6.250	7.000			3.000	3.000		4.380	4.380	4.380	4.380			36.750	tonne
SAR4 or ESAs	1.795	0.066			0.001	0.001		0.005	0.005	0.005	0.005			1.883	SAR
SAR5	2.077	0.034			0.000	0.000		0.000	0.000	0.000	0.000			2.111	SAR
SAR12	5.779	0.000			0.000	0.000		0.000	0.000	0.000	0.000			5.779	SAR
Loaded															
Axle group load (tonnes)	6.250	18.000			13.900	13.900		15.930	15.930	15.930	15.930			115.750	tonne
SAR4 or ESAs	1.795	2.895			0.516	0.516		0.890	0.890	0.890	0.890			9.282	SAR
SAR5	2.077	3.775			0.437	0.437		0.865	0.865	0.865	0.865			10.186	SAR
SAR12	5.779	24.251			0.137	0.137		0.705	0.705	0.705	0.705			33.126	SAR
Payload														94.000	tonnes

COMPONENT : 

Tower section 6

Vehicle:	TRUCK + 2X8 DOLLY + 4X8 JINKER													Total	Unit
Axles	SINGLE	TANDEM													
Tyres	SINGLE	DUAL			ROW 8	ROW 8		ROW 8	ROW 8	ROW 8	ROW 8				
Legal loading (tonnes)	6.000	16.500			18.000	18.000		18.000	18.000	18.000	18.000			130.500	tonne
Base load per SAR4	5.400	13.800			16.400	16.400		16.400	16.400	16.400	16.400				
Unloaded															
Axle group load (tonnes)	6.250	7.000			3.000	3.000		4.380	4.380	4.380	4.380			36.750	tonne
SAR4 or ESAs	1.795	0.066			0.001	0.001		0.005	0.005	0.005	0.005			1.883	SAR
SAR5	2.077	0.034			0.000	0.000		0.000	0.000	0.000	0.000			2.111	SAR
SAR12	5.779	0.000			0.000	0.000		0.000	0.000	0.000	0.000			5.779	SAR
Loaded															
Axle group load (tonnes)	6.250	18.000			13.000	13.000		13.880	13.880	13.880	13.880			105.750	tonne
SAR4 or ESAs	1.795	2.895			0.395	0.395		0.513	0.513	0.513	0.513			7.531	SAR
SAR5	2.077	3.775			0.313	0.313		0.434	0.434	0.434	0.434			8.215	SAR
SAR12	5.779	24.251			0.062	0.062		0.135	0.135	0.135	0.135			30.693	SAR
Payload														94.000	tonnes

COMPONENT : 

Blade

Vehicle:	TRUCK + 2X8 DOLLY + 4X8 JINKER											Total	Unit
Axles	SINGLE	TANDEM	TANDEM										
Tyres	SINGLE	DUAL	DUAL										
Legal loading (tonnes)	6.000	16.500	16.500									59.000	tonne
Base load per SAR4	5.400	13.800	13.800										
Unloaded													
Axle group load (tonnes)	6.250	6.500	5.000									24.250	tonne
SAR4 or ESAs	1.795	0.049	0.017									1.876	SAR
SAR5	2.077	0.023	0.006									2.106	SAR
SAR12	5.779	0.000	0.000									5.779	SAR
Loaded													
Axle group load (tonnes)	6.250	14.350	19.150									59.250	tonne
SAR4 or ESAs	1.795	1.169	3.708									8.038	SAR
SAR5	2.077	1.216	5.146									9.915	SAR
SAR12	5.779	1.598	50.989									60.915	SAR
Payload												38.000	tonnes

FIGURE 6.2- PAVEMENT LOAD VALUES (OSOM TOWER SECTIONS 5,6, BLADE)

COMPONENT :

Nacelle

Vehicle:	TRUCK AND 8X8 PLATFORM	○	○	○	○	○	○	○	○	○	○			Total	Unit
Axes		SINGLE	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW				
Tyres		SINGLE	DUAL	8	8	8	8	8	8	8	8				
Legal loading (tonnes)		6.000	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000			166.500	tonne
Base load per SAR4		5.400	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400				
Unloaded															
Axle group load (tonnes)		6.250	10.500	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000			56.750	tonne
SAR4 or ESAs		1.795	0.335	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009			2.199	SAR
SAR5		2.077	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			2.332	SAR
SAR12		5.779	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			5.816	SAR
Loaded															
Axle group load (tonnes)		6.250	18.400	14.513	14.513	14.513	14.513	14.513	14.513	14.513	14.513			140.750	tonne
SAR4 or ESAs		1.795	3.160	0.613	0.613	0.613	0.613	0.613	0.613	0.613	0.613			9.861	SAR
SAR5		2.077	4.214	0.543	0.543	0.543	0.543	0.543	0.543	0.543	0.543			10.632	SAR
SAR12		5.779	31.569	0.231	0.231	0.231	0.231	0.231	0.231	0.231	0.231			39.193	SAR
Payload		1.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500			121.000	tonnes

COMPONENT :

Generator segment 1

Vehicle:	TRUCK AND 10X8 PLATFORM	○	○	○	○	○	○	○	○	○	○	○	○	Total	Unit
Axes		SINGLE	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW		
Tyres		SINGLE	DUAL	8	8	8	8	8	8	8	8	8	8		
Legal loading (tonnes)		6.000	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	202.500	tonne
Base load per SAR4		5.400	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400		
Unloaded															
Axle group load (tonnes)		6.250	10.500	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750	5.750	62.750	tonne
SAR4 or ESAs		1.795	0.335	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	2.281	SAR
SAR5		2.077	0.255	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.332	SAR
SAR12		5.779	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.816	SAR
Loaded															
Axle group load (tonnes)		6.250	18.400	14.210	14.210	14.210	14.210	14.210	14.210	14.210	14.210	14.210	14.210	166.750	tonne
SAR4 or ESAs		1.795	3.160	0.564	0.564	0.564	0.564	0.564	0.564	0.564	0.564	0.564	0.564	10.591	SAR
SAR5		2.077	4.214	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	11.175	SAR
SAR12		5.779	31.569	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	39.193	SAR
Payload		1.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	148.000	tonnes

COMPONENT :

Generator segment 2

Vehicle:	TRUCK + 2X8 DOLLY + 4X8 LOW LOADER	○	○	○	○	○	○	○	○	○	○	○	○	Total	Unit
Axes		SINGLE	TANDEM	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW		
Tyres		SINGLE	DUAL	DUAL	8	8	8	8	8	8	8	8	8		
Legal loading (tonnes)		6.000	16.500	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	111.000	tonne
Base load per SAR4		5.400	13.800	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400		
Unloaded															
Axle group load (tonnes)		6.250	6.500	6.000	2.625	2.625	2.625	2.625	2.625	2.625	2.625	2.625	2.625	29.250	tonne
SAR4 or ESAs		1.795	0.049	0.036	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1.882	SAR
SAR5		2.077	0.023	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.116	SAR
SAR12		5.779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.779	SAR
Loaded															
Axle group load (tonnes)		6.250	14.100	18.000	8.730	8.730	8.730	8.730	8.730	8.730	8.730	8.730	8.730	73.270	tonne
SAR4 or ESAs		1.795	1.090	2.895	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	6.100	SAR
SAR5		2.077	1.114	3.775	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	7.137	SAR
SAR12		5.779	1.294	24.251	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	31.326	SAR
Payload		1.500	11.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	78.500	tonnes

COMPONENT :

Hub

Vehicle:	TRUCK + 2X8 DOLLY + 4X8 LOW LOADER	○	○	○	○	○	○	○	○	○	○	○	○	Total	Unit
Axes		SINGLE	TANDEM	TANDEM	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW	ROW		
Tyres		SINGLE	DUAL	DUAL	8	8	8	8	8	8	8	8	8		
Legal loading (tonnes)		6.000	16.500	16.500	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	18.000	111.000	tonne
Base load per SAR4		5.400	13.800	13.800	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400	16.400		
Unloaded															
Axle group load (tonnes)		6.250	7.000	5.000	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	33.250	tonne
SAR4 or ESAs		1.795	0.066	0.017	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	1.889	SAR
SAR5		2.077	0.034	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.117	SAR
SAR12		5.779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.779	SAR
Loaded															
Axle group load (tonnes)		6.250	16.900	27.600	11.630	11.630	11.630	11.630	11.630	11.630	11.630	11.630	11.630	97.270	tonne
SAR4 or ESAs		1.795	2.249	16.000	0.253	0.253	0.253	0.253	0.253	0.253	0.253	0.253	0.253	21.055	SAR
SAR5		2.077	2.754	32.000	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	37.549	SAR
SAR12		5.779	11.379	4096.000	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	4113.222	SAR
Payload		1.500	11.500	11.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	13.500	78.500	tonnes

FIGURE 6.3- PAVEMENT LOAD VALUES (OSOM NACELLE, GENERATOR SEGMENTS & HUB)

6.4 Extent of Impact

The percentage impact of development generated SARs upon the surrounding State controlled road network is shown in the '% EXIST' column of the 'Marginal Cost for sealed' page of the pavement impact spreadsheet.

6.5 Calculated Pavement Contribution under GTIA

A pavement impact assessment, including calculation of any applicable pavement contributions in accordance with the Guide to Traffic Impact Assessment (GTIA), will be completed following confirmation of the preferred haulage route and finalisation of the OSOM transport task.

As multiple haulage route options remain under consideration at this stage of the assessment, it is not currently possible to accurately determine the extent of pavement impacts or associated contribution requirements for individual road authorities. Pavement contributions, if required, will therefore be determined during the detailed design and transport planning phase following confirmation of the preferred route in consultation with TMR, TRC and WDRC.

6.6 Cecil Plains – Moonie Road

Pre- and post-construction condition surveys will be undertaken to assess any changes to the running surface, shoulders, and pavement performance (including potential bitumen edge wear and intersection skew impacts).

Regular inspections of Cecil Plains – Moonie Road will be undertaken due to its role as the primary construction access corridor, carrying a high proportion of project-related heavy vehicle movements (including general construction traffic and repeated OSOM support movements). While overall network impacts remain low to moderate in a network context, this section experiences a concentrated traffic loading compared to other links, warranting increased monitoring due to its functional importance to the project logistics chain and the presence of unsealed or lower-standard sections.

Surface condition surveys will be undertaken prior to construction to establish baseline pavement conditions. During construction, pavement maintenance will be carried out by the Principal Contractor as required to maintain safe and serviceable traffic conditions. Any significant damage presenting a safety risk will be rectified promptly in consultation with the relevant road authority, including TMR where applicable. A post-construction condition assessment will be undertaken to confirm reinstatement of affected road assets.

Reports may be provided to WDRC and TRC as required, including photographic and/or video evidence of existing roadway conditions along the nominated OSOM transport route. Condition reporting will generally focus on active haulage corridors and key intersection locations relevant to the selected route option. Additional inspections may be undertaken following significant rainfall events or other incidents where road condition impacts are identified, subject to agreement with WDRC and TRC.

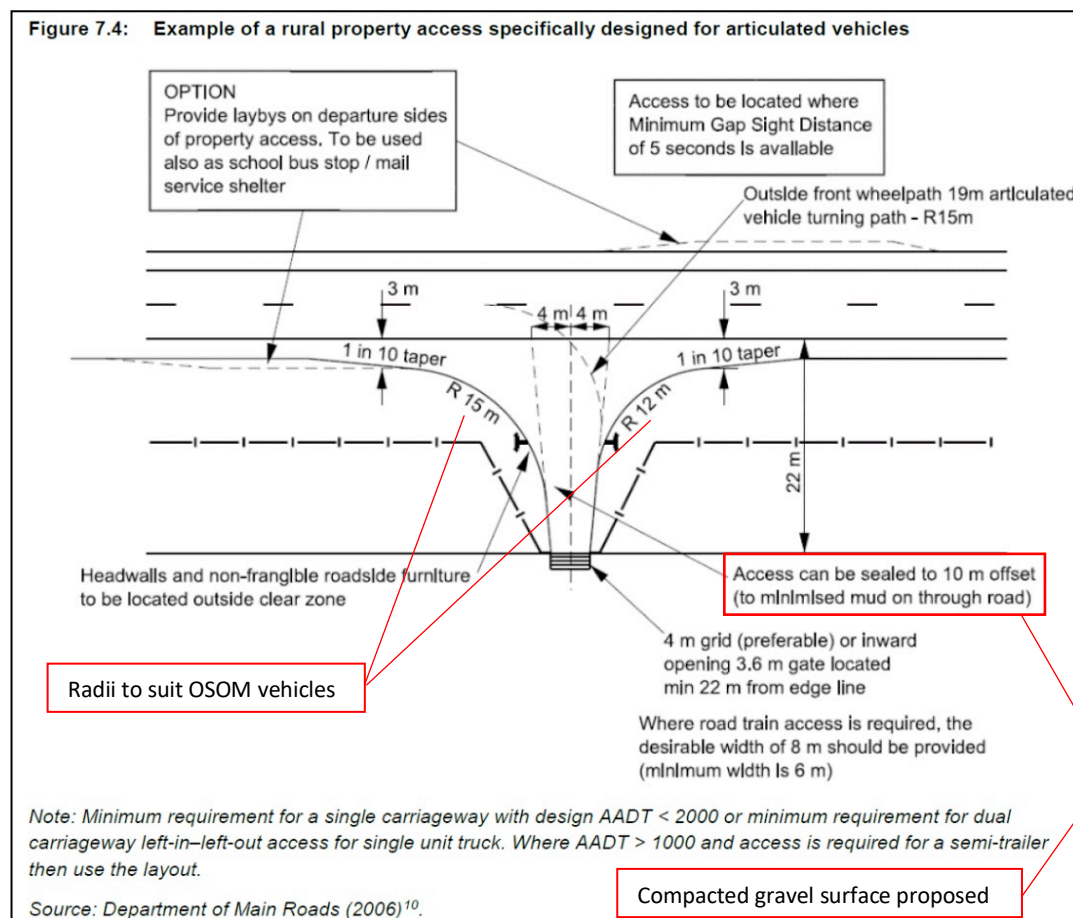
7.0 PROJECT AREA ACCESS ARRANGEMENTS

7.1 Form of Access

It is proposed that access to the Project Area will be provided via six (6) locations along Cecil Plains–Moonie Road. These access points will facilitate construction and operational access for wind turbine generator (WTG) components, Battery Energy Storage System (BESS) infrastructure, substation and switchyard works, as well as general construction traffic and ongoing maintenance activities.

Turbine deliveries will utilise each of these access points, noting that some locations may only receive one or two deliveries depending on final construction sequencing. In addition to wind turbine components, these access points will also accommodate deliveries associated with BESS containers, inverters, transformers, electrical switchgear, construction materials, and other ancillary infrastructure. The remaining access points will provide access to the switchyard site, substations, and the BESS facility, respectively.

The Project access points along Cecil Plains–Moonie Road will generally be designed in accordance with Austroads Guide to Road Design, with particular reference to rural property access requirements. However, final curve radii, throat widths, and intersection geometry will be governed by the swept path requirements of OSOM vehicles (including blade transport configurations), with additional allowance for BESS and transformer delivery vehicles where applicable.



**FIGURE 7.1 – REQUIRED MINIMUM ACCESS INTERSECTION LAYOUT
(FOR EACH PROJECT AREA ACCESS INTERSECTION ALONG CECIL PLAINS–MOONIE ROAD)**

7.2 Sight Distance

An inspection of each proposed access point indicates that sufficient sight distance will be available. This will be increased with the construction of each access road and associated clearing. Detailed drawings of each proposed Project Area access intersection demonstrating compliance with relevant sight distance design criteria, will be submitted to WDRC and TRC for approval prior to commencement of works.

Temporary signage along the route will also increase the awareness of each access point and encourage oncoming drivers to watch for turning construction traffic.

8.0 ROAD SAFETY ASSESSMENT

8.1 Required scope (GTIA)

The road safety assessment has been undertaken in accordance with the requirements of the relevant guidelines and considers the potential safety impacts associated with project generated traffic, including OSOM vehicle movements, on the surrounding state and local road network.

The assessment includes a review of existing road conditions, known safety constraints, crash history (where available), and the identification of potential risks and mitigation measures associated with the construction and operational phases of the Project.

8.2 Observed Road Safety Deficiencies

The majority of Project-related traffic will utilise the State-controlled road network between the Port of Brisbane and Charlton. These roads are designed to accommodate high traffic volumes, including a significant proportion of heavy vehicles associated with freight and agricultural movements. In this context, the incremental proportion of Project-generated traffic is low relative to existing traffic volumes and the overall capacity of the network, with movements also distributed over a defined construction period rather than occurring as a sustained long-term increase.

From Charlton to the Project Area, traffic will utilise a combination of State and local roads, including sections of the Cecil Plains–Moonie Road and surrounding regional road network. Along these routes, the Project traffic contribution becomes more locally concentrated due to the reduction in background traffic volumes and the transition onto lower-order roads. As a result, several localised safety constraints have been identified which require specific consideration in relation to intersection geometry, road shoulders, and OSOM vehicle movements.

Key observed deficiencies include:

- Biddeston locality (Toowoomba – Cecil Plains Road):
 - Identified “high crash zone” with existing warning signage; and
 - Presence of multiple four-way intersections with increased conflict potential.
- Horizontal alignment constraints:
 - Sharp curves near the Lutheran Church and Brookstead turn-off (OSOM Route C – refer to Figure 8.1); and
 - Reduced manoeuvrability for heavy and OSOM vehicles.
- Cecil Plains township (eastern approach):
 - An irregular intersection with Millmerran Cecil Plains Road where priority is not clearly legible to approaching drivers; and
 - Limited signage and line marking contributing to potential driver confusion, particularly for eastbound traffic.
- General pavement condition:
 - Sections of Cecil Plains–Moonie Road exhibit uneven and rough pavement conditions, likely associated with agricultural use (e.g. cotton harvesting equipment); and
 - Localised deterioration may affect vehicle stability and driver comfort.
- Narrow pavement widths and constrained shoulders:
 - Present along sections of the regional road network; and
 - May limit safe passing opportunities between heavy vehicles and general traffic.
- Pampas – Horrane Road (where applicable to route options):
 - Contains sections of constrained geometry and horizontal curvature, although impacts are less significant compared to Cecil Plains Road.



**FIGURE 8.1 – LOCATION OF HORIZONTAL ALIGNMENT CONSTRAINTS
(TOOWOOMBA – CECIL PLAINS ROAD, NORWIN)**

8.3 Road Crash Data

A review of road crash history has been undertaken for Cecil Plains–Moonie Road, Dalby–Cecil Plains Road, and Pampas–Horrane Road, utilising crash data from the Queensland Open Data database.

In accordance with the GTIA, a five-year analysis period (2021 – 2026) has been adopted. As shown in Table 8.1, six crashes were recorded within the defined study area during this period, with the spatial distribution shown in Figure 8.1.

Moonie Highway has not been included in the detailed crash cluster assessment as it primarily functions as a through-route within the wider State-controlled network and is not a principal corridor for Project-generated traffic in terms of volume distribution. Project traffic utilises Moonie Highway only in limited circumstances (including selected OSOM route options and ancillary construction movements), with the dominant traffic loading occurring on Cecil Plains–Moonie Road and Toowoomba–Cecil Plains Road.

Notwithstanding this, intersection performance and safety considerations at the Moonie Highway / Cecil Plains–Moonie Road junction have been addressed separately within Section 5.5 in relation to OSOM vehicle movements.

Table 8.1: Road Crash Locations (2021 – 2026)

Ref	Crash Severity	Crash Year	Crash Nature	Crash Street
1	Hospitalisation	2024	Overtuned	Cecil Plains Moonie Rd
2	Hospitalisation	2022	Overtuned	Cecil Plains Moonie Rd
3	Minor injury	2023	Overtuned	Dalby - Cecil Plains Rd
4	Hospitalisation	2023	Angle	Dalby - Cecil Plains Rd
5	Medical treatment	2021	Sideswipe	Dalby - Cecil Plains Rd
6	Hospitalisation	2022	Overtuned	Dalby - Cecil Plains Rd

As shown in Figure 8.1, the crashes have occurred at various locations throughout the network rather than at concentrated locations. On this basis, it is considered that there are no “black spot” areas which warrant a detailed assessment.

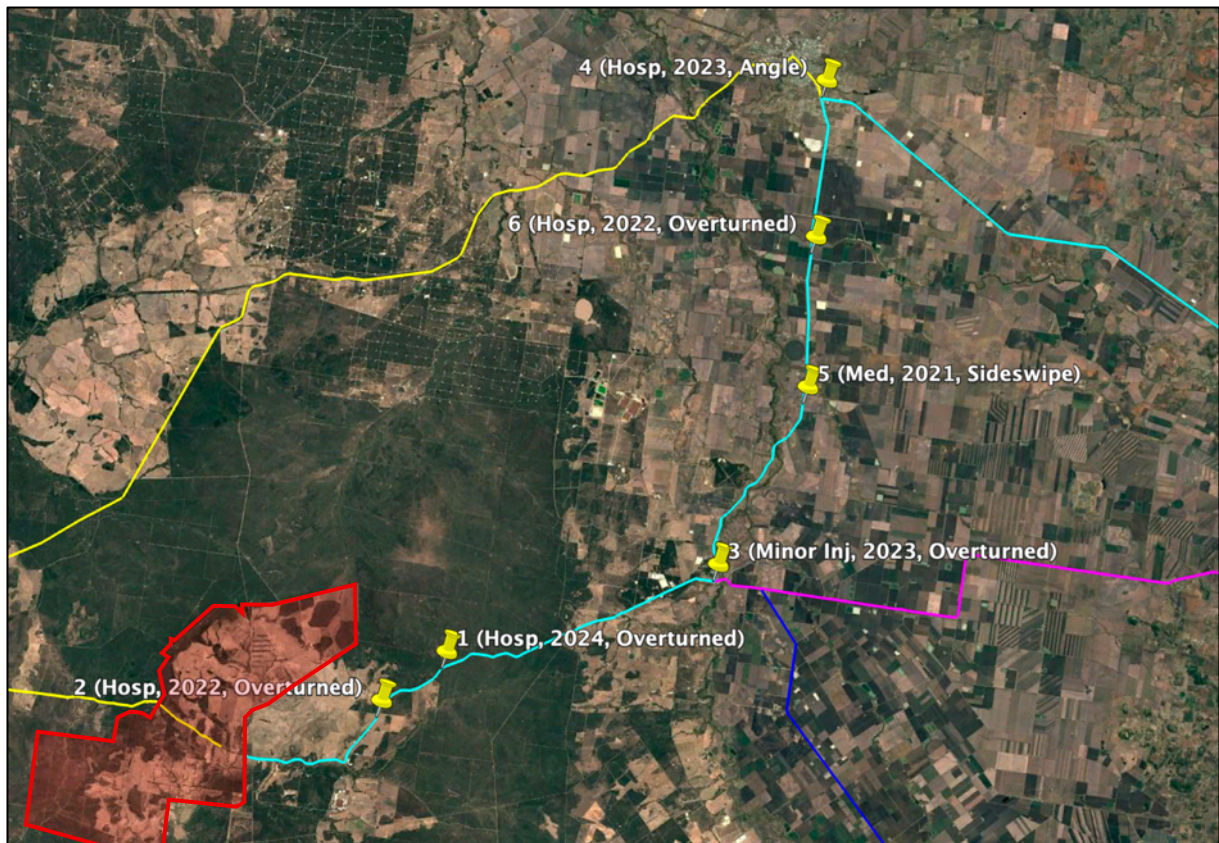


FIGURE 8.1 – RECORDED ROAD CRASH LOCATIONS (2021 – 2026)

8.4 Potential Risks

The following potential road safety risks have been identified based on the projected increase in construction traffic and the existing deficiencies within the Darling Downs regional network.

Risk of Vehicle Rollover (High Centre of Gravity Loads)

The crash data in Table 8.1 indicates a high frequency of "Overturned" vehicle incidents (4 out of 6 recorded crashes).

- The Risk: The delivery of 12,747 concrete foundation loads involves concrete agitators which possess a high centre of gravity. When combined with the "sharp curves" identified near the Lutheran Church and the "uneven and rough pavement" on Cecil Plains–Moonie Road, there is an elevated risk of vehicle instability or rollover if speed and cornering are not strictly managed.

Conflict with Vulnerable Road Users and Local Industry

Cecil Plains–Moonie Road is a dual-purpose link serving both local residents and the agricultural sector.

- The Risk: During the peak construction period, where project traffic may temporarily increase daily volumes on Cecil Plains–Moonie Road (up to approximately 225 vehicles per day including return movements), there is an increased potential for interaction with existing rural road users. These include heavy freight (e.g. cattle and grain transport), agricultural machinery, and local traffic operating at varying speeds. While the road already accommodates regular heavy vehicle movements, the additional construction traffic increases the frequency of interaction events, particularly during peak haulage periods.

Driver Confusion at Non-Standard Intersections

Key risk locations include the Cecil Plains township approach intersections (particularly Dalby–Cecil Plains Road / Taylor Street) and priority-controlled rural intersections along Cecil Plains–Moonie Road where geometry, sight distance, or priority control may be less intuitive. Additional exposure exists at higher-order interfaces such as the Warrego Highway / Moonie Highway intersection (OSOM Route A option).

- The Risk: Increased heavy vehicle and OSOM movements through intersections with non-standard geometry or less intuitive priority control may increase the potential for "failure to yield" or "angle" type conflicts. This is most relevant at township fringe intersections (e.g. Dalby–Cecil Plains Road / Taylor Street) and rural priority intersections along Cecil Plains–Moonie Road, particularly during initial mobilisation when driver familiarity with local conditions is lowest.

Accelerated Pavement Degradation and Stability

Sections of the local network already exhibit deterioration from agricultural use.

- The Risk: The introduction of concentrated axle loading during the peak construction phase may cause rapid edge-break or rutting.

OSOM Manoeuvring and Traffic Holding

OSOM movements include a range of abnormal loads such as turbine blades, tower sections, nacelles, hubs, drivetrain components, transformers, and selected BESS equipment (including containerised battery units and associated electrical infrastructure). These loads exhibit different handling characteristics, with blades requiring full carriageway occupation at intersections, and transformers

and heavy electrical components requiring slow-speed multi-axle manoeuvring with reduced acceleration and braking performance.

- The Risk: Inadequate communication or pilot-car positioning during these maneuvers could lead to rear-end collisions from through-traffic or head-on conflicts if motorists attempt to bypass OSOM units in areas with restricted sight distance.

8.5 Mitigation Measures

With regard to the impact of project related traffic upon general road safety in the region, it is noted that:

- A communication plan will be implemented to inform the general public of specific heavy vehicle movements, including OSOM deliveries along defined sections of the road network. The plan will also include regular liaison with school bus operators and the agricultural sector to understand local road use requirements, including livestock transport movements. OSOM movements will be scheduled to maintain sufficient road space for existing users and minimise conflict with peak rural freight activity;
- This communication plan will be further refined and tailored through ongoing engagement with local communities, businesses, and key stakeholders to ensure appropriate notification channels, timing, and methods are used for different user groups and operational contexts.
- Variable Message Signage will be deployed at each end of the Cecil Plains–Moonie Road to advise the community of project related traffic, particularly the scheduling of OSOM movements;
- Specific safety measures will be implemented for the movement of over-sized vehicles and such will be managed by police and private escort vehicles, where required. This strategy shall be detailed in the associated Traffic Management Plan;
- An experienced haulage contractor will be appointed to haul over-sized vehicles between the Port of Brisbane and the Project Area. This contractor will also prepare its own Route Assessment and Traffic Management Plan for approval by the NHVR;
- Various intersections that will be used by Project-related traffic will be upgraded, where required, to meet relevant Austroads and TMR design standards. These upgrades will specifically ensure that intersections are capable of safely accommodating Oversize Overmass (OSOM) vehicle movements, including turbine components, transformers, and BESS-related deliveries, without encroachment into opposing traffic lanes or reliance on temporary traffic intrusion into live carriageways; and
- All regular contractors and workers within the Project Area will be required to complete a Workplace Safety Induction. This will include requirements with respect to travel throughout the road network (e.g. keeping to speed limits, fatigue management, being courteous to the general public etc).

9.0 GENERAL TRAFFIC MANAGEMENT REQUIREMENTS

9.1 Duration of Parallel Works

Parallel works are those where public road network upgrades are undertaken concurrently with internal Project Area construction activities. This phase is expected to occur over a period of approximately 12 months, during which civil works, electrical installation, and wind turbine generator (WTG) and Battery Energy Storage System (BESS) delivery activities will overlap and reach a peak generation of approximately 1,494 heavy vehicle movements per month.

To mitigate risk, all primary Project Area access intersections will be designed and constructed to the defined Oversize Overmass (OSOM) design standard prior to the commencement of wind turbine foundation works. This milestone is selected as it represents the transition from early civil establishment activities to permanent infrastructure installation, at which point the delivery of major OSOM components (including turbine towers, blades, nacelles, transformers, and BESS equipment) commences in earnest and becomes critical to maintaining construction sequencing and programme continuity.

9.2 Estimated Traffic Volumes During Parallel Works

Prior to commencing major internal wind farm and BESS construction activity, the project will construct approved intersections at the designated project access points. These will be designed as rural property access intersections, upgraded to cater for the swept paths and axle loadings of the candidate design vehicles in accordance with the Council guidelines.

Construction works will be staged in accordance with the project schedule, ensuring that "Road Works Precede" requirements are met, specifically that Project Area-entry upgrades are operational before the associated heavy internal construction activity (such as foundation pouring) begins at those respective locations.

9.3 Traffic Management required to Facilitate Parallel Works

The following traffic management measures shall be implemented to facilitate parallel works:

- **Heavy Vehicle Routing:** All project-related heavy vehicles will utilise the designated haulage route via the Cecil Plains – Moonie Road to access the project entrance. Heavy vehicles may be distributed to various routes to minimise high traffic volumes on individual sections of road.
- **Intersection Priority:** While existing background traffic volumes on the Cecil Plains–Moonie Road are low, public road works will be sequenced to prioritise the upgrade of the project access points early in the program to separate turning project traffic from through-traffic.
- **Worker Access:** Light vehicles will access the Project Area via the designated primary access points. The use of multiple frontage entries will be utilised to distribute traffic load and minimise localised congestion during peak shift changes.
- **UHF Communication:** All project-related heavy vehicles and OSOM escorts shall be fitted with a UHF radio. Road signage informing the public of the project radio channel shall be erected at

the eastern and western extents of the Project Area frontage. This facilitates coordination between project drivers and local agricultural road users.

- **Traffic Control Personnel:** During periods of high traffic demand or OSOM component deliveries, accredited traffic control personnel shall be deployed to manage Project Area access points.
- **Driver Behaviour Policy:** All workers and contractors will be required to comply with the Project Driving Policy, including adherence to posted regulatory speed limits on public roads and defined internal speed controls within the Project Area. A project-imposed maximum speed of 80 km/h will apply to all Project-controlled vehicles operating on Cecil Plains–Moonie Road, where conditions permit and subject to posted limits and safety requirements. A reduced speed limit of 40 km/h (or as otherwise signposted) will apply within the internal Project Area road network to manage interactions between light vehicles, heavy vehicles, and construction plant.
- **Road Surface Monitoring:** The Principal Contractor shall monitor the condition of the road surface and shoulders periodically. Any degradation caused by project-related traffic will be remediated promptly in consultation with TMR, Western Downs Regional Council and Toowoomba Regional Council.

9.4 Blasting

During the construction of the works, blasting may be required for road upgrades. If blasting is necessary, a Blasting Management Plan must to be prepared in accordance with the development conditions, all relevant stakeholders are to be notified and Blasting Management Plan is to be submitted to the DTMR representative.

Following blasting, an inspection of the road is to be complete to ensure no damage or blasting spoil is impacting safe operation of the road prior to opening to live traffic. It is expected that the Project will have crews on standby to promptly remediate the road to minimise the period that the road is to be closed.

10.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Project Proposal

- The proposed development comprises a utility-scale wind farm at Cattle Creek, incorporating up to 135 wind turbine generators (WTGs), a Battery Energy Storage System (BESS) with an anticipated capacity of up to 450MW, and associated infrastructure including approximately 376 battery units, 94 MV transformers and two main HV substations;
- The Project Area will be accessed via multiple access points from Cecil Plains–Moonie Road, with primary construction access focused on key intersections upgraded to accommodate heavy and OSOM vehicles; and
- The project will be constructed over an approximate 32-month period, with the majority of workforce accommodation provided on-site and a limited proportion of workers travelling from nearby centres such as Toowoomba and Dalby.

Heavy Vehicle Haulage

- WTG and BESS components will be transported from the Port of Brisbane to the Project Area via a combination of State-controlled and local roads;
- Four potential OSOM haulage routes (Options A – D) have been identified, providing flexibility pending contractor selection and further consultation with relevant authorities; and
- General construction traffic (non-OSOM) will predominantly utilise the Toowoomba – Cecil Plains Road and surrounding regional road network.

Road Network Impacts (Traffic Operations)

- The project will generate a total of approximately 24,000 heavy vehicle movements (one-way) over the construction period, with peak activity occurring during the turbine foundation and electrical works phases;
- Traffic increases on the higher-order State-controlled road network (e.g. Warrego Highway, Gore Highway) will be minor and within acceptable operational limits;
- The most notable impact will occur on Cecil Plains–Moonie Road, where traffic volumes are expected to increase during peak construction periods; however, overall volumes will remain low in absolute terms and consistent with rural road capacity; and
- Intersection impacts will generally be minor from an operational perspective, with key considerations relating to OSOM vehicle manoeuvring, requiring temporary traffic management measures rather than major capacity upgrades.

OSOM Movements and Route Constraints

- OSOM vehicle movements will require detailed route planning, escort arrangements, and temporary traffic control;
- Localised constraints have been identified, including floodways, bridge load limits, and intersection geometry, which will require mitigation measures such as temporary widening, vegetation clearing, and traffic control; and
- These requirements will be finalised through the Transport Management Plan (TMP) and in consultation with TMR and relevant authorities following route selection.

Pavement Impact

- The primary pavement impacts will occur on Cecil Plains – Moonie Road due to the concentration of heavy vehicle movements;
- A detailed pavement impact assessment will be carried out in accordance with the Guide to Traffic Impact Assessment, with contributions to road maintenance to be determined in consultation with TMR; and
- Pre-, during-, and post-construction dilapidation surveys will be carried out, with ongoing monitoring and maintenance implemented throughout the construction period.

Road Safety

- The existing road network generally operates safely, with no identified crash “black spots”; however, localised safety constraints exist, including narrow pavements, horizontal curves, and irregular intersections;
- Key risks associated with the project include heavy vehicle interactions with agricultural traffic, potential vehicle rollover, OSOM manoeuvring requirements, and school buses; and
- Appropriate mitigation measures will be implemented, including traffic management plans, escort vehicles, driver induction requirements, communication strategies, and targeted intersection upgrades.

Traffic Management and Construction Controls

- Traffic management during construction will be governed by a Construction Traffic Management Plan (CTMP), including:
 - Designated haulage routes;
 - Use of traffic control personnel and signage;
 - Scheduling of OSOM movements (generally at night);
 - Coordination with local stakeholders, including school bus operators; and
 - Ongoing road condition monitoring and maintenance.
- Project Area access intersections will be upgraded prior to peak construction activities to ensure safe ingress and egress for all vehicle types.

Overall Conclusion

- Based on the preliminary information currently available, the proposed Wind Farm and Battery Energy Storage System (BESS) development can be accommodated on the surrounding State-controlled and local road network, subject to implementation of appropriate mitigation measures.
- Multiple haulage route options remain under consideration and no preferred route has been selected at this stage. Each route presents different operational, geometric, pavement and infrastructure constraints which will require further investigation during detailed design.
- Subject to the identification and implementation of any route-specific mitigation measures, infrastructure upgrades, traffic management controls, pavement rehabilitation requirements and stakeholder agreements, it is considered that the Project can be delivered without resulting in significant adverse impacts on the safety or operation of the surrounding transport network.
- Further assessment and refinement of traffic, pavement and route-specific requirements will be undertaken prior to construction once detailed project information and haulage arrangements have been confirmed.

APPENDICES

APPENDIX A – TRAFFIC IMPACT ASSESSMENT CERTIFICATION

APPENDIX A – TRAFFIC IMPACT ASSESSMENT CERTIFICATION

CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND for

Project title:	CATTLE CREEK WIND FARM
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As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

- I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and
- where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that
- the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that
- I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

Name:	Luke Rytenskild	RPEQ No:	6293
RPEQ competencies:	Civil Engineer (Traffic Engineering)		
Signature:		Date:	15.05.2026
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