Appendix G

Traffic impact assessment

Powerlink Queensland

Theodore Wind Farm Connection Project

Traffic Impact Assessment

December 2025

Public

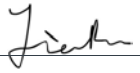
Question today
Imagine tomorrow
Create for the future

Theodore Wind Farm Connection Project
Traffic Impact Assessment

Powerlink Queensland

WSP
Level 12, 900 Ann Street
Fortitude Valley QLD 4006
GPO Box 2907
Brisbane QLD 4001

Tel: +61 7 3854 6200
Fax: +61 7 3854 6500
wsp.com

	Name	Date	Signature
Prepared by:	Jialu Fan	05/12/2025	
Reviewed by:	Nathan Durnin	05/12/2025	
Approved by:	Allison Rushton	05/12/2025	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of contents

Abbreviations v

1 Introduction 1

1.1 Project background 1

1.2 Purpose of this report 4

1.3 Methodology 4

2 Development profile 6

2.1 Project description 6

2.2 Development access 13

2.3 Traffic generation 15

3 Existing environment 20

3.1 Road network 22

3.2 Freight routes 42

3.3 Public transport 45

3.4 Active transport 47

4 Impact assessment 48

4.1 Construction stage 48

4.2 Operational stage 68

4.3 Mitigation measures 68

5 Summary 69

List of tables

Table 2.1 Indicative Project construction time periods 12
Table 2.2 Workforce numbers and generated trips by AM and PM 16
Table 2.3 Construction stage generated heavy vehicles – per year 17
Table 2.4 Highest day/peak hour heavy vehicle trips 18
Table 2.5 Operation activities traffic generation 19
Table 3.1 Road network 25
Table 3.2 AADT traffic volumes and heavy vehicle percentages (2023) 33
Table 3.3 Historic growth rates (2023) 37
Table 3.4 Crash descriptions 39
Table 4.1 Link capacity assessment (2026 – construction year) 48
Table 4.2 LoS criteria of highway peak hour flows per lane direction 49
Table 4.3 Level of Service description 49
Table 4.4 Link capacity assessment: Dawson Highway and Leichhardt Highway (2026 – construction year) 50
Table 4.5 Pavement impact assessment (2026 – construction year) 51
Table 4.6 Maximum practical DoS for priority intersections 51
Table 4.7 LoS criteria for priority controlled intersections 52
Table 4.8 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura 57
Table 4.9 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura 58
Table 4.10 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Biloela 59
Table 4.11 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Biloela 60
Table 4.12 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura or Biloela 62
Table 4.13 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura or Biloela 63
Table 4.14 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Theodore 65
Table 4.15 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Theodore 66
Table 4.16 Risk assessment 67

List of figures

Figure 1.1 Location of proposed developments 2
Figure 1.2 Project extent and surrounds 3
Figure 2.1 Property map and location of proposed renewable energy developments 7
Figure 2.2 Proposed development access 14
Figure 2.3 Indicative histogram of workforce on site 15
Figure 2.4 Transmission conductor drums and mobile crane utilised in structure erection 16
Figure 3.1 Existing State-controlled road (SCR) networks 21
Figure 3.2 Streetview of Leichhardt Highway 22
Figure 3.3 Streetview of Dawson Highway 23
Figure 3.4 Streetview of Uncle Toms Road 24
Figure 3.5 Streetview of Defence Road 25
Figure 3.6 Pavement types and load damage exponent 25
Figure 3.7 SAR calculation by Austroads heavy vehicle classification 25
Figure 3.8 Rural auxiliary lane (AU) turn treatments: Auxiliary Right Turn (AUR) and Auxiliary Left Turn (AUL) 26
Figure 3.9 Dawson Highway/Leichhardt Highway intersection 27
Figure 3.10 Streetview of Dawson Highway/Leichhardt Highway intersection facing west 27
Figure 3.11 Rural Basic (BA) turn treatments: Basic Left Turn (BAL) on the Minor Road 28
Figure 3.12 Leichhardt Highway/Uncle Toms Road intersection 28
Figure 3.13 Streetview of Leichhardt Highway/Uncle Toms Road intersection facing south 28
Figure 3.14 Leichhardt Highway/Defence Road intersection 29
Figure 3.15 Streetview of Leichhardt Highway/Defence Road intersection facing south 29
Figure 3.16 Road segments 32
Figure 3.17 Peak hour traffic volume 33
Figure 3.18 Dawson Highway/Leichhardt Highway AM and PM peak period intersection turn volumes (2023) 34
Figure 3.19 Leichhardt Highway/Uncle Toms Road AM and PM peak period intersection turn volumes (2023) 35
Figure 3.20 Leichhardt Highway/Defence Road AM and PM peak period intersection turn volumes (2023) 36
Figure 3.21 Background and extrapolated future year peak hour traffic volumes 37
Figure 3.22 Background and extrapolated future year peak period traffic volumes 38
Figure 3.23 Historical crash incident locations (2020–2024) 41

List of figures (continued)

Figure 3.24 Heavy vehicle route network 43
Figure 3.25 Critical roads network 44
Figure 3.26 Timetable information for Service GX461 and GX462 45
Figure 3.27 Intercity coach services 46
Figure 4.1 AM and PM construction peak Project turn volumes – Dawson Highway/Leichhardt Highway 52
Figure 4.2 AM and PM construction peak Project turn volumes – Dawson Highway/Leichhardt Highway 53
Figure 4.3 AM and PM construction peak Project turn volumes – Leichhardt Highway/Uncle Toms Road (2026) 54
Figure 4.4 AM and PM construction peak Project turn volumes – Leichhardt Highway/Defence Road (2026) 55
Figure 4.5 Dawson Highway/Leichhardt Highway intersection layout 56
Figure 4.6 Leichhardt Highway/Uncle Toms Road intersection layout 61
Figure 4.7 Leichhardt Highway/Defence Road intersection layout 64

List of appendices

Attachment A 19BAADT segment report

Attachment B 20BPeak hour traffic volume

Attachment C 21BDetailed SIDRA modelling outputs

Abbreviations

AADT	Average Annual Daily Traffic
AECOM	AECOM Australia Pty Ltd
AUL	Auxiliary Left Turn
AUR	Auxiliary Right Turn
BA	Basic
BAL	Basic Left
BESS	battery and energy storage system
CSR	Corridor Selection Report
DoS	Degree of Saturation
EAR	Environmental Assessment Report
EB	Eastbound
ESA	Equivalent Standard Axles
Electricity Act	*Electricity Act 1994* (Queensland)
ERM	Environmental Resources Management Australia Pty Ltd
EWP	Elevated work platform
GN	Granular Pavement
GTIA	*Guide to Traffic Impact Assessment* (Transport and Main Roads, 2018)
HV	Heavy vehicle
km/h	kilometres-per-hour
kV	kilovolt
LoS	Level of Service
LRRS	Local roads of regional significance
MID	Ministerial Infrastructure Designation
MW	megawatt
NB	Northbound
NHVR	National Heavy Vehicle Register
PCU	Passenger Car Units
PIA	*Pavement Impact Assessment* (Queensland)
Planning Act	*Planning Act 2016* (Queensland)
PN	Pacific National

Powerlink	Powerlink Queensland, trading name of Queensland Electricity Transmission Corporation
RWE	RWE Renewables Australia
SAR	Standard Axle Repetition
SB	Southbound
SCR	State-controlled Road
SL	Simple Left
s/veh	seconds per vehicle
The Project	Theodore Wind Farm Connection Project
TIA	Traffic Impact Assessment
TMR	Department of Transport and Main Roads (Queensland)
v/c ratio	volume to capacity ratio
WB	Westbound
WSP	WSP Australia Pty Ltd

1 Introduction

WSP Australia Pty Ltd (WSP) is working in conjunction with Powerlink Queensland (Powerlink) to prepare a Traffic Impact Assessment (TIA) in accordance with the Department of Transport and Main Roads (TMR) *Guide to Traffic Impact Assessment* (GTIA), TMR 2018) for the construction and operation of the Theodore Wind Farm Connection Project (the Project). This TIA will establish the Project construction and operational period transport routes, access arrangements, and workforce and heavy vehicle movements.

Road network data relating to traffic volumes and annual growth rates and any proposed road upgrades or major maintenance on the identified road links will be sourced and collated. An assessment of traffic operations and pavement impacts on road links and intersections, that meet analysis thresholds will be undertaken and appropriate mitigation measures will be identified. A road safety assessment will be developed to identify if there are increased risks due to the Project, identifying road features that may be adversely impacted by the construction traffic.

The outcomes of this analysis will be documented in this TIA report in accordance with the TMR *Guide to Traffic Impact Assessment* (GTIA) and the supplementary *Pavement Impact Assessment* (PIA) *Guidelines*.

1.1 Project background

RWE Renewables Australia (RWE) are seeking to establish the Theodore Wind Farm, a 1,100 megawatt (MW) renewable energy facility located approximately 22 kilometres (km) east of Theodore, 50 km south-west of Biloela and 150 km south-west of Gladstone (refer to Figure 1.1 for the locality plan).

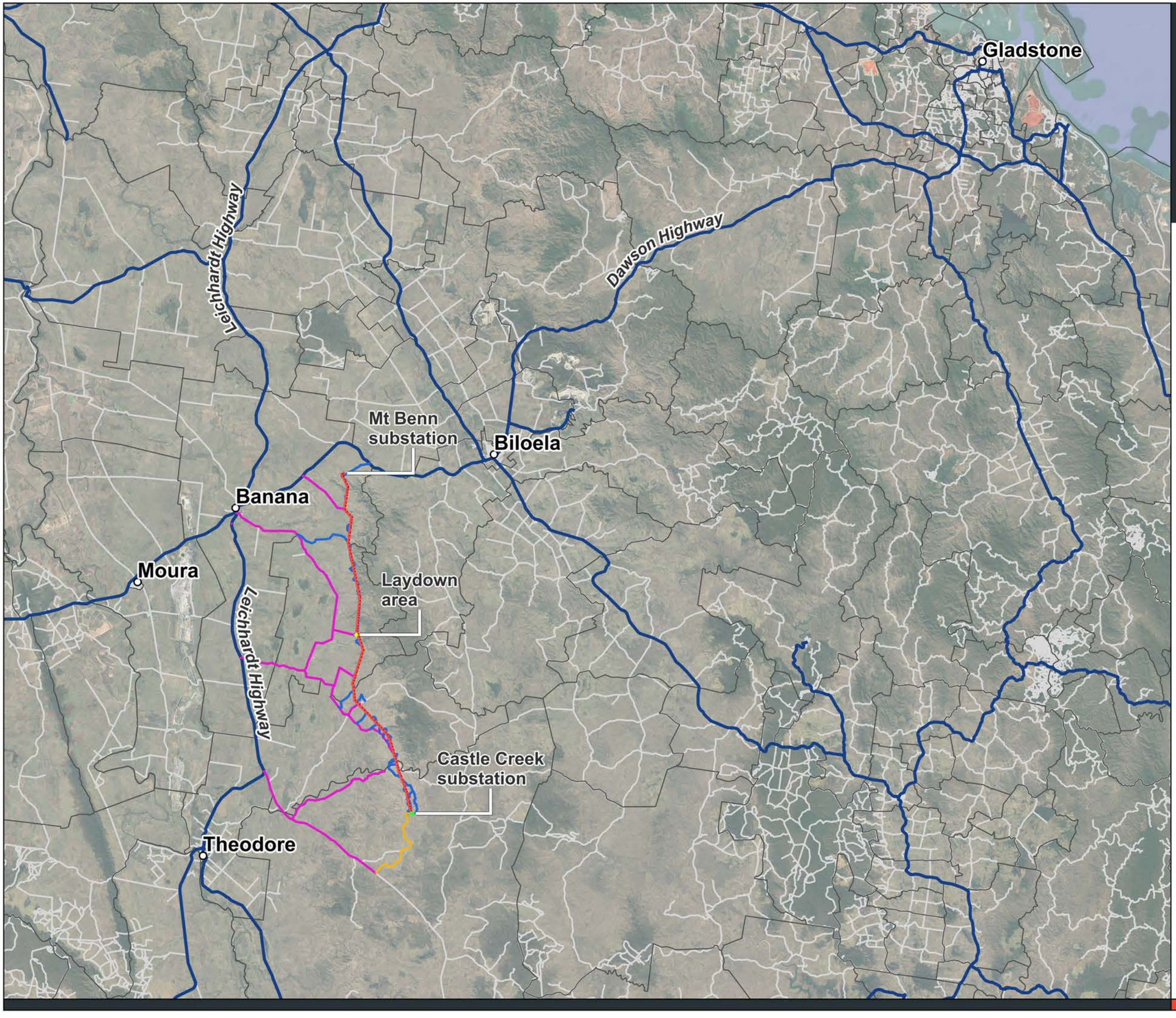
Theodore Wind Farm is intended to generate approximately 1,100 MW of electricity and will comprise 170 turbines, a 240 MW battery and energy storage (BESS) facility, ancillary buildings and infrastructure. The Project would generate enough electricity to power about 500,000 Queensland homes.

Powerlink Queensland (Powerlink), a transmission entity under the *Electricity Act 1994* (Electricity Act), owns, operates and maintains Queensland's high voltage electricity transmission network. Powerlink has been engaged by RWE to provide a connection for the Theordore Wind Farm to the transmission network.

The Theodore Wind Farm Connection Project (the Project) includes:

- a proposed 275 kilovolt (kV) substation, to be known as the Castle Creek Substation at the Theodore Wind Farm. The substation footprint encompassing an area of 445 m x 270 m (12 hectares (ha))
- construction of a new double circuit 275kV transmission line extending approximately 55.4 km north of the Theodore Wind Farm to a new substation to be constructed at Mt Benn. The Mt Benn Substation is part of the Banana Range Wind Farm Connection Project (currently in the planning and approvals phase) and does not form part of Theodore Wind Farm Connection Project. The proposed transmission line will be positioned within a new 60 m wide easement.

The Castle Creek Substation and the proposed transmission line will facilitate a grid connection for the Theodore Wind Farm. The Project site is accessible via Leichhardt Highway to the east and Dawson Highway to the north. The extent of the Project is shown on Figure 1.2 along with the surrounding road network.



PS218956
Theodore Wind Farm Connection Project

Figure 1.1
Location of proposed developments

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Roads

- State-controlled roads (SCR)
- Queensland roads and tracks

Boundaries

- Locality boundaries

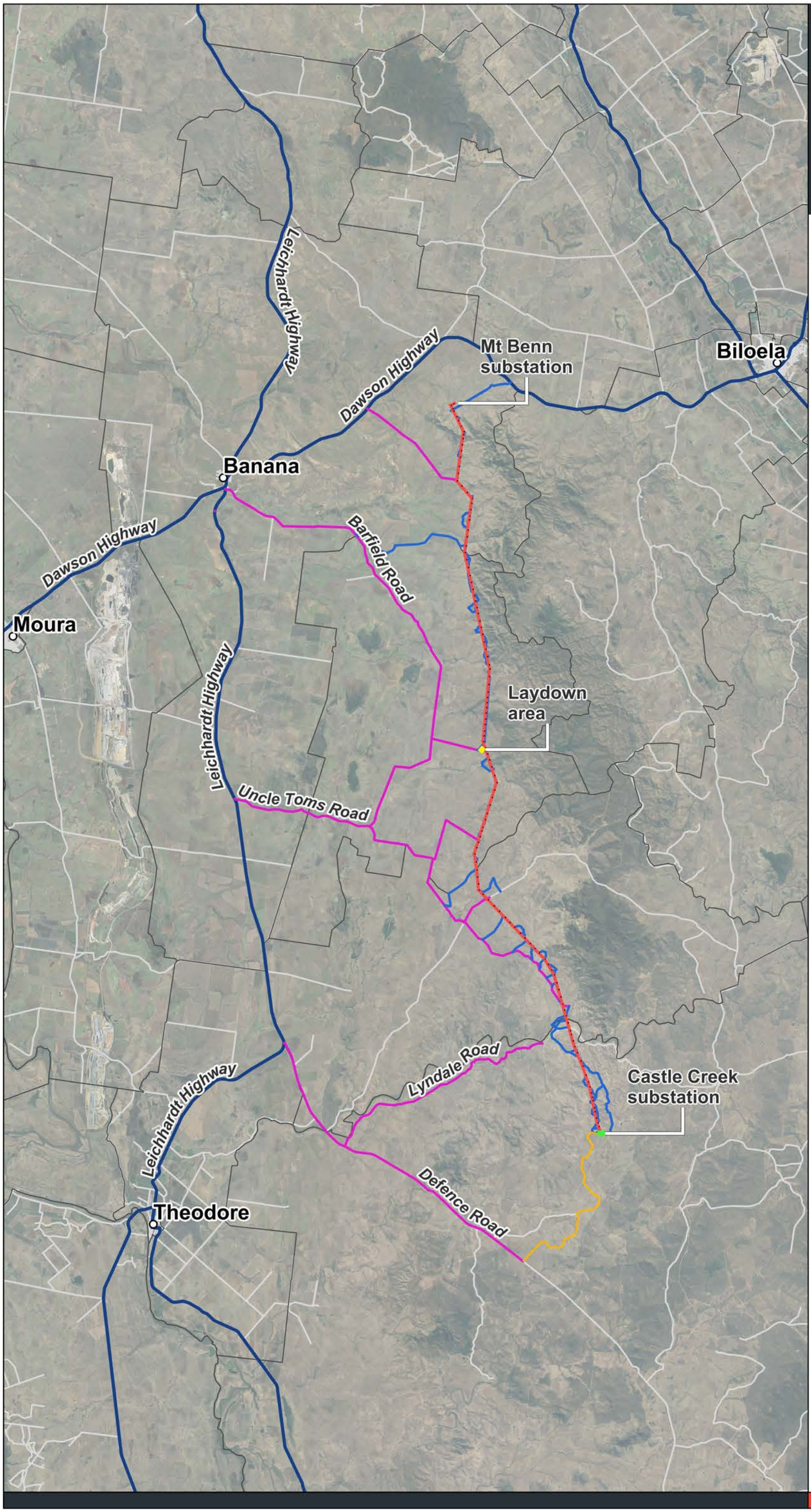
0 10 20 km

1:600,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

PS218956
Theodore Wind Farm Connection Project

Figure 1.2
Project extent and surrounds



Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Roads

- State-controlled roads (SCR)
- Queensland roads and tracks

Boundaries

- Locality boundaries

0 5 10 km

1:290,000

Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

1.2 Purpose of this report

This report presents the TIA undertaken to investigate the impacts of the Project's construction and operational periods on the surrounding State-controlled road network. The report considers:

- traffic generating characteristics of the Project (construction and operational phase)
- existing transport network environment on access routes to the Project site including:
  - key road links and intersections and associated traffic demands
  - crash incidents history
  - heavy vehicle routes
  - public and active transport
- anticipated impacts of the Project (construction and operational phases) on the surrounding Stated-controlled road network including:
  - link capacity and pavement damage
  - intersection delay
  - heavy vehicle routes
  - public and active transport networks
  - road safety.

1.2.1 Legislative framework

Approval for the Project is being sought via the Ministerial Infrastructure Designation Process (MID) under the *Planning Act 2016* (Planning Act). Infrastructure Designation is a planning process that allows the Minister to designate premises for a type of infrastructure. The infrastructure designation will affirm the Project as a site for electricity operating works and will provide a streamlined, considered whole-of-government response which avoids the need for later approvals under the Planning Act. As detailed in the GTIA this TIA will provide support to the designation of this infrastructure.

1.3 Methodology

This TIA follows the methodology detailed in the GTIA which provides information about the processes to assess traffic-related impacts created by a proposed development, such as the construction and operation of the Project in this case. In line with the GTIA, the following methodology has been adopted:

- identification of access routes to the Project site
- estimation of the traffic generation for the construction and operational phases of the Project and assignment of this traffic to the identified access routes
- review of transport networks to establish existing conditions (i.e., no project)
- assessment of impacts resulting from the Project-generated traffic to the Sate-controlled road network in relation to:
  - road link capacity Level of Service (LoS)
  - pavement impacts
  - intersection operation utilising SIDRA Intersection Software
  - other transport facilities
  - road safety assessment
- identification of mitigations measures.

1.3.1 Reference materials and supporting data sources

The reference resources and datasets listed below were used to guide and inform this assessment:

- *Guide to Traffic Impact Assessment* (TMR 2018)
- *Guide to Traffic Impact Assessment Practise Note: Pavement Impact Assessment* (TMR 2018)
- *Guide to Traffic Impact Assessment Case Studies* (TMR 2017)
- *Austroads Guide to Traffic Management: Part 6 – Intersections, Interchanges and Crossings Management* (Austroads 2020)
- *Austroads Guide to Traffic Management: Part 3 – Transport study and analysis methods* (Austroads 2020)
- Traffic data:
  - 2013–2023 traffic census data
  - Traffic data average by hour by day dataset (2023)
  - AADT Segment Annual Volume Report:
    - Site 61084 – at Dawson Highway – 600 m south of Biloela Callide Rd, Mt Murchison
    - Site 60012 – at Dawson Highway – 585 m west of Meissners Road, west of Biloela
    - Site 61020 – at Dawson Highway – 940 m east of Moriarty St, east of Banana
    - Site 61617 – at Dawson Highway – 1,047 m west of Leichhardt Hwy, west of Banana
    - Site 60050 – at Leichhardt Highway – 1,380 m south of Gibihi Rd, south of Banana
    - Site 61526 – at Leichhardt Highway – 360 m north of Dawson Hwy (46C), south of Banana
- Queensland Globe:
  - heavy vehicle routes
  - principal cycle routes
  - crash data from Queensland roads
- National Heavy Vehicle Register (NHVR) National Network Map
- Translink route network maps
- Previous reports:
  - Banana Range Wind Farm Planning Report (AECOM Australia Pty Ltd 2019)
  - Theodore Wind Farm Planning Report (Environmental Resources Management (ERM) Australia Pty Ltd 2024b)
  - Theodore Wind Farm Connection Project – Draft and Final Corridor Selection Reports (Theodore Wind Farm Connection Project | Powerlink)
  - The Project construction and operational activities and traffic generation (provided by Powerlink).

2 Development profile

2.1 Project description

The Project activities involve the construction and operation of the Castle Creek Substation and the proposed transmission line that provide a connection for the Theordore Wind Farm to the transmission network as shown in Figure 2.1. The proposed easement alignment for the transmission line is 60 m wide and approximately 55.4 km long travelling in a northerly direction from the Theodore Wind Farm connecting to the proposed Mt Benn Substation, approximately 17.1 km north-east of Banana. The easement alignment traverses the western foothills of the Banana Range crossing a number of watercourses including Castle Creek, Lonesome Creek, Sawpit Creek and Banana Creek. The Belmont State Forest is located immediately to the east of the easement alignment. Details of the construction and operation of the Project are presented in the following sections.

PS218956
Theodore Wind Farm Connection Project

Figure 2.1
Property map and location of proposed renewable energy developments

Legend

- Rail line
- Proposed Transmission Centreline
- Cadastre
- Project area
- Project easement
- Disturbance Footprint
- Mt Benn Substation
- Proposed Banana Range Wind Farm - Stage 1
- Dawson Wind Farm
- Watercourse lines

Roads

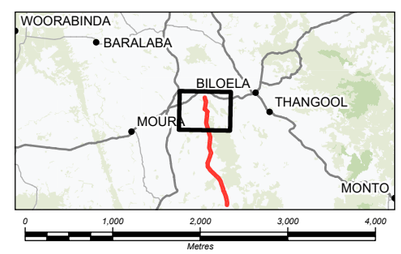
- Highway
- Local

Tenure

- Easement
- Freehold
- Lands Lease
- Profit à Prendre
- State Forest

Stock routes

- Tertiary



Coordinate system: GDA2020 MGA Zone 56
Scale ratio correct when printed at A3

1:70,000 Date: 17/10/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

PS218956
Theodore Wind Farm Connection Project

Figure 2.1
Property map and location of proposed renewable energy developments

Legend

- Proposed Transmission Centreline
- Cadastre
- Laydown area
- Project area
- Project easement
- Disturbance Footprint

Renewable energy projects

- Proposed Sawpit Solar Farm
- Dawson Wind Farm
- Watercourse lines

Roads

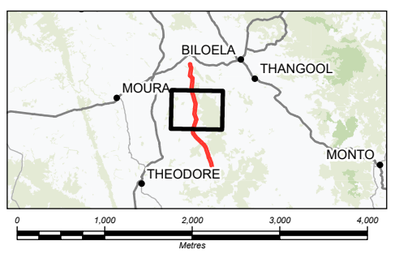
- Local

Tenure

- Easement
- Freehold
- Lands Lease
- Profit à Prendre
- State Forest

Stock routes

- Tertiary



Coordinate system: GDA2020 MGA Zone 56
Scale ratio correct when printed at A3

1:70,000 Date: 17/10/2025

GDA 2020

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

PS218956
Theodore Wind Farm Connection Project

Figure 2.1
Property map and location of proposed renewable energy developments

Legend

- Proposed Transmission Centreline
- Cadastre
- Project area
- Project easement
- Proposed Theodore Wind Farm
- Disturbance Footprint

Renewable energy projects

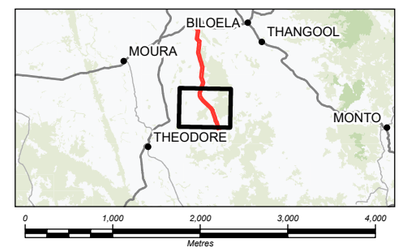
- Proposed Sawpit Solar Farm
- Watercourse lines

Roads

- Local

Tenure

- Freehold
- Lands Lease
- State Forest



Coordinate system: GDA2020 MGA Zone 56
Scale ratio correct when printed at A3

1:70,000 Date: 17/10/2025

GDA 2020

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

PS218956
Theodore Wind Farm Connection Project

Figure 2.1
Property map and location of proposed renewable energy developments

Legend

- Proposed Transmission Centreline
- Cadastre
- Castle Creek Substation
- Project area
- Project easement
- Proposed Theodore Wind Farm
- Disturbance Footprint
- Watercourse lines

Roads

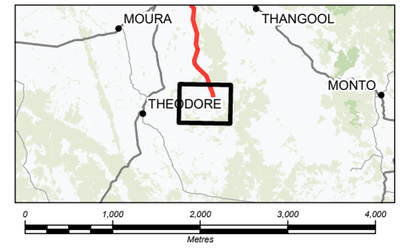
- Local

Tenure

- Easement
- Freehold
- Lands Lease

Stock routes

- Secondary
- Tertiary



Coordinate system: GDA2020 MGA Zone 56
Scale ratio correct when printed at A3

1:70,000 Date: 17/10/2025

GDA 2020

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

2.1.1 Construction

2.1.1.1 Castle Creek Substation

A new substation at Castle Creek is proposed as part of the Project. The substation is required to perform switching, transform voltage, control stability through reactive and system strength support and to connect to the customer system (Theodore Wind Farm).

The proposed substation will be located across Lot 8 DW2 and Lot 18 DW550 and will have a total surface area of 12 ha.

Construction of the proposed substation will involve a series of field activities including:

- a detailed site survey to allow detailed structure and substation design
- vegetation clearing
- earthworks and levelling for the substation platform and access road
- site fencing
- installation of a site drainage system
- installation of a substation cable trench and conduit system
- installation of the substation earthing mat
- installation of the substation structure and building foundations
- buildings, structure and electrical equipment erection
- conductor and earth wire stringing
- site rehabilitation.

2.1.1.2 Transmission line

A 275 kV double circuit above ground transmission line is required to connect the Theodore Wind Farm to the Powerlink transmission network. Details of the transmission line are outlined in the following subsections.

Construction of a transmission line involves a series of field activities which are broadly grouped as follows:

- site survey and set out
- flora and fauna surveys
- mobilisation, including establishment of accommodation camps, laydowns and offices
- installation of gates, grids, clean down bays and access tracks
- vegetation clearing
- tower site benching
- foundation installation
- structure assembly and erection
- conductor and earth wire stringing
- road crossings
- watercourse crossings
- laydown areas
- site reinstatement
- demobilisation.

2.1.1.3 Summary

Approvals for the Project are expected to be completed by Q1 2026. Subject to approvals, construction is expected to commence in Q2 2026 with estimated construction timeframe of 2 years and be completed in late 2028. These construction activities are proposed to occur six days a week (Monday to Saturday) over a 12-hour day (6:30 AM to 6:30 PM) for up to 24 months starting mid-2026. Key construction milestones are shown in Table 2.1. A Project site office will be provided at Powerlink's Biloela Substation.

Table 2.1 Indicative Project construction time periods

Construction work element	Time period
Access	August 2026 to April 2027
Foundation	February 2027 to September 2027
Steel	May 2027 to December 2027
String	August 2027 to March 2028
Support	June 2026 to October 2027
Management	June 2026 to October 2027
Substation	February 2027 to July 2028

2.1.2 Operation

The site access date is currently unknown due to delays associated with the acquisition of the transmission line easement. However, the overall construction timeframe is still anticipated to be approximately two years. The original schedule had targeted operations to begin in April 2028, but based on current delays, this is now expected to be deferred until Q3 2028.

2.1.2.1 Castle Creek Substation

After the completion of construction and commissioning of the substation, the amount of activity on site will decrease substantially as the substation is designed to be monitored and controlled remotely. Maintenance staff will carry out routine inspections of the substation and detailed maintenance of all plant and equipment at regular intervals. Additional inspections may be required as a result of equipment failure, damage, modifications and upgrades.

Substation equipment is designed with a service life in excess of 40 years with refurbishment scheduled every 15 years and is very reliable under most conditions. Apart from the detailed visual inspections that maintenance staff undertake, routine maintenance will be carried out periodically depending on the type and make of the item of plant concerned.

2.1.2.2 Transmission line

After the completion of construction and commissioning of the transmission line, the amount of activity on site will decrease substantially. During operation, normal practice is for maintenance staff to carry out scheduled inspections of the line, easement, and access tracks on average twice per year. These inspections (patrols) are either by vehicle or helicopter. Additional inspections may be required to perform such activities as emergency repairs. Powerlink maintains access tracks suitable for dry weather 4WD vehicles use.

Structures, conductors and fittings are inspected for any signs of unusual wear, corrosion or damage. Transmission lines are designed for a 50-year in-service life and are very reliable under most conditions. Maintenance staff normally conduct a detailed visual inspection about once every two to three years.

2.2 Development access

For construction and operation of the Project , access to the Castle Creek Substation and each transmission line structure location will be generally available from adjacent local roads such as Banana Holdings Road, Coupes Road, Barfield Road, Ogdens Road, Uncle Toms Road and Lyndale Road. Access to the local road network is proposed to be undertaken from Leichhardt Highway, Dawson Highway and Defence Road via the existing intersection. In all cases, maximum use is made of existing public and privately owned roads and tracks. Details regarding the proposed access is provided in Section 3.1.1 and illustrated in Figure 2.2.

Workers are expected to be locally sourced and/or accommodated (i.e. Moura, Biloela and Theodore), but the exact distribution is currently unknown. For the purpose of a comprehensive assessment of potential impacts the following staff origins scenarios have been analysed:

- 100% workers from/to the west (Moura) (via Dawson Highway and Leichhardt Highway)
- 100% workers from/to the east (Biloela) (via Dawson Highway and Leichhardt Highway)
- 100% workers from/to the south (Theodore) (via Leichhardt Highway).

These trips are expected to occur around workday start and end times with peak hours of 8:00 to 9:00 AM and 3:00 to 4:00 PM as per background traffic peak hours.

Heavy vehicle access to the transmission line is required during construction and for ongoing operation and maintenance. All heavy vehicles (plant, equipment and deliveries) are expected to originate from a variety of locations in the east (Gladstone) and access the Project site via the Dawson Highway and Leichhardt Highway.

PS218956
Theodore Wind Farm Connection Project

Figure 2.2
Proposed development access

Heavy vehicles
Leichhardt Highway
Dawson Highway
Mt Benn substation
Workforce
Biloela accommodation
Project site office
Barfield Road
Dawson Highway
Workforce
Moura accommodation
Leichhardt Highway
Laydown area
Uncle Toms Road
Lyndale Road
Castle Creek substation
Leichhardt Highway
Workforce
Defence Road
Theodore accommodation

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Locations

- Propsoed Project site office
- Proposed workforce accommodation

Roads

- State-controlled roads (SCR)
- Queensland roads and tracks

Boundaries

- Locality boundaries

0 5 10 km
1:290,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

2.3 Traffic generation

The traffic generation parameters, for both the construction and operational phases of the Project, adopted in this assessment are outlined below:

2.3.1 Construction

2.3.1.1 Workforce

Powerlink provided the following information regarding the proposed construction phase of the Project:

- Construction will commence in June 2026, with all construction activities to be completed in 24 months across a 6 day week and a 12 hour day. Construction of the Project is anticipated to require a peak construction phase workforce of 145 persons, occurring over a 2 year period. Construction personnel travelling to the Project site in private vehicles will generate light vehicle trips for worker movements during the construction phase. For the purposes of this assessment a car occupancy of 1.2 people per vehicle has been assumed.
- Accommodation camps for the Project workforce are not proposed as accommodation requirements are expected to be met in short-term accommodation in regional towns (i.e. Theodore, Moura or Biloela). As the proportional distribution of construction workers across the three potential accommodation location is currently unknown, this assessment adopts a conservative approach, assessing multiple scenarios assuming 100% of workers will travel to/ from each location via Leichhardt Highway and Dawson Highway to assess the maximum potential impact for each scenario.
- Worker vehicle trips "to" the site have been assessed between 8:00 and 9:00 AM and "from" the site between 3:00 and 4:00 PM as per background traffic peak hours, while the actual construction movement is expected to occur outside the background traffic peak hours. As such, this assessment has been undertaken as the worst case basis. The peak hour factor for the Project related light vehicles has been assumed at 100% of daily as shown in Table 2.2, which is considered conservative in relation to a 12-hour workday.
- All worker related traffic assessments have adopted the peak construction phase workforce numbers (145 persons) on site to reflect a worst case scenario.

A detailed breakdown of the construction tasks that are expected to generate light vehicle movements during the construction phase of the Project has been provided by Powerlink as shown in Figure 2.3 below.

Time Period	Access	Foundations	Steel	String	Support	Management	Substation	Total
May-26	0	0	0	0	0	0	0	0
Jun-26	0	0	0	0	10	5	0	15
Jul-26	0	0	0	0	10	5	0	15
Aug-26	10	0	0	0	10	10	0	30
Sep-26	20	0	0	0	15	10	0	45
Oct-26	20	0	0	0	15	10	0	45
Nov-26	20	0	0	0	15	10	0	45
Dec-26	20	0	0	0	15	10	0	45
Jan-27	20	0	0	0	15	10	0	45
Feb-27	20	10	0	0	15	10	30	85
Mar-27	20	20	0	0	15	10	30	95
Apr-27	10	20	20	0	15	10	30	105
May-27	0	20	30	0	15	10	30	105
Jun-27	0	20	50	0	15	8	30	123
Jul-27	0	20	50	0	15	8	30	123
Aug-27	0	10	50	30	10	8	30	138
Sep-27	0	10	50	40	10	5	30	145
Oct-27	0	0	50	50	5	5	30	140
Nov-27	0	0	50	50	0	0	30	130
Dec-27	0	0	50	50	0	0	30	130
Jan-28	0	0	0	50	0	0	30	80
Feb-28	0	0	0	50	0	0	30	80
Mar-28	0	0	0	30	0	0	30	60
Apr-28	0	0	0	0	0	0	30	30
May-28	0	0	0	0	0	0	30	30
Jun-28	0	0	0	0	0	0	30	30
Jul-28	0	0	0	0	0	0	15	15
Aug-28	0	0	0	0	0	0	0	0

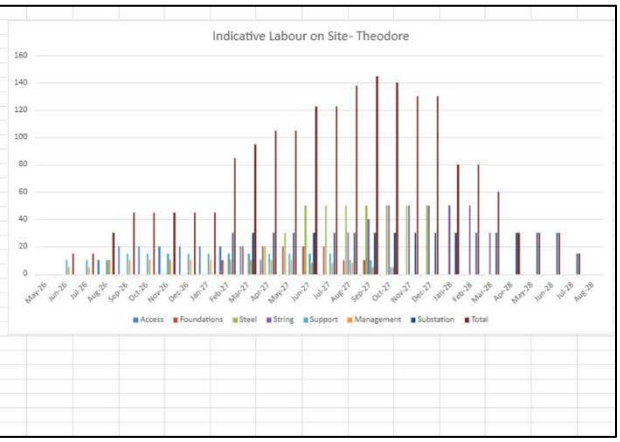


Figure 2.3 Indicative histogram of workforce on site

Table 2.2 Workforce numbers and generated trips by AM and PM

Time	Movements (in)		Movements (out)	
	Workforce	Trips generated	Workforce	Trips generated
AM	145	121	0	0
PM	0	0	145	121
Total	145	121	145	121
Peak hour (assumed 100% of daily)	145	121	145	121

2.3.1.2 Heavy vehicles

The construction of the proposed development is expected to generate a range of transport-related activities, including site establishment, clear and access, earthworks, foundation installation, structure assembly and erection of tower components, stringing, clip and sag. Further details of these activities and expected traffic generation are outlined below:

- Steel for lattice towers is fabricated, galvanised, sorted and bundled ready for delivery at a contractor's facility off site in Gladstone and transported to the final location, typically involve the movements of four 12 tonne flatbed trucks getting access to each tower (121 towers in total).
- Five low loader float trailers are used to deliver machines (3 drill rigs and 2 skid steer) to the Project site.
- Three large mobile crane (2 × 180 tonne cranes and 1× 260 tonne crane) (Figure 2.4) are used to move members and erect the tower in sections. Two excavators and four elevated work platforms (EWPs) are used for construction tasks.
- During the construction phase, it is assumed that all heavy are expected to originate from Gladstone (100% from Gladstone to the site and vice versa 100% from the site back to Gladstone) and access the Project site via Dawson Highway and Leichhardt Highway (constituting an assessment of worst-case distribution).

Figure 2.4 Transmission conductor drums and mobile crane utilised in structure erection

Expected heavy vehicle fleet composition and trip generation for each direction of the Dawson Highway and Leichhardt Highway is detailed in Table 2.3.

It is assumed that over the 24 month construction period, all heavy vehicles will travel via the Dawson Highway and Leichhardt Highway. However, the actual number of construction heavy vehicles using Dawson Highway is expected to gradually decrease from east to west, particularly for those turning onto Leichhardt Highway, as a proportion of heavy vehicles are expected to access the site via various entry points along the routes before reaching the intersection with Defence Road. Therefore, this assessment has been undertaken as the worst case basis.

Table 2.3 Construction stage generated heavy vehicles – per year

Heavy vehicle	Class - SAR4s (loaded / unloaded)	Comments	Stage total return trips (in & out)	Stage total SAR4s (in)	Stage total SAR4s (out)
Excavators	Class – 8: SAR4s 5.61/0.52	Two excavators (assumed five axle articulated truck) in loaded and out unloaded at start of the construction stage and in unloaded and out loaded after 8 months.	2	12	12
8x8 mounted EWP	Class – 5: SAR4s 4.09/0.41	Four vehicles (assumed four axle trucks) will enter the Project site at the beginning of this stage and exit at the end this stage	2	8	8
Semi low loader	Class – 6: SAR4s 4.43/0.6	Five vehicles (assumed three axle articulated truck) delivering three drill rigs and two skid steers in loaded and out unloaded at start of the construction stage and in unloaded and out loaded at the end of this stage.	5	25	25
Flatbed truck	Class – 6: SAR4s 4.43/0.6	Four vehicles (assumed three axle articulated truck) in loaded and out unloaded to each of the 121 structure sites.	242	1,217	1,217
180T Crane	Class – 10: SAR4s 6.3/0.53	Two vehicles (assumed B-double equivalent) trip in and out to each of the 121 structure sites.	121	762	762
260T Crane	Class – 10: SAR4s 6.3/0.53	One vehicle (assumed B-double equivalent) trip in and out.to each of the 121 structure sites.	61	381	381
Total			433	2,406	2,406

An estimate of the highest expected day and peak hour heavy vehicle movements has been made as shown in Table 2.4. This peak heavy vehicle traffic generation is expected to occur during the construction stage (which also has the highest expected workforce numbers) of the Project. The estimate is based on all excavators, EWPs and semi low loaders and a flatbed truck, a 180T crane and a 260T crane arriving on a single day. This estimate is expected to be higher than the actual volumes providing a "worst case" scenario for assessment. The peak hour factor for the Project related heavy vehicles has been assumed at 20% of daily, which is considered conservative in relation to a 12-hour workday.

Table 2.4 Highest day/peak hour heavy vehicle trips

Heavy vehicle	Movements (in)	Movements (out)
Excavators	2	2
8x8 mounted EWP	2	0
Semi low loader	5	5
Flatbed truck	1	1
180T Crane	1	0
260T Crane	1	0
Total	12	8
Peak hour (assumed 20% of daily)	2	2

2.3.2 Operations

It is assumed that traffic generation during the operational phase of the Project will be minimal as detailed in Table 2.5. Heavy vehicle movements during the operational stage of the Project will be extremely low i.e. negligible from a traffic engineering or transport planning perspective.

2.3.2.1 Castle Creek Substation

After the completion of construction and commissioning of the substation, the amount of activity on site will decrease substantially as the substation is designed to be monitored and controlled remotely. For safety and security reasons, only authorised personnel are permitted access to substation compound. Regular security checks will also be carried out. Remotely controlled operational cameras will be installed as remote video monitoring of the substation enables a quick response to issues.

Maintenance staff will carry out routine inspections of the substation and detailed maintenance of all plant and equipment at regular intervals. Additional inspections may be required as a result of equipment failure, damage, modifications and upgrades. During the routine inspections, the substation and items of plant will be inspected for signs of unusual wear, corrosion or damage. Faults and defects will be reported to maintenance staff who will rectify any problems identified.

Substation equipment is designed with a service life in excess of 40 years with refurbishment scheduled every 15 years and is very reliable under most conditions. Apart from the detailed visual inspections that maintenance staff undertake, routine maintenance will be carried out periodically depending on the type and make of the item of plant concerned.

Vegetation regrowth control within the substation compound and under the incoming power supply transmission lines will be undertaken to maintain electrical safety clearances between the conductors and vegetation.

2.3.2.2 Transmission line

After completion of construction and commissioning of the transmission line, the amount of activity on site will decrease substantially. During operation, normal practice is for maintenance staff to carry out scheduled inspections of the line, easement, and access tracks on average twice per year. These inspections (patrols) are either by vehicle, drones or helicopter. It is likely that vehicles or drones will be used for this Project. Additional inspections may be required to perform such activities as emergency repairs. Powerlink maintains access tracks suitable for dry weather 4WD vehicles use. Maintenance of access tracks is required to ensure that vehicle access to structure sites is available for inspections and structure maintenance.

Maintenance staff normally conduct a detailed visual inspection about once every two to three years. Provision may be made for some structure and conductor maintenance tasks to be carried out from a helicopter, with the line either energised or de-energised.

Inspection of the easements is carried out on each scheduled line patrol, with the main aim to record the type, density and height of vegetation regrowth.

Table 2.5 Operation activities traffic generation

Operational work element	Frequency	Maximum vehicles per visit	Maximum vehicles per year
Scheduled inspections of the line, easement, and access tracks	Twice per year (by vehicle, drones or helicopter)	2	4
Vegetation regrowth control	1 visit per 2 or 3 years	1	1
Total		**3**	**5**

3 Existing environment

The existing State-controlled road transport networks in the vicinity of the Project site expected to support movements of the Project related construction and operational vehicles are detailed in the following section and shown in Figure 3.1. This information is based on publicly available data.

PS218956
Theodore Wind Farm Connection Project
Figure 3.1
Existing State-controlled road (SCR) networks

Leichhardt Highway
Dawson Highway
Mt Benn substation
Biloela
Banana
Dawson Highway
Barfield Road
Moura
Leichhardt Highway
Laydown area
Uncle Toms Road
Lyndale Road
Castle Creek substation
Defence Road
Leichhardt Highway
Theodore

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Roads

- Queensland roads and tracks

State-controlled road network

- State strategic roads
- Regional roads
- Local government roads

Boundaries

- Locality boundaries

0 5 10 km
1:290,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

3.1 Road network

The Project intends to utilise the State-controlled road network in order to access the Project site. Key roads include Leichhardt Highway (26A – Westwood – Taroom) and Dawson Highway (46A – Gladstone – Biloela, Biloela – Banana, Banan – Rolleston).

3.1.1 Key road links

Leichhardt Highway: The Leichhardt Highway is a State-controlled road linking the towns of Banana in the north and Theodore in the south. It is typically a two-lane, two-way formation with sealed shoulders and edge line marking. The Leichhardt Highway is primarily located in a rural environment with occasional urban areas. It predominantly has a posted speed limit of 100 kilometres-per-hour (km/h) with speed reductions in some locations due to road geometry and urban centres. Indicative images of the Leichhardt Highway corridor in the vicinity of the Project are shown in Figure 3.2.

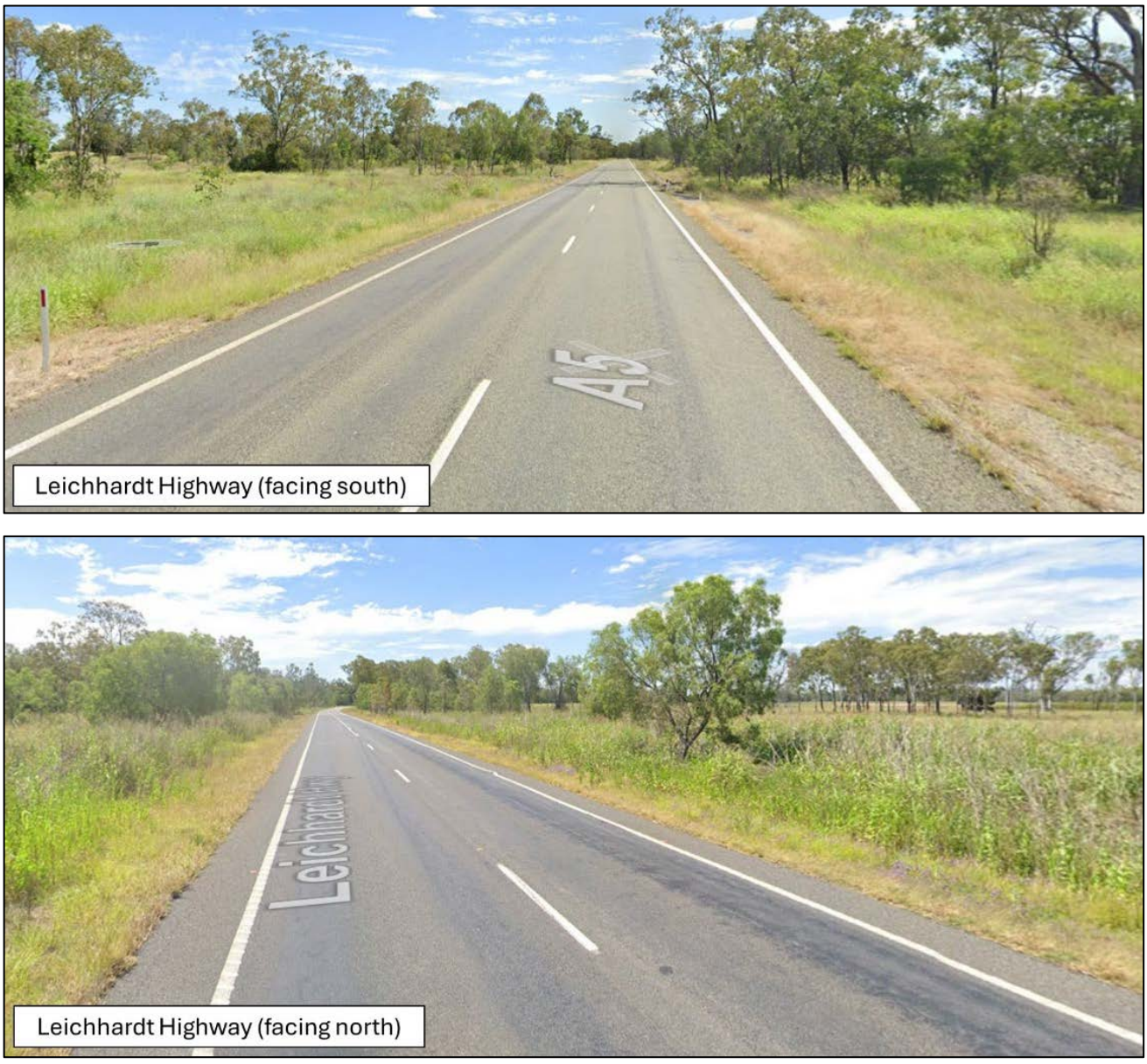


Figure 3.2 Streetview of Leichhardt Highway

Source: Google Maps

Dawson Highway: The Dawson Highway is a State-controlled road providing an east to west connection between Gladstone and Moura. The typical cross-section features two lanes, along with sealed shoulders and edge line marking. It is subject to a posted speed limit of 100 km/h with speed reductions in some locations due to road geometry and urban centres. Typical images of the Dawson Highway are shown in Figure 3.3.

Figure 3.3 Streetview of Dawson Highway

Source: Google Maps

Uncle Toms Road: Uncle Toms Road is not a TMR State-controlled road. It is an unsealed rural access route with non-paved surface, providing a link between the Leichhardt Highway and access tracks of the Project site. As Uncle Toms Road is not a State-controlled road, potential impacts resulting from the Project construction and operational activities have not been assessed within this TIA. The intersection with the Leichhardt Highway has been included to identify any impacts to the Leichhardt Highway. An image of Uncle Toms Road is shown in Figure 3.4.

Figure 3.4 Streetview of Uncle Toms Road

Source: Google Maps

Defence Road: Defence Road is a local government local road of regional significance (LRRS) that links the Leichhardt Highway in the north and Eidsvold Theodore Road in the south. Indicative images of the Defence Road are shown in Figure 3.5. The road has a speed limit of 80 km/h. This road has very low utilisation and will serve as the primary access route for workforce from Theodore and heavy vehicles during the construction phase of the Project. As Defence Road is not a State-controlled road, potential impacts resulting from the Project construction and operational activities have not been assessed within this TIA. The intersection with the Leichhardt Highway has been included to identify any impacts to the Leichhardt Highway.

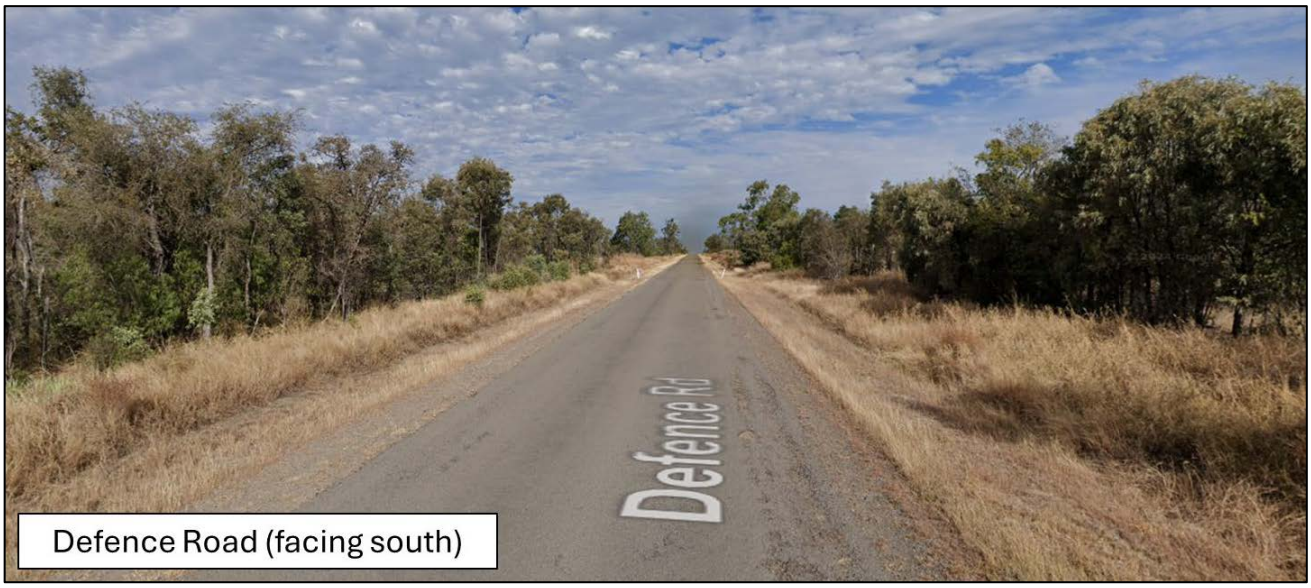


Figure 3.5 Streetview of Defence Road

Source: Google Maps

A summary of the existing parameters of the surrounding State-controlled road network in vicinity to the Project is detailed in Table 3.1.

Table 3.1 Road network

Road	Number of lanes	Road width	On street parking	Speed limit
Leichhardt Highway	One lane per direction (two-way)	8 m sealed with 3.5 m lanes and 0.5 m shoulders	Not permitted	100 km/h
Dawson Highway	One lane per direction (two-way)	8 m sealed with 3.5 m lanes and 0.5 m shoulders	Not permitted	100 km/h

Source: Nearmap

For the calculation of the Project related Standard Axle Repetitions (SARs), the Leichhardt Highway and Dawson Highway have been assumed to have a granular pavement (GN) and therefore the SAR4 damage value has been used to convert Equivalent Standard Axles (ESAs) to SARs as per Table 1 and by Austroads heavy vehicle classification as per Table 3 of the *Guide to Traffic Impact Assessment Practise Note: Pavement Impact Assessment* shown in Figure 3.6 and Figure 3.7 respectively.

Pavement type		TMR pavement type	Type of damage	Load damage exponent	Damage unit
Granular pavement with thin bituminous surfacing	Granular pavement (GN)	Sprayed seal over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	Overall pavement damage	4	ESA / SAR4

Figure 3.6 Pavement types and load damage exponent

Austroads vehicle class	3	4	5	6	7	8	9	10	11	12
Unloaded SAR4	0.54	0.50	0.46	0.60	0.56	0.52	0.51	0.53	0.55	0.58
Loaded SAR4	2.98	3.57	4.09	4.43	5.02	5.61	4.93	6.30	8.34	11.75

Figure 3.7 SAR calculation by Austroads heavy vehicle classification

3.1.2 Key intersections

Access to the Project site access routes by construction heavy vehicles and workforce and staff vehicles during the construction stage is supposed to be undertaken from the Dawson Highway and Leichhardt Highway via three existing intersections in proximity to the Project site.

Dawson Highway/Leichhardt Highway

This intersection is located approximately 17 km west of the Project site. The current configuration of the intersection is a priority controlled T-intersection, consisting a 100 m Auxiliary Left Turn (AUL) lane on the eastern approach and a 70 m Auxiliary Right Turn (AUR) on the western approach of the Dawson Highway as per Figure 2.5 and Figure 2.7 of the *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* as shown in Figure 3.8. The intersection is shown in Figure 3.9 and Figure 3.10.

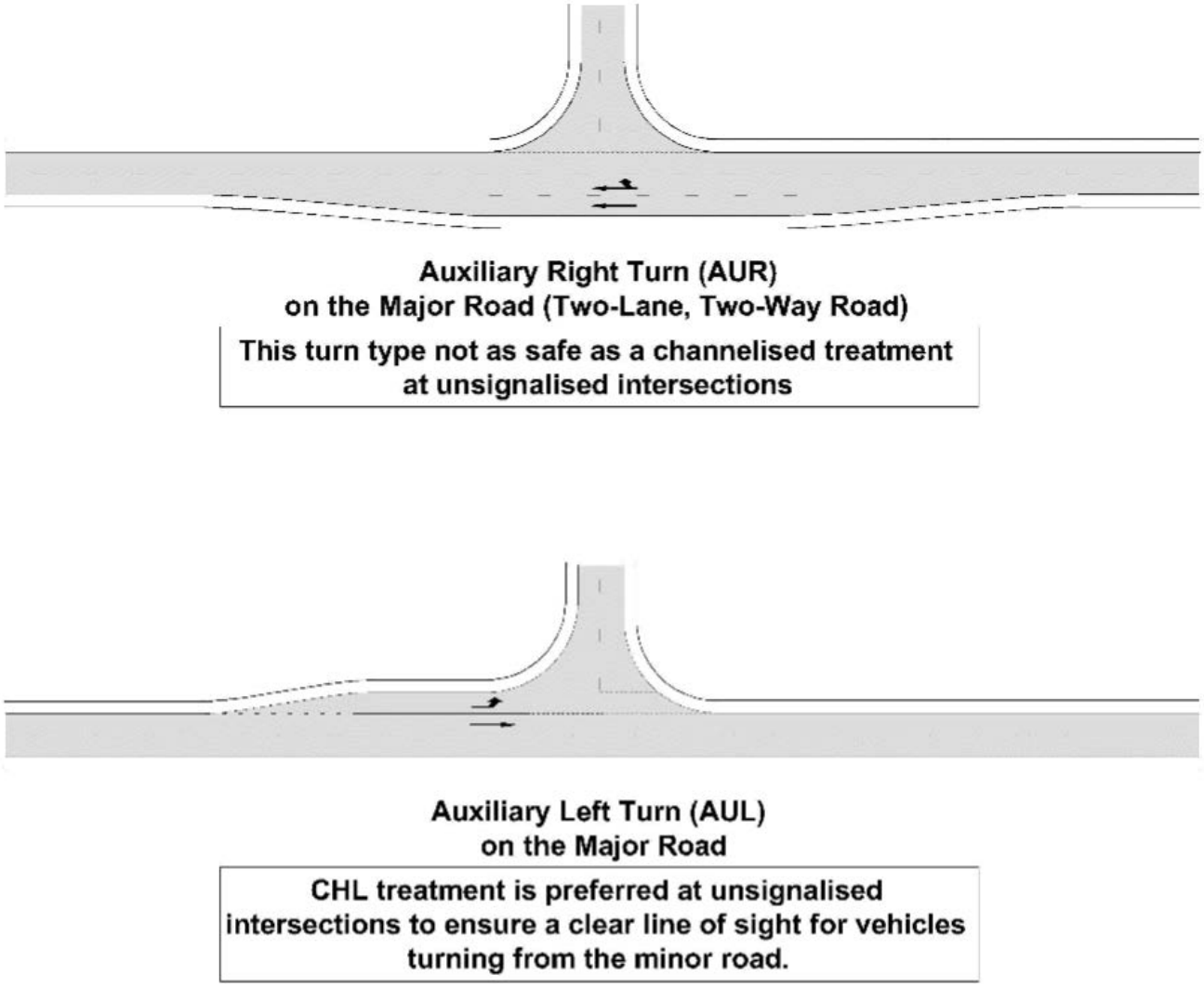


Figure 3.8 Rural auxiliary lane (AU) turn treatments: Auxiliary Right Turn (AUR) and Auxiliary Left Turn (AUL)

Figure 3.9 Dawson Highway/Leichhardt Highway intersection

Figure 3.10 Streetview of Dawson Highway/Leichhardt Highway intersection facing west

Source: Google Maps

Leichhardt Highway/Uncle Toms Road

This intersection is located approximately 18 km west of the Project site. The current configuration of the intersection is a priority-controlled T-intersection, consisting of Basic Left (BAL) Turn Treatment on the northern approach as per Figure 2.1 of the *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* as shown in Figure 3.11 and Simple Left (SL) Turn Treatment on the southern approach. The intersection is shown in Figure 3.12 and Figure 3.13.

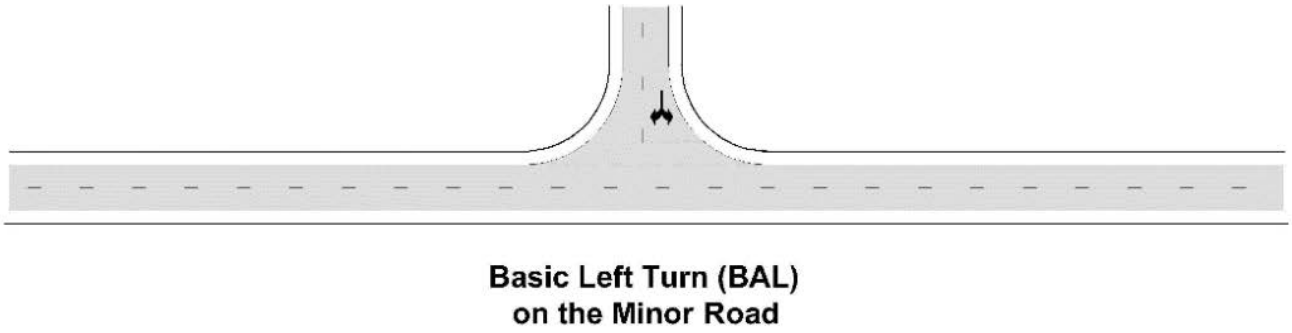


Figure 3.11 Rural Basic (BA) turn treatments: Basic Left Turn (BAL) on the Minor Road

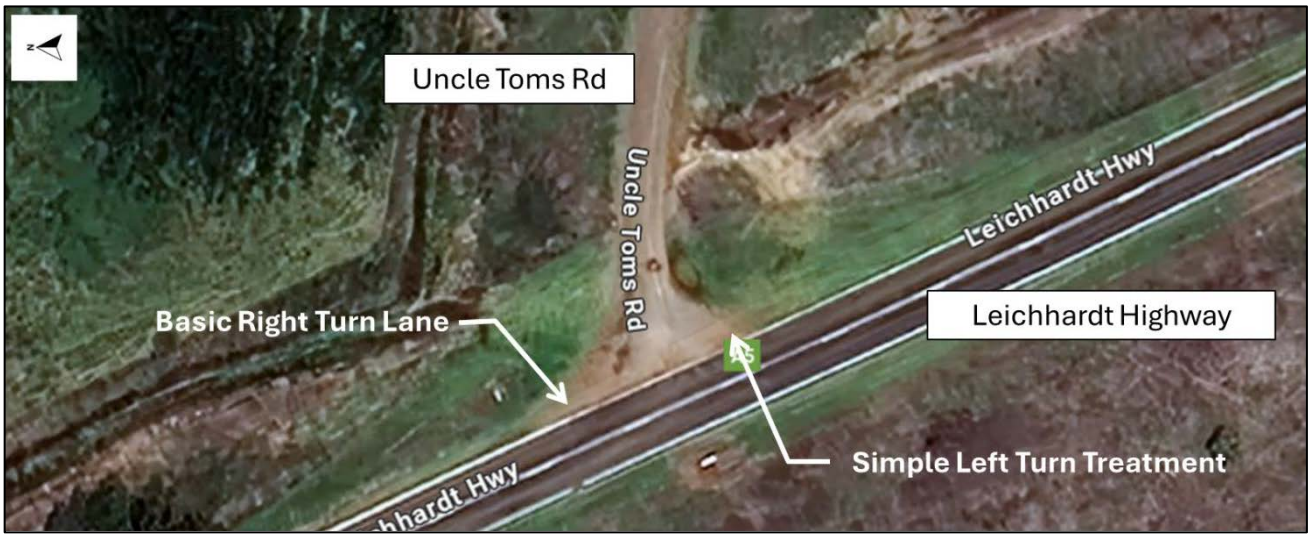


Figure 3.12 Leichhardt Highway/Uncle Toms Road intersection

Figure 3.13 Streetview of Leichhardt Highway/Uncle Toms Road intersection facing south

Source: Google Maps

Leichhardt Highway/Defence Road

This intersection is located approximately 20 km west of the Project site. The current configuration of the intersection is a priority-controlled T-intersection, consisting of Basic Left (BAL) Turn Treatment on the northern approach as per Figure 2.1 of the *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* as shown in Figure 3.11 above and Simple Left (SL) Turn Treatment on the southern approach. The intersection is shown in Figure 3.14 and Figure 3.15.

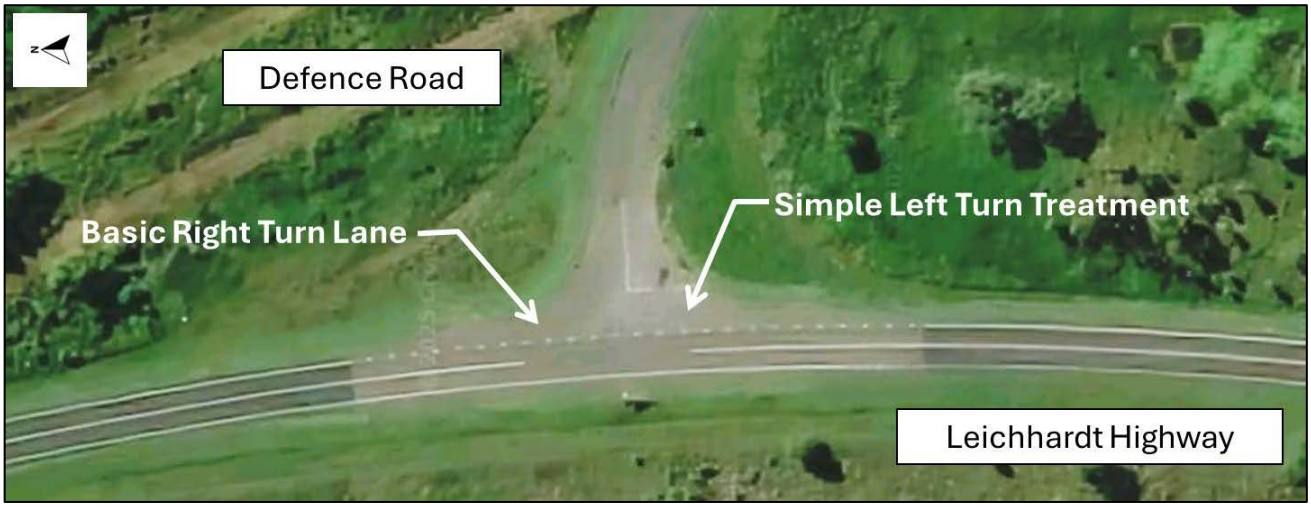


Figure 3.14 Leichhardt Highway/Defence Road intersection

Source: Google Maps

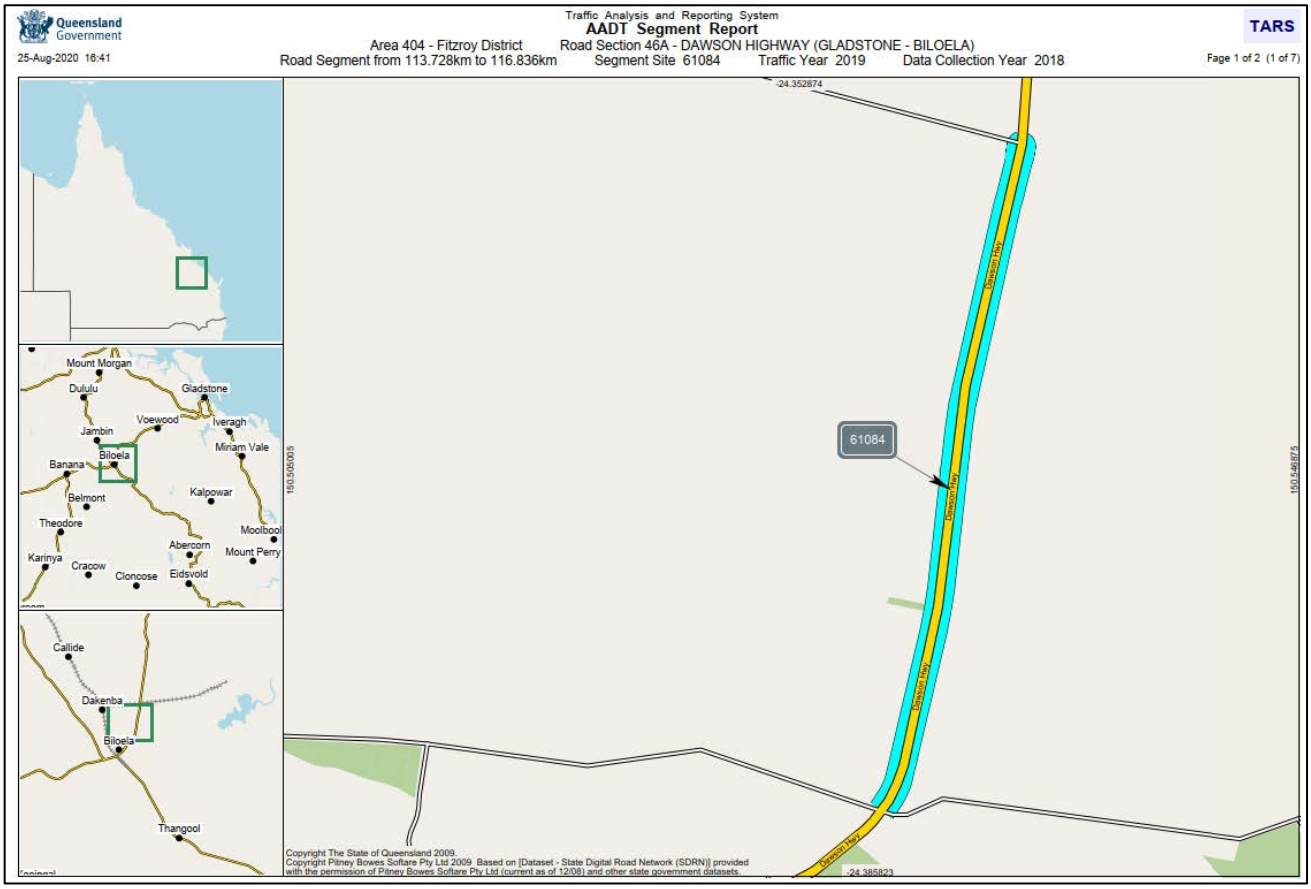
Figure 3.15 Streetview of Leichhardt Highway/Defence Road intersection facing south

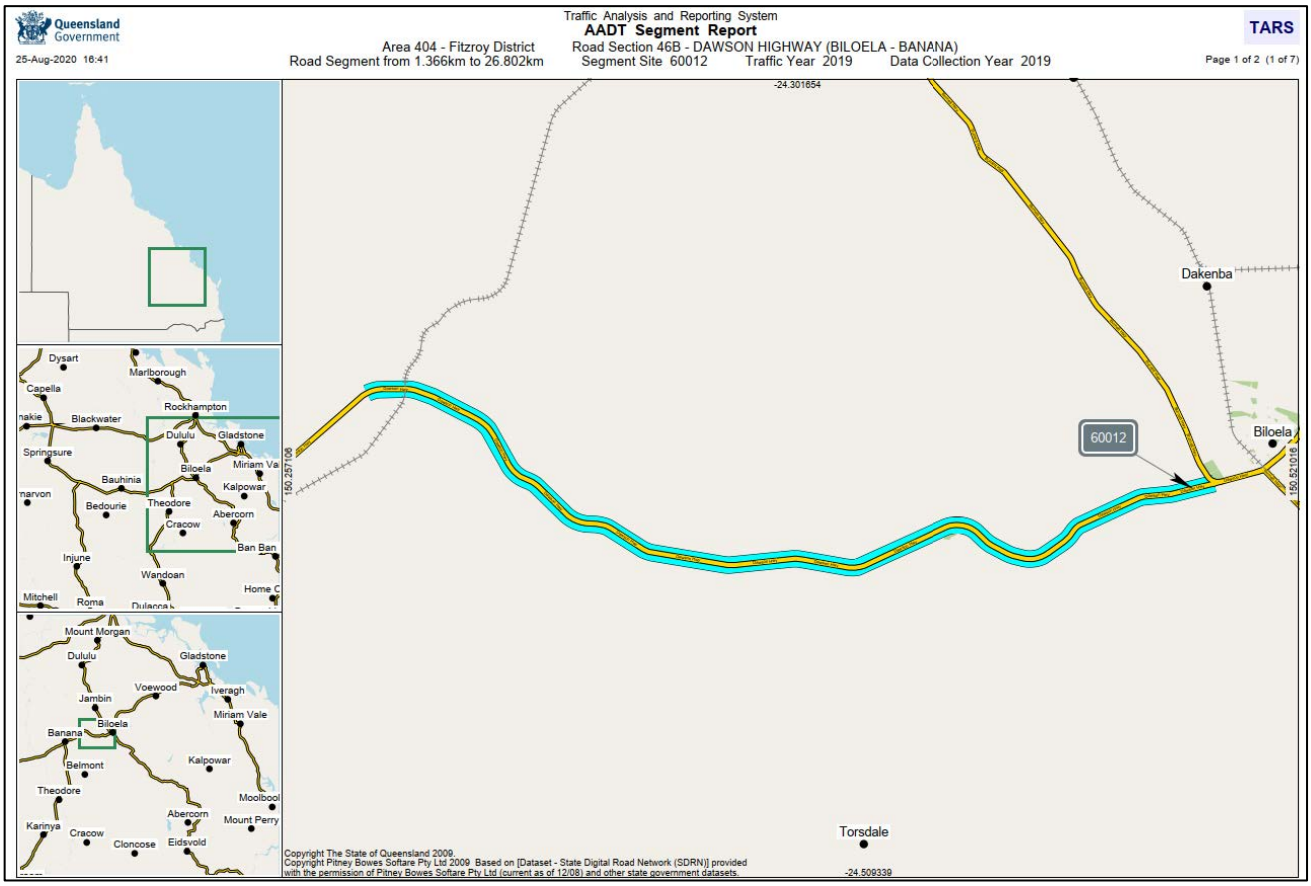
3.1.3 Existing traffic demands

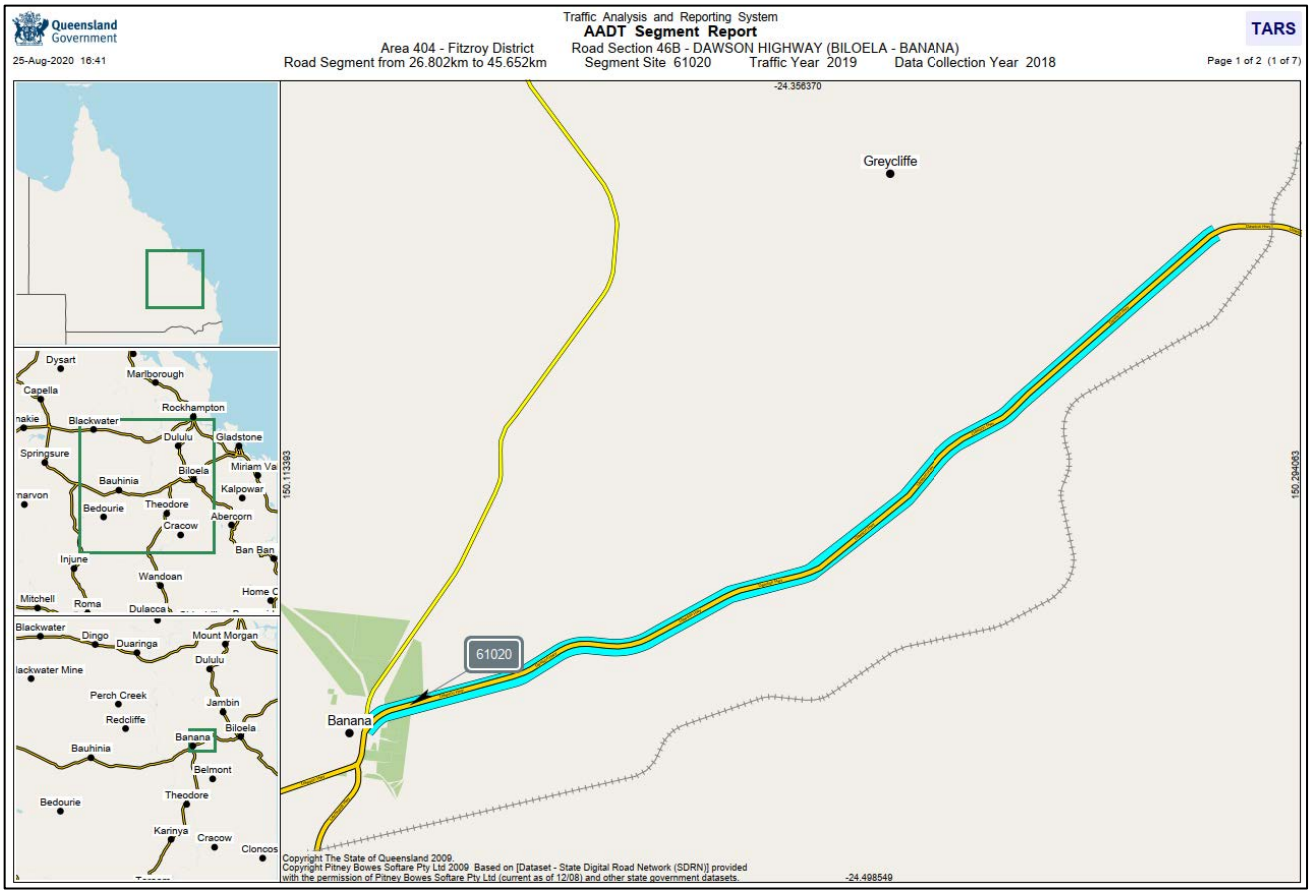
3.1.3.1 Link

Key road segments near the Project site to be assessed are shown in Figure 3.16.

Additional road sections, for which traffic data were collected for intersection turn volumes but not assessed in detail, are illustrated in Attachment A.




Queensland Government
25-Aug-2020 16:41
Traffic Analysis and Reporting System
AADT Segment Report
TARS
Area 404 - Fitzroy District
Road Segment from 1.366km to 26.802km
Road Section 46B - DAWSON HIGHWAY (BILOELA - BANANA)
Segment Site 60012
Traffic Year 2019
Data Collection Year 2019
Page 1 of 2 (1 of 7)
-24.301654
150.257106
150.521016
-24.509339
Dakenba
Biloela
Torsdale
60012
Dysart
Marlborough
Capella
Rockhampton
Blackwater
Dululu
Gladstone
Springsure
Miriam Va
Bauhinia
Biloela
Kalpowar
narvon
Bedourie
Theodore
Abercorn
Cracow
Ban Ban
Injune
Wandoan
Mitchell
Roma
Home C
Mount Morgan
Gladstone
Dululu
Voewood
Iveragh
Jambin
Miriam Vale
Biloela
Banana
Belmont
Kalpowar
Theodore
Moolboo
Abercorn
Mount Perry
Karinya
Cracow
Cloncose
Eidsvold
Copyright The State of Queensland 2009.
Copyright Pitney Bowes Softare Pty Ltd 2009 Based on [Dataset - State Digital Road Network (SDRN)] provided with the permission of Pitney Bowes Softare Pty Ltd (current as of 12/08) and other state government datasets.


Queensland Government
25-Aug-2020 16:41
Traffic Analysis and Reporting System
AADT Segment Report
TARS
Area 404 - Fitzroy District
Road Segment from 26.802km to 45.652km
Road Section 46B - DAWSON HIGHWAY (BILOELA - BANANA)
Segment Site 61020
Traffic Year 2019
Data Collection Year 2018
Page 1 of 2 (1 of 7)
-24.356370
150.113393
150.294063
-24.498549
Greycliffe
Banana
61020
Dysart
Marlborough
Capella
Rockhampton
Blackwater
Dululu
Gladstone
Springsure
Miriam Va
Biloela
Bauhinia
Kalpowar
narvon
Bedourie
Theodore
Abercorn
Cracow
Ban Ban
Injune
Wandoan
Mitchell
Roma
Home C
Blackwater
Dingo
Duaringa
Mount Morgan
Dululu
lackwater Mine
Perch Creek
Jambin
Redcliffe
Biloela
Banana
Bauhinia
Belmont
Theodore
Bedourie
Karinya
Cracow
Cloncos
Copyright The State of Queensland 2009.
Copyright Pitney Bowes Softare Pty Ltd 2009 Based on [Dataset - State Digital Road Network (SDRN)] provided with the permission of Pitney Bowes Softare Pty Ltd (current as of 12/08) and other state government datasets.

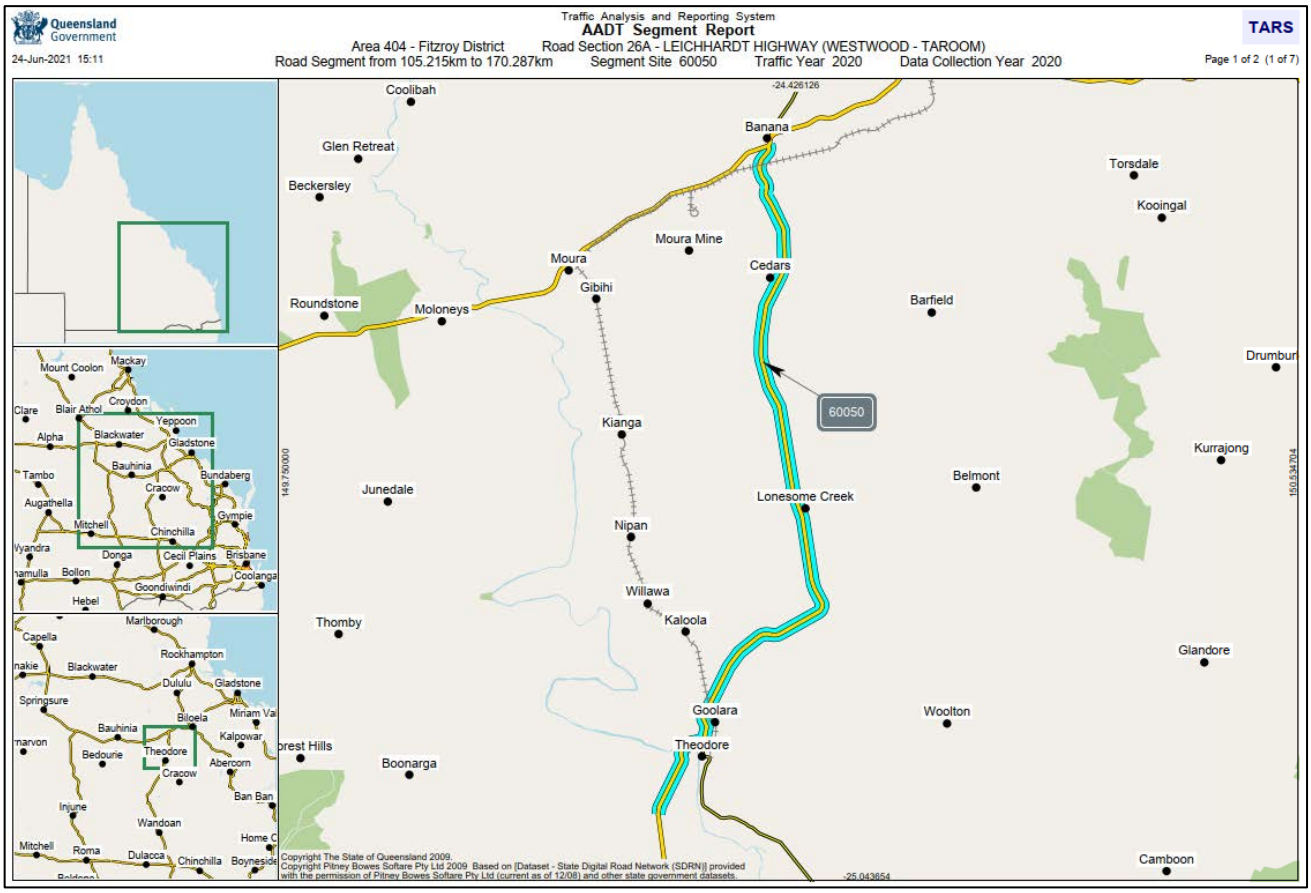


Figure 3.16 Road segments

Source: TMR AADT Segment Report

Table 3.2 shows the existing daily background traffic of each road segment (Site 61084, Site 60012, Site 61020, Site 61526, Site 61617 and Site 60050) near the Project site. Key information includes AADT and heavy vehicle percentages for the Gazettal (G), Against-Gazettal (A) and Both (B) directions, sourced from the 2023 Traffic Census, which is the most recent census year containing AADT segment reports for the four sites assessed in this report that have been identified as potentially impacted by construction and operational activities associated with the Project. The AM and PM peak hour traffic volumes for each segment and direction were derived from the Queensland Traffic Data Average by Hour by Day 2023 dataset.

The peak hour traffic volumes for a representative section of the Dawson Highway (Site 60012) shown in Figure 3.17 illustrates that the background AM and PM peak periods occur between 8:00 and 9:00 AM and 3:00 and 4:00 PM respectively and are typically 7% of daily flows. The detailed peak hour traffic volumes for each road segment mentioned above are provided in Attachment B.

Dawson Highway (Site 60012)			
Time	Westbound	Eastbound	Two way
0 to 1	2	2	4
1 to 2	2	1	3
2 to 3	3	2	5
3 to 4	4	2	6
4 to 5	22	8	30
5 to 6	66	31	97
6 to 7	57	44	101
7 to 8	65	70	135
8 to 9	**65**	**95**	**160**
9 to 10	68	87	155
10 to 11	69	81	150
11 to 12	68	77	145
12 to 13	75	70	145
13 to 14	75	67	142
14 to 15	74	74	148
15 to 16	**91**	**89**	**180**
16 to 17	84	85	169
17 to 18	87	74	161
18 to 19	47	56	103
19 to 20	27	36	63
20 to 21	19	17	36
21 to 22	14	9	23
22 to 23	5	5	10
23 to 24	3	2	5
Total	**1,092**	**1,084**	**2,176**

Figure 3.17 Peak hour traffic volume

Source: Queensland Traffic Data Average by Hour by Day 2023

Table 3.2 AADT traffic volumes and heavy vehicle percentages (2023)

Site	Road (section)	Chainage (km)	Volumes (AADT)			Heavy vehicle %			AM peak volume			PM peak volume		
			G	A	B	G	A	B	G	A	B	G	A	B
61084	46A – Dawson Highway (Gladstone – Biloela)	113.728 km to 116.836 km	834	848	1,682	22%	13%	17%	65	56	121	64	59	123
60012	46B – Dawson Highway (Biloela – Banana)	1.366 km to 26.802 km	975	991	1,966	15%	25%	20%	65	95	160	91	89	180
61020	46B – Dawson Highway (Biloela – Banana)	26.802 km to 45.652 km	626	642	1,268	24%	22%	23%	51	49	100	57	55	112
60050	26A – Leichhardt Highway (Westwood – Taroom)	105.215 km to 170.287 km	426	440	866	31%	40%	35%	37	33	70	31	37	68
61617	46C – Dawson Highway (Banana – Rolleston)	0.000 km to 7.750 km	659	642	1,301	35%	22%	28%	46	57	103	57	56	113
61526	26A – Leichhardt Highway (Westwood – Taroom)	104.655 km to 105.215 km	1,189	1,226	2,415	28%	24%	26%	81	87	168	89	98	187

3.1.3.2 Intersection

Dawson Highway/Leichhardt Highway intersection

2023 peak hour intersection turn volumes (8:00–9:00 AM and 3:00–4:00 PM) for the intersection of Dawson Highway/ Leichhardt Highway have been estimated based on:

- observed peak hour volumes on Dawson Highway (Site 61617) and Leichhardt Highway (Site 61526 and Site 60050)
- application of the directional distribution observed on Dawson Highway and the eastern approach of Leichhardt Highway during the AM and PM peak periods to the observed peak hour traffic volumes to generate expected turn movement volumes
- application of daily heavy vehicle proportions to the peak hour traffic volumes.

The estimated 2023 AM and PM peak hour intersection turn volumes are shown in Figure 3.18.

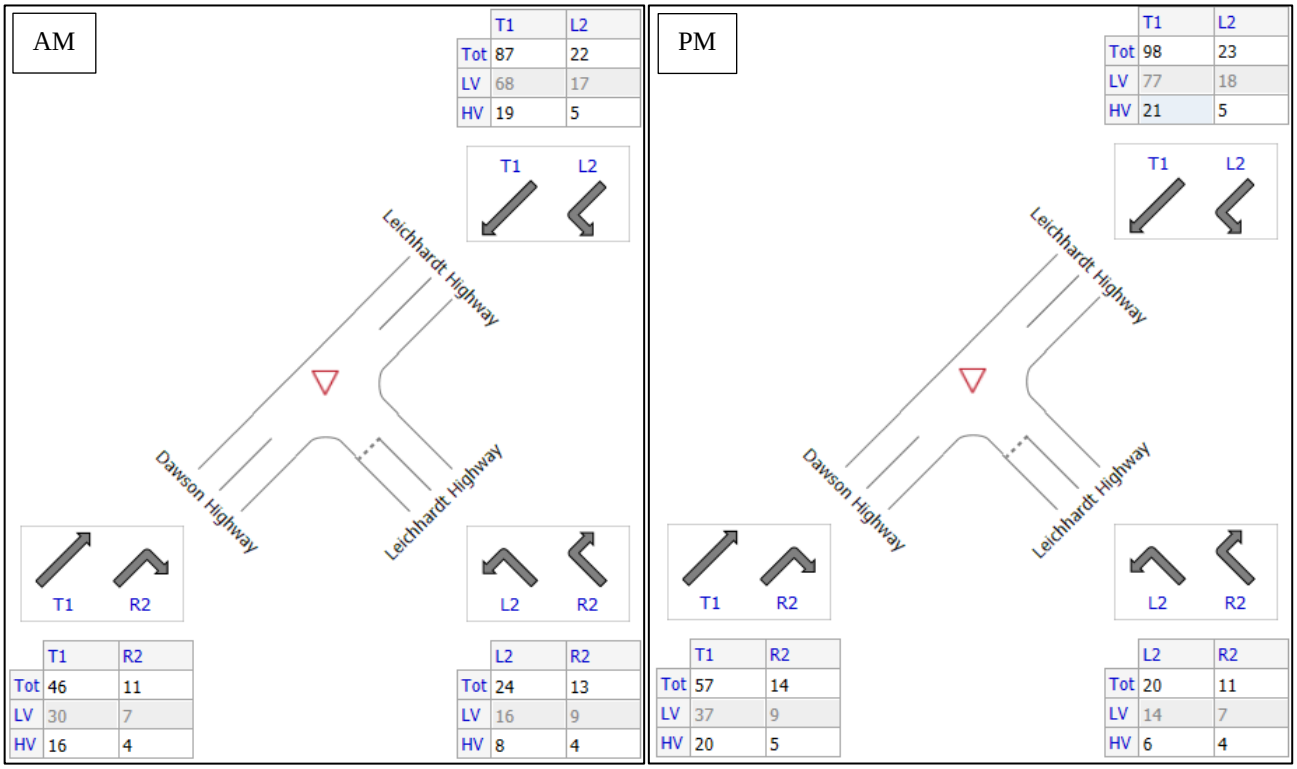


Figure 3.18 Dawson Highway/Leichhardt Highway AM and PM peak period intersection turn volumes (2023)

Leichhardt Highway/Uncle Toms Road intersection

2023 peak hour intersection turn volumes (8:00–9:00 AM and 3:00–4:00 PM) for the intersection of Leichhardt Highway/Uncle Toms Road intersection have been estimated based on:

- observed peak hour volumes on and Leichhardt Highway (Site 60050)
- application of a directional distribution of 10% (turning into/exiting Uncle Toms Road) to the calculated peak hour volumes on Leichhardt Highway
- application of daily heavy vehicle proportions to the peak hour traffic volumes.

The estimated 2023 AM and PM peak hour intersection turn volumes are shown in Figure 3.19.

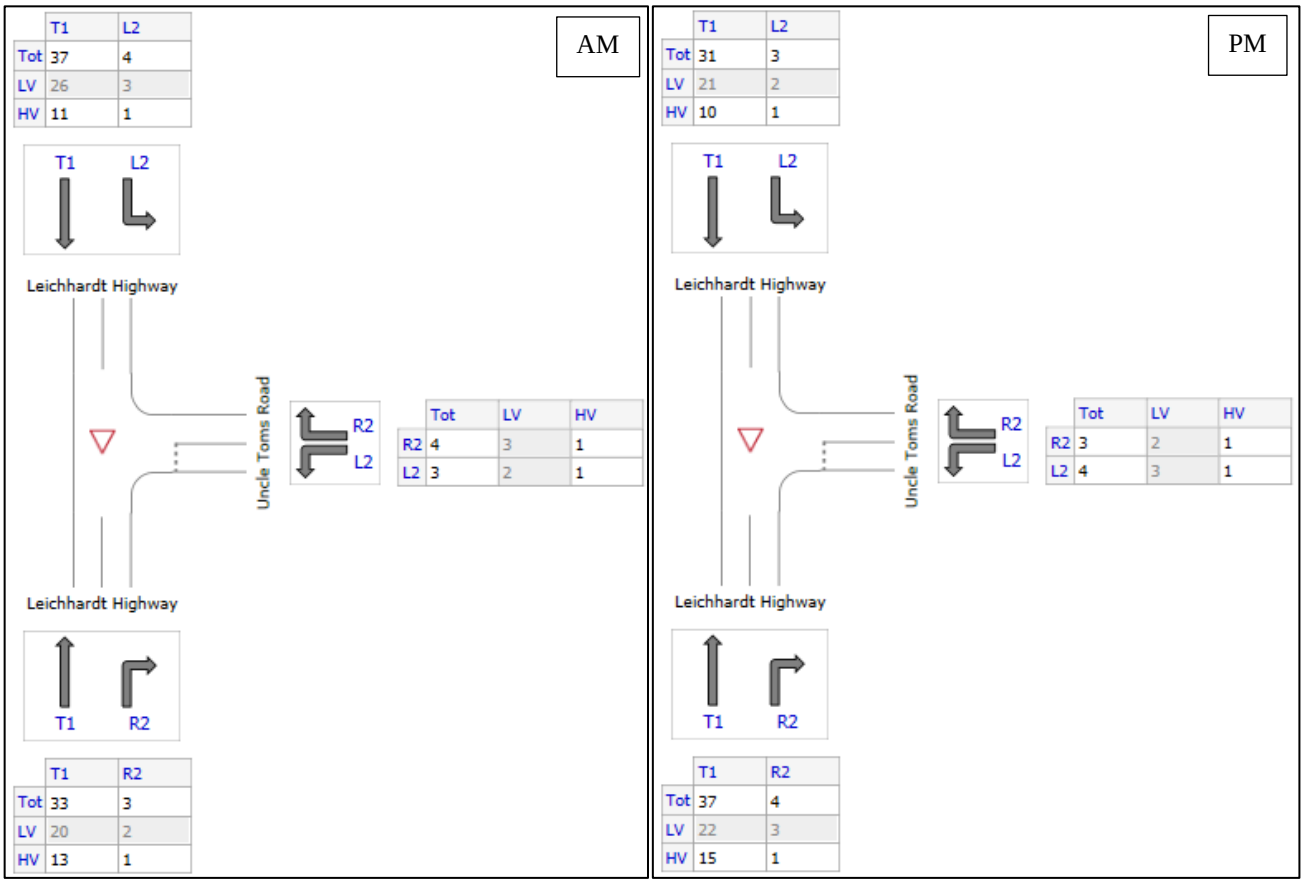


Figure 3.19 Leichhardt Highway/Uncle Toms Road AM and PM peak period intersection turn volumes (2023)

Leichhardt Highway/Defence Road intersection

2023 peak hour intersection turn volumes (8:00–9:00 AM and 3:00–4:00 PM) for the intersection of Leichhardt Highway/Defence Road intersection have been estimated based on:

- observed peak hour volumes on and Leichhardt Highway (Site 60050)
- application of a directional distribution of 10% (turning into/exiting Defence Road) to the calculated peak hour volumes on Leichhardt Highway to generate turn movement volumes
- application of daily heavy vehicle proportions to the peak hour traffic volumes.

The estimated 2023 AM and PM peak hour intersection turn volumes are shown in Figure 3.20.

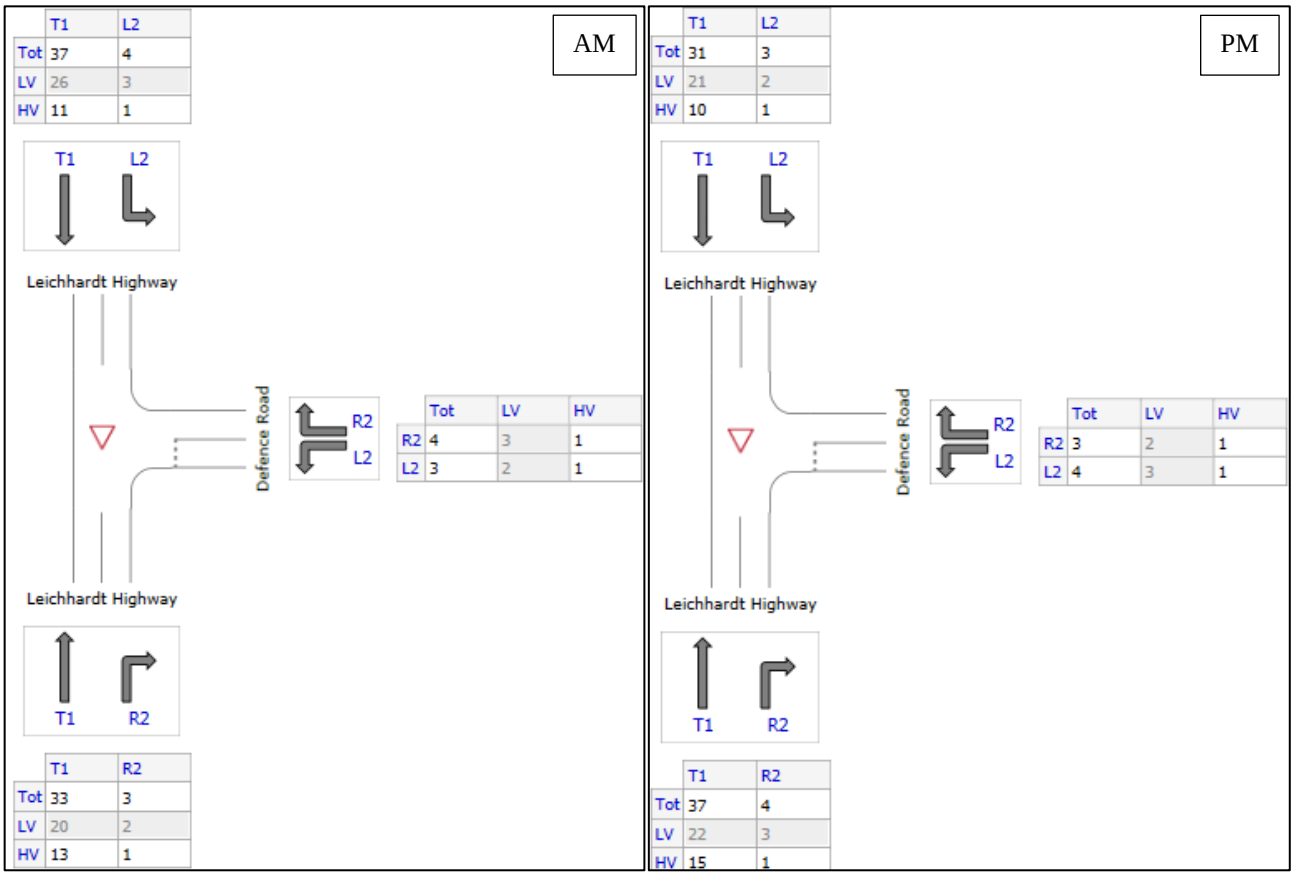


Figure 3.20 Leichhardt Highway/Defence Road AM and PM peak period intersection turn volumes (2023)

3.1.3.3 Growth rates

Historic AADT ten-year growth rates on each road segment (taken from the 2023 Traffic Census) are shown in Table 3.3.

Table 3.3 Historic growth rates (2023)

Site	Road section ID – road name	Chainage (km)	Ten-year growth rate %		
			G	A	B
61084	46A – Dawson Highway (Gladstone – Biloela)	113.728 km to 116.836 km	-1.57%	-1.99%	-1.81%
60012	46B – Dawson Highway (Biloela – Banana)	1.366 km to 26.802 km	0.04%	0.35%	0.18%
61020	46B – Dawson Highway (Biloela – Banana)	26.802 km to 45.652 km	0.32%	0.50%	0.40%
61526	26A – Leichhardt Highway (Westwood – Taroom)	104.655 km to 105.215 km	1.35%	1.50%	1.42%
61617	46C – Dawson Highway (Banana – Rolleston)	0.000 km to 7.750 km	-0.65%	-1.19%	-0.93%
60050	26A – Leichhardt Highway (Westwood – Taroom)	105.215 km to 170.287 km	0.31%	0.81%	0.56%

Based on the above, AADT traffic volumes and peak period traffic volumes for the construction year of 2026, opening year of 2028 and the design horizon year of 2038 have been extrapolated using the ten-year growth rates specific to each road segment and direction. To ensure a conservative assessment, locations (Site 61084 and Site 61617) which exhibited a negative growth trend have been assigned a zero growth rate for future year extrapolation to avoid underestimation.

The observed background and extrapolated future year AADT traffic volumes by direction are shown below in Figure 3.21 and peak period traffic volumes are shown in Figure 3.22.

Segment	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
61084	G	834	834	834	834	834	834	834	834	834	834	834	834	834	834	834	834	0.00%
	A	848	848	848	848	848	848	848	848	848	848	848	848	848	848	848	848	0.00%
	B	1682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	0.00%
60012	G	975	975	976	976	977	977	977	978	978	979	979	979	980	980	980	981	0.04%
	A	991	994	998	1,001	1,005	1,008	1,012	1,016	1,019	1,023	1,026	1,030	1,033	1,037	1,041	1,044	0.35%
	B	1966	1,970	1,973	1,977	1,980	1,984	1,987	1,991	1,994	1,998	2,002	2,005	2,009	2,013	2,016	2,020	0.18%
61020	G	626	628	630	632	634	636	638	640	642	644	646	648	650	653	655	657	0.32%
	A	642	645	648	652	655	658	662	665	668	671	675	678	682	685	688	692	0.50%
	B	1268	1,273	1,278	1,283	1,288	1,294	1,299	1,304	1,309	1,314	1,320	1,325	1,330	1,336	1,341	1,346	0.40%
60050	G	426	427	429	430	431	433	434	435	437	438	439	441	442	443	445	446	0.31%
	A	440	444	447	451	454	458	462	466	469	473	477	481	485	489	493	497	0.81%
	B	866	871	876	881	886	891	896	901	906	911	916	921	926	931	936	942	0.56%
61617	G	659	659	659	659	659	659	659	659	659	659	659	659	659	659	659	659	0.00%
	A	642	642	642	642	642	642	642	642	642	642	642	642	642	642	642	642	0.00%
	B	1301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	1,301	0.00%
61526	G	1189	1,205	1,221	1,238	1,255	1,271	1,289	1,306	1,324	1,342	1,360	1,378	1,397	1,415	1,435	1,454	1.35%
	A	1226	1,244	1,263	1,282	1,301	1,321	1,341	1,361	1,381	1,402	1,423	1,444	1,466	1,488	1,510	1,533	1.50%
	B	2415	2,449	2,484	2,519	2,555	2,591	2,628	2,666	2,703	2,742	2,781	2,820	2,860	2,901	2,942	2,984	1.42%

Figure 3.21 Background and extrapolated future year peak hour traffic volumes

Segment 61084	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Southbound	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	0.00%
(8-9am)	Northbound	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	0.00%
PM	Southbound	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	0.00%
(3-4pm)	Northbound	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	0.00%

Segment 60012	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Westbound	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	0.04%
(8-9am)	Eastbound	95	95	96	96	96	97	97	97	98	98	98	99	99	99	100	100	0.35%
PM	Westbound	91	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92	0.04%
(3-4pm)	Eastbound	89	89	90	90	90	91	91	91	92	92	92	92	93	93	93	94	0.35%

Segment 61020	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Westbound	51	51	51	51	52	52	52	52	52	52	53	53	53	53	53	54	0.32%
(8-9am)	Eastbound	49	49	49	50	50	50	50	51	51	51	52	52	52	52	53	53	0.50%
PM	Westbound	57	57	57	58	58	58	58	58	58	59	59	59	59	59	60	60	0.32%
(3-4pm)	Eastbound	55	55	56	56	56	56	57	57	57	58	58	58	58	59	59	59	0.50%

Segment 61617	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Westbound	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	0.00%
(8-9am)	Eastbound	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	0.00%
PM	Westbound	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	0.00%
(3-4pm)	Eastbound	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	0.00%

Segment 60050	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Southbound	37	37	37	37	37	38	38	38	38	38	38	38	38	39	39	39	0.31%
(8-9am)	Northbound	33	33	34	34	34	34	35	35	35	35	36	36	36	37	37	37	0.81%
PM	Southbound	31	31	31	31	31	31	32	32	32	32	32	32	32	32	32	32	0.31%
(3-4pm)	Northbound	37	37	38	38	38	39	39	39	39	40	40	40	41	41	41	42	0.81%

Segment 61526	Direction	Census Year			Construction Year		Opening Year										Design Horizon	Growth Rate
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
AM	Southbound	81	82	83	84	85	87	88	89	90	91	93	94	95	96	98	99	1.35%
(8-9am)	Northbound	87	88	90	91	92	94	95	97	98	99	101	102	104	106	107	109	1.50%
PM	Southbound	89	90	91	93	94	95	96	98	99	100	102	103	105	106	107	109	1.35%
(3-4pm)	Northbound	98	99	101	102	104	106	107	109	110	112	114	115	117	119	121	123	1.50%

Figure 3.22 Background and extrapolated future year peak period traffic volumes

3.1.4 Historical crash incidents

A review of the available five-year crash data between 2020 and 2024 revealed that there are 26 reported crash incidents in the vicinity of the Project site, including along the Leichhardt Highway, Dawson Highway and several nearby local roads as illustrated in Figure 3.23 and detailed in Table 3.4. The majority of these incidents were related to vehicles leaving the carriageway and of a severity requiring hospitalisation.

Table 3.4 Crash descriptions

Crash ID	Crash street	Crash year	Crash type	Degree of casualty	Crash description	Natural lighting	Speeding
117182	Leichhardt Highway	2020	Single Vehicle	Hospitalisation	Off Path-Straight: Out Of Control On Cway	Darkness – Not lighted	100–110 km/h
192210	Leichhardt Highway	2021	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Right Bend	Daylight	100–110 km/h
237385	Leichhardt Highway	2020	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Right Bend	Daylight	100–110 km/h
238022	Leichhardt Highway	2020	Single Vehicle	Minor injury	Off Path-Straight: Right Off Cway Hit Obj	Daylight	100–110 km/h
263090	Leichhardt Highway	2023	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Right Bend	Daylight	100–110 km/h
316957	Leichhardt Highway	2020	Single Vehicle	Hospitalisation	Off Path-Curve: Out Of Control On Cway	Darkness – Not lighted	100–110 km/h
206270	Leichhardt Highway	2020	Single Vehicle	Hospitalisation	Off Path-Curve: Mounts Traffic Island	Darkness – Lighted	60 km/h
400060	Leichhardt Highway	2020	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Rt Bend Hit Obj	Darkness – Not lighted	100–110 km/h
305902	Dawson Highway	2021	Single Vehicle	Hospitalisation	Vehs On Path: Temporary Object On Cway	Darkness – Not lighted	100–110 km/h
376391	Dawson Highway	2021	Single Vehicle	Medical treatment	Off Path-Curve: Off Cway Rt Bend Hit Obj	Daylight	100–110 km/h
153457	Dawson Highway	2020	Hit pedestrian	Hospitalisation	Pedn: Near Side Vehicle Hit From Right	Daylight	100–110 km/h
269012	Dawson Highway	2023	Multi-Vehicle	Hospitalisation	Vehs Opposite Approach: Head On	Daylight	100–110 km/h
299435	Dawson Highway	2024	Other	Minor injury	Pass & Misc: Hit Animal	Darkness – Not lighted	100–110 km/h
303800	Dawson Highway	2022	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Lt Bend Hit Obj	Daylight	100–110 km/h
163628	Dawson Highway	2020	Single Vehicle	Hospitalisation	Off Path-Curve: Out Of Control On Cway	Daylight	100–110 km/h

Crash ID	Crash street	Crash year	Crash type	Degree of casualty	Crash description	Natural lighting	Speeding
266916	Dawson Highway	2022	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Rt Bend Hit Obj	Daylight	100–110 km/h
364442	Dawson Highway	2023	Single Vehicle	Hospitalisation	Off Path-Curve: Out Of Control On Cway	Daylight	100–110 km/h
216315	Dawson Highway	2022	Single Vehicle	Hospitalisation	Off Path-Straight: Left Off Cway Hit Obj	Daylight	100–110 km/h
237084	Meissners Road	2020	Single Vehicle	Minor injury	Off Path-Straight: Out Of Control On Cway	Darkness – Not lighted	100–110 km/h
315774	Burnett Highway	2021	Single Vehicle	Medical treatment	Off Path-Straight: Left Off Cway Hit Obj	Daylight	80–90 km/h
365261	Dawson Highway	2024	Multi-Vehicle	Medical treatment	Vehs Manoeuvring: Entering From Footway	Daylight	70 km/h
301273	Leichhardt Highway	2023	Single Vehicle	Medical treatment	Off Path-Straight: Right Off Cway	Daylight	100–110 km/h
312178	Leichhardt Highway	2022	Single Vehicle	Minor injury	Off Path-Curve: Off Cway Lt Bend Hit Obj	Daylight	100–110 km/h
321740	Letchford Road	2023	Single Vehicle	Fatal	Off Path-Curve: Off Cway Lt Bend Hit Obj	Darkness – Not lighted	100–110 km/h
372495	Crowsdale-Camboon Road	2022	Other	Hospitalisation	Pass & Misc: Hit Animal	Daylight	100–110 km/h
381494	Shawlands Road	2022	Single Vehicle	Hospitalisation	Off Path-Straight: Out Of Control On Cway	Daylight	60 km/h

Source: Crash data from Queensland Roads (Queensland Globe)

PS218956
Theodore Wind Farm Connection Project
Figure 3.23
Historical crash incident locations
(2020 - 2024)

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Crash incident locations

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

Roads

- State-controlled roads (SCR)
- Queensland roads and tracks

Boundaries

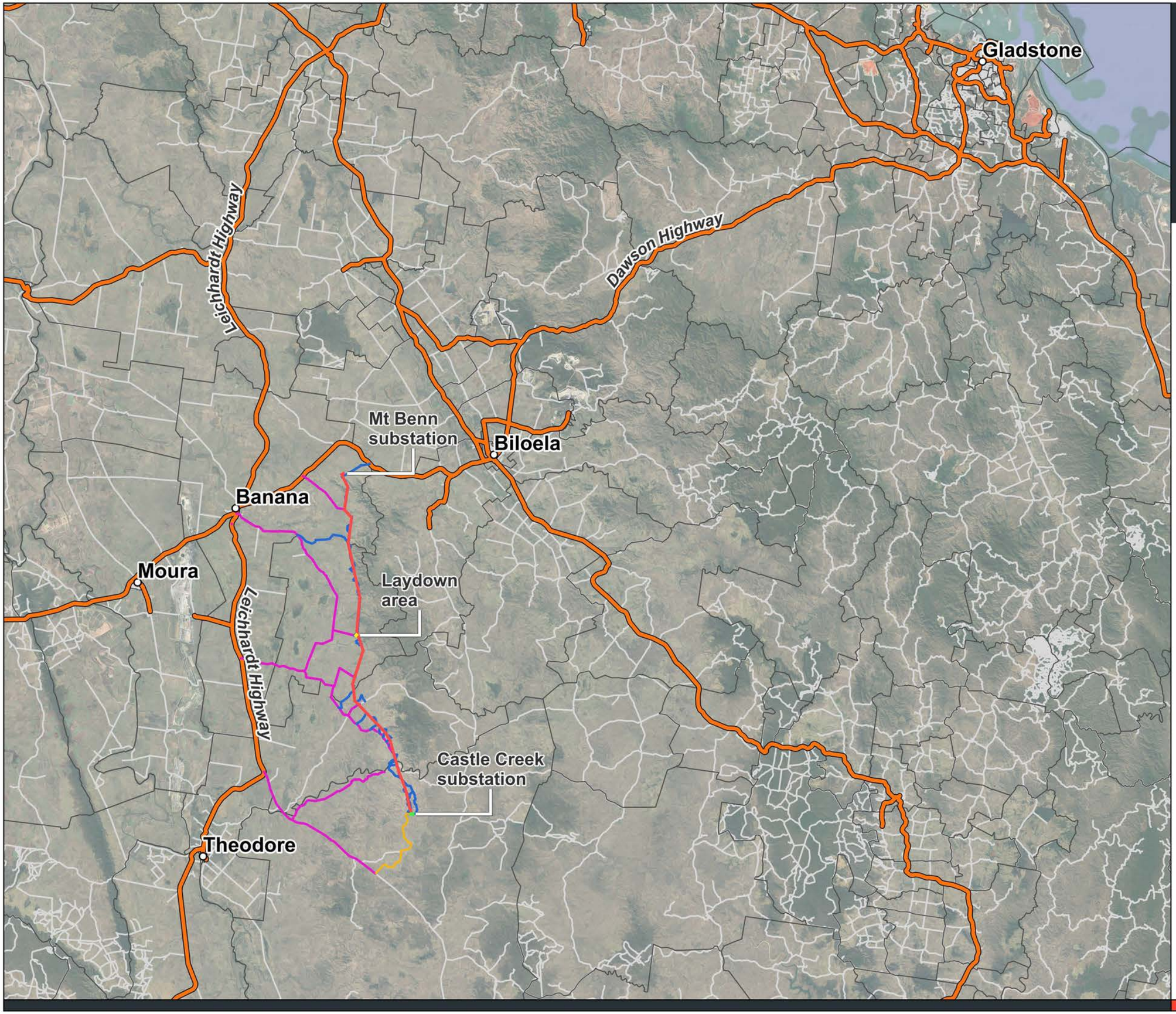
- Locality boundaries

0 5 10 km
1:290,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

3.2 Freight routes

A review of the State-controlled road network for heavy vehicle route restrictions was undertaken in the vicinity to the Project site to understand the potential limitations of the Project site access. Heavy vehicle routes in the vicinity of the Project site are shown in Figure 3.24 and Figure 3.25, indicating the extent of routes pre-approved for the B25/26 route (B-double 25m/26m network) and the critical roads network. It is noted that both the Leichhardt Highway and Dawson Highway are approved for the B-double vehicles up to 26 m and 4.6 m in height between Gladstone and the Project site.



PS218956
Theodore Wind Farm Connection Project
Figure 3.24
Heavy vehicle route network

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Roads

- B-double 25m/26m routes
- State-controlled roads (SCR)
- Queensland roads and tracks

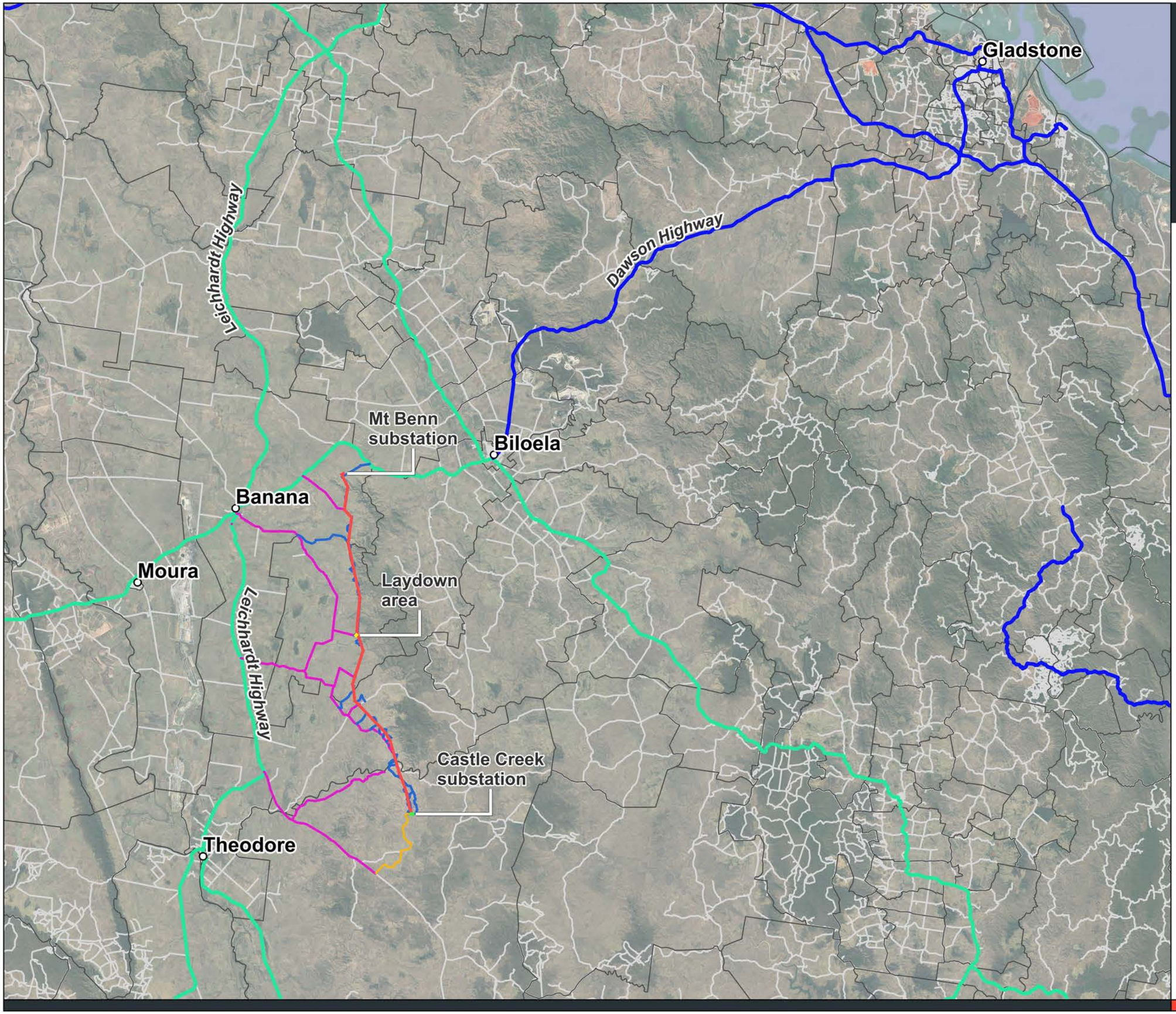
Boundaries

- Locality boundaries

0 10 20 km

1:600,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics



wsp

PS218956
Theodore Wind Farm Connection Project
Figure 3.25
Critical roads network

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Roads

- Queensland roads and tracks

Critical roads network

- Critical roads type A
- Critical roads type B

Boundaries

- Locality boundaries

0 10 20 km

1:600,000
Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

3.3 Public transport

The Project is not currently serviced by any public transport services. Private intercity coach services (Service GX461 and GX462) operated by Greyhound Australia travel along Leichhardt Highway and Dawson Highway between Miles and Rockhampton at a frequency of three services per week (Monday, Wednesday and Friday) as shown in Figure 3.26 and Figure 3.27.

13:15 Miles - Moura - Rockhampton (Service GX461) RE

Mo, We, Fr Services may be Altered on Public Holidays

Greyhound Australia

1300 473 946

Bookings are compulsory on all services. Call Centre: 06:30-17:00 EST Mon-Fri and Public Holidays; 06:30-16:00 EST Sat-Sun. On-line booking available

https://www.greyhound.com.au/

km				arr	dep	on days
343	Miles	Qld	Ampol Service Station, Murilla Street / Tully Street		13:15	Mo, We, Fr
392	Guluguba	Qld	Guluguba Store	13:55	13:55	Mo, We, Fr
412	Wandoan	Qld	BP Service Station, Zupp Road	14:05	14:05	Mo, We, Fr
470	Taroom	Qld	Dawson Valley Roadhouse	14:50	14:50	Mo, We, Fr
565	Theodore	Qld	Newsagency, 57 The Boulevard	15:55	15:55	Mo, We, Fr
591	Moura	Qld	BP Service Station	16:30	16:30	Mo, We, Fr
610	Banana	Qld	Banana Store - Choice Roadhouse, Bowen Street	16:55	17:30	Mo, We, Fr b
656	Biloela	Qld	Shell Service Station, Dawson Highway	17:50	17:50	Mo, We, Fr
686	Jambin	Qld	Emmerts Store	18:15	18:15	Mo, We, Fr
731	Dululu	Qld	Bus Stop - Bert Peacock Park	18:50	18:50	Mo, We, Fr
763	Mount Morgan	Qld	CQP Service Station, Opposite IGA	19:10	19:10	Mo, We, Fr
802	Rockhampton	Qld	Puma Service Station and Coach Terminal, 101 George Street	19:45		Mo, We, Fr

06:00 Rockhampton - Moura - Miles (Service GX462) RE

Mo, We, Fr Services may be Altered on Public Holidays

Greyhound Australia

1300 473 946

Bookings are compulsory on all services. Call Centre: 06:30-17:00 EST Mon-Fri and Public Holidays; 06:30-16:00 EST Sat-Sun. On-line booking available

https://www.greyhound.com.au/

km				arr	dep	on days
802	Rockhampton	Qld	Puma Service Station and Coach Terminal, 101 George Street		06:00	Mo, We, Fr
763	Mount Morgan	Qld	CQP Service Station, Opposite IGA	06:35	06:35	Mo, We, Fr
731	Dululu	Qld	Bus Stop - Bert Peacock Park	07:00	07:00	Mo, We, Fr
686	Jambin	Qld	Emmerts Store	07:35	07:35	Mo, We, Fr
656	Biloela	Qld	Shell Service Station, Dawson Highway	08:00	08:00	Mo, We, Fr
610	Banana	Qld	Banana Store - Choice Roadhouse, Bowen Street	08:30	09:00	Mo, We, Fr
591	Moura	Qld	BP Service Station	09:15	09:15	Mo, We, Fr
565	Theodore	Qld	Newsagency, 57 The Boulevard	10:00	10:00	Mo, We, Fr
470	Taroom	Qld	Dawson Valley Roadhouse	11:00	11:00	Mo, We, Fr
412	Wandoan	Qld	BP Service Station, Zupp Road	11:50	11:50	Mo, We, Fr
392	Guluguba	Qld	Guluguba Store	12:00	12:00	Mo, We, Fr
343	Miles	Qld	Ampol Service Station, Murilla Street / Tully Street	12:30		Mo, We, Fr

Figure 3.26 Timetable information for Service GX461 and GX462

Source: GetAbout Australia (https://getaboutaustralia.com)

PS218956
Theodore Wind Farm Connection Project
Figure 3.27
Intercity coach services

Legend

Project elements

- Proposed transmission lines
- Castle Creek substation

Proposed site access

- Proposed local access routes
- Proposed access tracks
- Proposed Castle Creek Substation Access Easement Route
- Laydown area

Intercity coach services

- Stops

Roads

- State-controlled roads (SCR)
- Queensland roads and tracks

Boundaries

- Locality boundaries

0 5 10 km

1:290,000

Date: 26/08/2025

Data sources: WSP, QLD Government, RWE, Powerlink, World Imagery: Earthstar Geographics

3.4 Active transport

Due to the rural nature of the area, there is no dedicated active transport infrastructure in the immediate vicinity of the Project site.

4 Impact assessment

4.1 Construction stage

4.1.1 Link capacity assessment

An assessment of the increases to AADT traffic volumes on the Dawson Highway and Leichhardt Highway as a result of the Project's construction traffic generation has been undertaken for the construction year of 2026. This analysis represents a worst-case assessment for link capacity increases, investigating a day of peak construction workers (121 trips in and out) and peak heavy vehicles (2 trips in and out). As per Section 3.1.3.3 the ten-year growth rates have been applied to the observed 2023 AADT traffic volumes to extrapolate to the 2026 construction year.

This link capacity assessment has been undertaken for the following Dawson Highway and Leichhardt Highway road segments:

- 61084 – Next segment to the east of the Project site (Free-Flow Speed, FFS=100 km/h)
- 60012 – Immediately adjacent to the Project site (Free-Flow Speed, FFS=100 km/h)
- 61020 – Immediately adjacent to the Project site (Free-Flow Speed, FFS=100 km/h)
- 60050 – Immediately adjacent to the Project site (Free-Flow Speed, FFS=100 km/h).

The results of this analysis are presented in Table 4.1. They show that during the day of the Project's highest generated traffic volumes, development flows exceed 5% of the background AADT volumes in either direction on both the Dawson Highway and Leichhardt Highway (greatest increase of 28.5%).

Table 4.1 Link capacity assessment (2026 – construction year)

Site	Road section ID – road name	Base AADT (G)	Construction daily volume (G)	% increase (G)	Base AADT (A)	Construction daily volume (A)	% increase (A)
61084	46A – Dawson Highway (Gladstone – Biloela)	834	123	14.7%	848	123	14.5%
60012	46B – Dawson Highway (Biloela – Banana)	976	123	12.56%	1,001	123	12.24%
61020	46B – Dawson Highway (Biloela – Banana)	632	123	19.4%	652	123	18.8%
60050	26A – Leichhardt Highway (Westwood – Taroom)	430	123	28.5%	451	123	27.2%

A more detailed peak hour link LoS assessment has been undertaken for Dawson Highway and Leichhardt Highway where construction traffic results in a greater than 5% increase to base AADT traffic volumes. As per Table 3.2 the based AADT traffic volumes of each road segment have been applied. Peak hour road link LoS has been calculated based on Table 5.5 of the *Guide to Traffic Management Part 3* (Austroads 2020), as replicated in Table 4.2 for a road of 100 km/h. A description of the six link based LoS is outlined below in Table 4.3. It is noted that the LoS criterion for Highways is based on Passenger Car Units (PCU), which has been accounted for by factoring background and proposed vehicle volumes for heavy vehicles by a PCU factor of 2.

The results of the link assessment are shown in Table 4.4. The results for the road section where the Project generated traffic exceeds 5% of the base AADT traffic volumes show all LoS with and without development traffic are LoS A with no change in peak hour link LoS. As such, The Project construction is not considered to have a significant impact on link capacity and no mitigation of link capacity impacts is required.

Table 4.2 LoS criteria of highway peak hour flows per lane direction

Level of Service	Maximum Service Flow (pcu/ln/hr)				
	A	B	C	D	E
100 km/h	660	1,080	1,550	1,980	2,200

Table 4.3 Level of Service description

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

Source: Guide to Traffic Generating Developments (Roads and Traffic Authority, 2002)

Table 4.4 Link capacity assessment: Dawson Highway and Leichhardt Highway (2026 – construction year)

Site	Peak	Direction	Volumes – without development	PCU 2026 flow – without development (pcu/ln/hr)	LoS	Development volumes		Volumes – with development	PCU 2026 flow - with development (pcu/ln/hr)	LoS
						LV	HV			
61084	AM	Southbound	65	79	A	121	2	188	203	A
		Northbound	56	63	A	0	2	58	67	A
	PM	Southbound	64	78	A	0	2	66	81	A
		Northbound	59	67	A	121	2	182	191	A
60012	AM	Westbound	65	75	A	121	2	188	199	A
		Eastbound	96	120	A	0	2	98	124	A
	PM	Westbound	91	105	A	0	2	93	108	A
		Eastbound	90	113	A	121	2	212	237	A
61020	AM	Westbound	51	64	A	121	2	174	188	A
		Eastbound	50	61	A	0	2	51	64	A
	PM	Westbound	58	71	A	0	2	59	75	A
		Eastbound	56	68	A	121	2	178	192	A
60050	AM	Southbound	37	49	A	121	2	160	173	A
		Northbound	34	47	A	0	2	36	51	A
	PM	Southbound	31	41	A	0	2	33	44	A
		Northbound	38	53	A	121	2	160	177	A

4.1.2 Pavement assessment

An assessment to determine potential pavement impacts to the surrounding State-controlled roads resulting from the Project's construction generated heavy vehicle traffic has been undertaken. The initial assessments identifies any road links where the total yearly development SARs are expected to exceed 5% of the yearly background traffic SARs in either direction on the link's during the construction period.

For the purpose of this assessment a SAR4 load damage exponent has been adopted for the Dawson Highway and Leichhardt Highway with an average SAR4 value of 4 (as per the *Guide to Traffic Impact Assessment Practise Note: Pavement Impact Assessment* (TMR 2018) "All other roads" SAR4s value) applied to background heavy vehicle traffic volumes. The results of this analysis are shown in Table 4.5.

This analysis shows that the total SAR4s generated by the Project do not exceed 5% of the construction year background SAR4s in either direction on the Dawson Highway and Leichhardt Highway. Only the first year Standard Axle Repetition (SARs) have been assessed, as background traffic volumes are anticipated to grow or remains constant. This makes the first year the worst case scenario in terms of construction traffic impact. As such, the Project is not considered to have a significant impact on pavements and no further analysis of pavement impacts is required.

Table 4.5 Pavement impact assessment (2026 – construction year)

Site	Road link	Base daily heavy vehicle (G)	Base yearly SAR4 (G)	Construction total heavy vehicle (G)	Construction Total SAR4 (G)	% increase (G)	Base daily heavy vehicle (A)	Base yearly SAR4 (A)	Construction total heavy vehicle (A)	Construction total SAR4 (A)	% increase (A)
61084	46A - Dawson Highway (Gladstone - Biloela)	181	264,106	433	2,406	0.91%	111	162,312	433	2,406	1.48%
60012	46B - Dawson Highway (Biloela - Banana)	149	217,368	433	2,406	1.11%	252	368,515	433	2,406	0.65%
61020	46B - Dawson Highway (Biloela - Banana)	151	220,447	433	2,406	1.09%	141	205,554	433	2,406	1.17%
60050	26A - Leichhardt Highway (Westwood - Taroom)	131	191,066	433	2,406	1.26%	177	257,795	433	2,406	0.93%

4.1.3 Intersection assessment

Intersection analysis was undertaken using SIDRA intersection software, reporting on the average delay, Degree of Saturation (DoS), delay-based Level of Service (LoS) and 95th percentile queues by approach.

Delay, is defined in SIDRA as:

- *The additional (excess) travel time experienced by a vehicle or pedestrian relative to a base travel time, e.g. the free-flow travel time. Average delay considering all vehicles or pedestrians that are queued and not queued is a common performance measure used for intersection and network analysis.*

DoS, is defined in SIDRA as:

- *The ratio of arrival (demand) flow rate to capacity during a given flow period. Also, known as the volume to capacity ratio (v/c ratio), utilisation ratio, utilisation factor and traffic intensity.*

The DoS criteria for a signalised intersections are shown in Table 4.6.

Table 4.6 Maximum practical DoS for priority intersections

Intersection type	Maximum practical DoS
Sign-controlled	0.80

LoS, is defined in SIDRA as:

- *An index of the operational performance of traffic on a given roadway, traffic lane, approach, intersection, route or network, based on measures such as delay and degree of saturation etc. during a given flow period. This provides a quantitative stratification of a performance measure or measures that represent quality of service, measured on an A to F scale, with LoS A representing the best operation conditions from the traveller's perspective and LoS F the worst.*

The adopted LoS criteria are shown in Table 4.7.

Table 4.7 LoS criteria for priority controlled intersections

LoS	Average delay per vehicle (s/veh)	Give-way and stop sign
A	Less than 14	Meets LoS requirements operation
B	15 to 25	Acceptable delays and spare capacity
C	29 to 42	Exceeds LoS C/D but accident study required
D	43 to 56	Near capacity, accident study required
E	57 to 80	At capacity, requires mitigations
F	Greater than 80	Extreme delay, major treatment required

95th Percentile Queue Length is defined in SIDRA as:

- *The 95th percentile queue length is the value below which 95 percent of all observed cycle queue lengths fall, or 5 per cent of all queue lengths exceed.*

The GTIA (TMR 2017) states that for priority-controlled intersections, when average peak hour delays for any turn movement exceeds 42 seconds (the LoS C / D threshold), then the intersection should be upgraded for safety reasons where it is practical to do so.

4.1.3.1 Project generated turn volumes

Dawson Highway/Leichhardt Highway – 100% workers from Moura

The combined background and development traffic generated by the Project in the AM and PM peak during the construction period at the intersection of Dawson Highway/Leichhardt Highway are shown in Figure 4.1. These volumes represent the combined highest peak hour of traffic generation for both light and heavy vehicles during the construction period.

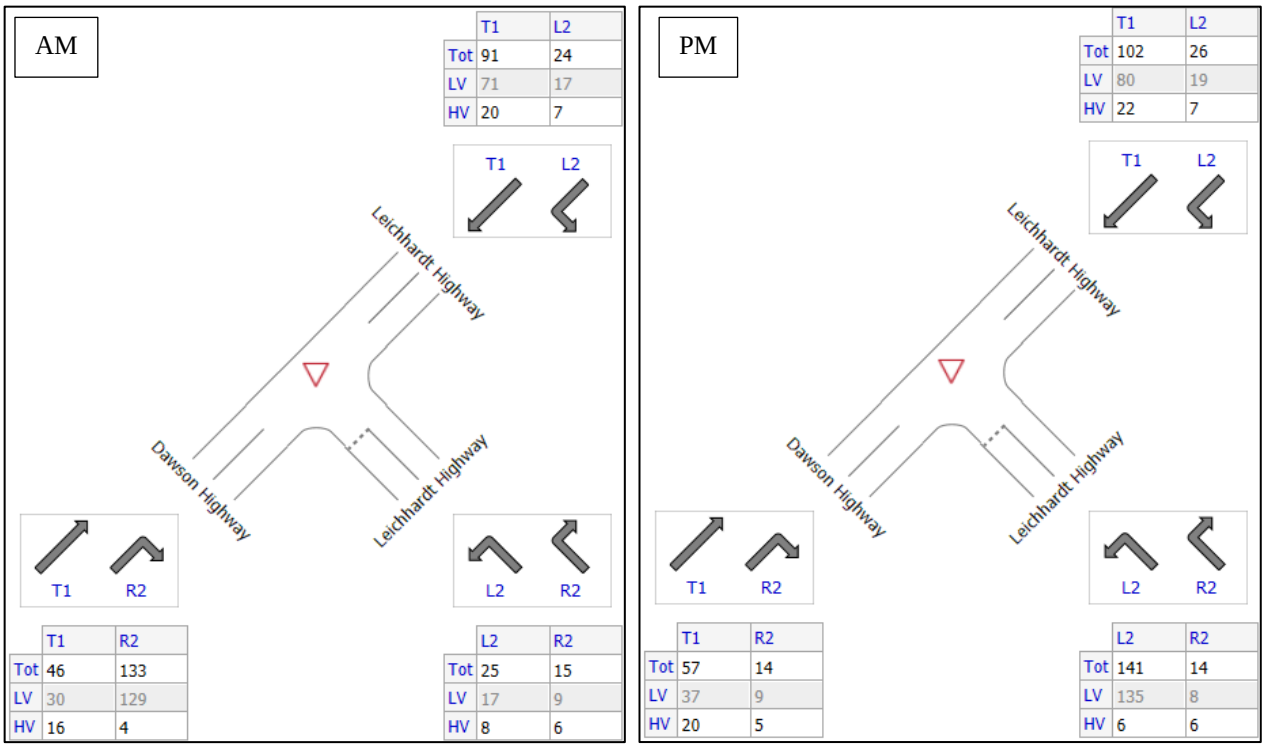


Figure 4.1 AM and PM construction peak Project turn volumes – Dawson Highway/Leichhardt Highway

Dawson Highway/Leichhardt Highway –100% workers from Biloela

The combined background and development traffic generated by the Project in the AM and PM peak during the construction period at the intersection of Dawson Highway/Leichhardt Highway are shown in Figure 4.2. These volumes represent the combined highest peak hour of traffic generation for both light and heavy vehicles during the construction period.

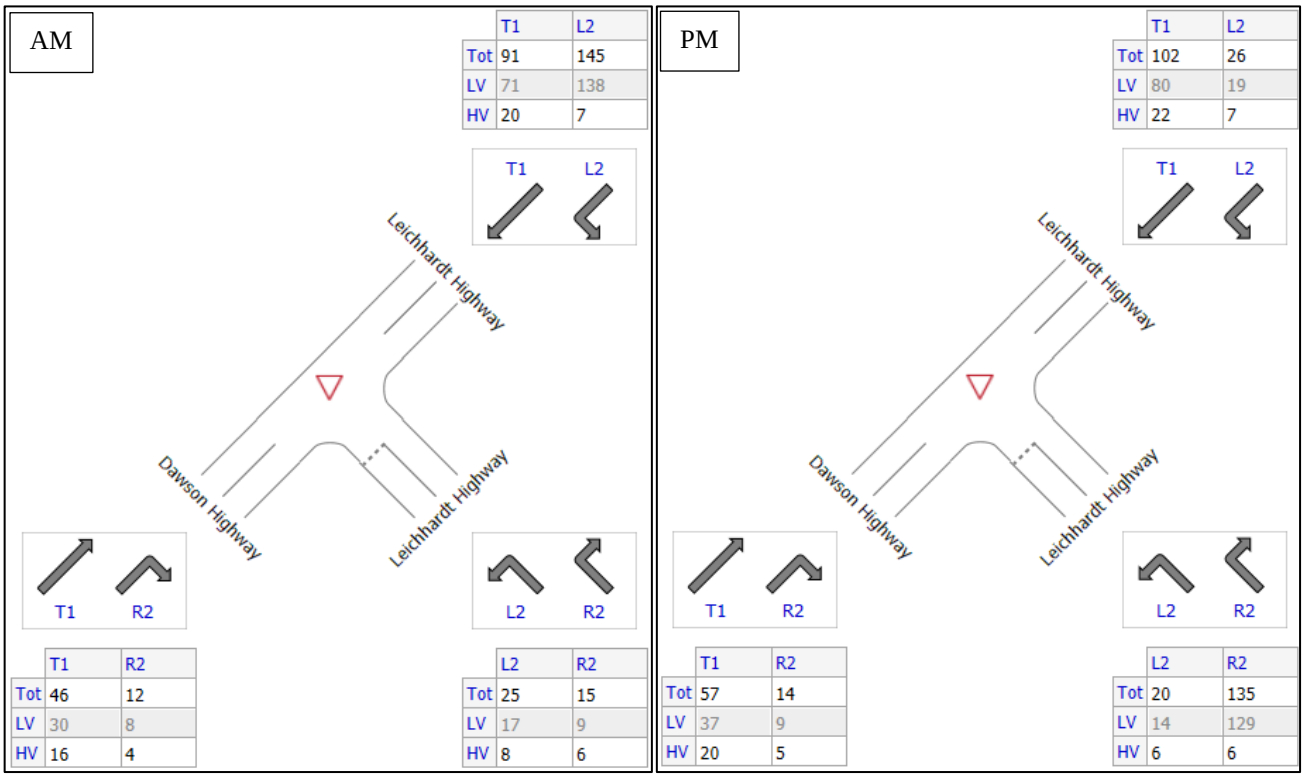


Figure 4.2 AM and PM construction peak Project turn volumes – Dawson Highway/Leichhardt Highway

Leichhardt Highway/Uncle Toms Road – 100% workers from Moura or Biloela

The combined background and development traffic generated by the Project in the AM and PM peak during the construction period at the intersection of Leichhardt Highway/Uncle Toms Road are shown in Figure 4.3. These volumes represent the combined highest peak hour of traffic generation for both light and heavy vehicles during the construction period.

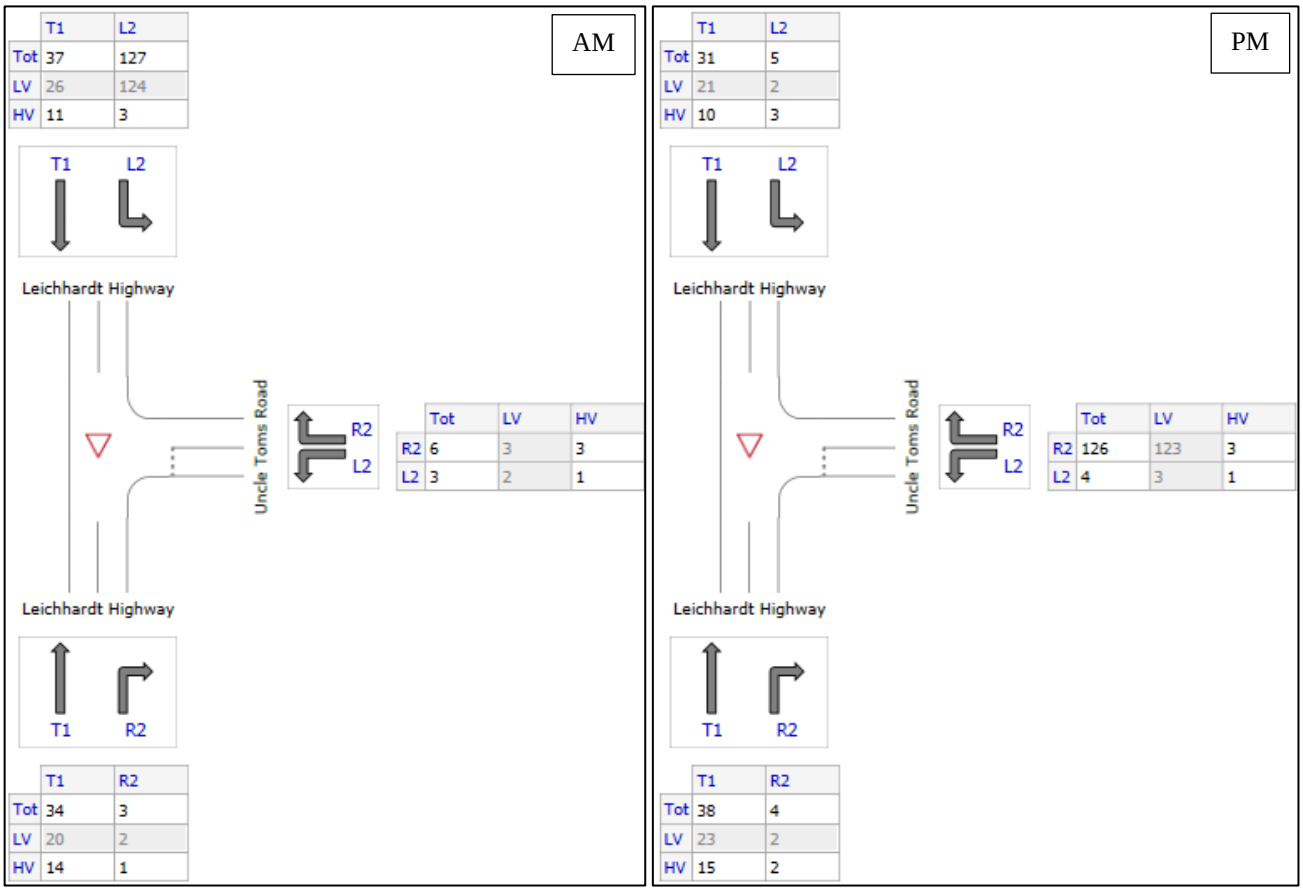


Figure 4.3 AM and PM construction peak Project turn volumes – Leichhardt Highway/Uncle Toms Road (2026)

Leichhardt Highway/Defence Road – 100% workers from Theodore

The combined background and development traffic generated by the Project in the AM and PM peak during the construction period at the intersection of Leichhardt Highway/Uncle Toms Road are shown in Figure 4.4. These volumes represent the combined highest peak hour of traffic generation for both light and heavy vehicles during the construction period.

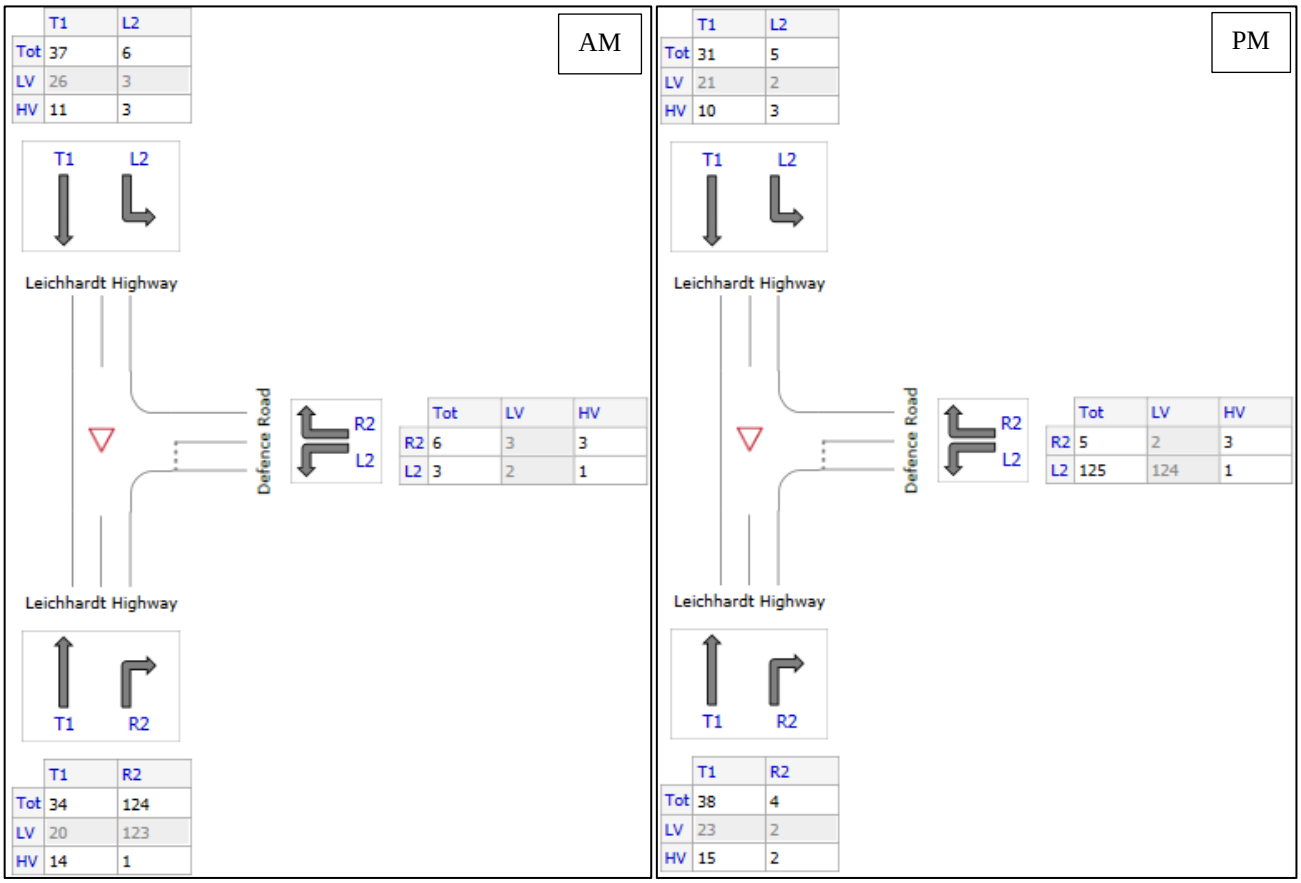


Figure 4.4 AM and PM construction peak Project turn volumes – Leichhardt Highway/Defence Road (2026)

4.1.3.2 Intersection operation

Dawson Highway/Leichhardt Highway

Although the Project construction activities generate relatively low traffic volumes, it is expected to generate an increase of more than 5% of the base traffic for turn movements at the intersection of Dawson Highway/Leichhardt Highway in the AM and PM peak periods due to the very low background volumes.

To assess the resulting impacts, the intersection of Dawson Highway/Leichhardt Highway has been investigated in the 2026 AM and PM peak periods for without and with construction scenarios. As per Section 3.1.3.3 the ten-year growth rates of each direction of each road segment have been applied to the estimated 2023 peak hour turn volumes to extrapolate to the 2026 construction year. Figure 4.5 shows the SIDRA layout of the Dawson Highway/ Leichhardt Highway configuration. The access intersection configuration consists of:

- Auxiliary Left Turn (AUL) lane on the eastern approach
- Auxiliary Right Turn (AUR) on the western approach.

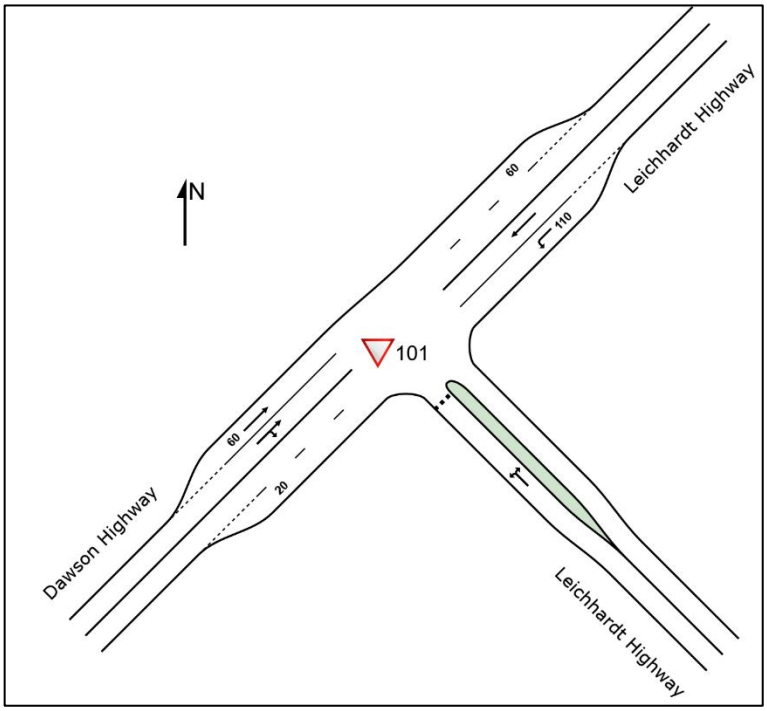


Figure 4.5 Dawson Highway/Leichhardt Highway intersection layout

The results of this assessment for the without and with construction generated traffic scenarios is shown in Table 4.8 to Table 4.11. Further detailed SIDRA modelling outputs are attached in Attachment C.

The assessment of the operation of Dawson Highway/Leichhardt Highway intersection in the AM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.01)
- minimal changes to delays (largest increase of 2 s)
- minimal changes to queue lengths (largest increase of 2.5 m).

The results demonstrate the Project is not considered to have a significant impact on intersection operation and no mitigations are required.

Table 4.8 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
AM	Southeast: Leichhardt Highway	Left	26	A	0.0	7	2	26	A	0.1	7	2
		Right	14	A	0.0	8	2	16	A	0.1	10	2
	Northeast: Leichhardt Highway	Left	23	A	0.0	6	0	25	A	0.0	6	0
		Through	96	A	0.1	0	0	96	A	0.1	0	0
	Southwest: Dawson Highway	Through	48	A	0.0	0	1	48	A	0.0	0	0
		Right	13	A	0.0	7	1	140	A	0.1	6	3
	Overall (Worst)	Southeast (Right)		A	0.0	8	2		A	0.1	10	2

The assessment of the operation of Dawson Highway / Leichhardt Highway intersection in the PM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.11)
- minimal changes to delays (largest increase of 0.8 s)
- minimal changes to queue lengths (largest increase of 3.1 m).

Table 4.9 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
PM	Southeast: Leichhardt Highway	Left	21	A	0.0	7	1	148	A	0.2	6	4
		Right	13	A	0.0	8	1	15	A	0.2	9	4
	Northeast: Leichhardt Highway	Left	25	A	0.0	6	0	27	A	0.0	6	0
		Through	107	A	0.1	0	0	107	A	0.1	0	0
	Southwest: Dawson Highway	Through	60	A	0.0	0	1	60	A	0.0	0	1
		Right	15	A	0.0	7	1	15	A	0.0	7	1
	Overall (Worst)	Southeast (Right)		A	0.0	8	1		A	0.2	9	4

The assessment of the operation of Dawson Highway/Leichhardt Highway intersection in the AM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.07)
- minimal changes to delays (largest increase of 1 s)
- minimal changes to queue lengths (largest increase of 0.2 m).

The results demonstrate the Project is not considered to have a significant impact on intersection operation and no mitigations are required.

Table 4.10 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Biloela

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
AM	Southeast: Leichhardt Highway	Left	26	A	0.0	7	2	26	A	0.1	7	2
		Right	14	A	0.0	8	2	16	A	0.1	9	2
	Northeast: Leichhardt Highway	Left	23	A	0.0	6	0	153	A	0.1	6	0
		Through	96	A	0.1	0	0	96	A	0.1	0	0
	Southwest: Dawson Highway	Through	48	A	0.0	0	1	48	A	0.0	1	1
		Right	13	A	0.0	7	1	13	A	0.0	7	1
	Overall (Worst)	Southeast (Right)		A	0.0	8	2		A	0.1	9	2

The assessment of the operation of Dawson Highway/Leichhardt Highway intersection in the PM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.16)
- minimal changes to delays (largest increase of 0.1 s)
- minimal changes to queue lengths (largest increase of 5.0 m).

Table 4.11 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Biloela

ss			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
PM	Southeast: Leichhardt Highway	Left	21	A	0.0	7	1	21	A	0.2	7	6
		Right	13	A	0.0	8	1	142	A	0.2	7	6
	Northeast: Leichhardt Highway	Left	25	A	0.0	6	0	27	A	0.0	6	0
		Through	107	A	0.1	0	0	107	A	0.1	0	0
	Southwest: Dawson Highway	Through	60	A	0.0	0	1	60	A	0.0	0	1
		Right	15	A	0.0	7	1	15	A	0.0	7	1
	Overall (Worst)	Southeast (Right)		A	0.0	8	1		A	0.2	7	6

Leichhardt Highway/Uncle Toms Road

Although the Project construction activities generate relatively low traffic volumes, it is expected to generate an increase of more than 5% of the base traffic for turn movements at the intersection of Leichhardt Highway/Uncle Toms Road in the AM and PM peak periods due to the very low background volumes.

To assess the resulting impacts, the intersection of Leichhardt Highway/Uncle Toms Road has been investigated in the 2026 AM and PM peak periods for without and with construction scenarios. As per Section 3.1.3.3 the ten-year growth rates of each direction of each road segment have been applied to the estimated 2023 peak hour turn volumes to extrapolate to the 2026 construction year.

Figure 4.6 shows the SIDRA layout of the Leichhardt Highway/Uncle Toms Road configuration. The access intersection configuration consists of Rural Basic (BA) turn treatments.

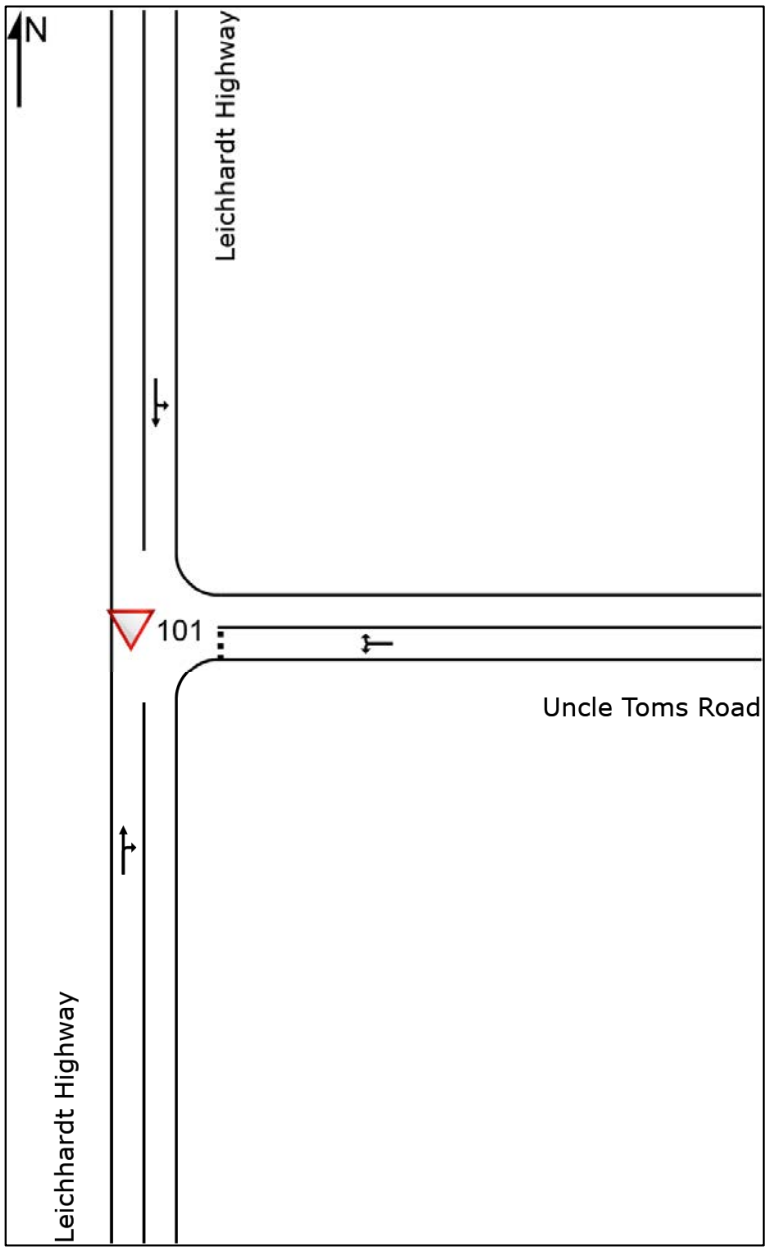


Figure 4.6 Leichhardt Highway/Uncle Toms Road intersection layout

The results of this assessment for the without and with construction generated traffic scenarios is shown in Table 4.12 and Table 4.13. Further detailed SIDRA modelling outputs are attached in Attachment C.

The assessment of the operation of Leichhardt Highway / Uncle Toms Road intersection in the AM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.07)
- minimal changes to delays (largest increase of 0.8 s)
- minimal changes to queue lengths (largest increase of 0.1 m).

The results demonstrate the Project is not considered to have a significant impact on intersection operation and no mitigations are required.

Table 4.12 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura or Biloela

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
AM	South: Leichhardt Highway	Through	36	A	0.0	0	0	36	A	0.0	0	0
		Right	3	A	0.0	6	0	3	A	0.0	7	0
	East: Uncle Toms Road	Left	3	A	0.0	6	0	3	A	0.0	6	0
		Right	4	A	0.0	6	0	6	A	0.0	7	0
	North: Leichhardt Highway	Left	4	A	0.0	6	0	134	A	0.1	6	0
		Through	39	A	0.0	0	0	39	A	0.1	0	0
	Overall (Worst)	South (Right)		A	0.0	6	0		A	0.0	7	0

The assessment of the operation of Leichhardt Highway / Uncle Toms Road intersection in the PM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.11)
- minimal changes to delays (largest increase of 0.3 s)
- minimal changes to queue lengths (largest increase of 2.7 m).

Table 4.13 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Moura or Biloela

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
PM	South: Leichhardt Highway	Through	40	A	0.0	0	0	40	A	0.0	0	0
		Right	4	A	0.0	6	0	4	A	0.0	6	0
	East: Uncle Toms Road	Left	4	A	0.0	6	0	4	A	0.1	6	3
		Right	3	A	0.0	6	0	133	A	0.1	6	3
	North: Leichhardt Highway	Left	3	A	0.0	6	0	5	A	0.0	6	0
		Through	33	A	0.0	0	0	33	A	0.0	0	0
	Overall (Worst)	South (Right)		A	0.0	6	0		A	0.0	6	0

Leichhardt Highway/Defence Road

Although the Project construction activities generate relatively low traffic volumes, it is expected to generate an increase of more than 5% of the base traffic for turn movements at the intersection of Leichhardt Highway/Defence Road in the AM and PM peak periods due to the very low background volumes.

To assess the resulting impacts, the intersection of Leichhardt Highway/Defence Road has been investigated in the 2026 AM and PM peak periods for without and with construction scenarios. As per Section 3.1.3.3 the ten-year growth rates of each direction of each road segment have been applied to the estimated 2023 peak hour turn volumes to extrapolate to the 2026 construction year.

Figure 4.7 shows the SIDRA layout of the Leichhardt Highway/Defence Road configuration. The access intersection configuration consists of Rural Basic (BA) turn treatments.

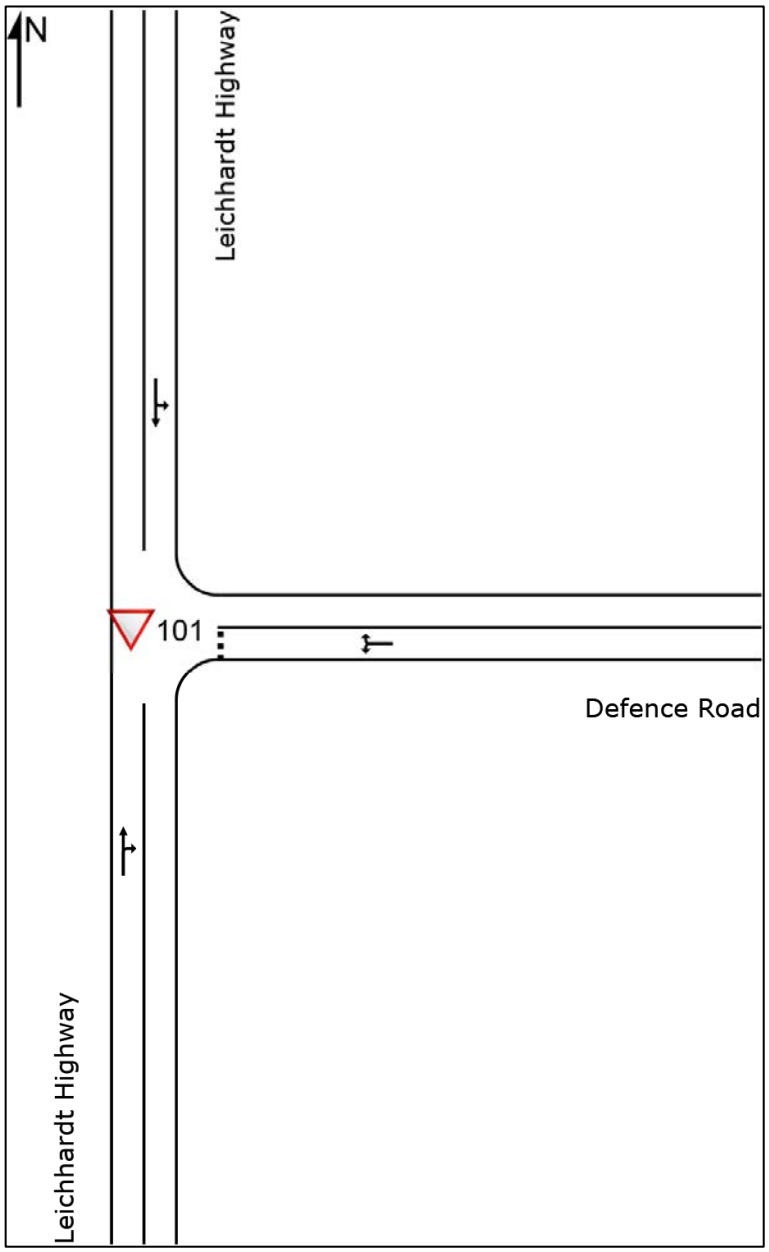


Figure 4.7 Leichhardt Highway/Defence Road intersection layout

The results of this assessment for the without and with construction generated traffic scenarios is shown in Table 4.14 and Table 4.15. Further detailed SIDRA modelling outputs are attached in Attachment C.

The assessment of the operation of Leichhardt Highway/Defence Road intersection in the AM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.07)
- minimal changes to delays (largest increase of 1.2 s)
- minimal changes to queue lengths (largest increase of 3.3 m).

The results demonstrate the Project is not considered to have a significant impact on intersection operation and no mitigations are required.

Table 4.14 AM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Theodore

Construction year 2026			Base					With Project				
Peak	**Approach**	**Movement**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**	**Traffic volumes**	**LoS**	**DoS**	**Average delay (s)**	**95th percentile queues (m)**
AM	South: Leichhardt Highway	Through	36	A	0.0	0	0	36	A	0.1	0	4
		Right	3	A	0.0	6	0	131	A	0.1	6	4
	East: Defence Road	Left	3	A	0.0	6	0	3	A	0.0	6	0
		Right	4	A	0.0	6	0	6	A	0.0	7	0
	North: Leichhardt Highway	Left	4	A	0.0	6	0	6	A	0.0	6	0
		Through	39	A	0.0	0	0	39	A	0.0	0	0
	Overall (Worst)	South (Right)		A	0.0	6	0		A	0.1	6	4

The assessment of the operation of Leichhardt Highway/Uncle Toms Road intersection in the PM peak period shows that with the addition of the heaviest expected peak period construction traffic the intersection continues to operate in an acceptable manner with:

- no change in intersection LoS
- minimal changes to approach DoS (largest increase of 0.08)
- minimal changes to delays (largest increase of 0.5 s)
- minimal changes to queue lengths (largest increase of 2.5 m).

Table 4.15 PM peak – SIDRA modelling outputs for construction year (2026) – 100% workers from Theodore

Construction year 2026			Base					With Project				
Peak	Approach	Movement	Traffic volumes	LoS	DoS	Average delay (s)	95th percentile queues (m)	Traffic volumes	LoS	DoS	Average delay (s)	95th percentile queues (m)
PM	South: Leichhardt Highway	Through	40	A	0.0	0	0	40	A	0.0	0	0
		Right	4	A	0.0	6	0	4	A	0.0	6	0
	East: Defence Road	Left	4	A	0.0	6	0	132	A	0.1	6	3
		Right	3	A	0.0	6	0	5	A	0.1	7	3
	North: Leichhardt Highway	Left	3	A	0.0	6	0	5	A	0.0	6	0
		Through	33	A	0.0	0	0	33	A	0.0	0	0
	Overall (Worst)	South (Right)		A	0.0	6	0		A	0.0	6	0

4.1.4 Other transport network impacts

4.1.4.1 Heavy vehicle routes

As a relatively low increase (general <5%) in AADT traffic volumes is noted on the Dawson Highway and Leichhardt Highway during the peak period of construction activities, it is not expected that construction heavy vehicle and workforce movements generated by the Project would impact the operation of existing heavy vehicles movements on the Dawson Highway and Leichhardt Highway 26 m B-double heavy vehicle route.

4.1.4.2 Public transport

No public transport in the vicinity of the site apart from occasional coach services in operation along the Dawson Highway and Leichhardt Highway. Due to the low traffic volumes generated by the Project construction activities (primarily workers' movements from Biloela, Moura and Theodore) it is expected to have a minimal impact on these services. In addition, it is noted that the heaviest time for construction movements is expected at the start and end of construction hours (6:30 AM to 6:30 PM) which is outside coach bus service periods in surrounding town centres.

4.1.4.3 Active transport

Given the land uses surrounding the Project, the demand for cycling and pedestrian travel in the area is likely to be low. Although there would be increased traffic from construction vehicles in surrounding town centres along the access routes, the increase is minor and no impact to existing active transport movements are expected. It is noted that the largest hourly construction movements (workforce) would occur outside peak traffic periods (typically between 6:00 AM and 6:00 PM) and would have minimal impact to pedestrians and cyclists.

4.1.5 Safety review

Dawson Highway and Leichhardt Highway in the vicinity of the Project site, have an AADT of less than 8,000 per day, with a posted speed limit of 100 km/h. This categorises the road environment as a medium risk. Considering this, and as this development is expected to be assessed under the *Planning Act 2016* meaning it does not qualify as a "Major Project", a road safety assessment for the construction period has been undertaken with the requirements set out in the GTIA. As per the GTIA, this assessment includes identification of current safety risks, potential new risks resulting from the development and recommendations on mitigation works to ensure the safety risk rating is not worsened.

This assessment has identified the following key risk associated with the Project construction activities:

- increases to heavy vehicles volumes along the Dawson Highway and Leichhardt Highway.

This risk has been assessed using the risk assessment framework as detailed in the GTIA, with the results presented in Table 4.16.

Table 4.16 Risk assessment

Risk item	Without development			With development			Mitigation measures	With development and mitigation		
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
Additional heavy vehicle left/right turn movements off Dawson Highway/ Leichhardt Highway; rear end collision caused by deceleration in the through lane or inadequate turn pocket/storage length	1	4	M	2	4	M	Construction access warning signage	1	4	M
Left/right turn movements off Leichhardt Highway/ Dawson Highway; rear end collision caused by deceleration in the through lane or inadequate turn pocket/storage length	1	4	M	2	4	M	Construction access warning signage	1	4	M

The safety review found:

- Following review of the current crash data it appears that the current intersection arrangements at these locations do not pose a significant safety risk under current traffic conditions. Furthermore, with no proposed change to the vertical or horizontal geometry of the intersection, no change in the existing sight lines is expected at the intersection.

To mitigate the increased safety risk, temporary warning signs will be introduced on the approaches to intersections on the access routes to provide road users advanced warning of construction activities. It should be noted that this is a temporary measure due to the fact the anticipated duration of the construction Project is approximately 24 months.

4.2 Operational stage

4.2.1 Design horizon

The analysis horizon year has been determined based on an assumed year of opening for the Project in 2028. The operational analysis has been undertaken for the year of opening and a 10-year design horizon (2038). The assessment assumes that the number of trips generated by the Project operational activities remains constant over the assessment period.

4.2.2 Traffic generation

Due to the nature of the Project, minimal traffic is expected to be generated as a result of the operation of the Project. As detailed in Section 2.3.2 the expected traffic generated by the operation of the Project results from periodic inspection and maintenance activities and is estimated in the region of three vehicle trips on average per year.

4.2.3 Impacts

As the construction activities were not found to have any significant impact on the transport network, and operational traffic is significantly less than that generated by construction activities, the operation of the Project is expected to have negligible impact on:

- link capacity and pavement
- intersection operation
- heavy vehicle routes
- active or public transport networks
- general road safety.

4.3 Mitigation measures

The following mitigation measures are recommended to be implemented to reduce and manage the potential impact to the Dawson Highway and Leichhardt Highway resulting from the Project construction activities:

- Temporary warning signs to be introduced on the approaches to intersections on the access routes to provide road users advanced warning of turning construction vehicles.

Due to the low generated traffic volumes associated with the Project operational activities (an average of 3 vehicle trips per year), no mitigation measures are required during the operational phase.

5 Summary

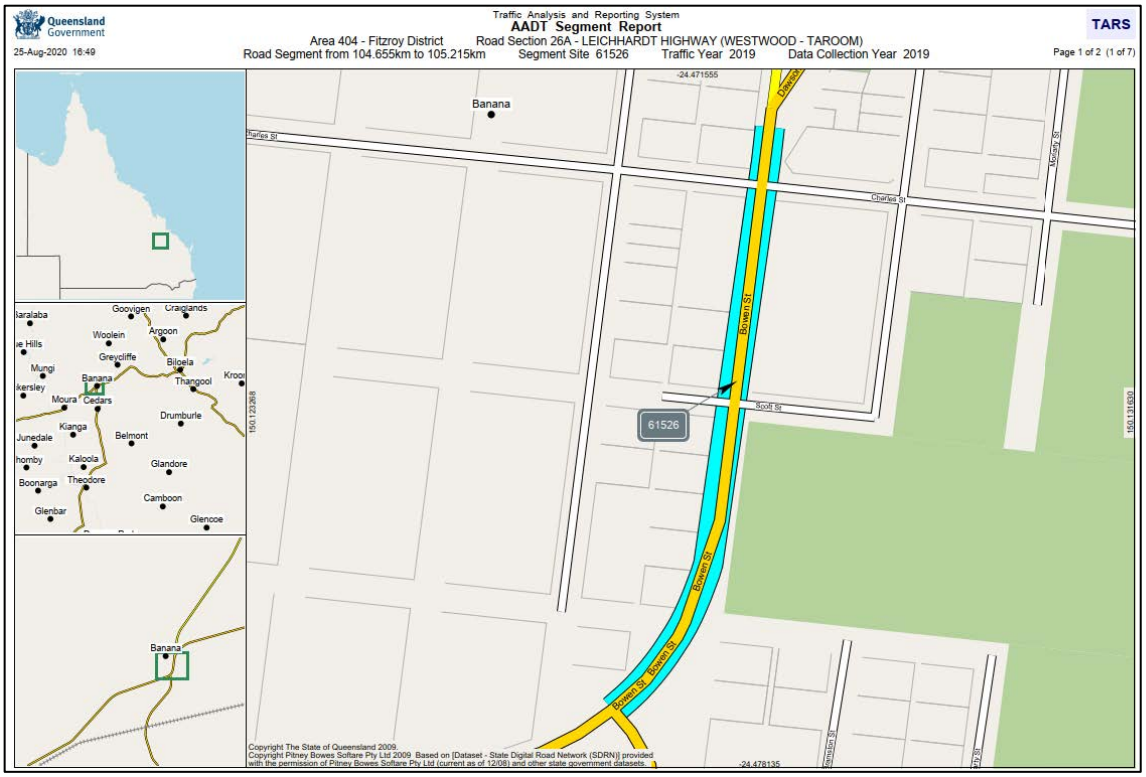
This Traffic Impact Assessment has defined the Project's activities and associated trip generation during its construction and operational phases, identified access routes, and collated road network traffic data. Based on this information the report provides an assessment as per the *Guide to Traffic Impact Assessment* (GTIA) (TMR 2018) of likely impacts of the Project on the State-controlled road network associated with intersection capacity, freight network, public transport, active transport and road safety during the construction and operational stages. The key findings of this assessment are summarised as:

- The Project is expected to generate:
  - A peak daily traffic generation of 2 heavy and 121 light vehicles trips (in and out) accessing the construction site with a maximum peak hour flow of 2 heavy and 121 light vehicles (in and out) movements.
  - During operations, a peak daily traffic generation of an average of 3 light vehicle trips (in and out) accessing the site of which the impact to the State-controlled road network is negligible.
- Due to the low traffic volumes generated by the construction and operation of the Project, no impacts to the Stated-controlled road network, intersections, pavement condition or public and active transport facilities are expected as:
  - Increases to link volumes on Dawson Highway and Leichhardt Highway are more than 5% increase to daily AADT due to the very low background volumes, but the impacts to link capacity are negligible with no change to operational LoS.
  - Increases to link SAR4s during the year of construction are less than 5% of annual SARs.
  - Although turn movements at the intersections of Dawson Highway/Leichhardt Highway, Leichhardt Highway/ Uncle Toms Road and Leichhardt Highway/Defence Road increase by more than 5% due to the low background volumes, the impacts to intersection performance are negligible with no change to operational LoS.
  - No dedicated active or public transport infrastructure is located in the vicinity of the Project site and increases to traffic volumes are not expected to impact active or public transport networks in the regional centres along the Dawson Highway and Leichhardt Highway.
- Increased safety risks are associated with construction the Project. To mitigate the identified increased road safety risk from increases in traffic associated with the Project, the following mitigation measure is recommended:
  - Temporary warning signs are recommended be introduced on the approaches to intersections in the vicinity of the Project during construction to provide road users advanced warning of additional turning vehicles during the construction stages.

Attachment A

AADT segment report

A1. AADT segment report



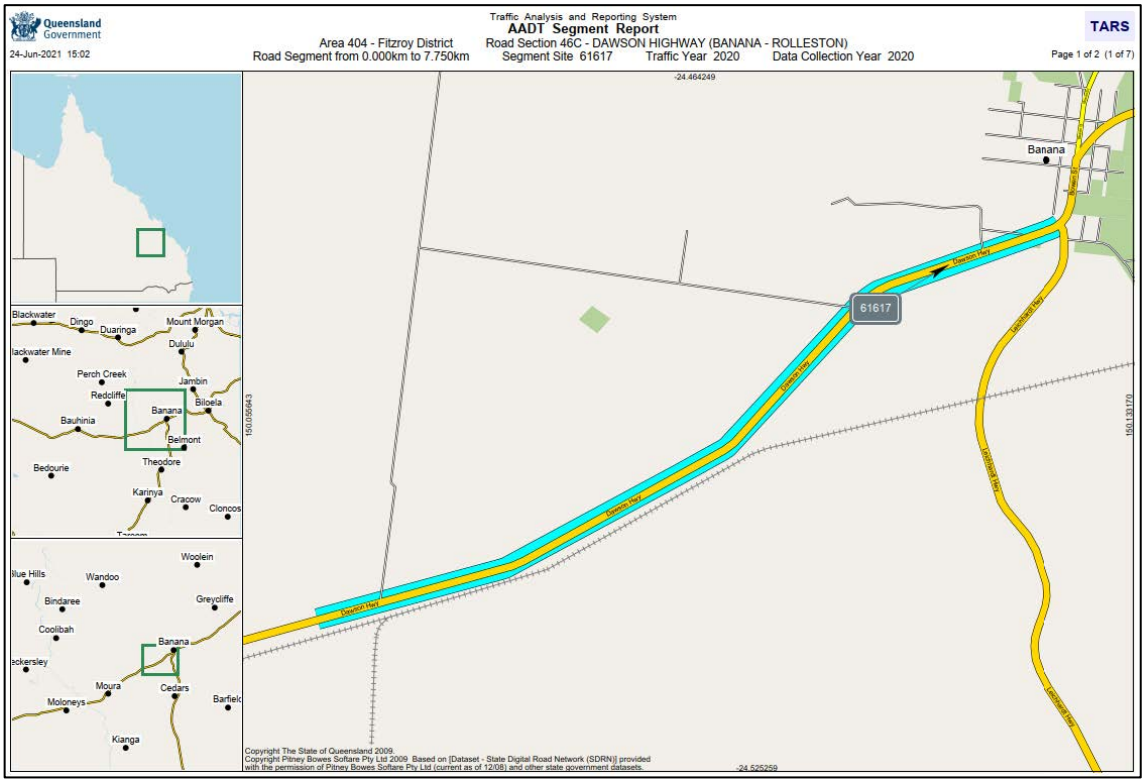


Figure A.1 Road segments

Source: TMR AADT Segment Report

Attachment B

Peak hour traffic volume

B1. Peak hour traffic volume

Dawson Highway (Site 61084)			
Time	Southbound	Northbound	Two way
0 to 1	3	1	4
1 to 2	2	0	2
2 to 3	2	1	3
3 to 4	3	1	4
4 to 5	10	15	25
5 to 6	19	84	103
6 to 7	49	73	122
7 to 8	68	48	116
8 to 9	**65**	**56**	**121**
9 to 10	57	56	113
10 to 11	52	52	104
11 to 12	48	52	100
12 to 13	47	51	98
13 to 14	51	55	106
14 to 15	60	52	112
15 to 16	**64**	**59**	**123**
16 to 17	66	60	126
17 to 18	66	70	136
18 to 19	80	31	111
19 to 20	41	20	61
20 to 21	13	16	29
21 to 22	10	8	18
22 to 23	6	5	11
23 to 24	5	2	7
Total	**887**	**868**	**1755**

Dawson Highway (Site 60012)			
Time	Westbound	Eastbound	Two way
0 to 1	2	2	4
1 to 2	2	1	3
2 to 3	3	2	5
3 to 4	4	2	6
4 to 5	22	8	30
5 to 6	66	31	97
6 to 7	57	44	101
7 to 8	65	70	135
8 to 9	**65**	**95**	**160**
9 to 10	68	87	155
10 to 11	69	81	150
11 to 12	68	77	145
12 to 13	75	70	145
13 to 14	75	67	142
14 to 15	74	74	148
15 to 16	**91**	**89**	**180**
16 to 17	84	85	169
17 to 18	87	74	161
18 to 19	47	56	103
19 to 20	27	36	63
20 to 21	19	17	36
21 to 22	14	9	23
22 to 23	5	5	10
23 to 24	3	2	5
Total	**1092**	**1084**	**2176**

Dawson Highway (Site 61020)			
Time	Westbound	Eastbound	Two way
0 to 1	1	1	2
1 to 2	1	1	2
2 to 3	2	2	4
3 to 4	3	3	6
4 to 5	9	8	17
5 to 6	41	38	79
6 to 7	47	45	92
7 to 8	49	50	99
8 to 9	**51**	**49**	**100**
9 to 10	50	48	98
10 to 11	50	48	98
11 to 12	51	48	99
12 to 13	47	47	94
13 to 14	48	50	98
14 to 15	48	49	97
15 to 16	**57**	**55**	**112**
16 to 17	50	53	103
17 to 18	48	50	98
18 to 19	38	40	78
19 to 20	20	21	41
20 to 21	8	9	17
21 to 22	5	7	12
22 to 23	4	4	8
23 to 24	2	2	4
Total	**730**	**728**	**1458**

Dawson Highway (Site 61617)			
Time	Westbound	Eastbound	Two way
0 to 1	2	2	4
1 to 2	1	1	2
2 to 3	3	2	5
3 to 4	3	3	6
4 to 5	9	6	15
5 to 6	48	16	64
6 to 7	44	38	82
7 to 8	35	53	88
8 to 9	**46**	**57**	**103**
9 to 10	41	54	95
10 to 11	42	48	90
11 to 12	46	48	94
12 to 13	40	40	80
13 to 14	42	38	80
14 to 15	51	43	94
15 to 16	**57**	**56**	**113**
16 to 17	52	55	107
17 to 18	54	38	92
18 to 19	39	43	82
19 to 20	23	16	39
20 to 21	13	10	23
21 to 22	9	5	14
22 to 23	6	3	9
23 to 24	3	2	5
Total	**709**	**677**	**1386**

Leichhardt Highway (Site 60050)			
Time	Southbound	Northbound	Two way
0 to 1	2	2	4
1 to 2	2	2	4
2 to 3	2	2	4
3 to 4	2	2	4
4 to 5	4	4	8
5 to 6	15	12	27
6 to 7	26	20	46
7 to 8	34	25	59
8 to 9	**37**	**33**	**70**
9 to 10	38	36	74
10 to 11	38	38	76
11 to 12	40	41	81
12 to 13	37	41	78
13 to 14	35	41	76
14 to 15	33	40	73
15 to 16	**31**	**37**	**68**
16 to 17	29	33	62
17 to 18	25	28	53
18 to 19	23	21	44
19 to 20	16	12	28
20 to 21	10	10	20
21 to 22	6	7	13
22 to 23	5	4	9
23 to 24	3	3	6
Total	**493**	**494**	**987**

Dawson Highway (Site 61526)			
Time	Southbound	Northbound	Two way
0 to 1	4	3	7
1 to 2	3	3	6
2 to 3	4	3	7
3 to 4	6	5	11
4 to 5	16	18	34
5 to 6	87	38	125
6 to 7	85	60	145
7 to 8	67	91	158
8 to 9	**81**	**87**	**168**
9 to 10	76	92	168
10 to 11	75	85	160
11 to 12	79	84	163
12 to 13	71	87	158
13 to 14	74	79	153
14 to 15	82	85	167
15 to 16	**89**	**98**	**187**
16 to 17	85	98	183
17 to 18	98	76	174
18 to 19	75	86	161
19 to 20	42	45	87
20 to 21	24	20	44
21 to 22	15	14	29
22 to 23	10	8	18
23 to 24	5	5	10
Total	**1253**	**1270**	**2523**

Figure B.1 Peak hour traffic volume

Source: Queensland Traffic Data Average by Hour by Day 2023

Attachment C

Detailed SIDRA modelling outputs

C1. SIDRA site reports

C1.1 Dawson Highway/Leichhardt Highway

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows [HV] %	Arrival Flows [Total veh/h]	Arrival Flows [HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	95% Back Of Queue [Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway															
21	L2	All MCs	26	32	26	32	0.045	6.5	LOS A	0.2	1.5	0.26	0.56	0.26	50.8
23	R2	All MCs	14	30.8	14	30.8	0.045	7.7	LOS A	0.2	1.5	0.26	0.56	0.26	50.8
Approach			40	31.6	40	31.6	0.045	6.9	LOS A	0.2	1.5	0.26	0.56	0.26	50.8
NorthEast: Leichhardt Highway															
24	L2	All MCs	23	22.7	23	22.7	0.014	5.8	LOS A	0	0	0	0.57	0	52
25	T1	All MCs	96	22	96	22	0.056	0	LOS A	0	0	0	0	0	60
Approach			119	22.1	119	22.1	0.056	1.1	NA	0	0	0	0.11	0	58.2
SouthWest: Dawson Highway															
31	T1	All MCs	48	34.8	48	34.8	0.032	0.2	LOS A	0.1	0.9	0.11	0.14	0.11	58.6
32	R2	All MCs	13	33.3	13	33.3	0.032	6.6	LOS A	0.1	0.9	0.17	0.22	0.17	53.9
Approach			61	34.5	61	34.5	0.032	1.6	NA	0.1	0.9	0.12	0.15	0.12	57.5
All Vehicles			220	27.3	220	27.3	0.056	2.3	NA	0.2	1.5	0.08	0.2	0.08	56.5

Figure C.1 SIDRA movement summary for 2026 AM peak – without development

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway																		
21	L2	All MCs	26	32	26	32	0.055		6.5	LOS A		0.2	1.8	0.3		0.57	0.3	50.4
23	R2	All MCs	16	40	16	40	0.055		9.7	LOS A		0.2	1.8	0.3		0.57	0.3	50
Approach			42	35	42	35	0.055		7.7	LOS A		0.2	1.8	0.3		0.57	0.3	50.2
NorthEast: Leichhardt Highway																		
24	L2	All MCs	25	29.2	25	29.2	0.016		5.9	LOS A		0	0	0		0.57	0	51.7
25	T1	All MCs	96	22	96	22	0.056		0	LOS A		0	0	0		0	0	60
Approach			121	23.5	121	23.5	0.056		1.2	NA		0	0	0		0.12	0	58
SouthWest: Dawson Highway																		
31	T1	All MCs	48	34.8	48	34.8	0.03		0	LOS A		0	0	0		0	0	60
32	R2	All MCs	140	3	140	3	0.112		6.1	LOS A		0.5	3.4	0.26		0.56	0.26	52
Approach			188	11.2	188	11.2	0.112		4.6	NA		0.5	3.4	0.19		0.42	0.19	53.8
All Vehicles			352	18.3	352	18.3	0.112		3.8	NA		0.5	3.4	0.14		0.33	0.14	54.7

Figure C.2 SIDRA movement summary for 2026 AM peak – with development – 100% workers from Moura

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway																		
21	L2	All MCs	26	32	26	32	0.052		6.5	LOS A		0.2	1.7	0.29		0.56	0.29	50.6
23	R2	All MCs	16	40	16	40	0.052		8.7	LOS A		0.2	1.7	0.29		0.56	0.29	50.3
Approach			42	35	42	35	0.052		7.3	LOS A		0.2	1.7	0.29		0.56	0.29	50.5
NorthEast: Leichhardt Highway																		
24	L2	All MCs	153	4.8	153	4.8	0.084		5.6	LOS A		0	0	0		0.57	0	52.7
25	T1	All MCs	96	22	96	22	0.056		0	LOS A		0	0	0		0	0	60
Approach			248	11.4	248	11.4	0.084		3.5	NA		0	0	0		0.35	0	55.3
SouthWest: Dawson Highway																		
31	T1	All MCs	48	34.8	48	34.8	0.033		0.5	LOS A		0.1	1.1	0.16		0.17	0.16	58.3
32	R2	All MCs	13	33.3	13	33.3	0.033		7.4	LOS A		0.1	1.1	0.26		0.28	0.26	53.5
Approach			61	34.5	61	34.5	0.033		1.9	NA		0.1	1.1	0.18		0.19	0.18	57.3
All Vehicles			352	18.3	352	18.3	0.084		3.7	NA		0.2	1.7	0.07		0.35	0.07	55

Figure C.3 SIDRA movement summary for 2026 AM peak – with development – 100% workers from Biloela

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway																		
21	L2	All MCs	21	30	21	30	0.04		6.5	LOS A		0.1	1.3	0.28		0.56	0.28	50.8
23	R2	All MCs	13	33.3	13	33.3	0.04		8	LOS A		0.1	1.3	0.28		0.56	0.28	50.7
Approach			34	31.3	34	31.3	0.04		7.1	LOS A		0.1	1.3	0.28		0.56	0.28	50.8
NorthEast: Leichhardt Highway																		
24	L2	All MCs	25	20.8	25	20.8	0.015		5.8	LOS A		0	0	0		0.57	0	52
25	T1	All MCs	107	21.6	107	21.6	0.062		0	LOS A		0	0	0		0	0	60
Approach			133	21.4	133	21.4	0.062		1.1	NA		0	0	0		0.11	0	58.3
SouthWest: Dawson Highway																		
31	T1	All MCs	60	35.1	60	35.1	0.039		0.3	LOS A		0.1	1.1	0.11		0.14	0.11	58.6
32	R2	All MCs	15	35.7	15	35.7	0.039		6.7	LOS A		0.1	1.1	0.17		0.22	0.17	53.8
Approach			75	35.2	75	35.2	0.039		1.5	NA		0.1	1.1	0.12		0.15	0.12	57.6
All Vehicles			241	27.1	241	27.1	0.062		2.1	NA		0.1	1.3	0.08		0.19	0.08	56.9

Figure C.4 SIDRA movement summary for 2026 PM peak – without development

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway																		
21	L2	All MCs	148	4.3	148	4.3	0.15		6.1	LOS A		0.6	4.4	0.25		0.57	0.25	51.9
23	R2	All MCs	15	42.9	15	42.9	0.15		8.8	LOS A		0.6	4.4	0.25		0.57	0.25	50.4
Approach			163	7.7	163	7.7	0.15		6.4	LOS A		0.6	4.4	0.25		0.57	0.25	51.8
NorthEast: Leichhardt Highway																		
24	L2	All MCs	27	26.9	27	26.9	0.017		5.9	LOS A		0	0	0		0.57	0	51.8
25	T1	All MCs	107	21.6	107	21.6	0.062		0	LOS A		0	0	0		0	0	60
Approach			135	22.7	135	22.7	0.062		1.2	NA		0	0	0		0.12	0	58.1
SouthWest: Dawson Highway																		
31	T1	All MCs	60	35.1	60	35.1	0.039		0.3	LOS A		0.1	1.1	0.11		0.14	0.11	58.6
32	R2	All MCs	15	35.7	15	35.7	0.039		6.8	LOS A		0.1	1.1	0.18		0.22	0.18	53.8
Approach			75	35.2	75	35.2	0.039		1.6	NA		0.1	1.1	0.13		0.16	0.13	57.6
All Vehicles			373	18.6	373	18.6	0.15		3.5	NA		0.6	4.4	0.14		0.32	0.14	55.1

Figure C.5 SIDRA movement summary for 2026 PM peak – with development – 100% workers from Moura

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Leichhardt Highway																		
21	L2	All MCs	21	30	21	30	0.197		6.6	LOS A		0.8	6.3	0.38		0.62	0.38	50.4
23	R2	All MCs	142	4.4	142	4.4	0.197		7.4	LOS A		0.8	6.3	0.38		0.62	0.38	51.4
Approach			163	7.7	163	7.7	0.197		7.3	LOS A		0.8	6.3	0.38		0.62	0.38	51.3
NorthEast: Leichhardt Highway																		
24	L2	All MCs	27	26.9	27	26.9	0.017		5.9	LOS A		0	0	0		0.57	0	51.8
25	T1	All MCs	107	21.6	107	21.6	0.062		0	LOS A		0	0	0		0	0	60
Approach			135	22.7	135	22.7	0.062		1.2	NA		0	0	0		0.12	0	58.1
SouthWest: Dawson Highway																		
31	T1	All MCs	60	35.1	60	35.1	0.039		0.4	LOS A		0.1	1.1	0.11		0.14	0.11	58.6
32	R2	All MCs	15	35.7	15	35.7	0.039		6.8	LOS A		0.1	1.1	0.18		0.22	0.18	53.8
Approach			75	35.2	75	35.2	0.039		1.6	NA		0.1	1.1	0.13		0.16	0.13	57.6
All Vehicles			373	18.6	373	18.6	0.197		4	NA		0.8	6.3	0.19		0.34	0.19	54.8

Figure C.6 SIDRA movement summary for 2026 PM peak – with development – 100% workers from Biloela

C1.2 Leichhardt Highway/Uncle Toms Road

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh]	95% Back Of Queue Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	36	41.2	36	41.2	0.025		0	LOS A		0	0.2	0.03		0.05	0.03	59.4
3	R2	All MCs	3	33.3	3	33.3	0.025		5.9	LOS A		0	0.2	0.03		0.05	0.03	54.9
Approach			39	40.5	39	40.5	0.025		0.5	NA		0	0.2	0.03		0.05	0.03	59
East: Uncle Toms Road																		
4	L2	All MCs	3	33.3	3	33.3	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.2
6	R2	All MCs	4	25	4	25	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.1
Approach			7	28.6	7	28.6	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.1
North: Leichhardt Highway																		
7	L2	All MCs	4	25	4	25	0.027		5.8	LOS A		0	0	0		0.06	0	55.8
8	T1	All MCs	39	29.7	39	29.7	0.027		0	LOS A		0	0	0		0.06	0	59.4
Approach			43	29.3	43	29.3	0.027		0.6	NA		0	0	0		0.06	0	59
All Vehicles			89	34.1	89	34.1	0.027		1	NA		0	0.2	0.02		0.1	0.02	58.3

Figure C.7 SIDRA movement summary for 2026 AM peak – without development

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	36	41.2	36	41.2	0.026		0.1	LOS A		0	0.2	0.06		0.07	0.06	59.3
3	R2	All MCs	3	33.3	3	33.3	0.026		6.6	LOS A		0	0.2	0.06		0.07	0.06	54.8
Approach			39	40.5	39	40.5	0.026		0.6	NA		0	0.2	0.06		0.07	0.06	58.9
East: Uncle Toms Road																		
4	L2	All MCs	3	33.3	3	33.3	0.01		6.1	LOS A		0	0.3	0.19		0.55	0.19	51
6	R2	All MCs	6	50	6	50	0.01		6.9	LOS A		0	0.3	0.19		0.55	0.19	50
Approach			9	44.4	9	44.4	0.01		6.6	LOS A		0	0.3	0.19		0.55	0.19	50.3
North: Leichhardt Highway																		
7	L2	All MCs	134	2.4	134	2.4	0.097		5.6	LOS A		0	0	0		0.45	0	53.5
8	T1	All MCs	39	29.7	39	29.7	0.097		0	LOS A		0	0	0		0.45	0	55.8
Approach			173	8.5	173	8.5	0.097		4.3	NA		0	0	0		0.45	0	54
All Vehicles			221	15.7	221	15.7	0.097		3.8	NA		0	0.3	0.02		0.39	0.02	54.6

Figure C.8 SIDRA movement summary for 2026 AM peak – with development – 100% workers from Moura or Biloela

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																	
2	T1	All MCs	40	39.5	40	39.5	0.029	0	LOS A	0	0.3	0.03	0.06	0.03	59.4
3	R2	All MCs	4	50	4	50	0.029	6.1	LOS A	0	0.3	0.03	0.06	0.03	54.2
Approach			44	40.5	44	40.5	0.029	0.6	NA	0	0.3	0.03	0.06	0.03	58.9
East: Uncle Toms Road																	
4	L2	All MCs	4	25	4	25	0.006	6	LOS A	0	0.2	0.13	0.54	0.13	51.5
6	R2	All MCs	3	33.3	3	33.3	0.006	6.3	LOS A	0	0.2	0.13	0.54	0.13	50.8
Approach			7	28.6	7	28.6	0.006	6.1	LOS A	0	0.2	0.13	0.54	0.13	51.2
North: Leichhardt Highway																	
7	L2	All MCs	3	33.3	3	33.3	0.022	5.9	LOS A	0	0	0	0.05	0	55.5
8	T1	All MCs	33	32.3	33	32.3	0.022	0	LOS A	0	0	0	0.05	0	59.5
Approach			36	32.4	36	32.4	0.022	0.5	NA	0	0	0	0.05	0	59.1
All Vehicles			87	36.1	87	36.1	0.029	1	NA	0	0.3	0.03	0.1	0.03	58.3

Figure C.9 SIDRA movement summary for 2026 PM peak – without development

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV] %	Arrival Flows [Total veh/h]	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh]	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	40	39.5	40	39.5	0.029		0	LOS A		0	0.3	0.03		0.06	0.03	59.4
3	R2	All MCs	4	50	4	50	0.029		6.2	LOS A		0	0.3	0.03		0.06	0.03	54.2
Approach			44	40.5	44	40.5	0.029		0.6	NA		0	0.3	0.03		0.06	0.03	58.9
East: Uncle Toms Road																		
4	L2	All MCs	4	25	4	25	0.116		6	LOS A		0.4	2.9	0.18		0.58	0.18	51.4
6	R2	All MCs	133	2.4	133	2.4	0.116		5.8	LOS A		0.4	2.9	0.18		0.58	0.18	52.1
Approach			137	3.1	137	3.1	0.116		5.8	LOS A		0.4	2.9	0.18		0.58	0.18	52.1
North: Leichhardt Highway																		
7	L2	All MCs	5	60	5	60	0.024		6.2	LOS A		0	0	0		0.08	0	54.3
8	T1	All MCs	33	32.3	33	32.3	0.024		0	LOS A		0	0	0		0.08	0	59.5
Approach			38	36.1	38	36.1	0.024		0.9	NA		0	0	0		0.08	0	58.7
All Vehicles			219	16.3	219	16.3	0.116		3.9	NA		0.4	2.9	0.12		0.39	0.12	54.4

Figure C.10 SIDRA movement summary for 2026 PM peak – with development – 100% workers from Moura or Biloela

C1.3 Leichhardt Highway/Defence Road

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV] %	Arrival Flows [Total veh/h]	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh]	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	36	41.2	36	41.2	0.025		0	LOS A		0	0.2	0.03		0.05	0.03	59.4
3	R2	All MCs	3	33.3	3	33.3	0.025		5.9	LOS A		0	0.2	0.03		0.05	0.03	54.9
Approach			39	40.5	39	40.5	0.025		0.5	NA		0	0.2	0.03		0.05	0.03	59
East: Defence Road																		
4	L2	All MCs	3	33.3	3	33.3	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.2
6	R2	All MCs	4	25	4	25	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.1
Approach			7	28.6	7	28.6	0.006		6.1	LOS A		0	0.2	0.15		0.55	0.15	51.1
North: Leichhardt Highway																		
7	L2	All MCs	4	25	4	25	0.027		5.8	LOS A		0	0	0		0.06	0	55.8
8	T1	All MCs	39	29.7	39	29.7	0.027		0	LOS A		0	0	0		0.06	0	59.4
Approach			43	29.3	43	29.3	0.027		0.6	NA		0	0	0		0.06	0	59
All Vehicles			89	34.1	89	34.1	0.027		1	NA		0	0.2	0.02		0.1	0.02	58.3

Figure C.11 SIDRA movement summary for 2026 AM peak – without development

Vehicle Movement Performance																		
Mov ID	Turn	Mov Class	and Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	36	41.2	36	41.2	0.096		0.2	LOS A		0.5	3.5	0.14		0.45	0.14	55.3
3	R2	All MCs	131	0.8	131	0.8	0.096		5.6	LOS A		0.5	3.5	0.14		0.45	0.14	52.8
Approach			166	9.5	166	9.5	0.096		4.4	NA		0.5	3.5	0.14		0.45	0.14	53.3
East: Defence Road																		
4	L2	All MCs	3	33.3	3	33.3	0.01		6.1	LOS A		0	0.3	0.21		0.55	0.21	50.9
6	R2	All MCs	6	50	6	50	0.01		7.3	LOS A		0	0.3	0.21		0.55	0.21	49.9
Approach			9	44.4	9	44.4	0.01		6.9	LOS A		0	0.3	0.21		0.55	0.21	50.2
North: Leichhardt Highway																		
7	L2	All MCs	6	50	6	50	0.028		6.1	LOS A		0	0	0		0.08	0	54.6
8	T1	All MCs	39	29.7	39	29.7	0.028		0	LOS A		0	0	0		0.08	0	59.4
Approach			45	32.6	45	32.6	0.028		0.9	NA		0	0	0		0.08	0	58.7
All Vehicles			221	15.7	221	15.7	0.096		3.8	NA		0.5	3.5	0.12		0.38	0.12	54.2

Figure C.12 SIDRA movement summary for 2026 AM peak – with development –100% workers from Theodore

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	40	39.5	40	39.5	0.029		0	LOS A		0	0.3	0.03		0.06	0.03	59.4
3	R2	All MCs	4	50	4	50	0.029		6.1	LOS A		0	0.3	0.03		0.06	0.03	54.2
Approach			44	40.5	44	40.5	0.029		0.6	NA		0	0.3	0.03		0.06	0.03	58.9
East: Defence Road																		
4	L2	All MCs	4	25	4	25	0.006		6	LOS A		0	0.2	0.13		0.54	0.13	51.5
6	R2	All MCs	3	33.3	3	33.3	0.006		6.3	LOS A		0	0.2	0.13		0.54	0.13	50.8
Approach			7	28.6	7	28.6	0.006		6.1	LOS A		0	0.2	0.13		0.54	0.13	51.2
North: Leichhardt Highway																		
7	L2	All MCs	3	33.3	3	33.3	0.022		5.9	LOS A		0	0	0		0.05	0	55.5
8	T1	All MCs	33	32.3	33	32.3	0.022		0	LOS A		0	0	0		0.05	0	59.5
Approach			36	32.4	36	32.4	0.022		0.5	NA		0	0	0		0.05	0	59.1
All Vehicles			87	36.1	87	36.1	0.029		1	NA		0	0.3	0.03		0.1	0.03	58.3

Figure C.13 SIDRA movement summary for 2026 PM peak – without development –100% workers from Theodore

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	and Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c		Aver. Delay sec	Level of Service		95% Back Of Queue [Veh. veh	Dist] m	Prop. Que		Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Leichhardt Highway																		
2	T1	All MCs	40	39.5	40	39.5	0.029		0	LOS A		0	0.3	0.03		0.06	0.03	59.4
3	R2	All MCs	4	50	4	50	0.029		6.2	LOS A		0	0.3	0.03		0.06	0.03	54.2
Approach			44	40.5	44	40.5	0.029		0.6	NA		0	0.3	0.03		0.06	0.03	58.9
East: Defence Road																		
4	L2	All MCs	132	0.8	132	0.8	0.089		5.7	LOS A		0.4	2.7	0.11		0.54	0.11	52.5
6	R2	All MCs	5	60	5	60	0.089		6.8	LOS A		0.4	2.7	0.11		0.54	0.11	49.8
Approach			137	3.1	137	3.1	0.089		5.7	LOS A		0.4	2.7	0.11		0.54	0.11	52.4
North: Leichhardt Highway																		
7	L2	All MCs	5	60	5	60	0.024		6.2	LOS A		0	0	0		0.08	0	54.3
8	T1	All MCs	33	32.3	33	32.3	0.024		0	LOS A		0	0	0		0.08	0	59.5
Approach			38	36.1	38	36.1	0.024		0.9	NA		0	0	0		0.08	0	58.7
All Vehicles			219	16.3	219	16.3	0.089		3.8	NA		0.4	2.7	0.08		0.37	0.08	54.6

Figure C.14 SIDRA movement summary for 2026 PM peak – with development

About Us

WSP is one of the world's leading engineering professional services consulting firms, bringing together approximately 65,000+ talented people around the globe. We are technical experts who design and provide strategic advice on sustainable solutions and engineer Future ReadyTM projects that will help societies grow for lifetimes to come. wsp.com