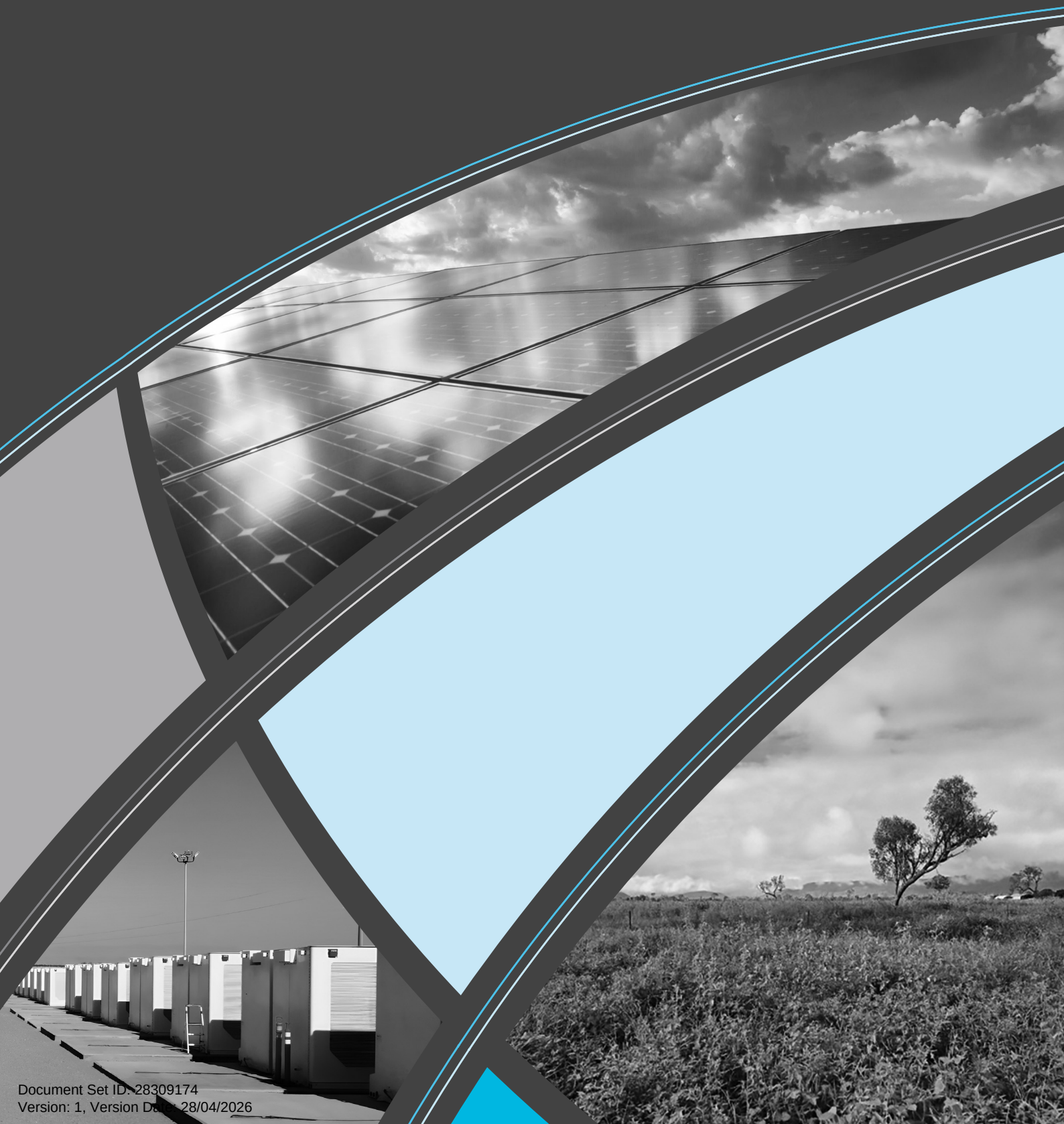
Appendix J

Traffic impact assessment



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20 April 2026

Assessment Manager

Re: Development application - Integrated impact assessment context

1.1 Purpose

The intent of this letter is to outline the planning context and explain the assessment approach adopted for the technical impact assessments which were prepared to support the development application. With consideration of changes to the planning framework introduced on 12 December 2025, which have directly influenced the assessment pathway for the project.

1.2 Context

Supernode North BESS ProjectCo Pty Ltd as trustee for Supernode North BESS Project Trust is a wholly owned portfolio company of funds managed by Quinbrook Infrastructure Partners (Quinbrook). Private Energy Partners Pty Ltd (PEP) is an affiliated Quinbrook entity and is a dedicated development, delivery, and operations service provider. Together they propose to develop a Battery Energy Storage System (BESS), substation and transmission lines to facilitate electricity supply for future manufacturing facilities as part of the broader Northern Quartz Campus (NQC) Project (prescribed project).

The project was originally properly made on 12 September 2025 with Townsville City Council (TCC), as the Assessment Manager, as a combined Battery Energy Storage System (BESS), substation, and transmission line project. Following the commencement of the *Planning (Battery Storage Facilities) and Other Legislation Amendment Regulation 2025* on 12 December 2025, the original application was taken to be invalid, and a revised assessment pathway was established resulting in the separate assessment of the BESS.

As a result of the changes to assessment pathway and following detailed pre-lodgement discussions with SARA, TCC, and the Office of the Coordinator-General (OCG), it was agreed that the development components should be assessed separately based on the land-use as defined by the *Planning Regulation 2017.* As such, the development components have been separated into two development application packages. The delineation of development infrastructure within each of the application packages is as follows:

- Development application 1:
    - Development permit for Material Change of Use of a premises for a battery storage facility.

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- Development application 2:
  - Development permit for Material Change of Use for Major Electricity Infrastructure (transmission lines), and
  - Development permit for Material Change of Use for a Substation

While administratively assessed separately, these components function collectively to deliver an energised, operational BESS which is connected to the substation via overhead transmission lines. This electrical infrastructure will connect into the publicly owned Calcium Substation which is to be delivered separately by Powerlink Queensland.

1.3 Environmental impact assessment approach

The project has been designed, engineered and assessed as an integrated system. The environmental and technical assessments have been developed on a whole-of-project basis, consistent with the operational and construction realities of delivering the project.

Accordingly, all technical impact assessments have assessed the combined impacts of the integrated complete development (this including the substation, transmission line and BESS facility as a single unified development). The information provided within the technical impact assessments are provided in their completeness and include outcomes from the original application RFI period previously undertaken in an effort to provide transparency of information.

This integrated methodology also provides a more accurate representation of real-world impacts, enables more effective identification and mitigation of cumulative impacts, and supports a streamlined, practical delivery pathway for all project components.

1.4 Assessment outcomes

The technical impact assessments that have been completed to support the development applications packages have demonstrate compliance with both the requirements with *State Code 27: Battery storage facility* and the *TCC Planning scheme* codes. A summary of the model considerations and outcomes from the technical impact assessments are provided in Table 1.

Table 1 Summary of technical impact assessment outcomes

Impact assessment	Impact assessment considerations	Compliance
Noise Impact assessment	Acoustic objectives of the Environmental Protection (Noise) Policy 2019.	• State Code 27: PO20 & PO21 • TCC Planning Scheme Codes: – High Impact Industry
Bushfire	• National Construction Code 2022 (NCC) • State Planning Policy (SPP) and associated guidelines (Department of Infrastructure, Local Government and Planning (DILGP), July 2017) • Townsville City Plan 2014 (version 2024/01) • Australian Standard AS3959:2018 – Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018)	• State Code 27: – PO2 - PO7 – PO13 – PO15 • TCC Planning Scheme Codes: – Bushfire Hazard Overly Code

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Impact assessment	Impact assessment considerations	Compliance
Traffic	• Queensland Government's *Guide to Traffic Impact Assessment* (DTMR 2018) • Townsville City Plan Part 9.3.5: Transport impact, access and parking code (Townsville City Council 2020) • QLD *Transport Infrastructure Act 1994* (TI Act)	• State Code 27: PO24 – PO28 • TCC Planning Scheme Codes: – High Impact Industry – Transport Impact, Access, and Parking Code – Works Code
Visual	• *Guidelines for Landscape and Visual Impact Assessment Third Edition* (2013) (the GLVIA), Landscape Institute and Institute of Environmental Management and Assessment • Guidance Note for Landscape and Visual Assessment (2018), Australian Institute of Landscape Architects (Queensland).	• State Code 27: PO22 • TCC Planning Scheme Codes: – High Impact Industry – Telecommunications, Facilities and Utilities Code – Landscape Code
Water resource	• Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia. Version 4.2, August 2024. • DES 2016, Manual for assessing consequence categories and hydraulic performance of structures ESR/2016/1933 Version 5.02, Department of Environment and Science.	• State Code 27: PO16-PO19 • TCC Planning Scheme Codes: – High Impact Industry – Natural Assets Overlay Code – Healthy Water Code – Landscape Code – Flood Hazard Overlay Code
Hazard assessment report	• Work Health and Safety Regulation 2011 – Schedule 15 • AS/NZ ISO 31000:2018 Risk Management - Guidelines	• State Code 27: PO5-PO7 • TCC Planning Scheme Codes: – High Impact Industry – Works Code – Bushfire Hazard Overlay Code
Fire Safety Study	• Large-scale battery energy storage system installations v1.0, 05/02/2025 • *Queensland Fire and Emergency Services Act, 1990* • AS/NZ ISO 31000:2018 Risk Management - Guidelines • FM Global Property loss prevention data sheet 5-33 electrical energy storage systems	• State Code 27: PO5-PO7 • TCC Planning Scheme Codes: – High Impact Industry – Works Code

1.5 Closing

The aim of this letter is to assist the Assessment Manager in understanding the relationship between the project components, the legislative changes that have shaped the assessment pathway, and the rationale for the integrated approach adopted across all technical assessments which support the two development applications.

Please do not hesitate to contact us should further detail or clarification be required.

Yours sincerely

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Northern Quartz Campus

Traffic Impact Assessment - BESS, Substation and Transmission Line

Solquartz and Private Energy Partners

E231133 RP2

August 2025

Version	Date	Prepared by	Reviewed by	Comments
V1-0	01/08/2025	C. Cheng	A. Uddin	Client review
V2-0	28/08/2025	C. Cheng	A. Uddin	For use

Approved by

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This report has been prepared in accordance with the brief provided by Solquartz and Private Energy Partners and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. This report is to only be used for the purpose for which it has been provided. Except as permitted by the Copyright Act 1968 (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to Solquartz and Private Energy Partners (and subject to the terms of EMM's agreement with Solquartz and Private Energy Partners).

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Executive Summary

ES1 Introduction

This report details the traffic impact assessment (TIA) undertaken for the Northern Quartz Campus (NQC) Battery Energy Storage System (BESS), Substation and transmission line Project (the development) located at 132 Bidwilli Road, Calcium.

The development involves the construction and operation of a 780 megawatt (MW) BESS and substation facility with its ancillary facility. The BESS, substation and transmission line will facilitate electricity supply for future Metallurgical Silicon (MG-Si) and Polysilicon (Poly-Si) manufacturing facilities as part of the broader NQC project. The purpose of the report is to identify the traffic impact to the adjoining road network due to the construction of this development.

ES2 Existing conditions

Traffic generated as a result of the development is anticipated to approach the development site from the north along Flinders Highway by using Flinders Highway/Woodstock-Giru Road/Glenn Road intersection. As part of this study, the existing traffic volumes at this intersection has been surveyed during the AM and PM peak hours in May 2025.

Currently vehicles access the precinct via Glenn Road/Woodstock Avenue /Jones Road /No-Name Road. As part of the masterplan development of this precinct, Jones Road will be realigned and have a direct connection at Flinders Highway. No-Name Road will be upgraded and extended to Bidwilli Road. The road upgrades are being completed by Townsville City Council (TCC) and are likely to occur before commencement of construction of the development.

ES3 Assessment of impacts

Traffic generated by the development will be the highest during peak construction in 2027 and is expected to be negligible during operations. There are expected to be a maximum of approximately 93 workers during peak construction, all driving to the site.

During the peak construction for a period of three months, traffic is expected to reach 93 light vehicle movements and 10 heavy vehicle movements, for a total of 103 vehicle movements the AM and PM peak hours (inbound and outbound).

The Flinders Highway/Woodstock-Giru Road/Glenn Road intersection is expected to maintain a level of service LOS B with the construction traffic. However, with neighbouring development traffic, the intersection will operate at LOC C during the AM peak hour. Nonetheless, there will not be any excessive queuing by the inbound vehicles that will affect the right turn by on Flinders Highway. Even with construction and cumulative traffic, the intersection will have sufficient capacity to accommodate additional traffic.

It has been identified that there are two major Drive IT events per annum which results in significant traffic generation at this precinct. To minimise any potential traffic impact, it is recommended that the heavy vehicle deliveries are to be restricted during the time of the event for these two days.

The Austroads intersection turn warrant assessment shows that no road infrastructure upgrade is required at Flinders Highway/Woodstock-Giru Road/Glenn Road as this intersection already have dedicated right and left turn bays at the north and south approaches.

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A level crossing assessment is undertaken at the realigned Jones Road. It is recorded that there are two train movements during the AM peak and one train movement during the PM peak hours that pass this level crossing. The assessment shows that due to the cumulative traffic, Flinders Highway will be impacted due to the excessive queuing. Therefore, it is recommended that the heavy vehicle deliveries are to be restricted during the train crossing at this level crossing. The heavy vehicle movement will be controlled by a Construction Traffic Management Plan (CTMP) to be prepared in collaboration with TCC.

ES4 Road upgrades and mitigation measures

The proposed mitigation measures to minimise the potential traffic impact are summarised below:

- The CTMP to be drafted to cover the Drivers Code of Conduct which will outline all relevant information in relation to haulage traffic e.g. haulage route, delivery time and other associated matters as outlined in Section 7.2.1.
- Heavy vehicle operation to the site is to be restricted during the two annual major events for Drive IT.
- Inbound heavy vehicles are to avoid timing while the level crossing on Jones Road is operational.

It is assumed that all road infrastructure in this precinct will be constructed in accordance with the masterplan to ensure unimpeded access to the development site.

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1 Introduction

1.1 Overview

Solquartz, a wholly owned portfolio company of funds managed by Quinbrook Infrastructure Partners (Quinbrook), and Private Energy Partners Pty Ltd (PEP), an affiliate enterprise of Quinbrook and Quinbrook's dedicated development, delivery and operations service provider, are proposing to develop a BESS, substation and transmission lines to facilitate electricity supply for future Metallurgical Silicon (MG-Si) and Polysilicon (Poly-Si) manufacturing facilities as part of the broader Northern Quartz Campus (NQC) project.

The premises which form the development application is on part of Lot 19 SP321818 and part of Lot 87 on RP911426, near Woodstock in TCC local government area. The development includes the proposed overhead transmission line which traverses south along the western edge of the project premises and connect into the future Powerlink Calcium substation.

EMM Consulting Pty Ltd (EMM) has been engaged by Private Energy Partners Pty Ltd (PEP) to prepare a Traffic impact assessment (TIA) for the development.

1.2 Development description

The development involves the construction and operation of a 780 MW BESS and substation facility which will be supported by enabling infrastructure including roads, parking, switchgear, transformers, site offices and onsite storage areas. The BESS will provide firming for the electricity supply provided to the MG-Si and Poly-Si manufacturing facilities as part of the larger NQC project. A 275 kV transmission line is proposed between the NQC substation and the Powerlink Calcium substation, the length of this transmission line is 2658 m and incudes 21 transmission towers. The Powerlink Calcium substation does not form part of this application though the connection of the transmission lines into it does.

1.3 Development areas

The development site is at 132 Bidwilli Road, Calcium Townsville, approximately 40 km south of Townsville within the LEIP (Figure 1.1 and Figure 1.2). The Project is proposed to be located centrally on part of Lot 19 on SP321818 and part of Lot 87 on RP911426.

The development includes the proposed overhead transmission line which traverses south along the western edge of the project premises and connect into the future Powerlink Calcium substation. The overhead transmission line interacts with the following road reserves and lot boundaries:

- Lot 19/SP321818
- Lot 87/RP911426
- Lot 30/SP321818
- Lot 55/E124248
- Lot 65/E124264
- No Name Road
- Bidwilli Road
- An unnamed road reserve
- Manton Quarry Road.

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1.4 Site access

Access to the premises during both construction and operation phases will be via the northern LEIP access intersection point which includes Flinders Highway via Glenn Road and Jones Road. The proposed site access on Bidwilli Road will act as a new left-in/right-out driveway as all vehicles will arrive and depart from/to the north (Figure 1.2). This access will be used during construction and operation.

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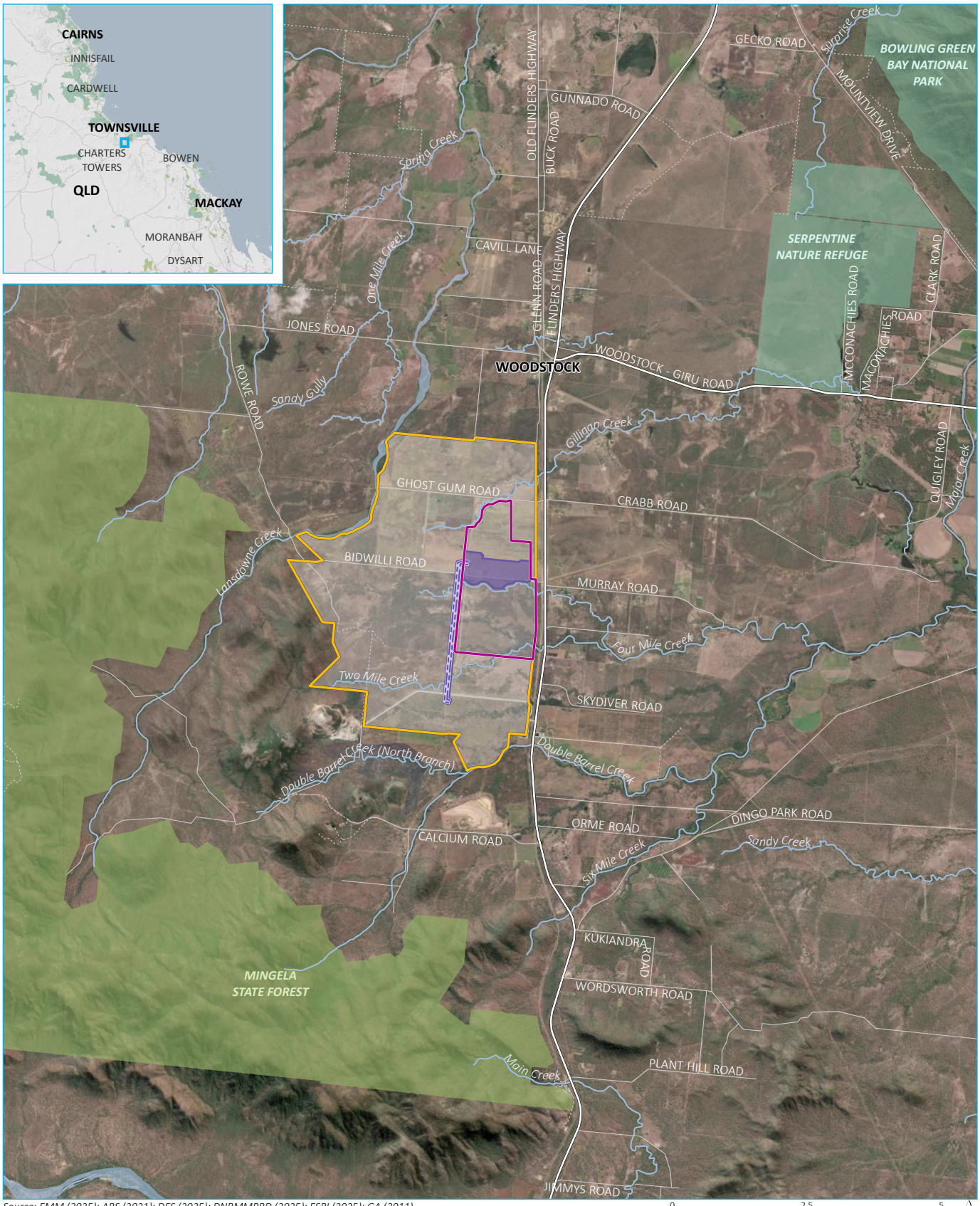

Source: EMM (2025); ABS (2021); DES (2025); DNRMMRRD (2025); ESRI (2025); GA (2011)

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KEY

- Lansdown Eco-Industrial Precinct
- Northern Quartz Campus
- Package 1- Premises
- Package 1- Transmission line

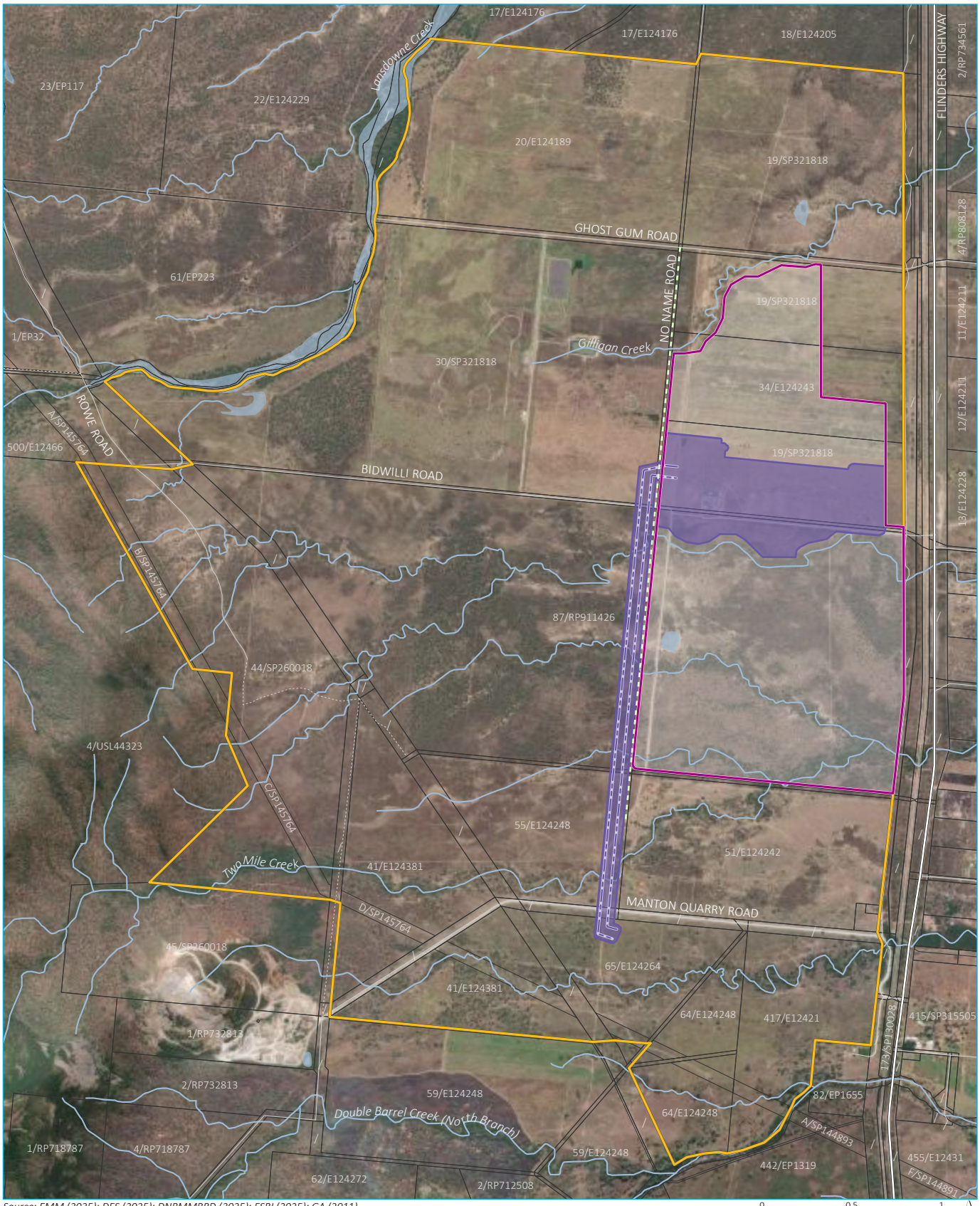
Existing environment

- Major road
- Minor road
- Vehicular track
- Named watercourse
- Named waterbody
- National park/nature reserve
- State forest

Regional context

Northern Quartz Campus
Package 1- BESS, transmission line and substation
Traffic Impact Assessment
Figure 1.1

EMM creating opportunities



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KEY

- Lansdown Eco-Industrial Precinct
- Northern Quartz Campus
- Package 1- Premises
- Package 1- Transmission line
- No Name Road (proposed)

Existing environment

- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary

Local context

Northern Quartz Campus
Package 1- BESS, transmission line and substation
Traffic Impact Assessment
Figure 1.2

EMM creating opportunities

1.5 Purpose of this report

This TIA has been prepared to support the Development Application of the proposed development, for submission to Townsville City Council (TCC) for assessment.

This TIA has been prepared generally in accordance with the requirements of the Queensland Government's *Guide to Traffic Impact Assessment* (DTMR 2018) and incorporates the following investigations and analysis:

- background traffic data review
- site inspection and current traffic surveys
- SIDRA intersection analysis
- railway level crossing assessment
- future road upgrade requirements and maintenance impacts.

A visual inspection of the primary affected roads, comprising Flinders Highway, Glenn Road and Jones Road has been undertaken to confirm the current general road widths and traffic conditions for these routes. Photographs and videos have been taken at the key development access intersections.

The intent of the report is to identify and address the traffic impact resulting from the development and how this interacts with cumulative traffic impacts for the LEIP.

1.6 Pre-lodgement advice

The first formal pre-lodgement meeting with TCC was held on 27 November 2024 to introduce TCC to Solquartz team and the project components. A follow up formal meeting with TCC was held on 17 April 2025 (PLM25/0068) to introduce the planning pathway, project components and detail on the BESS development. Meeting minutes received from TCC can be referred to the application package materials.

The third meeting was held with the TCC planning team and Owner's team on 24 July 2025. The purpose of this meeting was to inform the TCC Owners Consent team of the project.

Informal communications with the Planning assessment team at TCC has been ongoing during the baseline studies for the project site since August 2024. Outcomes from which have identified alignment of model input considerations and technical model scenarios.

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2 Legislation, policy, standards and guidelines

2.1 Statutory guidelines

The *Guide to Traffic Impact Assessment* (DTMR 2018) outlines the considerations that need to be documented in a TIA. This includes the impacts the development proposal is likely to have on local and State-controlled road (SCR) network operations and on transport infrastructure, and recommends measures to avoid, manage and mitigate these impacts.

In addition, the TIA has been prepared with reference to the following guidelines:

- Townsville City Plan Part 9.3.5: Transport impact, access and parking code (Townsville City Council 2020)
- Austroads Guide to Road Design Part 3: Geometric Design (Austroads 2021a)
- Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads 2023)
- Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (Austroads 2020a).

2.2 Regulatory requirements

The key applicable legislations informing the TIA are the QLD *Transport Infrastructure Act 1994* (TI Act)*, Land Act 1994* (Land Act) and *Rail Safety National Law Act 2017* (RSNL Act).

The overall objective of the TI Act is to provide a regime that allows for and encourages effective integrated planning and efficient management of a system of transport infrastructure. For roads this means:

- those of national and State significance can be effectively planned and efficiently managed
- adequate levels of safety and community access to the road network can be provided
- that impacts on adjacent developments from environmental emissions generated by SCRs can be addressed.

One of the main purposes of the Land Act is to allocate land for development in the context of the State's planning framework and applying contemporary best practice in design and land management.

The RSNL Act provides for safe railway operations in Australia by establishing the Office of the National Rail Safety Regulator. This act makes provision for a national system of rail safety and for the effective management of safety risks associated with railway operations.

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3 Methodology

3.1 Site visit

EMM's traffic team conducted a site visit on Tuesday and Wednesday 13 and 14 May 2025 (non-school holiday period) to inspect and survey the relevant road network and the key affected intersection at the vicinity of the site. Photographs were taken during the site visit which are presented throughout this TIA.

3.2 Desktop research and analysis

Traffic related information, e.g. Townsville Aimsun Integrated Model, Queensland Government Open Data Portal and Queensland Globe were reviewed in preparation of this TIA.

3.3 Data analysis

EMM conducted intersection traffic survey at the key affected intersection. The details of this survey are explained in Section 4.2.

3.3.1 Identify capacity of the road network (existing and forecast)

Intersection modelling software SIDRA has been used to analyse existing and forecast intersection performance. Details on the results of existing and development intersection modelling scenarios are explained in Section 6.1.

3.3.2 Impacts of the road network due to the proposed development and cumulative traffic

A detailed assessment of the traffic impact and road upgrade work due to the development as well as the cumulative developments have been undertaken. This is detailed in Section 6.

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4 Existing environment

4.1 Road network

The DTMR comprises of four administrative classifications in its hierarchy of roads. These are:

- National Highway (NH)
- State Strategic Road (SSR)
- Regional Road (RR)
- District Road (DR).

The above four classification are State Controlled Roads. The local roads are managed by local Councils.

The premises is bounded by Flinders Highway on the east and by Bidwilli Road on the south. Flinders Highway is a National Highway and forms part of the DTMR strategic highway network and is designated as a heavy vehicle transport link capable, servicing up to and including Class 12 (Triple Road Train) vehicles. Glenn Road, Jones Road and Bidwilli Road are managed by TCC (i.e. a local road). The LEIP development proposes No-Name Road reserve which runs north-south and traverses on the west of the development site. This hierarchy is shown in Figure 4.1 (near premises). An overview of each of the key roads is provided in Table 4.1 to Table 4.3.

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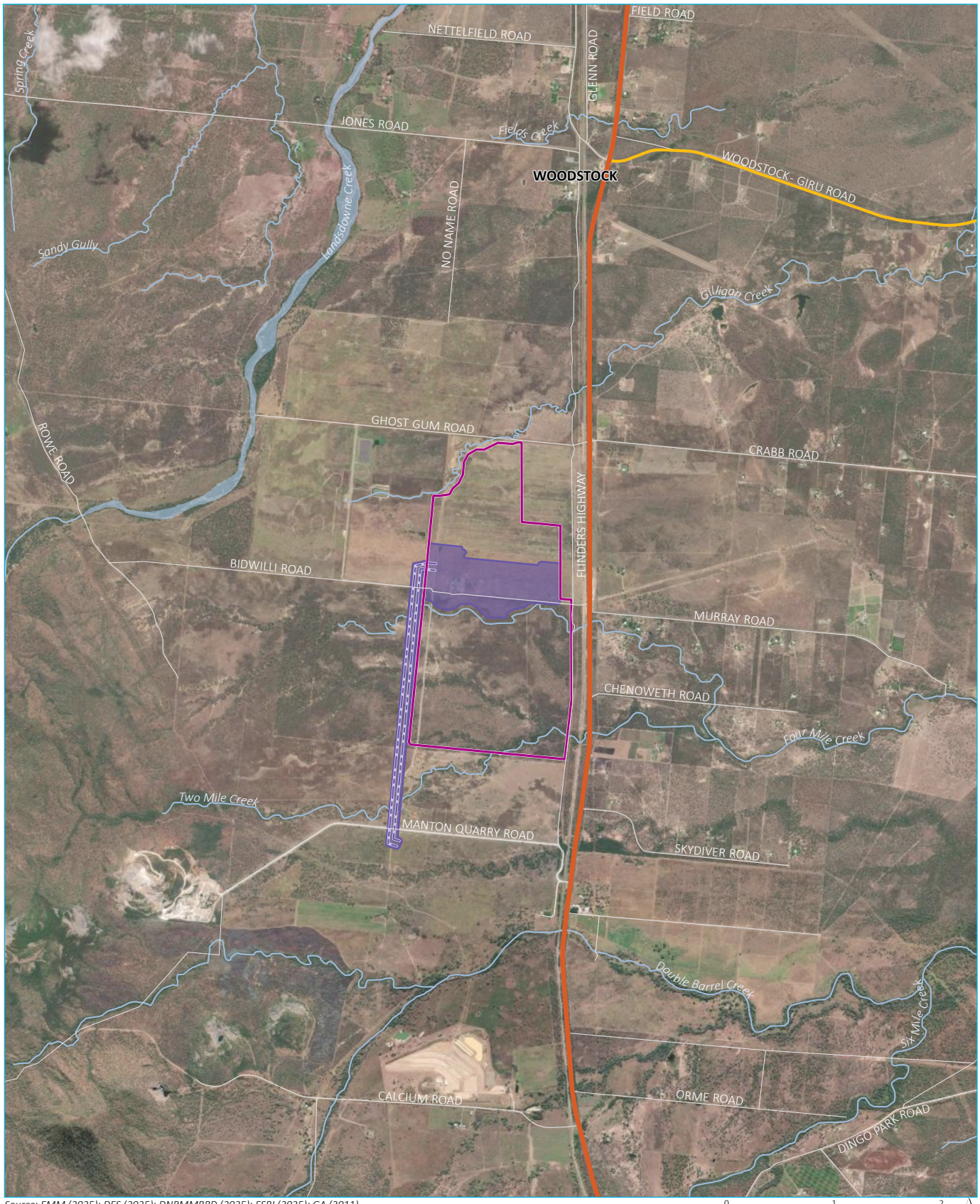

Source: EMM (2025); DES (2025); DNRMMRRD (2025); ESRI (2025); GA (2011)

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KEY

- Northern Quartz Campus
- Package 1- Premises
- Package 1- Transmission line

Road hierarchy

- National highway
- State road
- Local road

Existing environment

- Named watercourse
- Named waterbody

Road hierarchy near development site

Northern Quartz Campus
Package 1- BESS, transmission line and substation
Traffic Impact Assessment
Figure 4.1

EMM creating opportunities

4.1.1 Flinders Highway

An overview of Flinders Highway is summarised in Table 4.1.

Table 4.1 Flinders Highway

Aspect	Description
Road classification and connectivity	National Highway between Bruce Highway (Townsville) and Barkley Highway (Cloncurry), passing through local and regional towns such as Julia Creek and Richmond
Alignment	North – south in the vicinity of the site
Number of lanes	One lane each way, excluding near the intersections
Carriageway type	Sealed road
Carriageway width	Varies in various section of the road, approximately 9 m wide
Posted speed limit	110 km/h
Heavy vehicle access	Approved for road trains type 2[1]
Traffic function	Carries regional and local traffic between townships

Note: 1. Type 2 road train means a road train using either a rigid truck hauling unit towing two trailers when the combination length is no longer than 47.5 m or a road train using a prime mover hauling unit towing three or four trailers when the combination length is no longer than 53.5 m.

Photograph 4.1 Flinders Highway facing south nearby Bidwilli Road (taken on 14 May 2025)

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4.1.2 Glenn Road

An overview of Glenn Road is summarised in Table 4.2.

Table 4.2 Glenn Road

Aspect	Description
Road classification and connectivity	Local road
Alignment	East - west
Number of lanes	One lane each way
Carriageway type	Sealed road
Carriageway width	Approximately 5.5-6.5 m wide
Default speed limit	100 km/h general speed rural speed limit
Heavy vehicle access	No
Traffic function	Predominantly carries local traffic
Additional comments	There is a railway level crossing approximately 280 m west of Flinders Highway. A cycling lane is provided for a short section along the northern departure lane near the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

Photograph 4.2 Glenn Road facing west near railway level crossing (taken on 14 May 2025)

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4.1.3 Jones Road

An overview of Jones Road is summarised in Table 4.3.

Table 4.3 Jones Road

Aspect	Description
Road classification and connectivity	Local road between Woodstock Avenue and Rowe Road
Alignment	East - west
Number of lanes	One lane
Carriageway type	Sealed road
Carriageway width	Approximately 5 m wide
Default speed limit	100 km/h general speed rural speed limit
Heavy vehicle access	No
Traffic function	Predominantly carries local traffic

Photograph 4.3 Jones Road facing west near Woodstock Avenue (taken on 14 May 2025)

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4.2 Key intersection

A description and layout of the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection is provided in Table 4.4 and Figure 4.2.

Table 4.4 Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

Aspect	Description
Location from the site	Approximately 3.7 km north of the development site
Intersection control	Priority and stop controlled intersection
Major road	Flinders Highway
North approach	Two departure and three approach lanes. Kerbside left turn lanes on approach and departure, as well as the right turn lane onto Glenn Road are short lanes.
East approach	One approach and one departure lane
South approach	Three approach and two departure lanes. Kerbside lanes on approach and departure as well as the right turn onto Woodstock Giru Road are short lanes.
West approach	One approach and one departure lane. An additional left turn lane is provided onto Flinders Highway.
Pedestrian connectivity	There is no pedestrian connectivity
Traffic function	Predominantly carries regional traffic and provide access to the rural properties
Speed limit	110 km/h on Flinders Highway Assume default 100 km/h on Glenn Road and Woodstock-Giru Road
Additional comments	Dedicated left and right turn bays are provided on both north and south approaches Bicycle connectivity is provided on west approach

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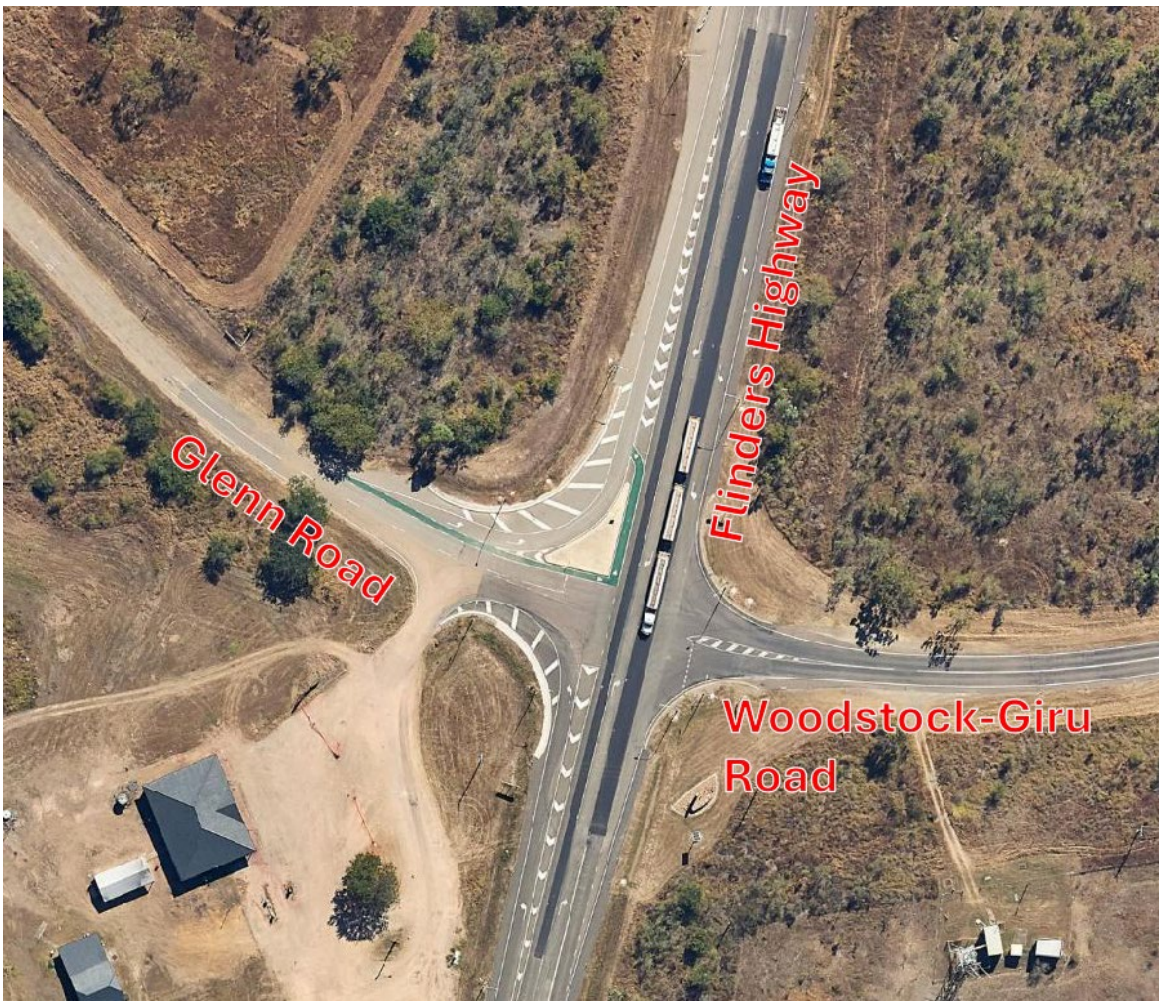

Source: Queensland Globe

Figure 4.2 Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

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4.3 Existing traffic volumes

4.3.1 Intersection counts

Intersection traffic survey was undertaken at Flinders Highway/Woodstock-Giru Road/Glenn Road intersection on 13 and 14 May 2025 (weekday, non-school holiday) from 7 am to 9 am and from 3 pm to 5 pm. The survey identified the following peak hours for this intersection:

- 7:15 am to 8:15 am
- 4 pm to 5 pm.

The results of the intersection traffic surveys are presented in Figure 4.3.

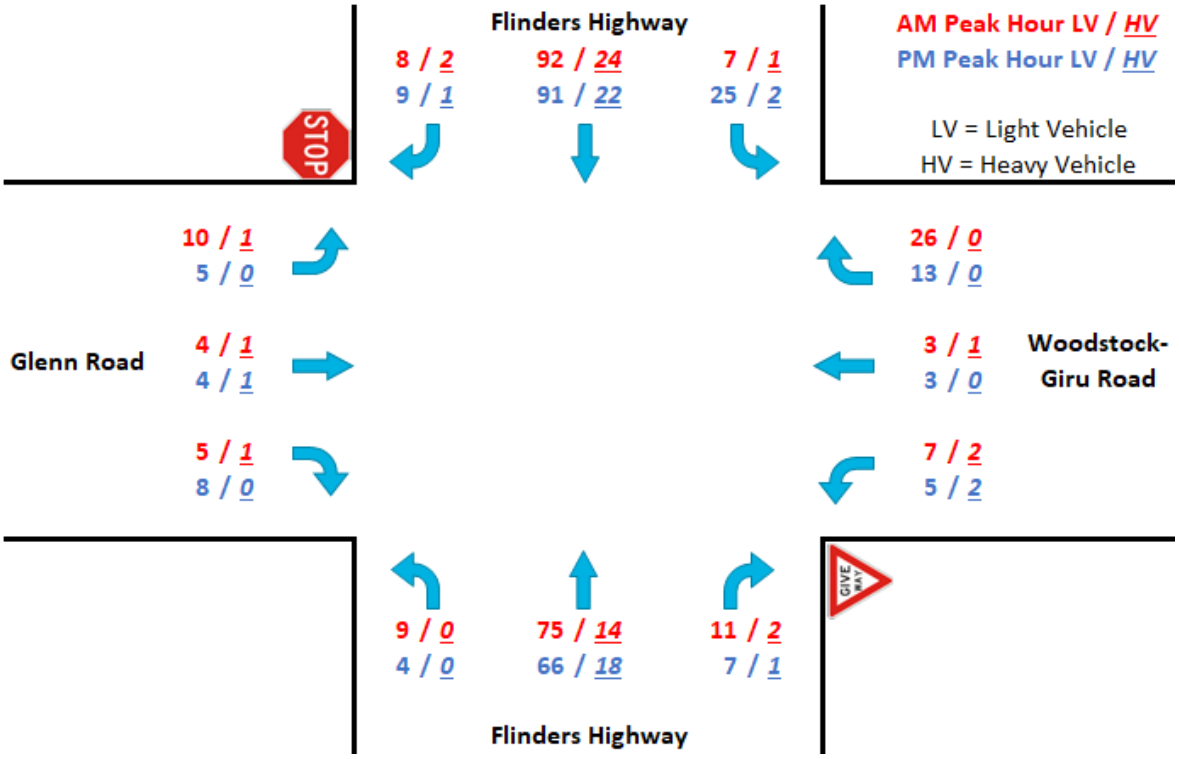

Figure 4.3 2025 surveyed peak hourly traffic volumes

At Flinders Highway/Woodstock-Giru/Glenn Road intersection, there is no definite traffic pattern where the majority of the traffic uses the highway and minor traffic on the side roads. The recorded heavy vehicle movements on Flinders Highway were significant which varied between 18% and 27%, depending on the peak hour and direction.

The intersection count data are presented in Attachment C.

4.4 Level crossing

Glenn Road crosses the Mt Isa Rail Line via a signal-controlled level crossing (Photograph 4.4). The closest train stop is Woodstock, located approximately 250 m south of the level crossing. In the future, the station will be repositioned to approximately 120 m south of the new level crossing (Section 5.8). For westbound traffic on Glenn Road, there is approximately 250 m of road available for vehicle queuing when the level crossing is occupied by a passing train. Future upgrades propose aligning Glenn Road with Jones Road (Section 5.8). In that configuration, the available queuing distance would reduce to approximately 180 m.

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The Mt Isa Rail Line currently carries frequent freight train services. A public timetable for these services is not available. Queensland Rail operates *The Inlander*, a passenger train running between Townsville and Mount Isa, twice weekly with two return trips each week. The timetable is provided in Table 4.5 and Table 4.6. Woodstock is located between Townsville and Charters Towers. Although the commuter trains do not stop at Woodstock, it can be estimated using Table 4.7 that Woodstock is approximately one hour from Townsville by train.

During the most recent site visit on 13 to 14 May 2025, two freight trains traversed the level crossing within the total survey periods (two hours in the AM peak and two hours in the PM peak). One train passed during the AM period and one during the PM period, both heading northbound. Each freight train took approximately one minute to clear the level crossing, and no queuing was observed on Glenn Road during these times. Data gathered for the Townsville Energy and Chemicals Hub [1]project, identified that each freight train took approximately three minutes to clear the level crossing. Therefore, as a conservative approach, the longer train is considered for the analysis which provides the queuing for the worst-case scenario.

A potential delay factor for traffic is the warning time for road users prior to the arrival of a train at the level crossings. Queensland Rail does not publish the advance warning time for level crossings that have flashing lights. However, the Australian Rail Track Corporation (ARTC) standard for single track railway level crossings using flashing lights and warning bells is 25 seconds (s) advance warning time (ARTC 2022). For the purpose of this TIA, 25 seconds of advance warning time is assumed.

There is also the small allowance once the train has cleared the level crossing for the deactivation of the warning systems. For this assessment, a nominal time of 3 seconds is adopted. With the total warning, passing and clearance time, the typical delay time for a freight train at an 'active' type level crossing is approximately 208 seconds which equates to 180 seconds (3 minutes) stop + 25 seconds warning on approach to the train + 3 seconds of waiting time after the departure of the train.

The train travel time information is provided in the following tables.

Table 4.5 The Inlander (Train number 3M34) – Townsville to Mount Isa train timetable

Station	Wednesday, Saturday
Townsville **depart**	12:40 pm
Charter Towers **arrive**	3:30 pm
Charter Towers **depart**	3:40 pm

Source: Queensland rail travel

Table 4.6 The Inlander (Train number 3231) – Mount Isa to Townsville train timetable

Station	Friday, Monday
Charter Tower **arrive**	6:55 am
Charter Towers **depart**	7:05 am
Townsville **arrive**	10:10 am

Source: Queensland rail travel

Table 4.7 shows that between Townsville and Woodstock; the estimated freight train travel time is approximately 60 to 70 minutes.

[1] Source: EMM Traffic Impact Assessment report dated 8 November 2021 (Section 5.4)

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Table 4.7 Sectional running times for the freight trains

Section	To (minutes)	From (minutes)
Townsville Jetty > Stuart	28	24
Stuart > Antill Plains	18	15
Antill Plains > Woodstock	22	18

Source: Queensland rail travel

Photograph 4.4 Glenn Road level crossing (taken on 14 May 2025)

Photograph 4.5 Freight train traversing the level crossing looking from Jones Road (taken on 10 March 2021)

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4.5 Crash data analysis

The Queensland Government Open Data portal provides road crash locations and characteristics of crashes within Queensland, for all reported road traffic crashes 1 January 2001 to 30 June 2024.

The road crash data from 1 July 2024 to 2025 was not available at the time of preparation of this report. The road crash locations within 6 km of the premises from 2019 to June 2024 are shown in Figure 4.4 and further detailed in Table 4.8.

Queensland Data Portal records various types of crash severity. However, all of the crash data within 6 km of the premises between 2019 and June 2024 resulted in hospitalisation. There was a total of eight crashes (within 6 km) on Flinders Highway between 2019 and June 2024 with eight hospitalisations.

A motorcycle was involved in two of the crashes while a truck was involved in four of the crashes. Three hospitalisations occurred by single vehicle crash where the vehicle veered off road and eventually hit an object. As this section of the Flinders Highway is a straight section of road, the crashes likely to be due to factors such as driver fatigue. Two crashes occurred in Field Road and south of Flinders Highway/Woodstock-Giru Road/Glenn Road intersection respectively are not along the haulage route of the Development.

Within 1 km of the development site, there are no recorded crash on local roads. Given there have been a total of eight crashes over the 4.5-year period, it is considered that crash incidents are infrequent and minor. Furthermore, the crash type does not indicate any road safety deficiency which requires immediate attention. As such, based on the crash statistics, there is not major road safety issues at the vicinity of the development site.

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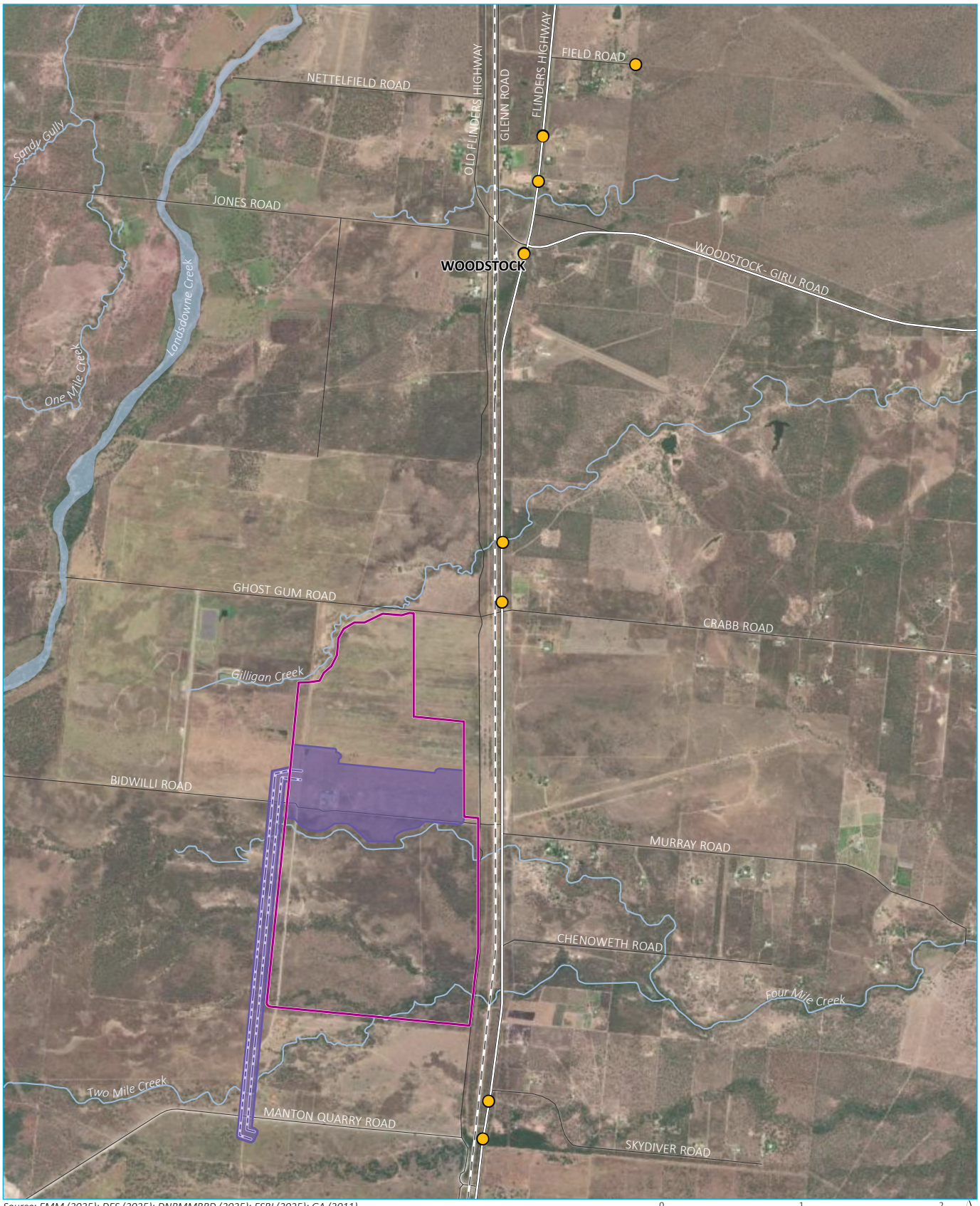

Source: EMM (2025); DES (2025); DNRMMRRD (2025); ESRI (2025); GA (2011)

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KEY

- Northern Quartz Campus
- Package 1- Premises
- Package 1- Transmission line

Crash severity

- Hospitalisation

Existing environment

- Rail line
- Major road
- Minor road
- Named watercourse
- Named waterbody

Crash data between 2019 and June 2024 within 6 km of the development site

Northern Quartz Campus
Package 1- BESS, transmission line and substation
Traffic Impact Assessment
Figure 4.4

EMM
creating opportunities

Table 4.8 Crash history between 2019 and June 2024 within 6 km of the development site

Crash year	Crash severity	Crash details	Street	Speed limit	Lighting condition	Car involved	Motorcycle involved	Truck involved
2019	Hospitalised	Off path-straight: hit object	Field Road	0-50 km/h	Dawn/Dusk	-	1	-
2020	Hospitalised	Vehicles opposite approach: head on	Flinders Highway	100-110 km/h	Daylight	1	-	1
	Hospitalised	Off path-straight: right off carriageway hit object	Flinders Highway	100-110 km/h	Daylight	1	-	-
2022	Hospitalised	Hit animal	Flinders Highway	100-110 km/h	Darkness	-	1	-
2023	Hospitalised	Off path-straight: right off carriageway hit object	Flinders Highway	100-110 km/h	Daylight	1	-	-
	Hospitalised	Vehicles same direction: rear-end	Flinders Highway	100-110 km/h	Daylight	2	-	1
	Hospitalised	Hit animal	Flinders Highway	100-110 km/h	Darkness	-	-	1
2024	Hospitalised	Vehicles opposite approach: head on	Flinders Highway	100-110 km/h	Daylight	1	-	1

4.6 Public transport

4.6.1 Buses

There are no bus stops in the vicinity of the site, which reflects the general rural nature of the site location.

4.6.2 School bus

School bus service (Route 283) is provided by Sunbus Townsville. It operates from Flinders Highway near Plant Hill Road to Heatley Secondary College in Heatley along Flinders Highway. The school bus operates from 7 to 9 am and from 3 to 4:40 pm, passing through Flinders Highway/Woodstock-Giru Road/Glenn Road intersection at around 7:16 am and 4:18 pm according to TransLink (2025).

4.6.3 Trains

Woodstock Station is a heritage-listed former railway station that is 4.5 km north of the site. There are no operational/ public train stations in the vicinity of the site.

4.7 Active transport

TCC publishes an active travel booklet within Townsville. However, it does not extend beyond the city and does not reflect the rural nature of the site.

There is a cycling lane on the western side of Flinders Highway and on the northern side of Glenn Road, at the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection. The cycling lane does not extend beyond the intersection. This bicycle lane improves cycling safety at this intersection. Photograph 4.6 presents the cycling lane on Glenn Road and Flinders Highway respectively.

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Photograph 4.6 A cycling lane on Flinders Highway looking north from Glenns Road (taken on 14 May 2025)

4.8 Parking

There is no street parking available in the vicinity of the premises on Flinders Highway, Glenn Road, Jones Road or Bidwilli Road.

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5 Traffic generation

This section discusses the construction, operational activities and the resulted traffic generation related to the development as discussed in Section 1.2.

5.1 Baseline traffic volumes

Peak construction activities with the highest number of full-time equivalent (FTE) workers are anticipated to commence in month 11, as shown on Figure 5.1, which is expected to be May 2027. Therefore, 2027 has been adopted for this assessment. Baseline traffic volumes for 2027 have been calculated using 2.42% and 2.17% per annum linear growth rate in the AM and PM peak hour respectively and the data captured as part of this assessment (Figure 4.3). The annual linear growth rates were provided as per the Townsville Aimsun Integrated Model (TAIM) by TCC (Attachment A). These traffic volumes have been used in subsequent analysis in Sections 5 and 6.

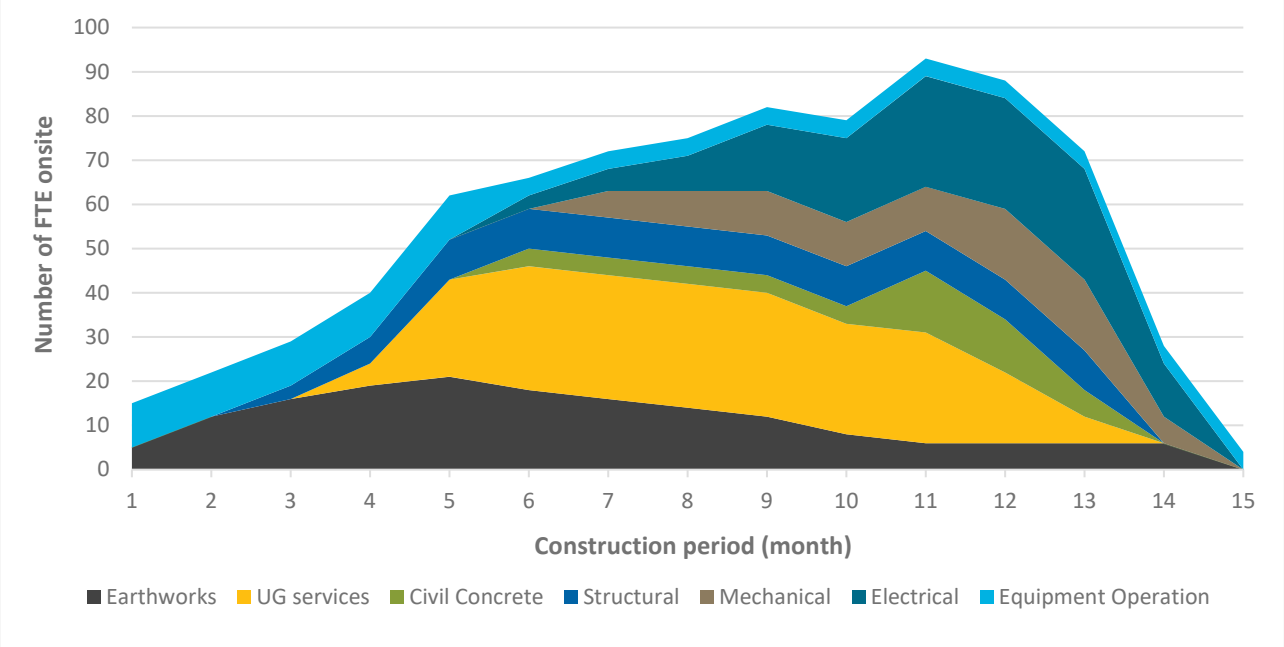

Figure 5.1 Number of FTE onsite during construction period

Based on the annual growth, the estimated 2027 baseline traffic volumes are presented in Figure 5.2.

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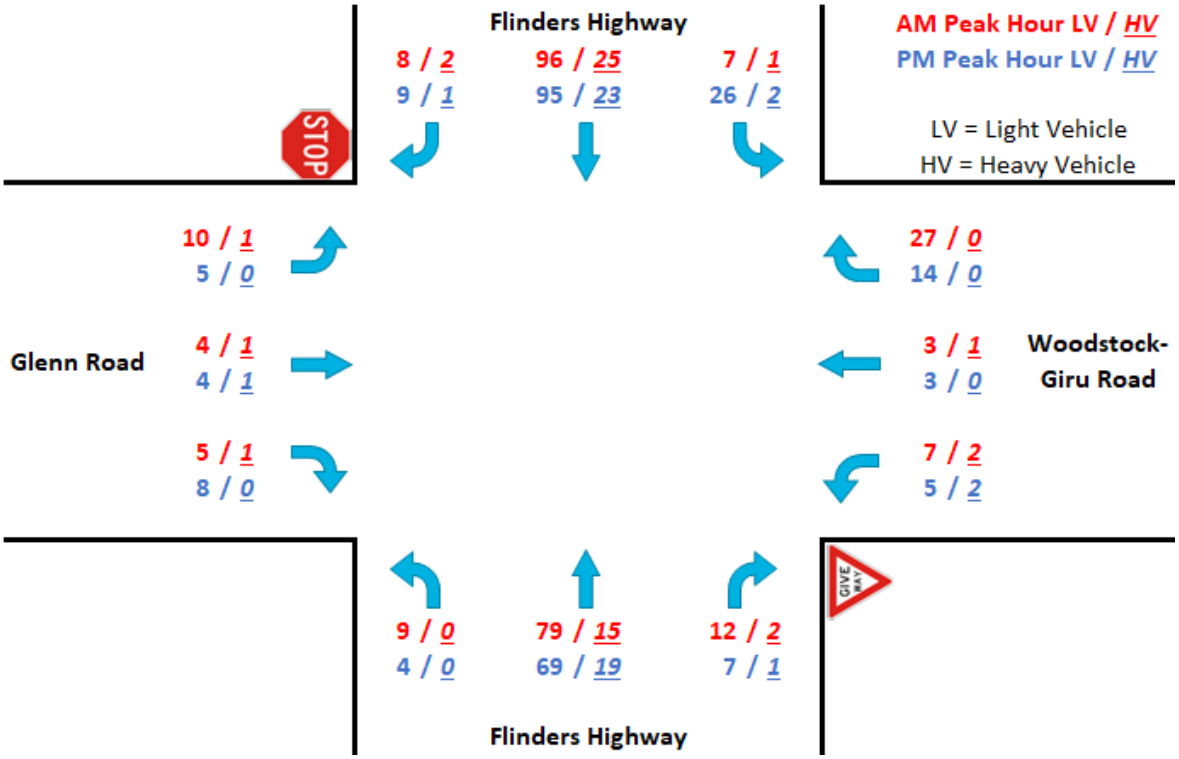

Figure 5.2 2027 baseline peak hourly traffic volumes

5.2 Trip distribution

All construction traffic will access the development site through Bidwilli Road to/from the north via the intersection of Flinders Highway/Woodstock-Giru Road/Glenn Road, realigned Jones Road and upgraded No Name road.

5.3 Construction stage

During the initial 24 to 36-month period, the project will comprise of primarily of site establishment works and Stage 1 and Stage 2 of the BESS. This period will involve the majority of the site establishment earthworks, as well as most of the cabling works. Stages 1 and 2 of the BESS will deliver up to 520 MW of capacity. In addition, the NQC Substation will be constructed with two transformers, and transmission infrastructure will be installed to connect to the Calcium substation via a single tower double circuit, comprising approximately 12 towers.

Stage 3 of the BESS will add further capacity, up to 260 MW. This stage will also include the installation of an additional transformer and another set of transmission towers, consisting of 12 structures, to support the expanded system.

It is estimated that construction stage will occur over a minimum period of 18 months, commencing in Q4 2026. Most construction works, including trenching and deliveries, will be undertaken during standard construction hours as per TCC Planning scheme:

- Monday to Saturday, 6:30 am – 6:30 pm
- No work on Sundays or Public Holidays.

Exceptions to these hours may be required on limited occasions. TCC and surrounding landholders will be notified of any work outside of these hours. Once constructed, the development will operate 24 hours per day, 7 days per week, 365 days per year (24/7).

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5.3.1 Light vehicles

Peak construction activities with the highest number of FTE workers are expected to commence in month 11 (Figure 5.1). A workforce of approximately 93 personnel will be required on-site during the peak construction period. They will be driving directly to the development site from Townsville. This equates to 93 light vehicle movements during the peak hours (AM inbound and PM outbound).

The light vehicle assumptions provided are considered highly conservative as it is likely personnel will arrive and depart the site outside of the AM and PM network peak hours, given the proposed construction hours.

5.3.2 Heavy vehicles

Construction vehicle movements are based on the following assumptions:

- traffic movements associated with construction personnel (refer to Figure 5.1)
- traffic movements associated with transport of site infrastructure.

Assumptions associated with transport of site infrastructure include:

- 1,170 BESS containers
- 234 inverters
- 3 transformers
- transmission infrastructure including powerlines and towers.

All equipment will be transported by 19-m-long semi-trailers. The total number of HV movements are based on:

- 2 BESS (2,438 x 6,058 x 2,896 mm) can be accommodated on one 13.7-m-long truck bed
- 4 inverters (2,438 x 3,000 mm) can be accommodated on one 13.7-m-long truck bed
- 1 transformer (approx. 2,400 x 6,000 x 2,800 mm) proposed to be accommodated on a specialist 14x8 960 series platform trailer (or similar)
- steel components for the transmission towers and associated powerlines components are to be transported on one 13.7-m-long truck bed.

This correlates to a total of 627 trips for the 15-month construction period. For the purpose of the assessment, it is assumed that HV movements carrying peak construction will occur within three months, from month 5 when electrical construction commences (Figure 5.1). Therefore this 3-month period is targeted to reflect the worst-case scenario. As such, it is estimated that with a maximum of 10 HV trips per day, 24 working days per month will deliver these materials over a 3-month period.

On this basis, there will be 10 daily HV trips during the peak construction period. This equates to total 20 daily HV movements. For the purpose of the traffic assessment, it is assumed that 50% of the daily HV trips will occur during the AM and PM peak hours with an equal inbound and outbound split.

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5.3.3 Total trip generation

Based on the above, the peak hourly movements anticipated in 2027 are shown in Table 5.1.

Table 5.1 Peak hour traffic generation during 2027

Vehicle type	AM inbound movements	AM outbound movements	PM inbound movements	PM outbound movements	Total movements during the AM and PM peaks
Light	93	-	-	93	186
Heavy	5	5	5	5	20
Total	**98**	**5**	**5**	**98**	**206**

Note: Given 100% will be from the north e.g. Townsville, inbound refers to southbound movements along Flinders Highway, while outbound refers to northbound movements along Flinders Highway.

The peak hour construction traffic volumes for 2027 are shown in Figure 5.3.

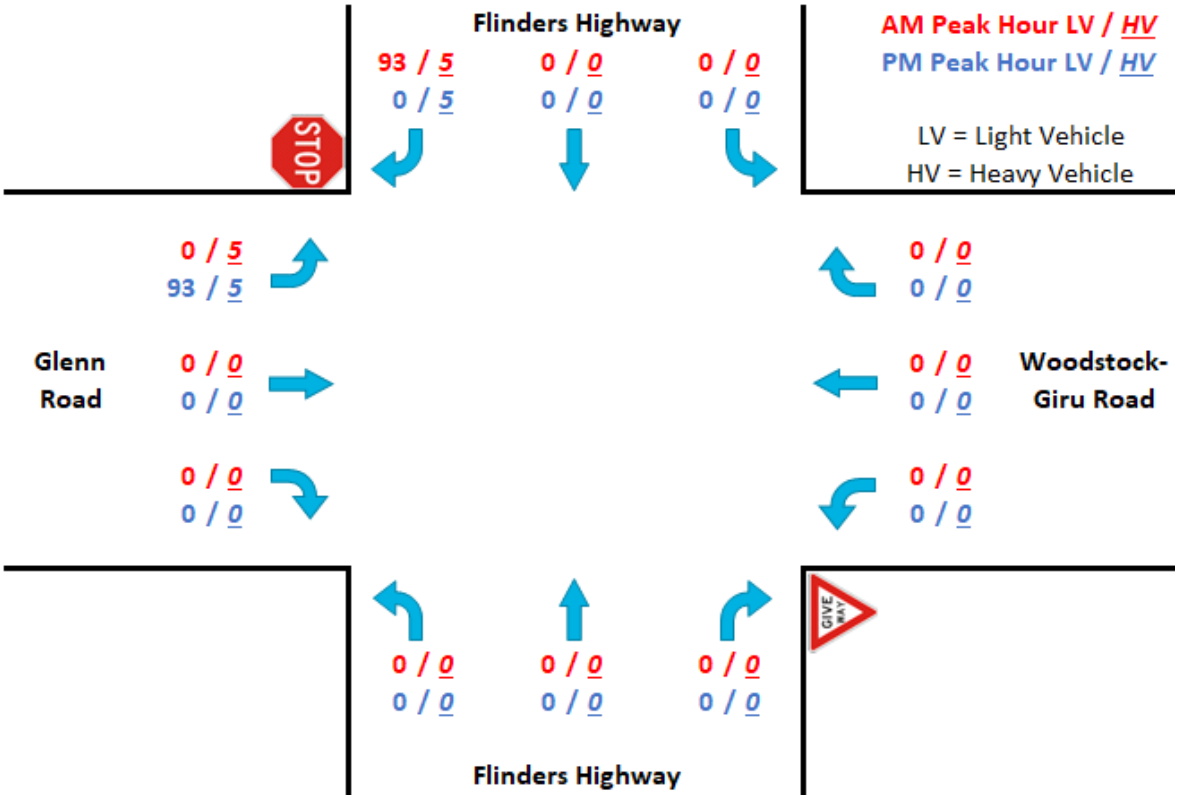

Figure 5.3 2027 peak hourly construction traffic volumes

The peak hour construction traffic volumes have been added to the 2027 baseline traffic volumes and is shown in Figure 5.4.

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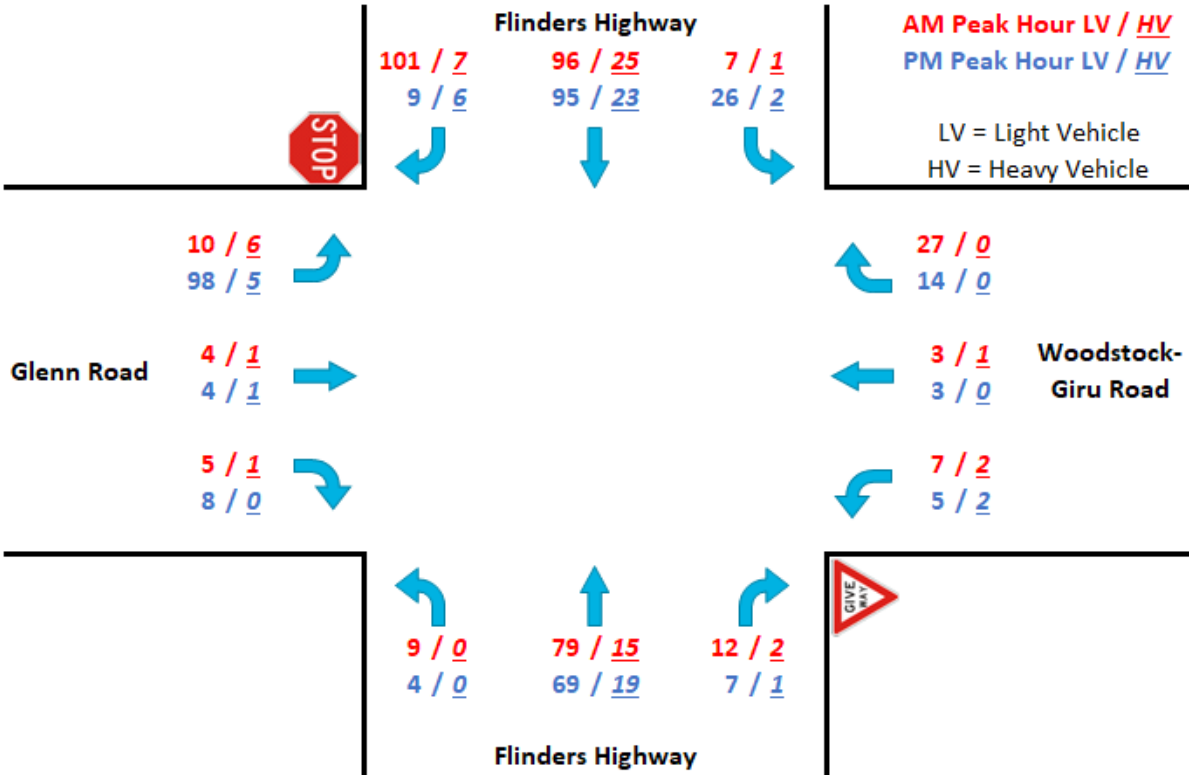

Figure 5.4 2027 peak hourly baseline + construction traffic volumes

5.4 Operational traffic

The development is proposed to operate 24/7. It is expected that the operation of the BESS will require around one to two fulltime workers per week, as well as additional contractors for regular and ad-hoc maintenance and repairs for the 20-year operational life of the development.

It is estimated that the operational traffic will be significantly lower than construction traffic and hence operational traffic impacts have not been considered as part of this TIA.

The swept path analysis that has been completed by Aurecon is provided as Attachment F.

5.5 Cumulative traffic

5.5.1 Neighbouring developments in LEIP

A cumulative assessment has been undertaken to assess the cumulative traffic of the development and three other developments proposed at LEIP:

1. Queensland Pacific Metals Townsville Energy Chemicals Hub Project (QPM)
2. Drive IT NQ Motor Sport Facility (Drive IT)
3. Edify Green Hydrogen Project and Hub (EGH2).

The locations of all four developments are shown in Figure 5.5.

These projects are addressed in a higher level of detail primarily due to:

- their proximity to the development and similar use of the primary access route, Flinders Highway, for both light and heavy vehicles
- status in the development approval process (i.e. an EIS has been submitted, and a TIA is available).

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Therefore, there is some potential for these projects to contribute towards cumulative traffic impacts on Flinders Highway. It is emphasised that there is a high level of uncertainty regarding the timing for construction and operation of these projects.

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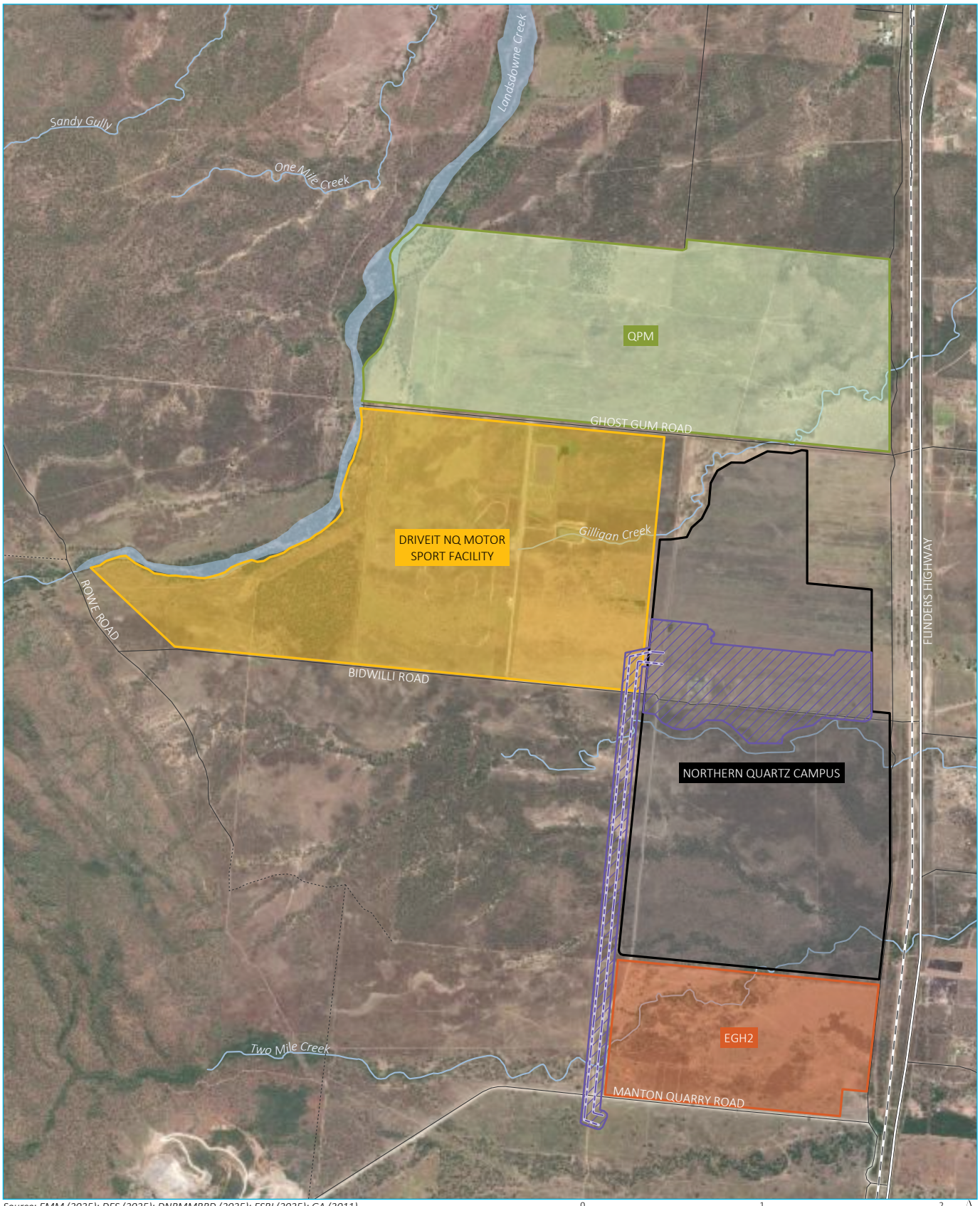

Source: EMM (2025); DES (2025); DNRMMRRD (2025); ESRI (2025); GA (2011)

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KEY

- Northern Quartz Campus
- Package 1 - Premises
- Package 1 - Transmission line

Nearby project location

- DriveIT NQ Motor Sport Facility
- QPM
- EGH2

Existing environment

- Rail line
- Major road
- Minor road
- Vehicular track
- Named watercourse
- Named waterbody

Cumulative assessment - development location

Northern Quartz Campus
Package 1 - BESS, transmission line and substation
Traffic Impact Assessment
Figure 5.5

EMM creating opportunities

i QPM

QPM proposes to develop a mineral refining facility adjacent to the development. Based on the approved documentation ([2]EMM 2021), the construction stage of this project is expected to finish by 2023. However, construction has not commenced, and the project website has no updated information. Due to the uncertainty surrounding construction timeframes, the constructional phase of project has been excluded from the cumulative traffic assessment. Instead, the operational phase is included in the cumulative traffic assessment due to its longer duration.

The proposed operational route of QPM is the same as the proposed route of the subject development. Most of the light and heavy vehicles will be travelling to/from Townsville via Flinders Highway/Woodstock-Giru Road/Glenn Road intersection.

The peak hourly operational traffic volume of QPM at the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection is showed in Figure 5.6.

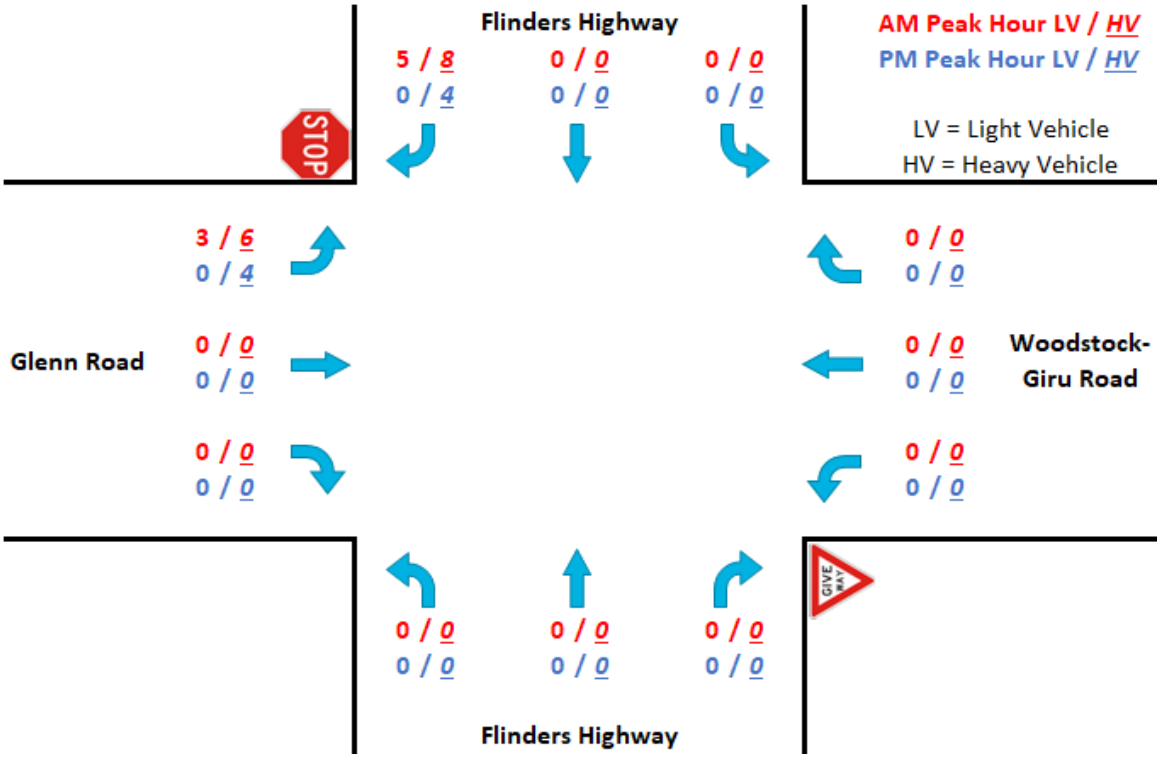

Figure 5.6 Estimated peak hourly traffic generation by QPM for the cumulative assessment

ii Drive IT

Drive IT is a motor sport facility under operational stage adjacent to the project. In a letter dated 8 February 2019, Queensland State Development, Manufacturing, Infrastructure and Planning provided the estimated operational traffic generation and details. The letter is provided in Attachment A.

The largest motor sport events generate the highest peak hour traffic movements by the visitors which are between 883 and 1,177 daily light vehicle trips on weekdays and weekends. These larger events occur twice per year. As these events are infrequent, these events are excluded from the cumulative traffic impact.

[2] EMM Traffic Impact Assessment dated 8 November 2021

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For the purpose of this assessment, traffic volumes for events with higher frequencies (e.g. 40 events per calendar year) is adopted. The document states that there are 250 inbound and 250 outbound light vehicle movements within an hour for event start and event finish times respectively. These peak hourly traffic movements are generated by the motorsport events and occur regularly on both weekdays and weekends.

As the Drive IT facility operates between 8 am and 12 am (midnight), there is a possibility that their traffic generation may coincide with the road network peak hours. As the events will occur for more than one hour period, it is assumed the inbound and outbound vehicle movements will not occur within the same hour.

The proposed route of Drive IT is the same as the proposed route of the development. Most light vehicles will be travelling from Townsville via Flinders Highway/Woodstock-Giru Road/Glenn Road, Jones Road and unnamed road.

It should be noted that during the EMM peak hour traffic surveys, there was no Drive IT event. As such, Drive IT's traffic generation has been added in the cumulative assessment which provides the traffic impact at the road network for the worst-case scenario.

The peak hourly operational traffic volume of Drive IT at the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection is showed in Figure 5.7.

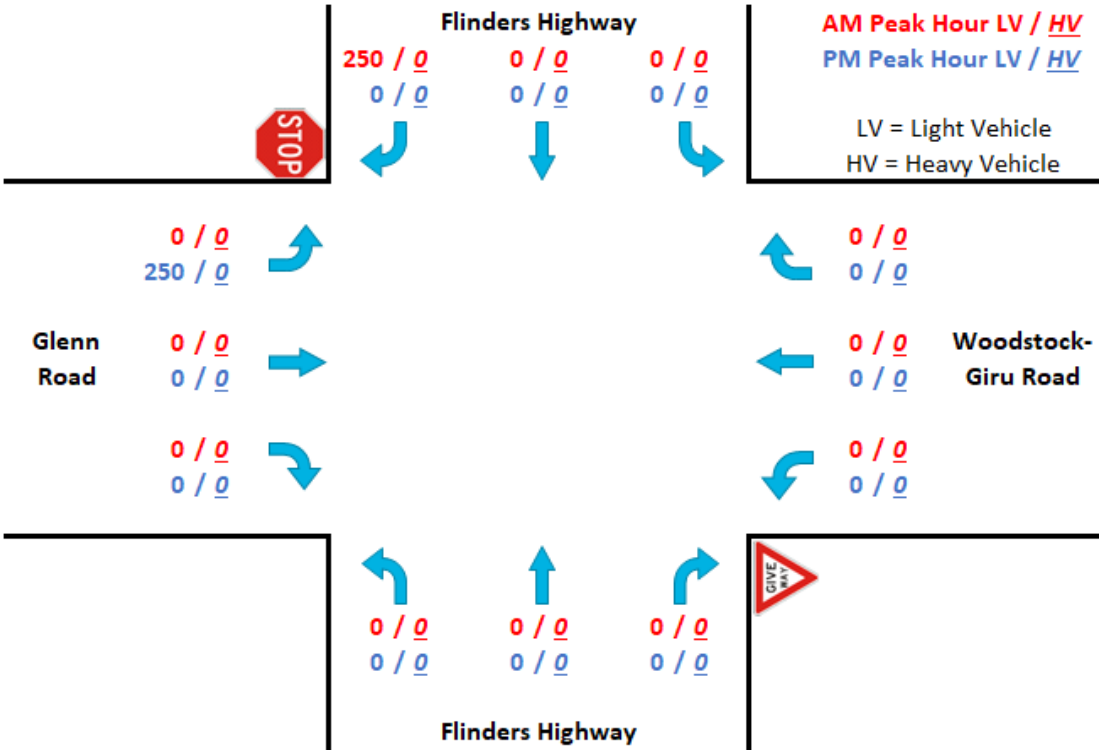

Figure 5.7 Estimated peak hourly traffic generation by Drive IT for the cumulative assessment

iii EGH2

EGH2 proposes to develop a multi-stage green hydrogen production plant with solar PV renewable energy generation and a BESS (MCU21/0040). It is located directly south of the development. According to the approved document (Northern Consulting Engineers 2021), the bulk delivery period of the construction stage is expected to finish in 6 weeks after the approval in 2021. However, construction has not commenced, and the project website has no updated information. Due to the uncertainty and short period of the construction timeframes, the operational phase of the project is included in the cumulative traffic assessment, instead of the constructional phase.

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The propose operational route of EGH2 is similar to that of the development. Most light and heavy vehicles will be travelling from Townsville via Flinders Higher/Manton Quarry Road intersection by passing through the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection.

The peak hourly operational traffic volume of EGH2 at the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection is showed on Figure 5.8.

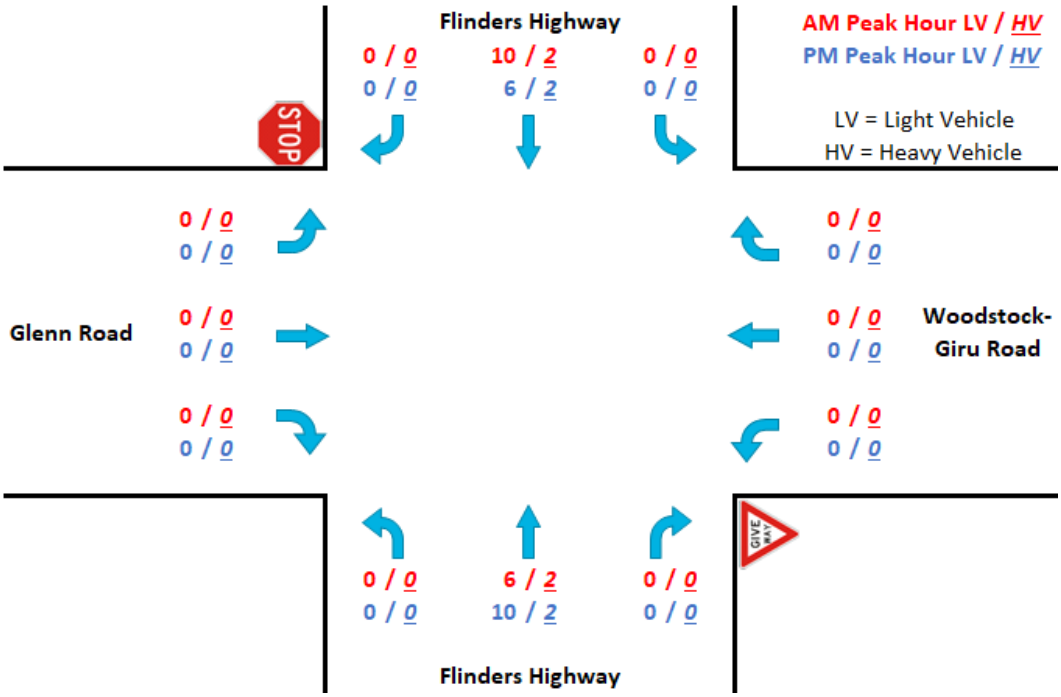

Figure 5.8 Estimated peak hourly traffic generation by EGH2 for the cumulative assessment

5.5.2 2027 baseline traffic with construction and cumulative traffic

The peak hourly baseline with construction and cumulative traffic volumes are provided in Figure 5.9.

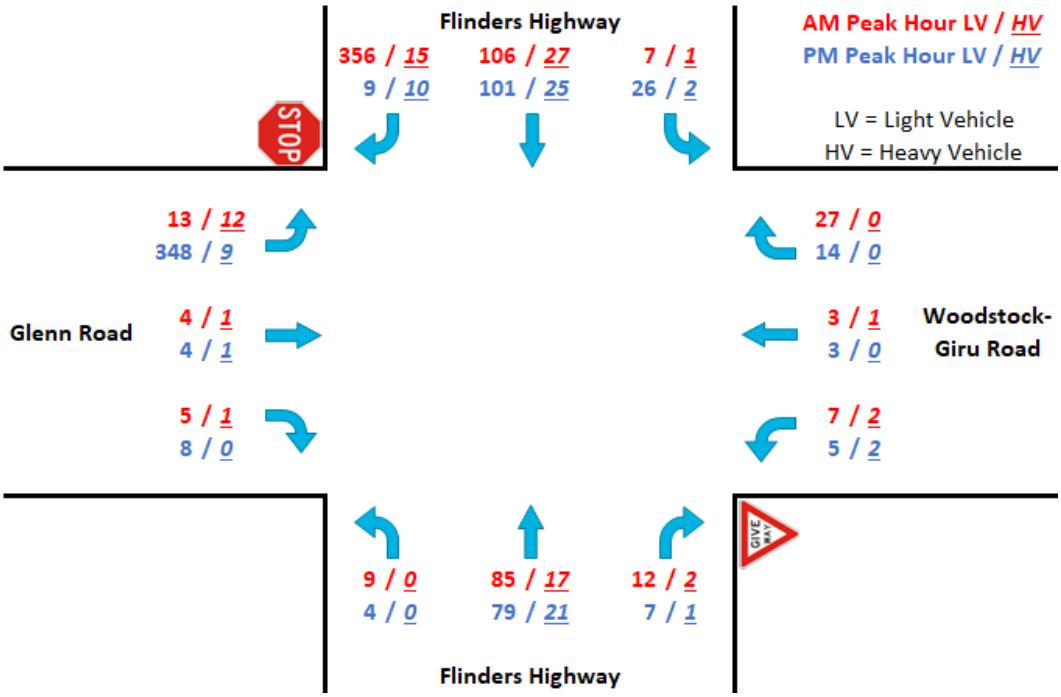

Figure 5.9 2027 peak hourly baseline + construction + cumulative traffic volumes

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5.6 Vehicle type

The longest heavy vehicles that are proposed to access the development site are expected to be 19-m-long semi-trucks.

5.7 Car parking

A car parking area will be accommodated within the laydown area, servicing 89 car parks for the construction workforce and nine car parks for operations. Car parking will be designed in accordance with the requirements of the transport impact, access and parking code within the Townsville City Plan 2014 and Australian Standards appropriate to the proposed heavy industry land use.

5.8 Road upgrade work (TCC proposed)

TCC is the landholder and developer of the LEIP. Discussions between Solquartz and TCC are ongoing to ensure all necessary road upgrades are in place before commencement of the construction of this BESS. For the purposes of this assessment, it is assumed that the upgrade will be implemented in the future.

A 130 m long realignment of Glenn Road is proposed as an extension to Jones Road which would provide a more direct connection between Jones Road and Flinders Highway. The proposed realignment will include decommissioning the existing railway crossing and part of Glenn Road. The new/relocated railway crossing will have adequate sight distance. Furthermore, No-Name Road is proposed to be realigned and extended from Jones Road to Bidwilli Road and development site access. This provides a more direct connection between the development site and Jones Road. The new road and intersection will be constructed in accordance with relevant Austroads standards.

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6 Impact assessment

6.1 Intersection performance

The Flinders Highway/Woodstock-Giru Road/Glenn Road intersection have been modelled with the SIDRA Intersection 10 software, a micro-analytical tool for individual intersections and linked intersection-network modelling. The modelling is based on the baseline traffic volumes detailed in Section 5.1, construction traffic volumes in Section 5.3 and cumulative traffic volumes in Section 5.5. SIDRA provides the following performance indicators:

- Degree of saturation (DOS) – the total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation (e.g. 0.8 = 80% saturation). In practice, the target degrees of saturation of 0.90 for signals, 0.85 for roundabouts and 0.80 for unsignalised intersections are generally agreed to. These are usually called 'practical degrees of saturation'.

- Average delay (DEL) – for signalised intersections and roundabouts, this is the average delay in seconds encountered by all vehicles passing through the intersection. For priority-controlled intersections, this is the average delay encountered by vehicles on the worst approach and turning movement. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.

- Level of service (LOS) – this is a categorisation of average delay, intended for simple reference.

- 95% queue lengths (Q95) – is defined to be the queue length in metres that has only a 5% probability of being exceeded during the analysed time period. It transforms the average delay into measurable distance units.

The LOS is a good indicator of overall performance for individual intersections, with the corresponding average delay for each level summarised in Table 6.1.

Table 6.1 Intersection LOS standards

Level of service	Average delay (seconds per vehicle)
A	<14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>71

Source: TfNSW *Guide to Transport Impact Assessment* (2024)

SIDRA intersection modelling has been conducted for the following scenarios for year 2027:

- Baseline scenario: This scenario includes survey traffic volumes only and without any proposed construction traffic volumes.

- Baseline and construction scenario: This scenario includes the survey traffic volumes combined with proposed construction traffic volumes.

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- Baseline, construction and cumulative scenario: This scenario includes the survey traffic volumes combined with proposed construction traffic volumes and cumulative traffic volumes.

The SIDRA results for the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection are presented in Table 6.2. The SIDRA movement summaries and intersection layout are presented in Attachment D.

Table 6.2 SIDRA modelling result for Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

Control: Priority controlled (Give-Way & Stop)	AM Peak					PM Peak				
2027 Scenario	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Maximum queue (m) (approach)**	**Intersection volume**	**DEL (s)**	**LOS**	**DOS**	**Maximum queue (m) (approach)**
1. Baseline (without construction)	337	15.9	B	0.076	1.8 (east)	316	15.2	B	0.072	0.9 (east)
2. Baseline and BESS construction	455	18.6	B	0.091	2.8 (north)	424	15.4	B	0.072	0.8 (west)
3. Baseline, BESS construction and cumulative	753	33.9	C	0.313	11.5 (north)	717	15.9	B	0.206	1.8 (east)

Key Findings:

- In both AM and PM, the intersection performs satisfactorily within capacity with LOS B and DOS <0.1 for baseline and baseline with construction scenarios. The intersection has spare capacity to accommodate additional development traffic.
- With the construction traffic, the LOS will remain the same with slightly increased capacity.
- With the cumulative traffic, the LOS in the AM peak will deteriorate to C. This is considered acceptable given the BESS construction is temporary and most of the impacts will occur due to the Drive IT development. Furthermore, the queue lengths will remain within an acceptable level with no impact to the through movements on Flinders Highway.

6.2 Turn warrant assessment

Intersection operations are assessed from a combination of the peak hourly through and turning traffic movements that occur at Flinders Highway/Woodstock-Giru Road/Glenn Road intersection. This determines the need for additional intersection turning lanes (e.g. basic, auxiliary lane and channelised) in accordance with the current intersection design standards (Austroads 2023) *Guide to Road Design Part 4a, Unsignalised and Signalised Intersections* (Figure 6.1), where:

- Curve 1 (red line) represents the boundary between a basic right turn (BAR) and a channelised short right turn (CHR(s)) treatment and between a basic left turn (BAL) and an auxiliary short left turn (AUL(s)) treatment.

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- Curve 2 (blue line) represents the boundary between a CHR(s) and a full length CHR treatment and between an AUL(s) and a full length AUL or channelised left turn (CHL) treatment. The choice of CHL over an AUL will depend on factors such as the need to change the give way rule in favour of other manoeuvres at the intersection and the need to define more appropriately the driving path by reducing the area of bitumen surfacing.

Figure 6.1 contains one graph for the selection of turn treatments on roads with a design speed more than or equal to 100 km/h, which is appropriate for high-speed rural roads.

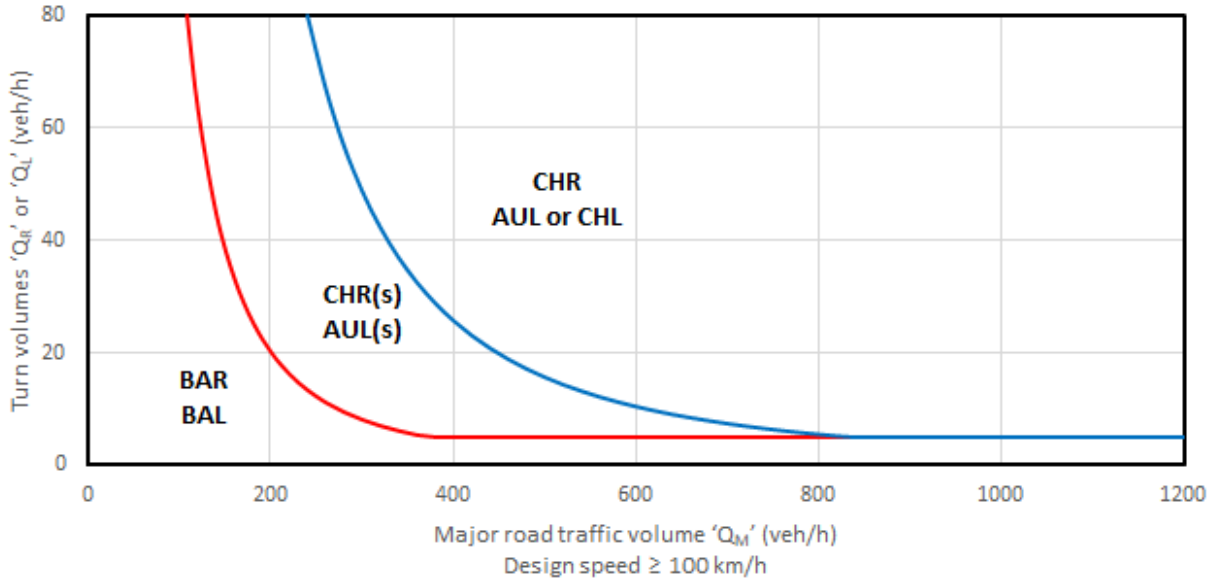

Figure 6.1 Austroads warrant design charts for high-speed rural intersection turning lanes

The Austroads guide recommends that intersections are designed for a travel speed 10 km/h greater than the posted speed limit on roads with a speed limit greater than 60 km/h. As Flinders Highway near Glenn Road and Woodstock-Giru Road have a posted speed limit of 110 km/h, their intersection should be designed for 120 km/h, which is 10 km/h above the posted speed limit. Hence, Figure 6.1 is appropriate for determining the turn treatment.

The warrant for turn treatments is assessed using the 2027 baseline + construction traffic volumes + cumulative traffic volumes (Figure 5.9) (not including the proposed Jones Road upgrade by TCC), representing the worse-case scenario.

At the vicinity of the site, the only impacted intersection that requires a turn warrant assessment is Flinders Highway/Woodstock-Giru Road/Glenn Road intersection. Only the west approach of the intersection (Flinders Highway/Glenn Road intersection) is assessed as no development-related traffic uses the east approach (Flinders Highway/Woodstock-Giru Road intersection) (Figure 5.3).

6.2.1 Left turn treatment onto west approach (Glenn Road)

Non-development related light and heavy vehicles can travel from the south on Flinders Highway. Hence, this left turn assessment has no material impact by the development traffic. The left turn treatment warrant design chart is shown in Figure 6.2.

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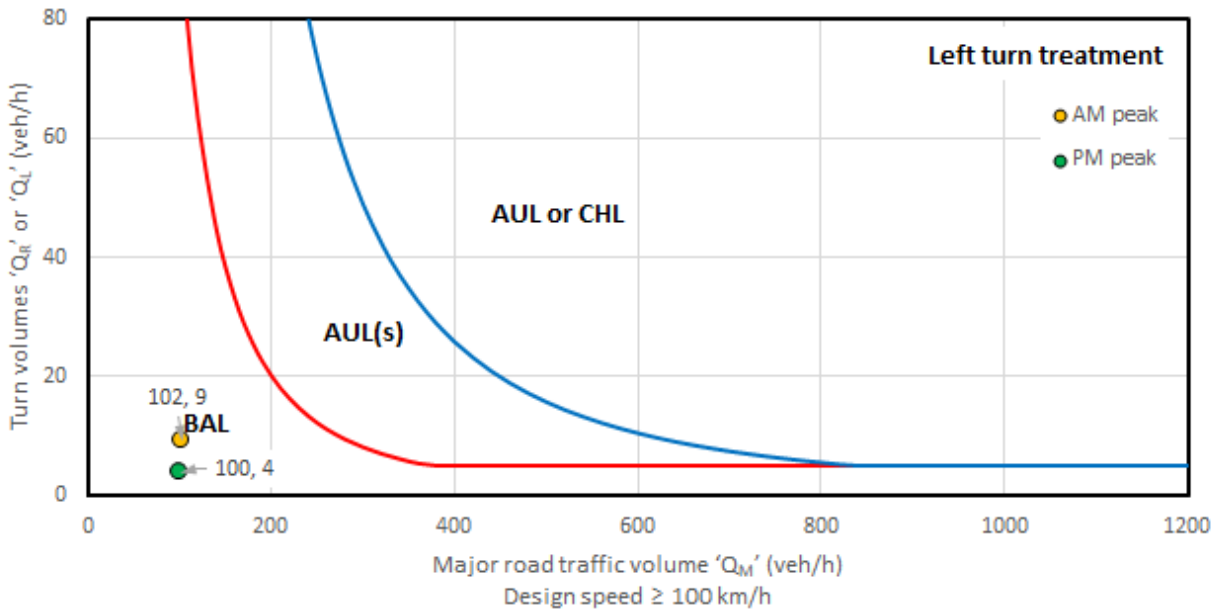

Figure 6.2 Warrant design chart for left turning lane requirement on the west approach

For the 9 and 4 turn volumes from Flinders Highway to Glenn Road during the AM and PM peak hour, a basic left turn (BAL) treatment will be required. However, this intersection already provides a dedicated left turn bay from Flinders Highway to Glenn Road (Figure 4.2). Hence, no additional road upgrade is necessary.

6.2.2 Right turn treatment onto west approach (Glenn Road)

All development related light and heavy vehicles are assumed to be coming from the north on Flinders Highway. Hence, assessment is required for a possible right turn bay from Flinders Highway. The right turn treatment warrant design chart is shown in Figure 6.3.

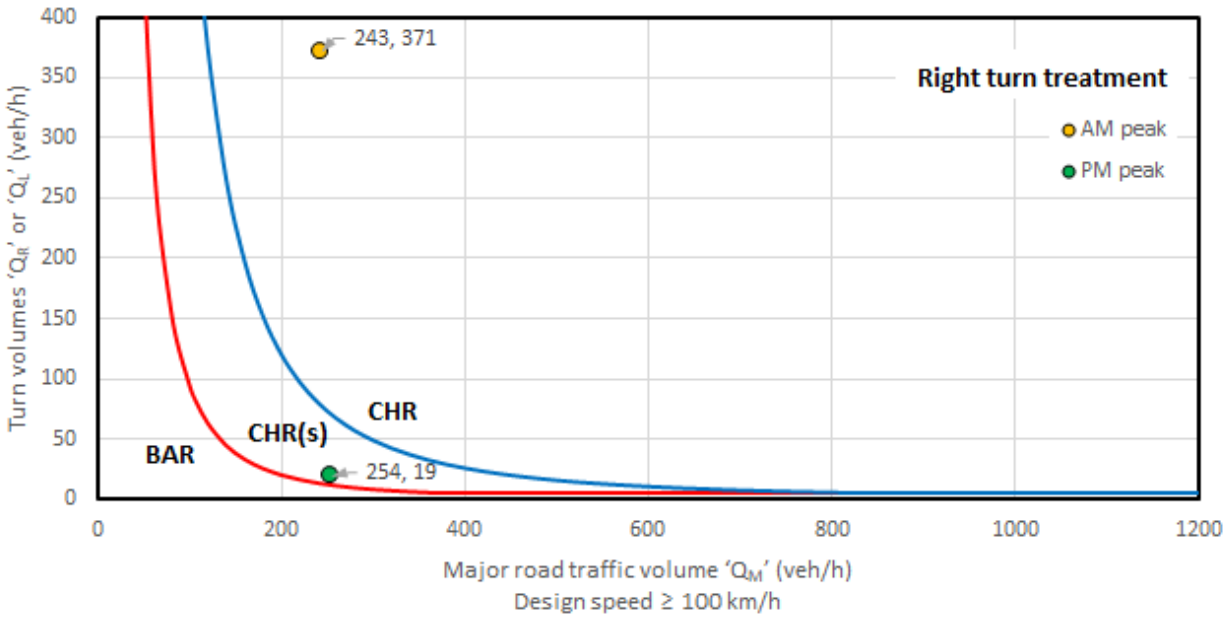

Figure 6.3 Warrant design chart for right turning lane requirement on the west approach

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As shown in Figure 6.3, for 371 right-turning vehicles and 243 major road vehicles on Flinders Highway from the north during the AM peak hour, a channelised right turn (CHR) will be required. However, a CHR is already provided at the west approach of this intersection. Hence, no additional road upgrade is necessary.

6.3 Road safety assessment

Flinders Highway near Glenn Road and Woodstock-Giru Road has a sign posted speed limit of 110 km/h. In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads 2023) Table 3.2, the design speed is 120 km/h. The minimum safe intersection sight distance (SISD) required for a general 2.5 second driver's reaction time is 341 m.

6.3.1 Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

The sight distances on Flinders Highway from Glenn Road have been estimated based on the line of sight and observation (Figure 6.4).

Sight distance to the left (~483 m)

Sight distance to the right (~423 m)

Source: site visit on 14 May 2025 and Queensland Globe

Figure 6.4 Sight distance to the left and right from Glenn Road to Flinders Highway

The sight distance from Glenn Road to the left (483 m) and right (423 m) along Flinders Highway meet the minimum requirement (341 m) for the design speed of 120 km/h stipulated in the *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads 2023).

6.4 Impact on public and active transport infrastructure

The development is unlikely to have any significant impact on the public and active transport infrastructure.

6.5 Access to properties

This development will have no impact to any adjoining properties.

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6.6 Level crossing assessment

As outlined in Section 4.4, train movements through the level crossing at Woodstock typically include two freight trains during the AM peak and none during the PM peak under the worst-case conditions. However, to adopt a conservative approach, this assessment assumes a worst-case scenario of two northbound freight trains in the AM peak, as outlined at the EMM report for Townsville Energy and Chemicals Hub traffic report, and one northbound freight train in the PM peak, as observed during the site visit from 13 to 14 May 2025.

The total time the level crossing is assumed to be closed to vehicular traffic is estimated at 208 seconds. This includes 180 seconds for a train to pass through Glenn Road, an additional 25 seconds of advance warning time and 3 seconds of deactivation time.

By assuming that all vehicles entering the realigned Jones Road are heading westbound and all vehicles exiting via Jones Road are heading eastbound at the level crossing, the peak hour traffic volumes in Figure 5.2, Figure 5.4, and Figure 5.9 have been rearranged to represent the peak hour traffic scenario at the level crossing. The revised peak hour traffic volumes are shown in Figure 6.5, Figure 6.6, and Figure 6.7.

A queueing assessment has been conducted using SIDRA to obtain the 95th percentile queue length (m) for the realigned Jones Road. The model was developed as a signalised intersection, with two trains crossing in the AM peak hour and one train crossing in the PM peak hour, each assumed to block traffic on Jones Road for 208 seconds in every 30-minute interval. The queue lengths for Jones Road at the level crossing are presented in Table 6.3. The SIDRA results are attached in Attachment E.

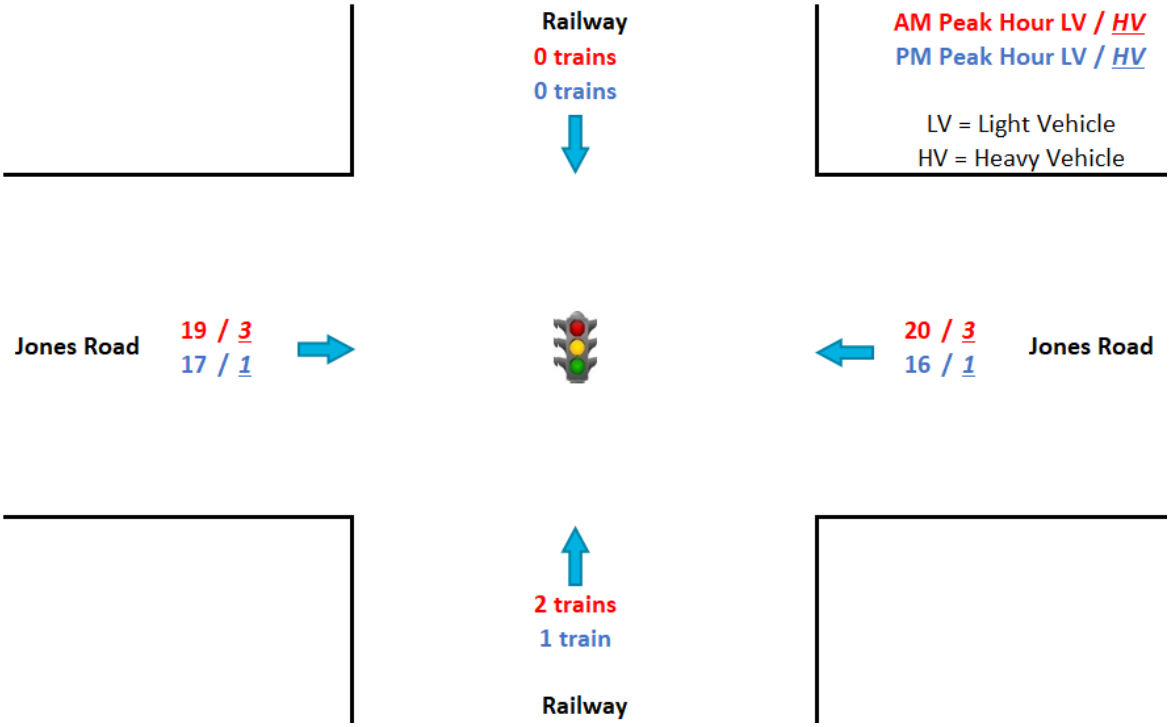

Figure 6.5 2027 baseline traffic volumes at the realigned Jones Road level crossing

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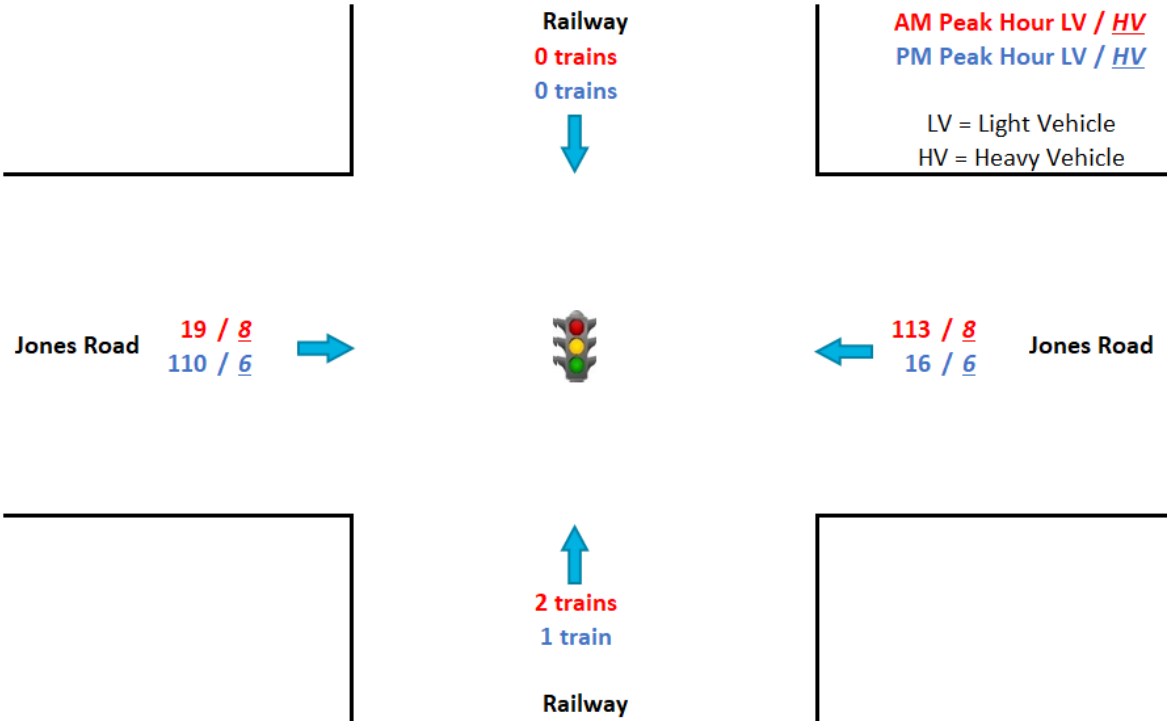

Figure 6.6 2027 baseline + construction traffic volumes at the realigned Jones Road level crossing

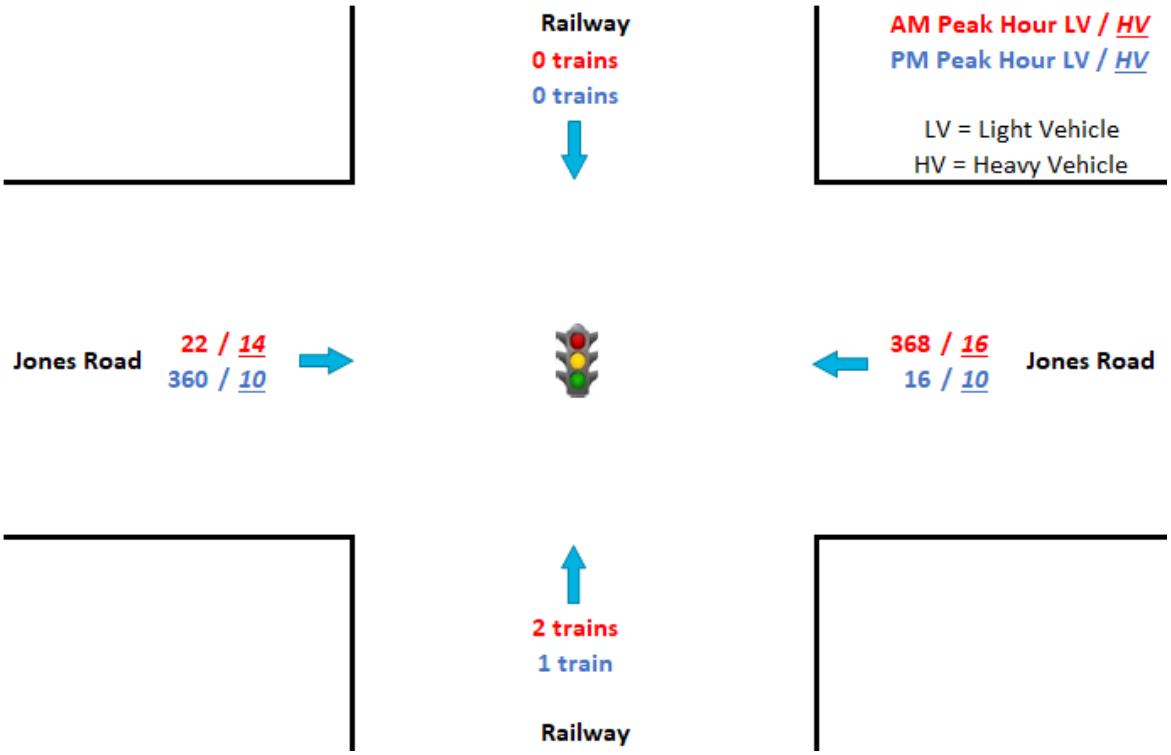

Figure 6.7 2027 baseline + construction + cumulative traffic volumes at the realigned Jones Road level crossing

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Table 6.3 Queue length on Jones Road at the level crossing

Scenario	Peak hour	East approach		West approach		95th percentile queue length (m)	
		Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	East approach	West approach
2027 baseline	AM	20	3	19	3	18.7	18.0
	PM	16	1	17	1	13.0	13.7
2027 baseline + BESS construction	AM	113	8	19	8	99.3	24.9
	PM	16	6	110	6	19.9	93.7
2027 baseline + BESS construction + cumulative	AM	368	16	22	14	366.9	35.7
	PM	16	10	360	10	19.1	344.5

As shown in Table 6.3, on Jones Road at the east approach, the increase in queue length between the 2027 baseline scenario and the 2027 baseline + BESS construction scenario is 99.3 m. The traffic remains within the estimated future allowable queue length of 180 m without impacting Flinders Highway. However, the increase in queue length under the 2027 baseline + BESS construction + cumulative scenario is 366.9 m, exceeding the allowable limit. This exceedance is attributed to the cumulative traffic from the Drive IT motor sport facility which is currently operational.

For the west approach, the queue length increases between the 2027 baseline and the 2027 baseline + construction scenario is 93.7 m, which remains well within the estimated allowable queue length of 420 m. The west approach can also accommodate traffic under the 2027 baseline + BESS construction + cumulative scenario, with the 344.5 m queue length increase remaining within the allowable limit.

Based on the potential queuing on Flinders Highway, it is recommended that the inbound heavy vehicles to the site are to be restricted while the level crossing is operational.

6.7 Construction Traffic Management Plan

As port of this development approval, a Construction Traffic Management Plan (CTMP) will be prepared in consultation with TCC. The plan will include:

- the Driver's code of conduct
- identification of haulage route
- operational hours e.g. delivery times
- presence of level crossing (Refer to Section 6.6)
- presence of any school zone along the haulage route
- presence of cyclists at Flinders Highway/Gleen Road/Woodstock Giru Road intersection
- calendar timing for the two Drive IT major events, in an effort to minimise any traffic disruption it is recommended that deliveries to be ceased in during the two major Drive IT events (Refer to Section 5.5).

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7 Road upgrades and mitigation measures

7.1 Schedule of road upgrades

It is assumed that all scheduled road upgrades will occur in accordance with the masterplan, including realignment of Jones Road, prior to the commencement of this development.

7.2 Construction

7.2.1 Construction traffic management plan

Subject to the assessment outcome, a construction traffic management plan (CTMP) will be prepared. An outline of the CTMP is provided below.

i Objective

The CTMP will address the safety of workers and road users within the vicinity and will aim to:

- minimise the impact of the construction vehicle traffic on the overall operation of the road network
- ensure continuous, safe and efficient movement of traffic for both the general public and construction workers
- provide a description of the construction vehicles and the volume of these construction vehicles accessing the development site
- provide a description of the proposed external routes for vehicles including the construction vehicles accessing the development site.

ii General requirements

In accordance with Queensland Government's requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the development site. All subcontractors will be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the development site. The lead contractors will monitor the roads leading to and from the development site and take all necessary steps to clean any load deposits on the road caused by development-related vehicles.

iii Access

The development site will be accessed directly from Bidwilli Road. The site access will be clearly signed and demarcated. On arrival, all vehicles, plant and equipment will be directed to remain within clearly demarcated areas.

iv Traffic control measures

A CTMP will be developed by a qualified personnel in consultation with TCC. The CTMP will include:

- a map of the primary transport route/s highlighting critical locations
- identification of local bus operations, including maps of routes/bus stops, and consultation with local bus operators

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- safety initiatives for haulage through residential areas and/or school zones
- an induction process for vehicle operators and regular toolbox meetings
- a public Feedback Mechanism, complaint resolution and disciplinary procedure
- any proposed temporary measures such as Traffic Guidance Scheme
- community consultation measures for peak haulage periods.

v Pedestrian access

To provide segregation and protection for pedestrians, fencing will be provided to define all boundaries of the development site. Pedestrian activity in the locality, including along Bidwilli Road is generally minimal due to the long distance from the nearest residences and/or urban areas.

vi Road occupancy licences

Prior to the commencement of construction of the site access on Bidwilli Road, the relevant application form will be completed and lodged to TCC.

A regular liaison is required with TCC in relation to the other road upgrade works in this precinct to facilitate construction related vehicles.

vii Work site security

All access gates will be securely locked when the development site is unoccupied, or construction activities are not in progress.

viii Staff safety and induction briefings

All staff and subcontractors will be required to undergo a site induction prior to the commencement of their work on-site. The site induction will include briefings in relation to permitted transport routes for travel to and from the development site for light and heavy vehicles, the Driver's Code of Conduct, as well as standard environmental, occupational health and safety, vehicle safety and emergency safety procedures.

ix Feedback mechanism

A feedback mechanism for the development will be implemented to enable active community consultation, maintain positive communication and capture complaints from local residents. The purpose of this system will be to manage community expectations by providing timely responses to community feedback and monitoring the ongoing environmental performance of development construction.

A dedicated phone number will be established that is available 24 hours, seven days a week for community members who have enquiries or who wish to lodge feedback in relation to construction. The phone number allows community members to enquire or lodge complaints about development-related vehicles travelling on the public road network.

7.2.2 Driver's Code of Conduct

A Driver's Code of Conduct will be provided to all relevant personnel prior to their arrival at the development site. The Driver's Code of Conduct must be read and signed by all light and heavy vehicle drivers prior to operation of vehicles. This will be in addition to regular safety briefings and updates. The Driver's Code of Conduct will address all relevant site and locality road safety and traffic management measures including:

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- compliance with all road rules and regulations
- approved traffic routes (e.g. 100% of the haulage route to/from the north along Flinders Highway)
- vehicle speeds
- driving to local road conditions
- driver behaviour
- courtesy to other road users
- fatigue management
- dangers of mobile phone use while driving
- checking vehicles and covering loads
- the appropriate use of compression braking
- safety procedures for accidents and breakdowns.

7.2.3 Enforcement of the prescribed haulage route

All modern trucks have GPS embedded onto them. Hence, enforcement of the haulage route will be achieved via GPS tracking.

7.2.4 Summary of mitigation measures

Construction traffic mitigation measures are outlined in Table 7.1.

Table 7.1 Construction traffic mitigation measures

Reference	Mitigation measure	Responsibility	Timing
T1	Site access on Bidwilli Road.	Proponent	PC
T2	Enforcement of the haulage route to/from the north.	Proponent	C
T3	A detailed CTMP will be developed prior to the commencement of construction. The CTMP will be prepared and implemented in accordance with Australian Standard 1742.3. The CTMP will identify strategies to manage the impacts of development-related traffic and include a Driver's Code of Conduct.	Proponent	PC
T4	Prohibit inbound truck delivery during the operation of the level crossing on Jones Road	Transport contractor	C
T5	Prohibit any delivery during the two-yearly major event of Drive IT	Transport contractor	C

Note: PC = pre-construction; C = construction.

7.3 Operation

No material traffic impacts are expected during operations. Accordingly, no mitigation measures are proposed for operations.

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7.4 Decommissioning

Decommissioning traffic will be captured in the Rehabilitation and Decommissioning Plan, which will be developed and submitted to TCC for approval at least one year prior to decommissioning. As such, no additional mitigation measures are required during the development approval stage.

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8 Conclusion

The development consists of the installation, operation, maintenance and decommissioning of a BESS, substation transmission line and associated ancillary infrastructure. Traffic generated by the development will be the highest during construction period and is expected to be negligible during operations.

Construction of the development has been estimated to occur over a minimum timeframe of approximately 18 months, and the peak construction workforce will be approximately 93 people occurring over an approximately three-month period. During construction, development-related vehicles will access the development site via Flinders Highway – realigned Jones Road – No-Name Road – Bidwilli Road. A new site access intersection will be constructed on Bidwilli Road to facilitate access to the development site.

The construction workforce will travel to/from Townsville by private vehicles. Construction vehicle movements include heavy vehicles for deliveries. During peak construction, approximately 93 light vehicle movements and 10 heavy vehicle movements are anticipated during peak hour periods.

The impact of development-related vehicles on the Flinders Highway/Woodstock-Giru Road/Glenn Road intersection has been assessed:

- SIDRA analysis shows that the intersection will remain at LOS B in all scenarios, except the AM peak hour with cumulative traffic where the intersection will operate at LOS C. However, the overall performance of the intersection will not deteriorate significantly which will trigger the intersection upgrade.
- Sight distance meets the minimum requirements.
- The intersection has dedicated right and left turn bays from Flinders Highway to Glenn Road. A turn treatment warrant assessment shows that no further intersection upgrade is warranted.

To minimise any potential traffic at Flinders Highway/Woodstock-Giru Road/Glenn Road intersection, it is recommended that:

- Heavy vehicle operation to the site is to be restricted during the two annual major events for Drive IT.
- Inbound heavy vehicles are to avoid timing while the level crossing on Jones Road is operational

A CTMP (including a Driver Code of Conduct) will be prepared prior to commencement of construction. With the implementation of the proposed road upgrades and CTMP, the development is not expected to have significant adverse impacts on other traffic or the road network in the vicinity of the development site.

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Abbreviations

Abbreviation	Full name
ADT	average daily traffic
ARTC	Australian Rail Track Corporation
AUL(S)	auxiliary short left turn
BAL	basic left turn
BAR	basic right turn
BESS	battery energy storage system
CHR(S)	channelised short right turn
Council	Townsville City Council
CTMP	construction traffic management plan
DEL	average delay
DOS	degree of saturation
Drive IT	Drive IT NQ Motor Sport Facility
DTMR	Department of Transport and Main Roads
EGH2	Edify Green Hydrogen Project and Hub
EMM	EMM Consulting Pty Limited
FTE	full-time equivalent
ha	hectares
km	kilometres
kV	kilovolts
Land Act	*Land Act 1994*
LEIP	Lansdown Eco-Industrial Precinct
LOS	level of service
MW	megawatts
development	BESS, Substation and Transmission line
QPM	Queensland Pacific Metals Townsville Energy Chemicals Hub Project
Q95	95% queue lengths
RSNL Act	*Rail Safety National Law Act 2017*
SARA	State Assessment and Referral Agency
SCR	State-controlled road
TAIM	Townsville Aimsun Integrated Model
TCC	Townsville City Council
TIA	Traffic impact assessment

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Abbreviation	Full name
TI Act	*Transport Infrastructure Act 1994*

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Glossary

- **Development footprint:** The development footprint is wholly within the development area and is the maximum extent of ground disturbing works associated with the construction and operation of the development and is approximately 86.93 ha. The development footprint has been refined to avoid and minimise impacts where possible based on the outcomes of the technical assessments and stakeholder engagement. Approval is sought to disturb anywhere within the development footprint.

- **Development area**: The land required for the development. The development area is proposed to be located centrally on part of Lot 19 on SP321818 and part of Lot 87 on RP911426, north of Four Mile Creek and Bidwilli Road. The development includes the proposed overhead transmission line which traverses south along the western edge of the project premises and connect into the future Powerlink Calcium substation. The overhead transmission line interacts with the following road reserves and lot boundaries:

  - Lot 19/SP321818
  - Lot 87/RP911426
  - Lot 30/SP321818
  - Lot 55/E124248
  - Lot 65/E124264
  - No Name Road
  - Bidwilli Road
  - An unnamed road reserve
  - Manton Quarry Road

  The development area is the maximum area considered for the development based on the extent of land required for the development.

- **Site access point**: The proposed locations where all construction and operation traffic will access the development footprint. Access to the development footprint will be possible via Bidwilli Road.

- **Vehicle movement**: A vehicle movement is a single, one-way journey from one point to another, excluding the return journey. If a return journey is considered, this will be classified as another vehicle movement.

Document Set ID: 28309174
Version: 1, Version Date: 28/04/2026

Attachment A

Townsville Aimsun Integrated Model

EMM
creating opportunities

Document Set ID: 28309174
Version: 1, Version Date: 28/04/2026

TAIM 2019 Calibration - Traffic Projections for Flinders Highway at Lansdown Industrial Area

Following are screenshots taken from the 2019 Calibration of the Townsville Aimsun Integrated Model (TAIM) for the Flinders Highway at Lansdown Industrial Area.

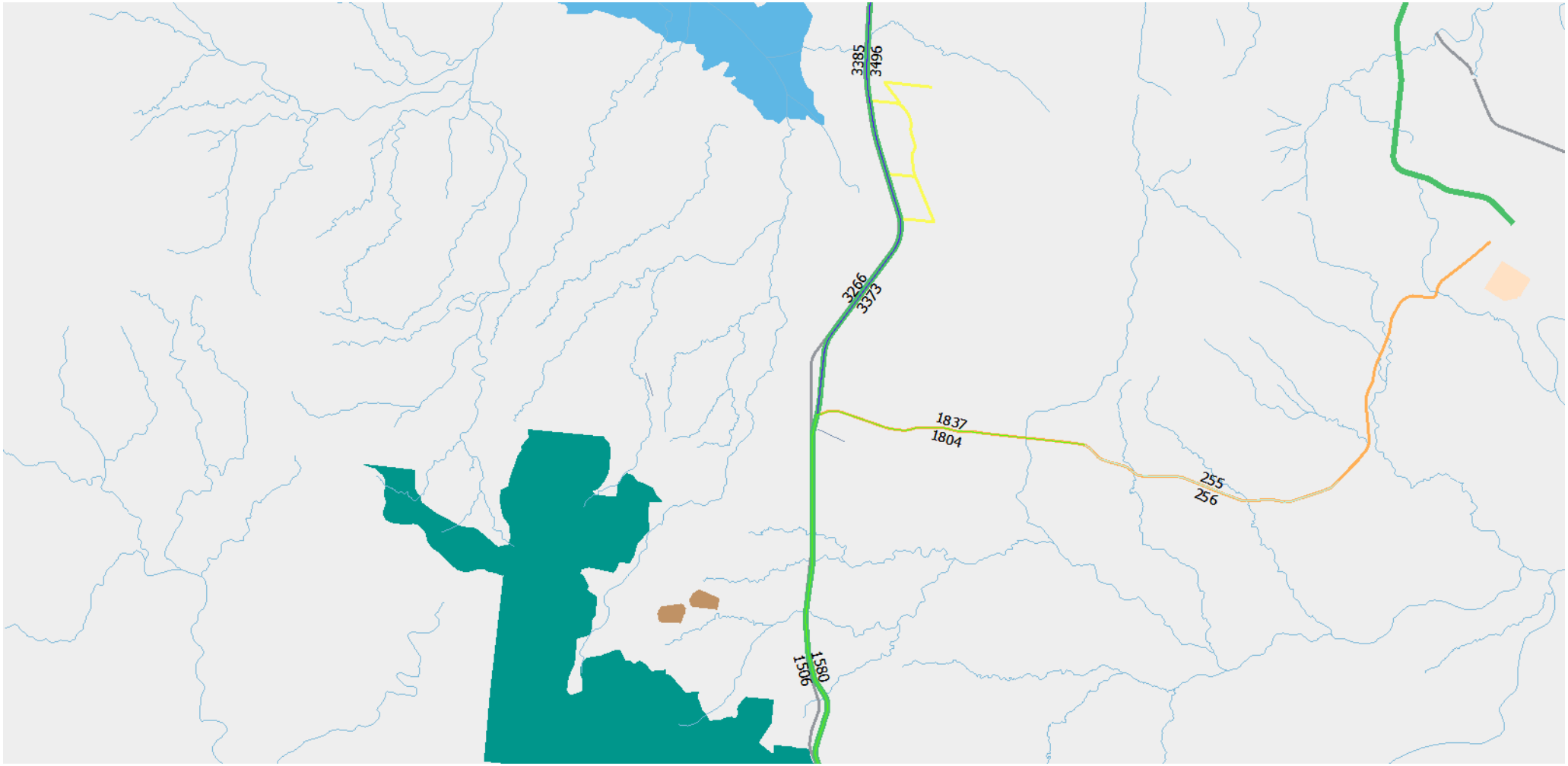
The data provided is calculated AADT, Peak AM & Peak PM volumes calibrated to data collected between Sunday 8th September and Saturday 14th September 2019. The data has been processed to give average weekday hourly counts across the day from the five weekdays supplied.

Traffic Model Fact Sheet:

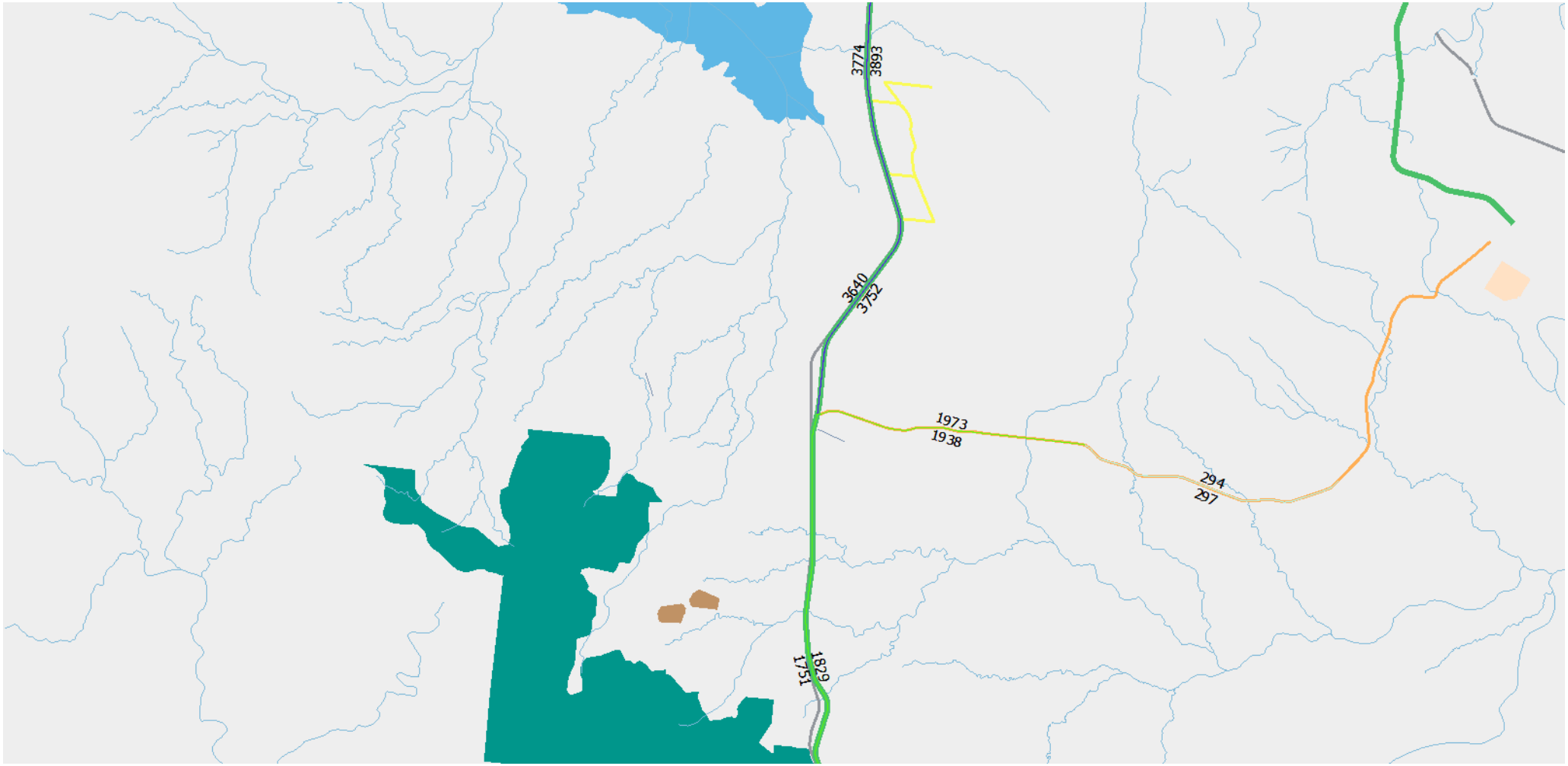
- Townsville City Council Maintains a traffic model for the entire city.
- The model is called the Townsville Aimsun Integrated Model (TAIM).
- The TAIM is a city-wide mesoscopic model and is Council's primary planning tool for the analysis of proposed improvement options, upgrades and interventions on the road network to support growth identified in the Local Government Infrastructure Plan (LGIP).
- The TAIM is calibrated annually against traffic signal information provided by the Department of Transport and Main Roads and provides detailed traffic flow information across the entire city for the calibration year and future year projections in 2021, 2026, 2031 and 2036.
- The TAIM is also used to assess the impacts of land development proposals on the operation of the Townsville road network.
- Model information comprising traffic flow data can be provided by Council upon request, Council encourages the use of this data when submitting a development application for assessment as the modelled traffic flows represent the planned future network structure in accordance with the LGIP.

The following limitations apply to the Traffic Model

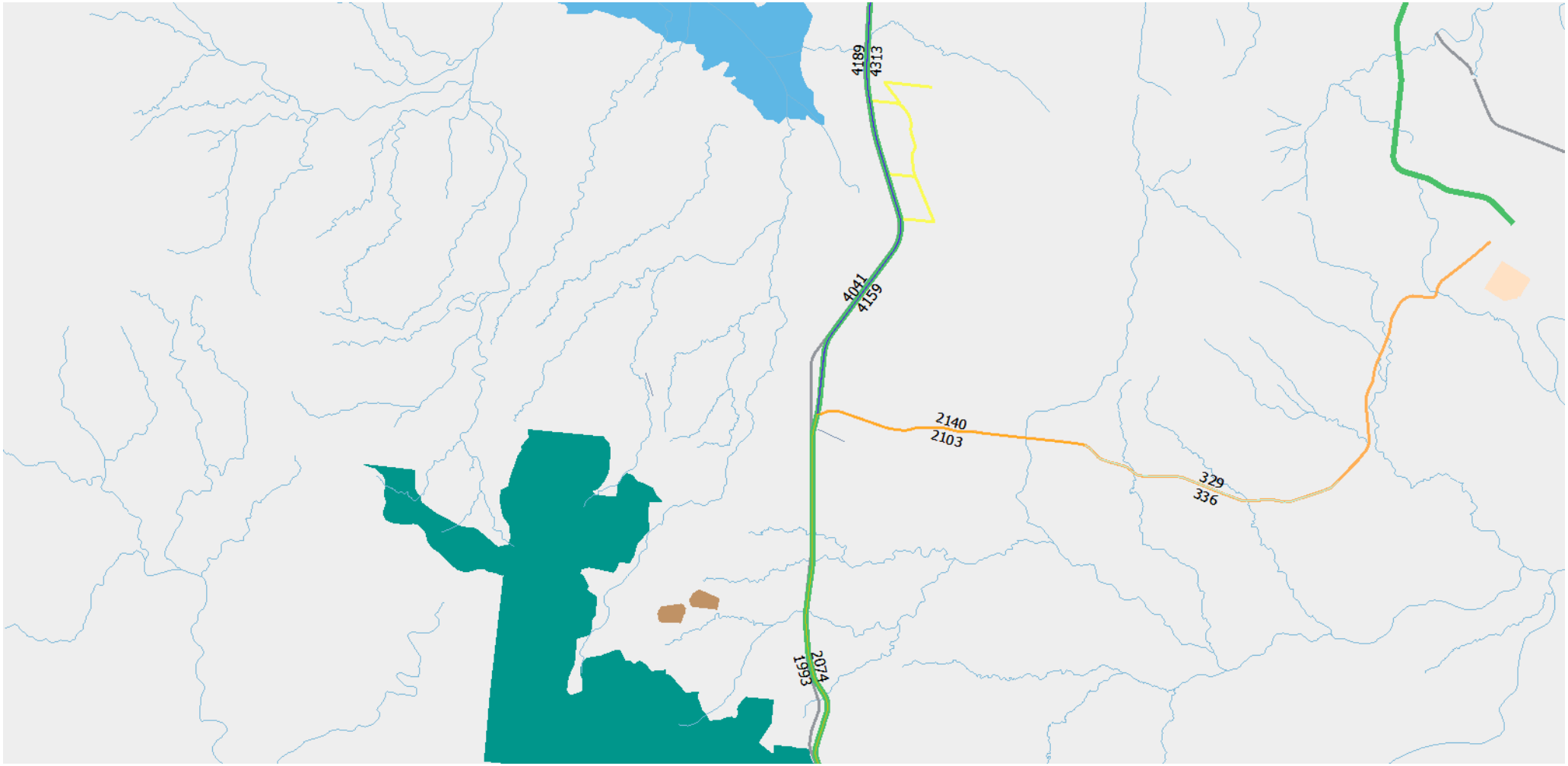
- The TAIM is an imperfect representation of traffic information on the road network in the calibration year. The traffic model has been developed using Aimsun traffic modelling software and provides an interpretation of the traffic conditions limited by the modelling processes.
- The model has been calibrated against traffic flow data recorded by vehicle detection equipment at 148 signalised intersections comprising 2175 detection counts, and 55 mid-block permanent traffic counter sites located across the city.
- Townsville City Council accepts no responsibility for damages, if any, suffered by any party because of decisions or actions made based on data extracted from the model.



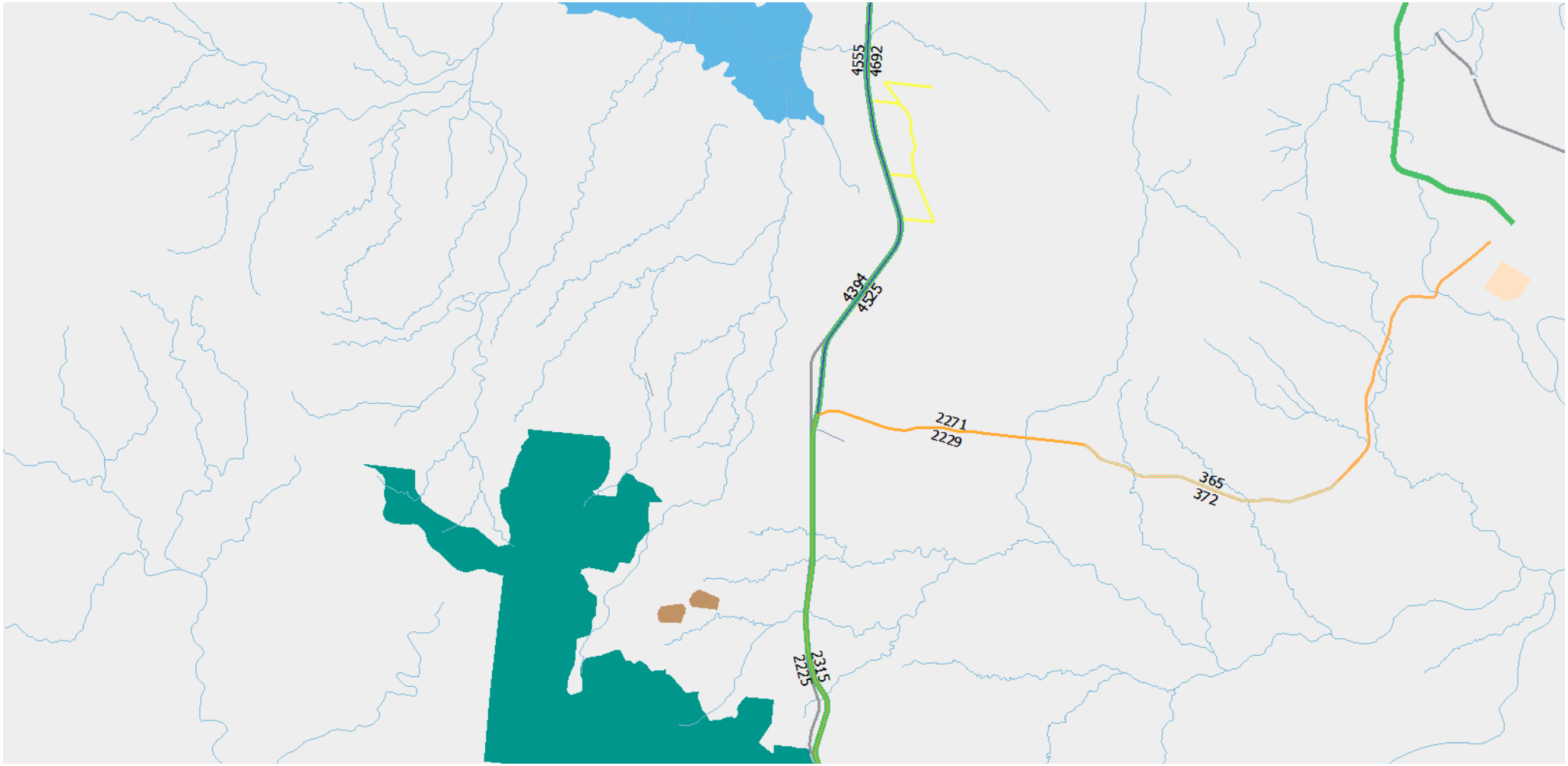
FLINDERS HIGHWAY AT LANSDOWN - 2021 PROJECTION – AADT



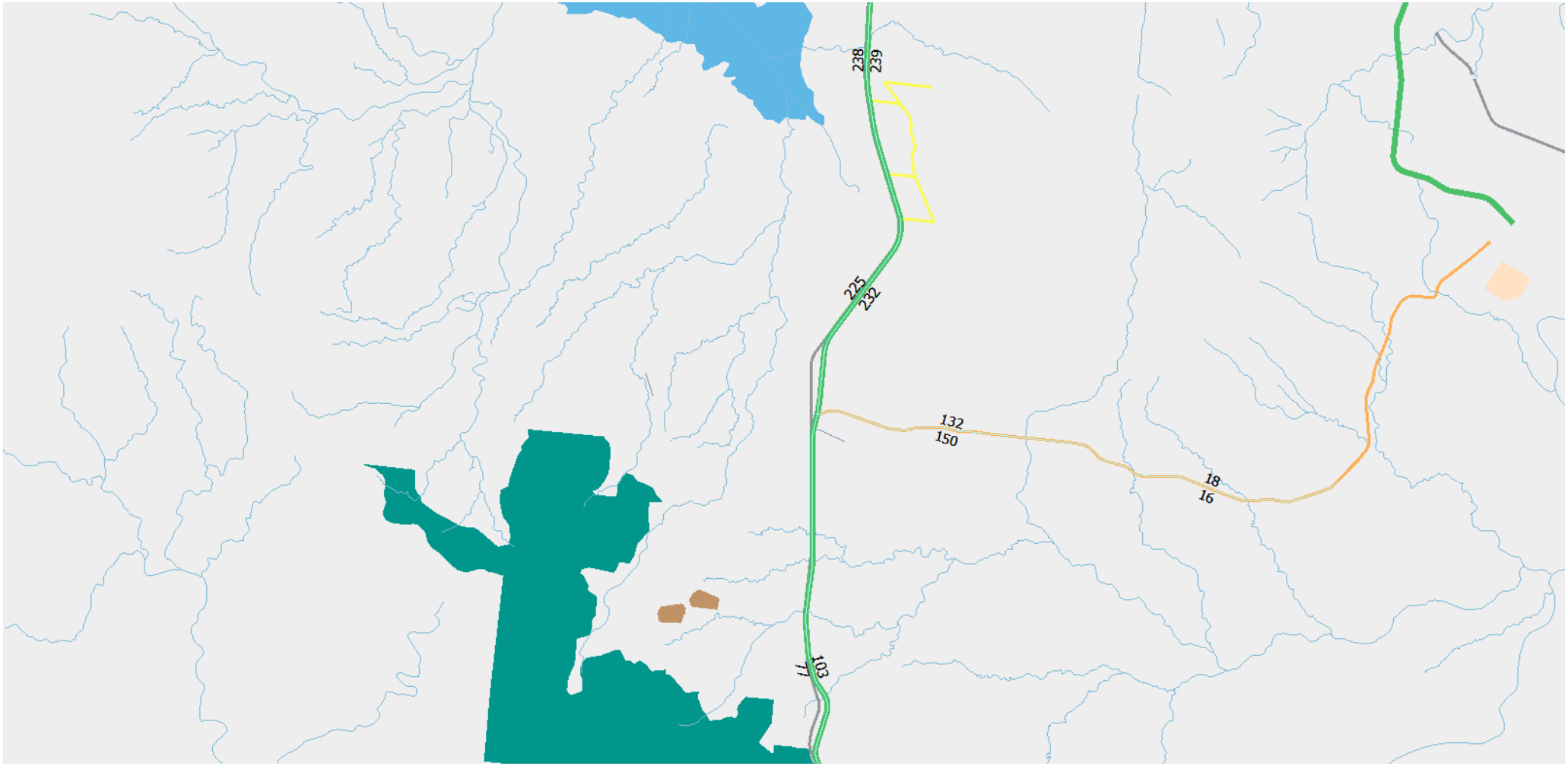
FLINDERS HIGHWAY AT LANSDOWN - 2026 PROJECTION – AADT



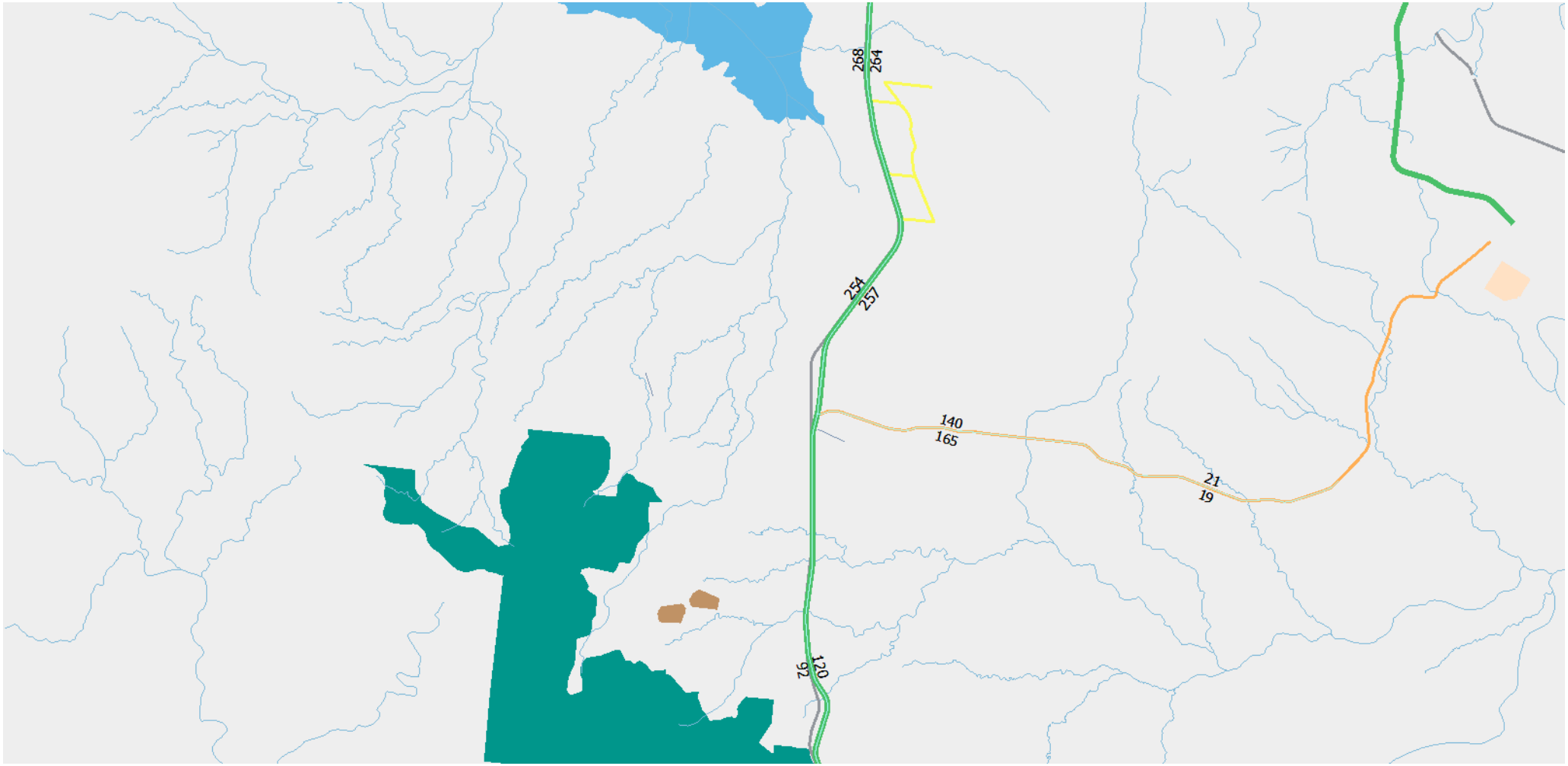
FLINDERS HIGHWAY AT LANSDOWN - 2031 PROJECTION – AADT



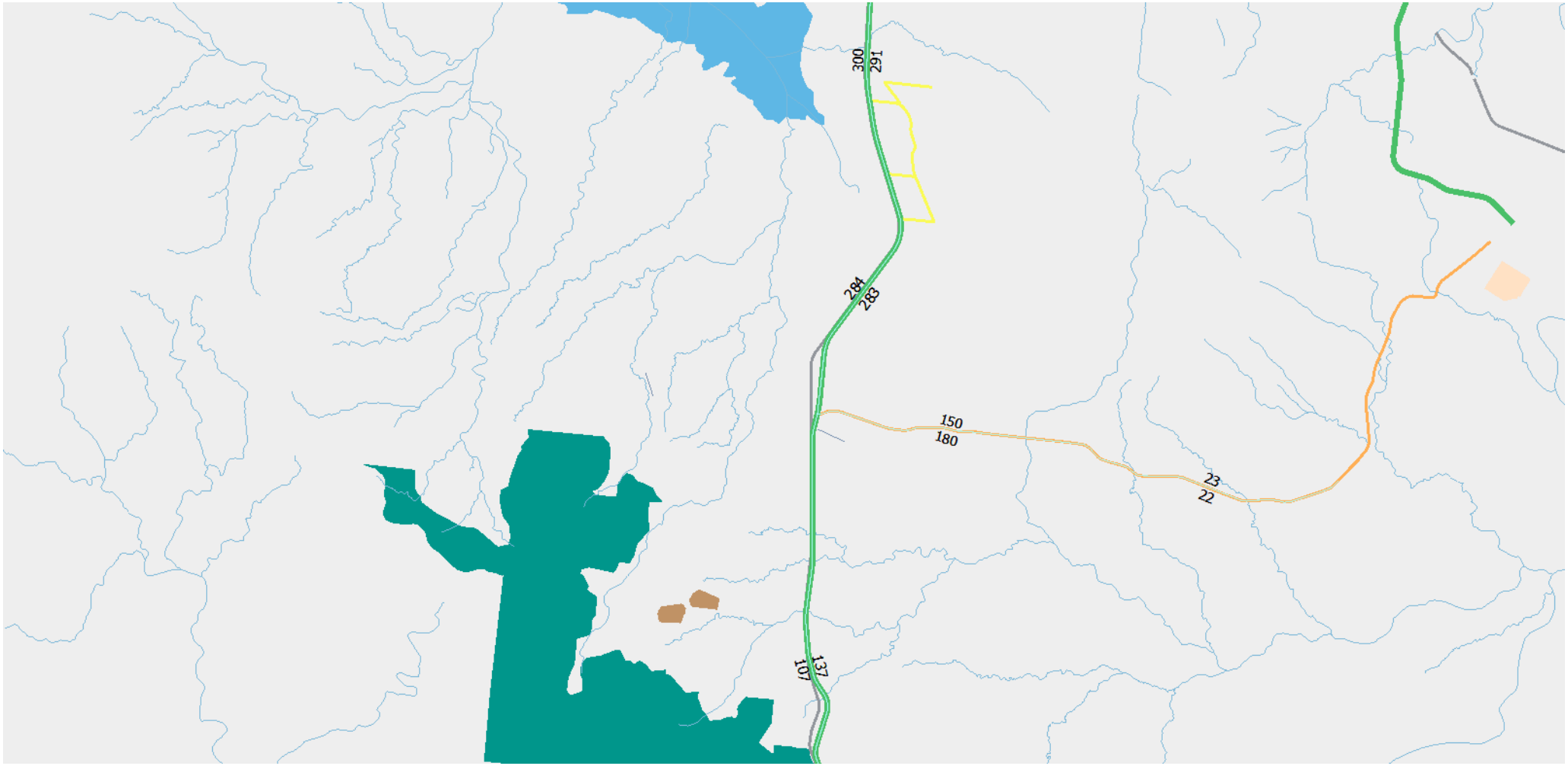
FLINDERS HIGHWAY AT LANSDOWN - 2036 PROJECTION – AADT



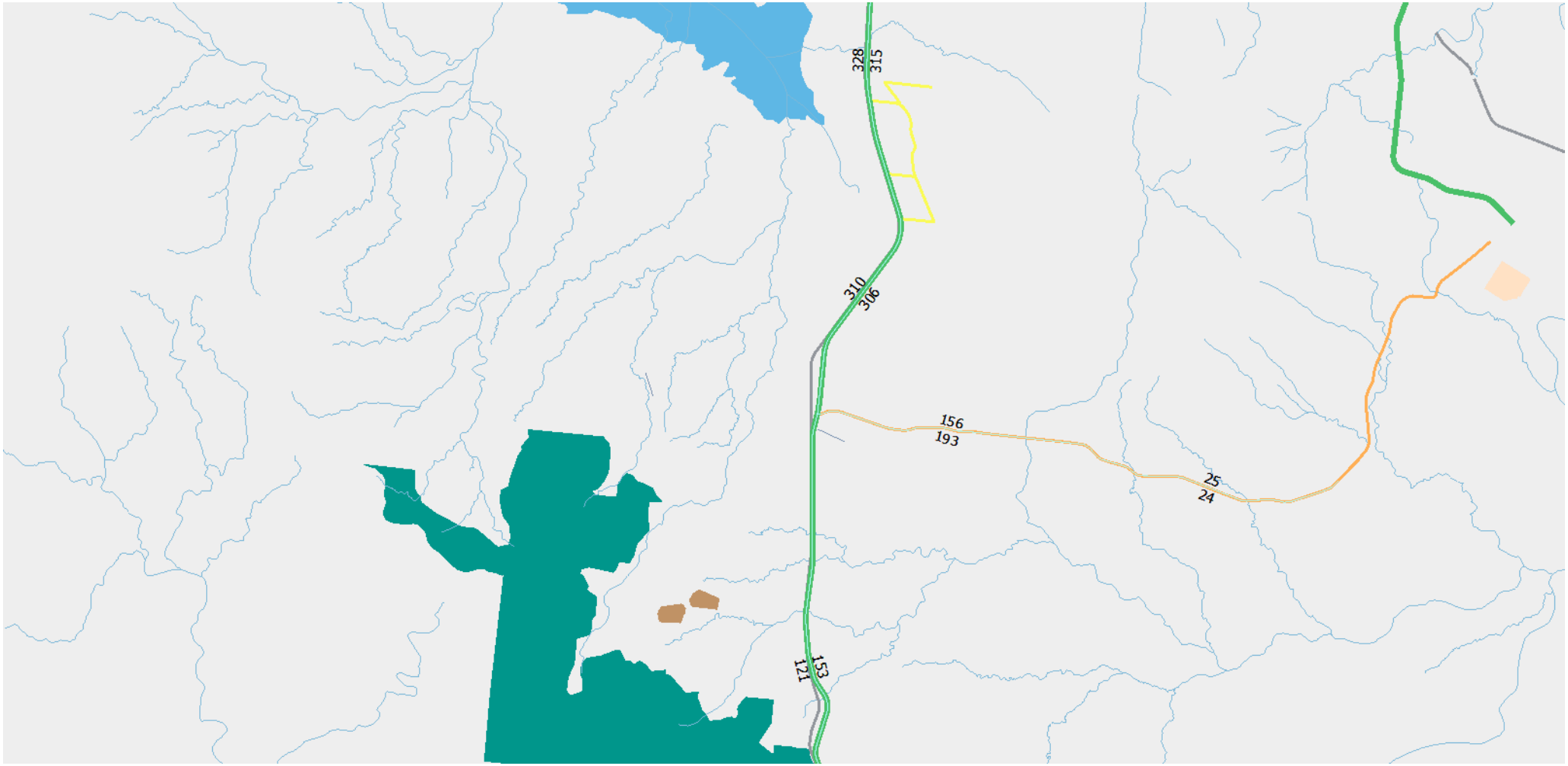
FLINDERS HIGHWAY AT LANSDOWN - 2021 PROJECTION – PEAK AM



FLINDERS HIGHWAY AT LANSDOWN - 2026 PROJECTION – PEAK AM



FLINDERS HIGHWAY AT LANSDOWN - 2031 PROJECTION – PEAK AM



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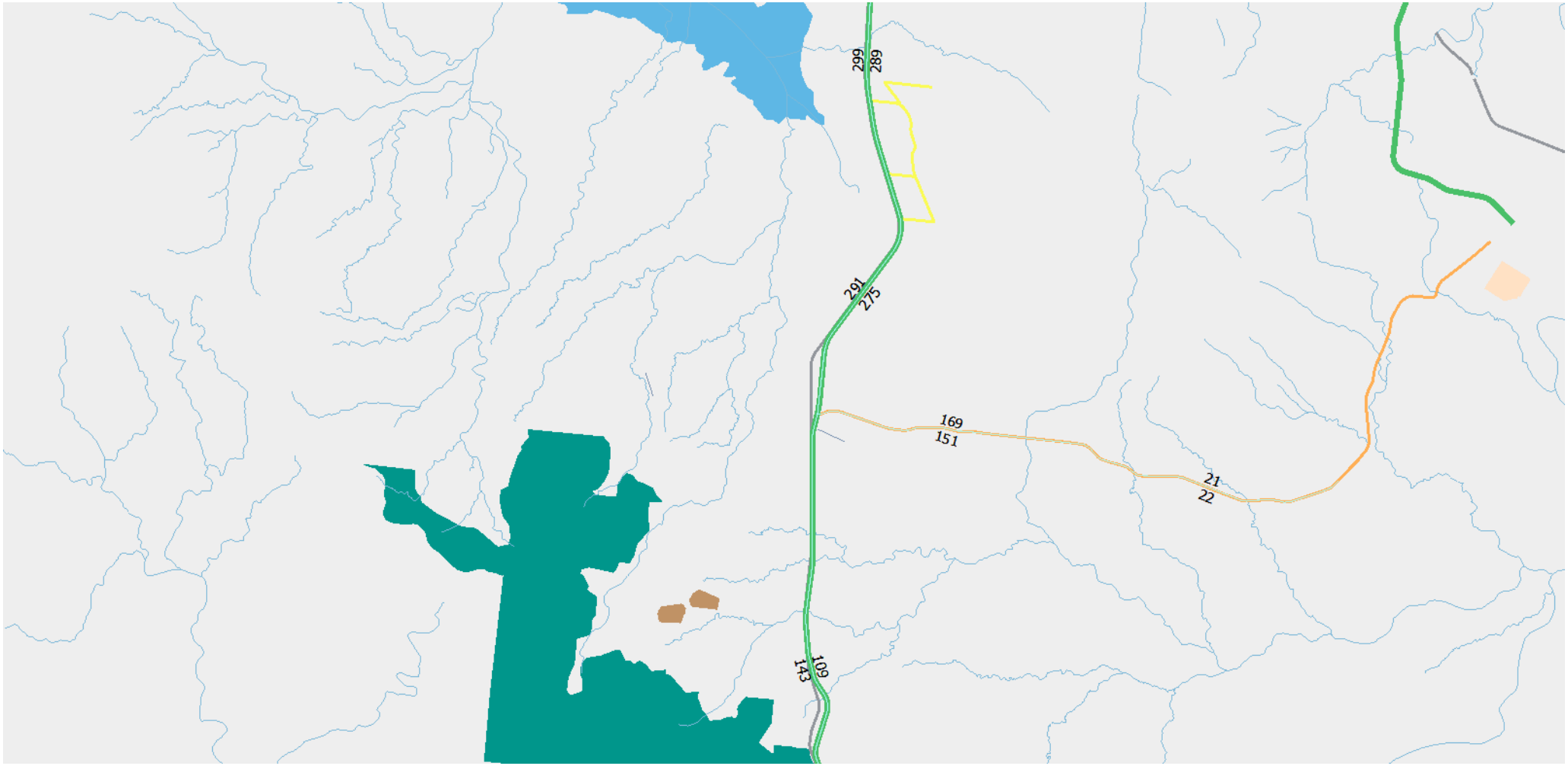
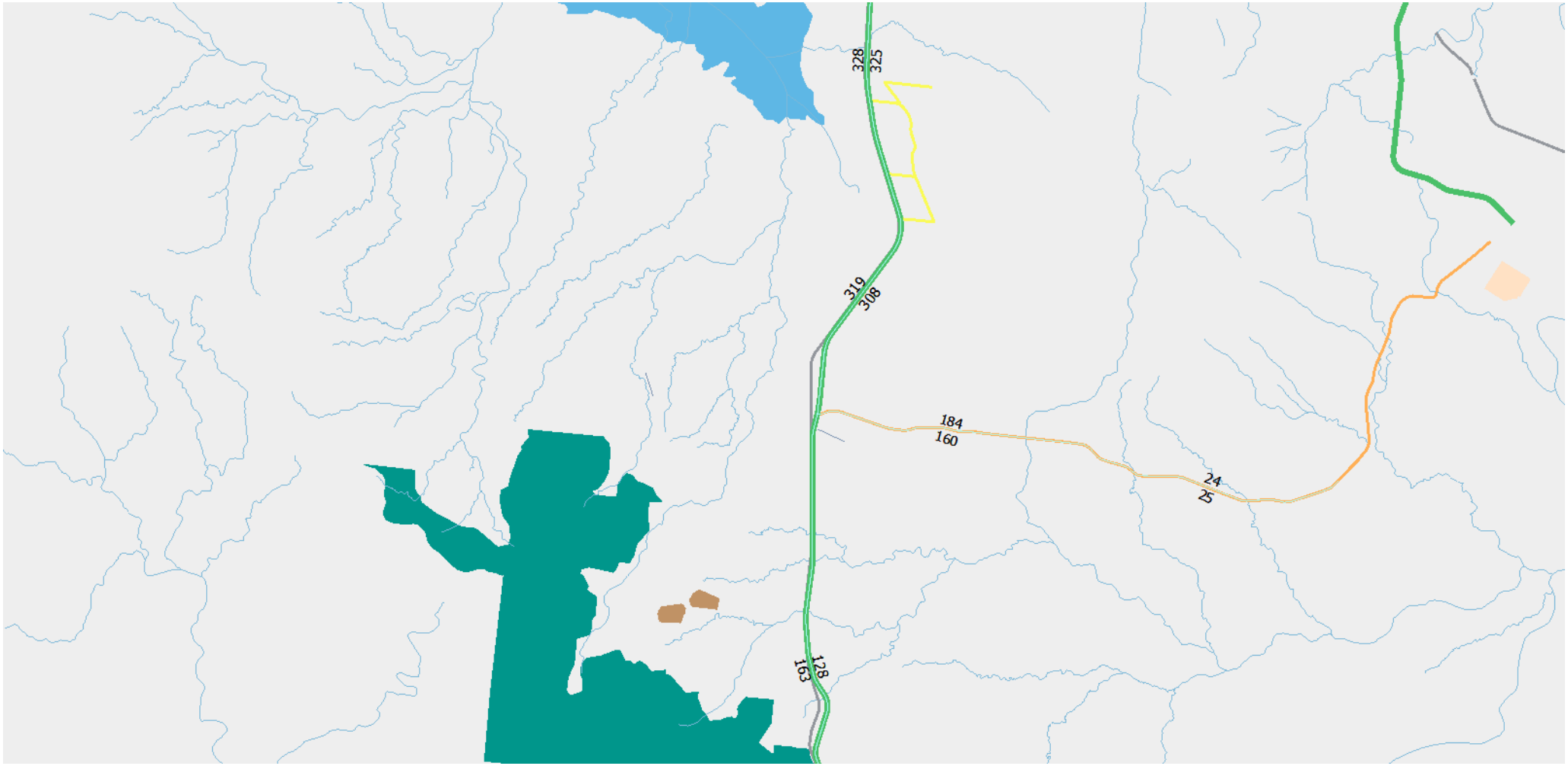
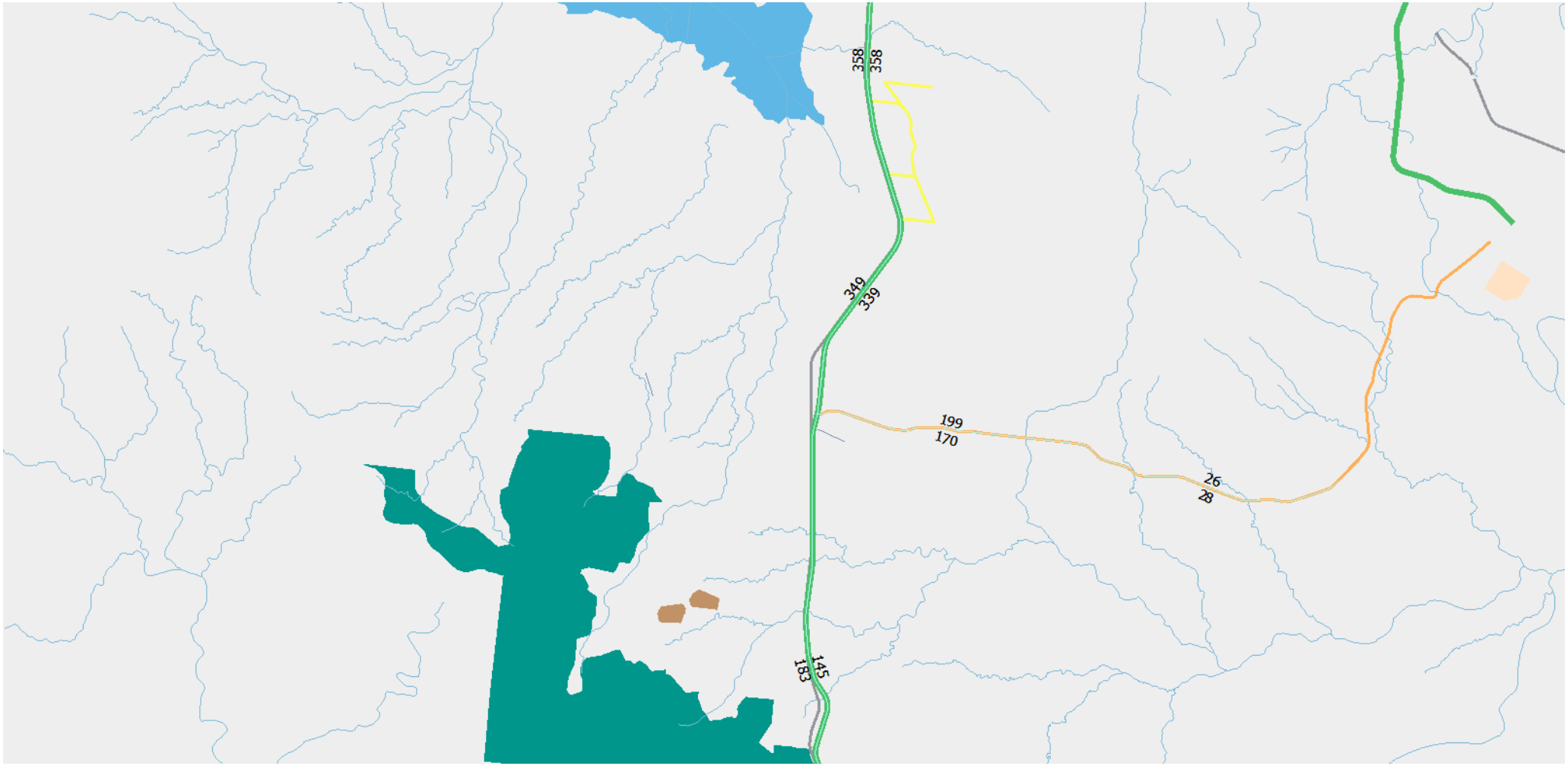


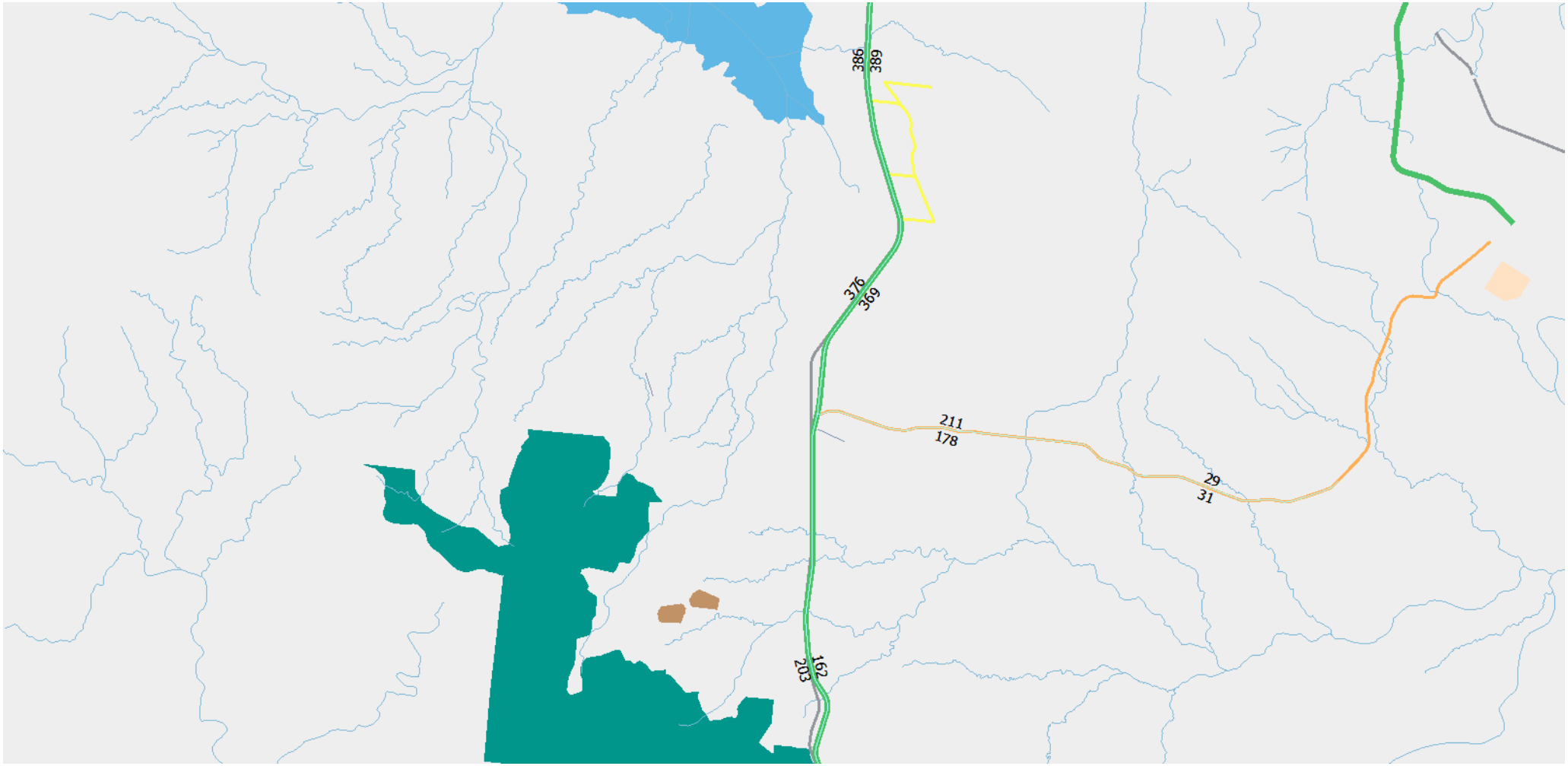
FLINDERS HIGHWAY AT LANSDOWN - 2021 PROJECTION – PEAK PM



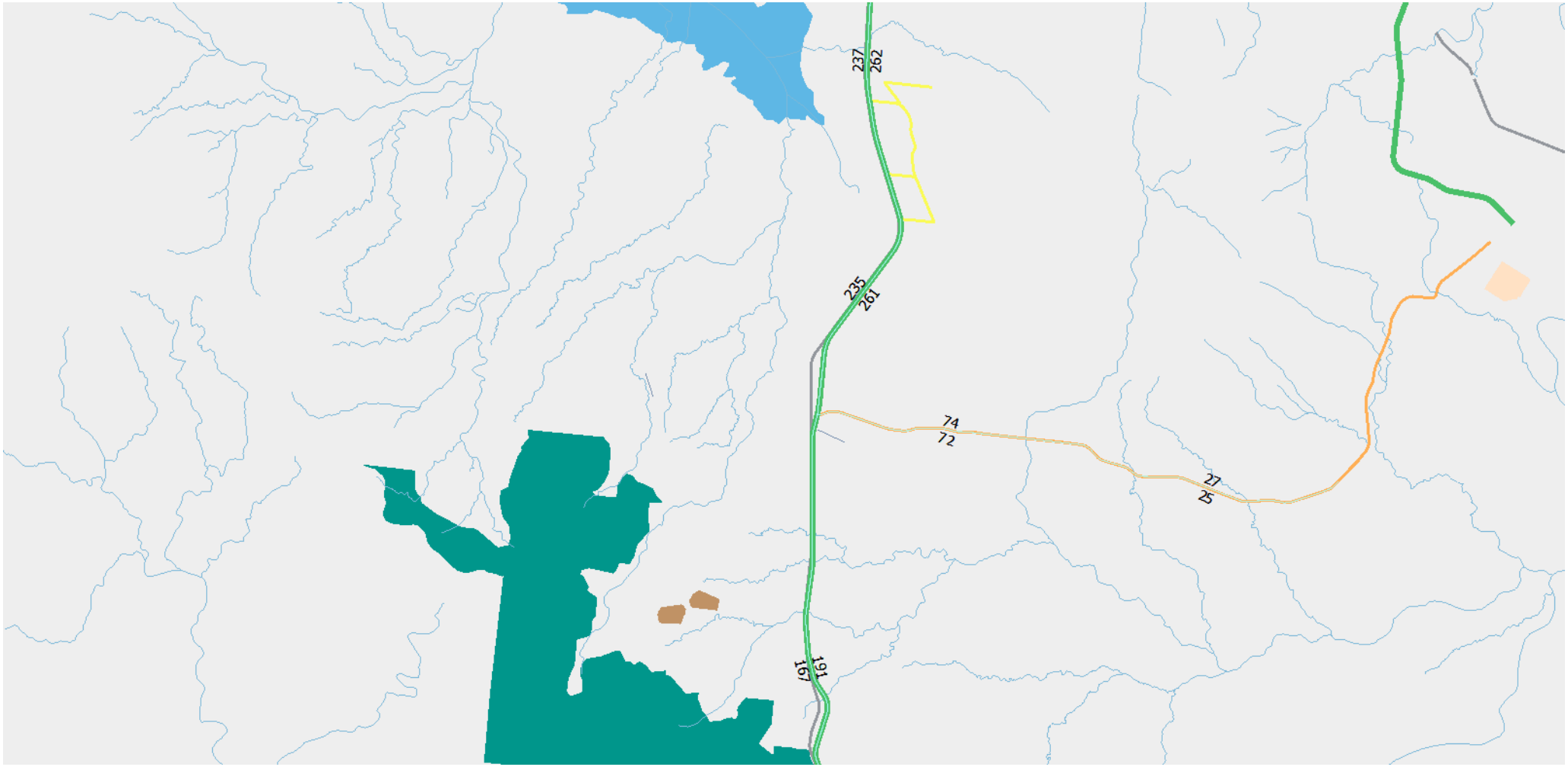
FLINDERS HIGHWAY AT LANSDOWN - 2026 PROJECTION – PEAK PM



FLINDERS HIGHWAY AT LANSDOWN - 2031 PROJECTION – PEAK PM



FLINDERS HIGHWAY AT LANSDOWN - 2036 PROJECTION – PEAK PM



FLINDERS HIGHWAY AT LANSDOWN - 2021 PROJECTION – HCV DAILY TRAFFIC

Attachment B

Drive IT letter

EMM
creating opportunities

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: SDA-0717-040799
Your reference: MI17/0015

8 February 2019

Chief Executive Officer
Townsville City Council
PO Box 1268
TOWNSVILLE QLD 4810
developmentassessment@townsville.qld.gov.au

Attention: Jeff Smith

Dear Mr Smith

SARA concurrence agency response— 132 Bidwilli Road, Calcium
(Given under section 285 of the *Sustainable Planning Act 2009*)

The concurrence agency material for the development application described below was received by the Department of State Development, Manufacturing, Infrastructure and Planning (formally Department of Infrastructure, Local Government and Planning) under section 272 of the *Sustainable Planning Act 2009* on 12 July 2017.

Referral triggers

The development application was referred to the department under the following provisions of the Sustainable Planning Regulation, 2009:

Referral trigger	Schedule 7, Table 3, Item 2 – Development impacting on state transport infrastructure

Response

Date of response:	8 February 2019
Response details:	Concurrence agency response with conditions and approval of stage 3 events as a preliminary approval only
Development details:	Development Permit for Material Change of Use – Motor Sport and Driver Education Facility (stage 1 and 2 events) Preliminary Approval for a Material Change of Use – Motor Sport and Driver Education Facility (stage 3 events)
Conditions:	The conditions set out in Attachment 1 must be attached to any development approval

Townsville City Council
Received
08/02/2019

Development Assessment Advisory Team
Level 13, 1 William Street
BRISBANE QLD 4000
PO Box 15009, CITY EAST QLD 4002

Document Set ID: 17668299
Version: 1, Version Date: 08/02/2019
Document Set ID: 19390184
Version: 2, Version Date: 28/08/2020

Location details

Street address:	132 Bidwilli Road, Calcium
Real property description:	Lot 19 on RP901592, Lot 38 on E124269 and Lots 31 & 39 on E124247
Local government area:	Townsville City Council

Applicant details

Applicant name:	Drive It NQ C/- Milford Planning Consultants
Applicant contact details:	PO BOX 5463 TOWNSVILLE QLD 4810 info@milfordplanning.com.au

A copy of this response has been sent to the applicant for their information.

For further information, please contact Duncan Livingstone, Principal Planner, on 3452 7180, or email duncan.livingstone@dsdmip.qld.gov.au, who will be pleased to assist.

Yours sincerely

Steve Conner
Executive Director – Planning Group

cc: Drive It NQ
C/- Milford Planning Consultants - info@milfordplanning.com.au

enc: Attachment 1—Concurrence agency conditions
Attachment 2—Reasons for imposing conditions
Attachment 3—Advice to the applicant
Attachment 4—Approved plan and specifications

Document Set ID: 17668299
Version: 1, Version Date: 28/02/2019
Document Set ID: 19390184
Version: 2, Version Date: 28/08/2020

Attachment 1—Concurrence agency conditions

No.	Conditions	Condition timing
Development Permit for Material Change of Use – Motor Sport and Driver Education Facility (Stage 1 and 2 events)		
Development impacting on state transport infrastructure (threshold) —The chief executive administering the *Sustainable Planning Act, 2009* nominates the Director-General of Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
Stage 1 events		
1.	Vehicular access to the site is to be in accordance with Site Access, prepared by Milford Planning, dated 07/02/2019, reference M0000-SK-03, Sheet 1 of 1.	At all times
2.	(a) The occupancy and use of the development for Stage 1 events must not generate more than 75 vehicle trips per hour in accordance with Drive It NQ – Staging Schedule of Events, received 23 January 2019, version 3 (b) Provide the Department of Transport and Main Roads with attendance records evidencing part (a) of this condition has been complied with.	(a) At all times (b) Every twelve (12) months from the commencement of use
3.	(a) A Traffic Management Plan must be prepared by a Registered Professional Engineer of Queensland (RPEQ) and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads (b) The Traffic Management Plan must demonstrate: (i) vehicles are directed to the proposed access route referenced in condition 1 (ii) vehicles do not utilise Bidwilli Road and Ghost Gum Road east of the site for access (iii) maximum vehicle trips per hour are in accordance with condition 2. The Traffic Management Plan is to be prepared in accordance with: - Department of Transport and Main Roads' *Guide to Traffic Impact Assessment 2017* - *Road Planning and Design Manual (2nd edition)* - *Austroads Guide to Traffic Management and Guide to Road Safety.*	(a) and (b) Prior to obtaining development approval for building work or operational work, whichever occurs first

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Version: 1, Version Date: 28/03/2019
Document Set ID: 18700184
Version: 2, Version Date: 28/08/2020

	(c) The operation of the development must be undertaken in accordance with the Traffic Management Plan.	(c) At all times during operation
4.	(a) A Construction Management Plan, including a Traffic Management Plan, must be prepared by a Registered Professional Engineer of Queensland (RPEQ) and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads (b) The Construction Management Plan must demonstrate that there will be no disruption to: (i) the safety and operational integrity of the railway level crossing of the Great Northern Line at the Old Flinders Highway (ID: 1071) (ii) the safety and operational efficiency of the Flinders Highway / Woodstock-Giru Road / Glenn Road intersection during the course of construction. (c) The construction of the development must be undertaken in accordance with the Construction Management Plan.	(a) and (b) Prior to obtaining development approval for building work or operational work, whichever occurs first (c) At all times during construction
5.	(a) Stormwater management of the development must ensure no worsening or actionable nuisance to the state-controlled road and railway (b) Any works on the land must not: (i) create any new discharge points for stormwater runoff onto the state-controlled road and railway (ii) interfere with and/or cause damage to the existing stormwater drainage on the state-controlled road and railway (iii) surcharge any existing culvert or drain on the state-controlled road and railway (iv) reduce the quality of stormwater discharge onto state-controlled road and railway. (c) RPEQ certification, with supporting documentation, must be provided to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with parts (a) and (b) of this condition.	(a) At all times (b) At all times (c) Prior to the commencement of use
Stage 2 events		
6.	Vehicular access to the site is to be in accordance with Site Access, prepared by Milford Planning, dated 07/02/2019, reference M0000-SK-03, Sheet 1 of 1.	At all times

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Version: 2, Version Date: 28/08/2020

7.	(a) The occupancy and use of the development for Stage 2 events must not generate more than 250 vehicle trips per hour in accordance with Drive It NQ – Staging Schedule of Events, received 23 January 2019, version 3 (b) Provide the Department of Transport and Main Roads with attendance records evidencing part (a) of this condition has been complied with.	(a) At all times (b) Every twelve (12) months from the commencement of use
8.	(a) A Traffic Management Plan must be prepared by a Registered Professional Engineer of Queensland (RPEQ) and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads (b) The Traffic Management Plan must demonstrate: (i) vehicles are directed to the proposed access route referenced in condition 6 (ii) vehicles do not utilise Bidwilli Road and Ghost Gum Road east of the site for access (iii) maximum vehicle trips per hour are in accordance with condition 7. The Traffic Management Plan is to be prepared in accordance with: - Department of Transport and Main Roads' *Guide to Traffic Impact Assessment 2017* - *Road Planning and Design Manual (2nd edition)* - *Austroads Guide to Traffic Management and Guide to Road Safety.* (c) The operation of the development must be undertaken in accordance with the Traffic Management Plan.	(a) and (b) Prior to obtaining development approval for building work or operational work, whichever occurs first (c) At all times during operation
9.	(a) A Construction Management Plan, including Traffic Management Plan, must be prepared by a Registered Professional Engineer of Queensland (RPEQ) and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads (b) The Construction Management Plan must demonstrate that there will be no disruption to: (i) the safety and operational integrity of the railway level crossing of the Great Northern Line at the Old Flinders Highway (ID: 1071)	(a) and (b) Prior to the commencement of works

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Version: 1, Version Date: 28/02/2019
Document Set ID: 29390784
Version: 2, Version Date: 28/08/2020

	(ii) the safety and operational efficiency of the Flinders Highway / Woodstock-Giru Road / Glenn Road intersection during the course of construction. (c) The construction of the development must be undertaken in accordance with the Construction Management Plan.	(c) At all times during construction
10.	(a) Stormwater management of the development must ensure no worsening or actionable nuisance to the state-controlled road and railway (b) Any works on the land must not: (i) create any new discharge points for stormwater runoff onto the state-controlled road and railway (ii) interfere with and/or cause damage to the existing stormwater drainage on the state-controlled road and railway (v) surcharge any existing culvert or drain on the state-controlled road and railway (vi) reduce the quality of stormwater discharge onto state-controlled road and railway. (c) RPEQ certification, with supporting documentation, must be provided to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with part/s (a) and (b) of this condition.	(a) At all times (b) At all times (c) Prior to the commencement of use
11.	(a) Road works comprising an acceleration lane, a minimum of 500m in length, with a merge taper to the northern approach of the Flinders Highway / Woodstock-Giru Road / Glenn Road intersection, must be provided generally in accordance with the Preliminary Woodstock Road Option b Intersection Overall Layout Plan, prepared by Northern Consulting Engineers, dated 28 April 2016, reference MIL0006/C6b, issue P1 (as amended in red) (b) The road works must be designed and constructed in accordance with the Department of Transport and Main Roads' *Road Planning and Design Manual, Second Edition and Manual on Uniform Traffic Control Devices (MUTCD)* and *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised intersections.*	(a) and (b) Prior to the commencement of use
12.	(a) The railway level crossing of the Great Northern Line at the Old Flinders Highway (ID: 1071) must be upgraded to include the following: (i) boom barriers on each side of the crossing in accordance with Section 2.3.8 'Boom barrier' and Figure 4.7 'Railway crossing with straight approach controlled	(a) and (b) Prior to the commencement of use

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Version: 1, Version Date: 28/02/2019
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Version: 2, Version Date: 28/08/2020

	by flashing lights and half-boom barrier (Active control)' within AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings* (ii) street lighting on each side of the crossing in accordance with Townsville City Council standards (iii) advance warning signage on the Woodstock Avenue approach to the crossing in accordance with Section 2.3.5 – 'Railway crossing flashing signals ahead on side road assembly (RX-7)' and signs W7-4 and W8-3(R) within AS1742.7:2016 *Manual of uniform traffic control devices, Part 7: Railway crossings.* (b) The applicant must provide written evidence from the railway manager (Queensland Rail) to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads, confirming that the development has been designed and constructed in accordance with part (a) of this condition.	
Preliminary Approval for Material Change of Use – Motor Sport and Driver Education Facility - Stage 3 events		
Development impacting on state transport infrastructure (threshold) —The chief executive administering the *Sustainable Planning Act 2009* nominates the Director-General of Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
13.	(a) A Traffic Impact Assessment must be prepared by a Registered Professional Engineer of Queensland (RPEQ) and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads. The Traffic Impact Assessment must ensure that there will be no adverse impacts to the safety and operational efficiency of the state-controlled road network (b) The Traffic Impact Assessment must: (i) be developed in accordance with the Department of Transport and Main Roads' *Guide to Traffic Impact Assessment 2017* and *Road Planning and Design Manual (2nd Edition)* (ii) recommend mitigation measures to ensure no adverse impact(s) on the safety and operational efficiency of the state-controlled road network.	(a) and (b) Prior to issue of the Development Permit
14.	(a) A Rail Safety Assessment must be prepared and given to the Program Delivery and Operations Unit, North Queensland Region at North.Queensland.IDAS@tmr.qld.gov.au within the Department of Transport and Main Roads. The Rail Safety Assessment must ensure that there will be no adverse	(a) and (b) Prior to issue of the Development Permit

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	impacts to the safety and operational integrity of the railway corridor. (b) The Rail Safety Assessment must: (i) be developed in accordance with Section 2.2 – Railway Crossing Safety of the Department of Transport and Main Roads' *Guide for Development in a Transport Environment: Rail* (ii) recommend mitigation measures to ensure no adverse impact(s) on the safety and operational integrity of the rail network.	

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Version: 1, Version Date: 28/03/2019
Document Set ID: 29390784
Version: 2, Version Date: 28/08/2020

Attachment 2—Reasons for imposing conditions

The reasons for this decision are:

- To ensure access across the railway to the state-controlled road from the site does not compromise the safety and integrity of the railway and safety and efficiency of the state-controlled road.
- To ensure the development does not compromise the safe and efficient management or operation of the state-controlled road and railway level crossings.
- To ensure that the impacts of stormwater events associated with development are minimised and managed to avoid creating any adverse impacts on state-transport corridors.
- To ensure the development does not compromise the safe and efficient operation and integrity of state transport infrastructure during construction.
- To ensure the road works on, or associated with, the state-controlled road network are undertaken in accordance with applicable standards.
- To ensure that work on, or associated with, the railway level crossing are undertaken in accordance with applicable standards.

Document Set ID: 17683299
Version: 1, Version Date: 28/02/2019
Document Set ID: 29300184
Version: 2, Version Date: 28/08/2020

Attachment 3—Advice to the applicant

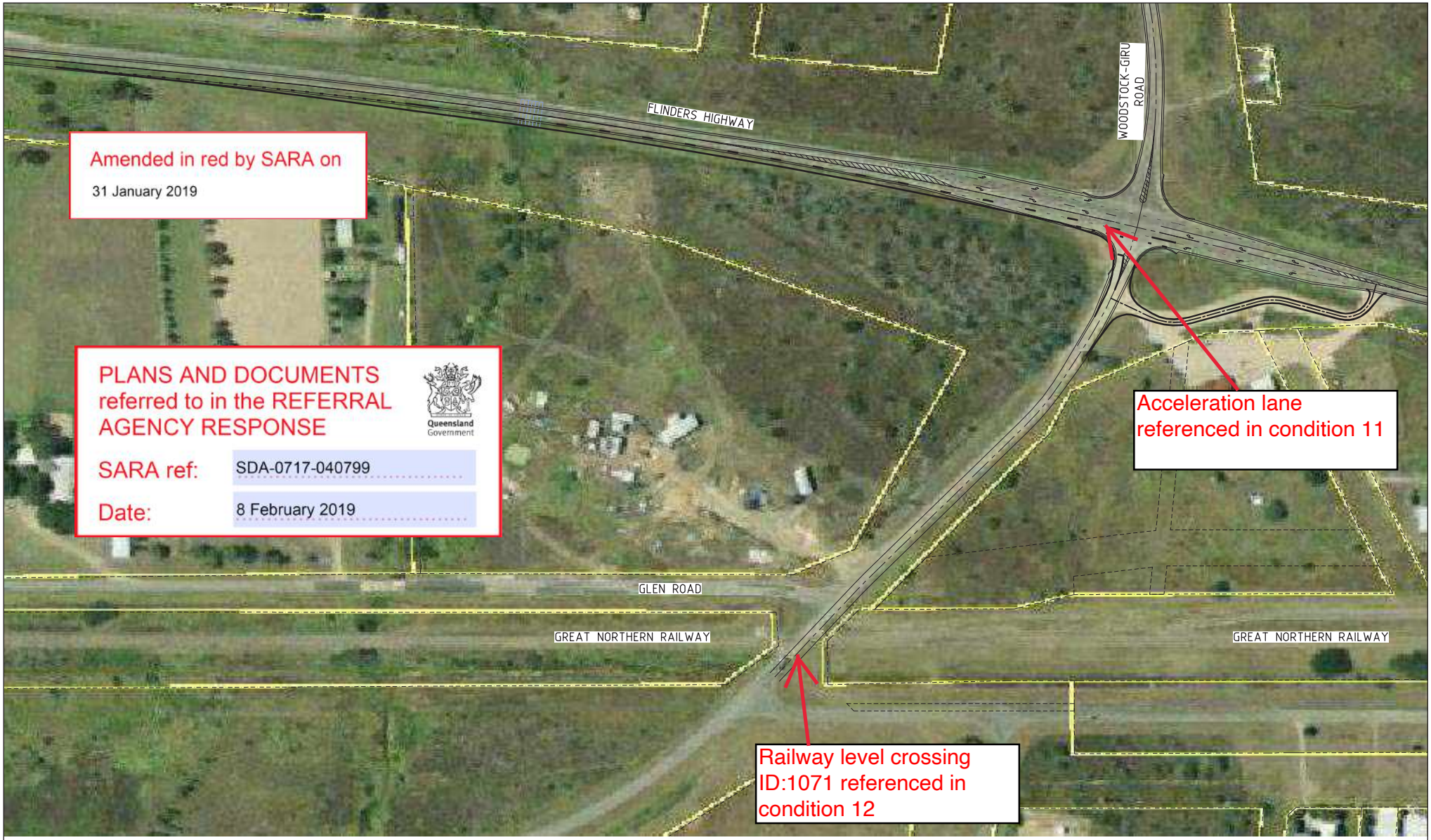
Further approvals required – Road works approval	
1.	Under section 33 of the Transport Infrastructure Act 1994, written approval is required from the Department of Transport and Main Roads to carry out road works on a state-controlled road. Please contact the Department of Transport and Main Roads' at North.Queensland.IDAS@tmr.qld.gov.au to make an application for road works approval. This approval must be obtained prior to commencing any works on the state-controlled road reserve. The approval process may require the approval of engineering designs of the proposed works, certified by a Registered Professional Engineer of Queensland (RPEQ).

Document Set ID: 17668799
Version: 1, Version Date: 28/03/2019
Document Set ID: 19300784
Version: 2, Version Date: 28/08/2020

Attachment 4—Approved plan and specifications

Document Set ID: 17868799
Version: 1, Version Date: 28/03/2019
Document Set ID: 19700784
Version: 2, Version Date: 28/04/2022

Document Set ID: 17683299
Version: 1, Version Date: 27/02/2019
Document Set ID: 29300784
Version: 2, Version Date: 28/08/2020



Amended in red by SARA on

31 January 2019

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: SDA-0717-040799

Date: 8 February 2019

LAYOUT PLAN

N

Scale

0 10 20 30 40m

THE ORIGINAL OF THIS DOCUMENT IS COMPLETED TO THE SCALE NOTED. AS REPRODUCTION CAN DISTORT SIZE & SHAPE USE ONLY THE DIMENSIONS PROVIDED ON ARCHITECTURAL &/OR ENGINEERING DRAWINGS. VERIFY DIMENSIONS ON SITE BEFORE CONSTRUCTION.

All work is to be carried out in accordance with LOCAL AUTHORITIES standard details.

SCI QUAL INTERNATIONAL

NORTHERN CONSULTING engineers

Civil & Structural Engineers
50 Punari Street, Currajong 4812
Phone: [07] 4725 5550 Fax: [07] 4725 5850
Email: mail@nceng.com.au
Milton Messer & Associates Pty. Ltd.
ACN 100 817 356

Issue	Description	Date
P1	PRELIMINARY - NOT FOR CONSTRUCTION - ISSUED FOR DISCUSSION PURPOSES ONLY.	28/04/2016

Drawn: DC
Date: 28/04/2016
Checked
Approved
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In Association With: DRIVE IT NQ

DRIVERS EDUCATION CENTRE AND MOTORSPORTS COMPLEX
FLINDERS HIGHWAY
CALCIUM

PRELIMINARY WOODSTOCK ROAD OPTION b INTERSECTION OVERALL LAYOUT PLAN

Drawing Number: MIL0006/C6b

Issue: P1

Document Set ID: 17668299
Version: 1, Version Date: 28/02/2019
Document Set ID: 28580164
Version: 2, Version Date: 28/08/2020

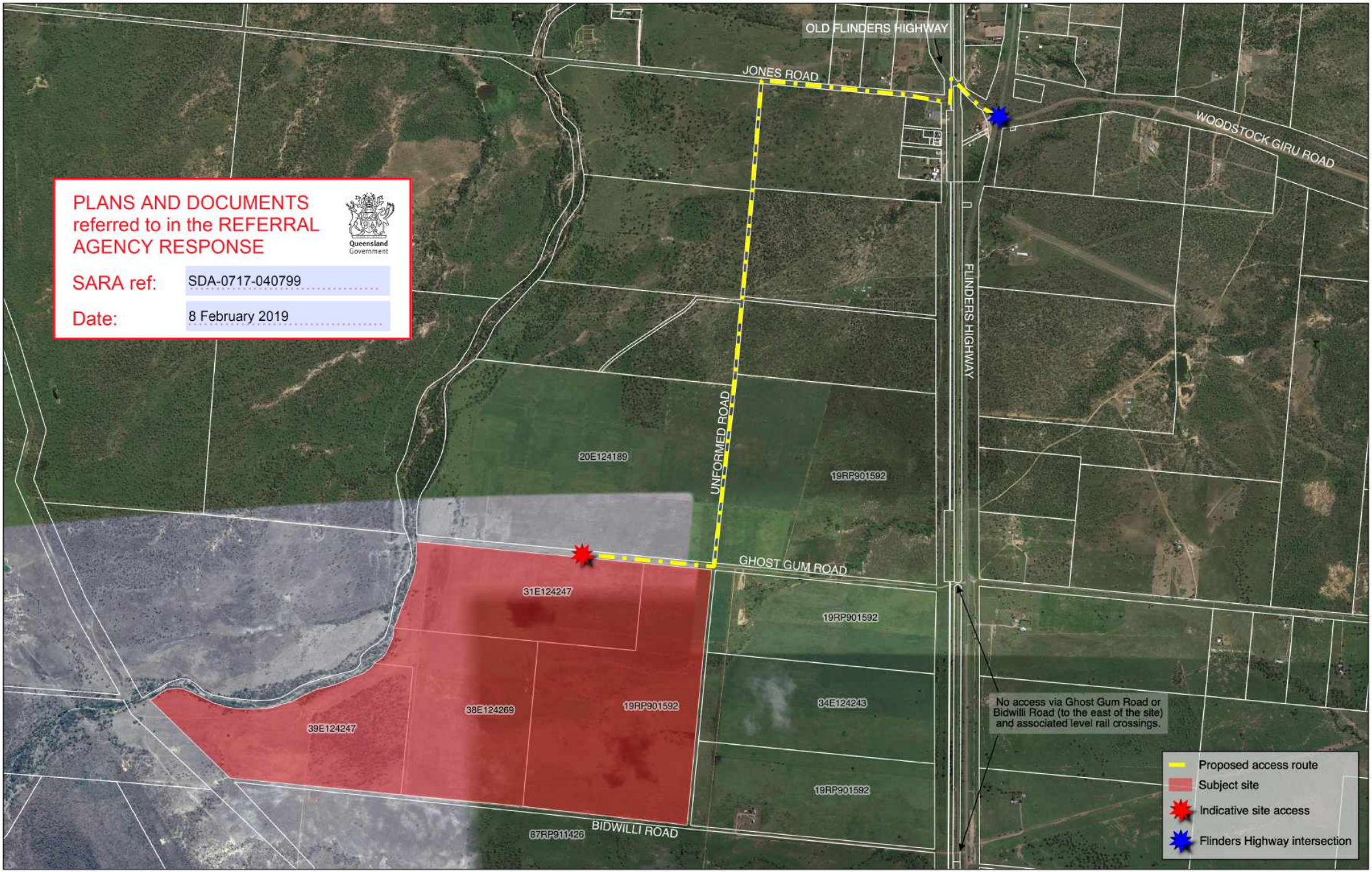
Received by SARA on
23 January 2019

Drive It NQ – Staging Schedule of Events (Version 3)

Stage	Event	Event Frequency (per year)	Vehicles Per Hour (maximum) Entrance	Exit	Facility
Stage 1 (≤75vph)	Driver Education	200	20	20	Education pad
	Product Launch and Testing (not requiring race circuit)	200	20	20	Education pad, Off-road circuit
	Off-road/ Rally (practice – weekday)	200	1	1	Off-road circuit
	Off-road/ Rally (practice – weekend)	26	2	7	Off-road circuit
	Karting Practice (weekday)	200	1	1	Karting track
	Karting Practice (weekend)	40	7	7	Karting track
	Off-road/ Rally (minor event)	12	30	44	Off-road circuit
	Karting (minor event)	12	50	75	Karting track
Stage 2 (≤250vph) [railway crossing upgrade and acceleration lane required]	Drags Street Meet	40	250	250	Drag strip
	Circuit Club Drive	10	146	146	Race circuit
	Off-road/ Rally (major event)	2	96	128	Off-road circuit
	Karting (major event)	2	148	198	Karting track
	Remote Control Cars (minor event)	40	89	44	RC track
	Remote Control Cars (major event)	1	237	237	RC track
Stage 3 (>250vph) [traffic impact assessment required]	Speedway (minor event)	8	370	555	Speedway
	Speedway (major event)	2	494	494	Speedway
	Burnouts (minor event)	8	488	732	Education pad
	Burnouts (major event)	2	730	974	Education pad
	Drags (minor event)	8	363	545	Drag strip
	Drags (major event)	2	883	1177	Drag strip
	Circuit (minor event)	8	251	377	Race circuit
	Circuit (major event)	2	542	723	Race circuit
	Festival/ Concert/ Field Day	2	875	875	Open space, speedway

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE
Queensland Government
SARA ref: SDA-0717-040799
Date: 8 February 2019

Document Set ID: 17668299
Version: 1, Version Date: 28/03/2019
Document Set ID: 19300784
Version: 2, Version Date: 28/08/2020



MILFORD PLANNING

DRAWING TITLE
Site Access
Drive It NQ Driver Education and Motorsport Facility

PROPERTY ADDRESS
Lot 19 on RP901592, Lot 38 on E124269, and Lots 31 and 39 on E124247

DRAWING No. M0000-SK-03
REVISION
SCALE (at A3 original) 1:20000
SHEET 1 of 1
DATE 07/02/2019
AUTHOR(S) MAS

200 0 200 400 600 800 m

SOURCE(S)
Milford Planning GIS at publication date; DCDB extract, State of Queensland, 2019; aerial imagery, Google, 2019.
NOTE: Areas and dimensions are approximate only and are subject to site survey.

N

Document Set ID: 17068299
Version: 1, Version Date: 28/02/2019
Document Set ID: 28390774
Version: 1, Version Date: 28/08/2020

Drive It NQ – Staging Schedule of Events

Stage	Event	Event Frequency (per year)	Vehicles Per Hour (maximum) Entrance	Exit	Facility
Stage 1 (≤75vph)	Driver Education	200	20	20	Education pad
	Product Launch and Testing	200	20	20	Race circuit
	Off-road/ Rally (practice – weekday)	200	1	1	Off-road circuit
	Off-road/ Rally (practice – weekend)	26	2	7	Off-road circuit
	Off-road/ Rally (minor event)	12	30	44	Off-road circuit
	Karting Practice (weekday)	200	1	1	Karting track
	Karting Practice (weekend)	40	7	7	Karting track
	Karting (minor event)	12	50	75	Karting track
Stage 2 (≤250vph) [acceleration lane required]	Drags Street Meet	40	250	250	Drag strip
	Circuit Club Drive	10	146	146	Race circuit
	Off-road/ Rally (major event)	2	96	128	Off-road circuit
	Karting (major event)	2	148	198	Karting track
	Remote Control Cars (minor event)	40	89	44	RC track
	Remote Control Cars (major event)	1	237	237	RC track
Stage 3 (>250vph) [traffic management or significant intersection upgrade required]	Speedway (minor event)	8	370	555	Speedway
	Speedway (major event)	2	494	494	Speedway
	Burnouts (minor event)	8	488	732	Education pad
	Burnouts (major event)	2	730	974	Education pad
	Drags (minor event)	8	363	545	Drag strip
	Drags (major event)	2	883	1177	Drag strip
	Circuit (minor event)	8	251	377	Race circuit
	Circuit (major event)	2	542	723	Race circuit
	Festival/ Concert/ Field Day	2	875	875	Open space, speedway

Townsville City Council

Approved Subject to Conditions

MI17/0015
26/03/2019

Document Set ID: 17838782
Version: 1, Version Date: 27/03/2019
Document Set ID: 19300184
Version: 1, Version Date: 28/08/2020

Attachment C

Intersection count

EMM
creating opportunities

Document Set ID: 28309174
Version: 1, Version Date: 28/04/2026

Intersection count for Project Green Poly - BESS, Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

Light Vehicles

Time		North Approach Flinders Highway				East Approach Woodstock Giru Road				South Approach Flinders Highway				West Approach Glenn Road			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00:00 AM	6:15:00 AM																
6:15:00 AM	6:30:00 AM																
6:30:00 AM	6:45:00 AM																
6:45:00 AM	7:00:00 AM																
7:00:00 AM	7:15:00 AM		4	17	4		2	0	2		3	15	0		0	0	4
7:15:00 AM	7:30:00 AM		4	22	0		8	0	1		2	25	4		2	0	4
7:30:00 AM	7:45:00 AM		0	25	3		11	0	1		0	16	0		2	2	1
7:45:00 AM	8:00:00 AM		3	24	3		5	1	4		4	19	4		0	0	3
8:00:00 AM	8:15:00 AM		1	21	1		2	2	1		5	15	1		1	2	2
3:00:00 PM	3:15:00 PM		0	29	4		0	0	1		1	21	1		2	2	4
3:15:00 PM	3:30:00 PM		3	21	5		1	0	1		1	20	0		0	0	2
3:30:00 PM	3:45:00 PM		3	21	6		4	0	2		2	13	0		0	0	0
3:45:00 PM	4:00:00 PM		1	17	3		3	0	1		2	26	2		0	0	0
4:00:00 PM	4:15:00 PM		0	20	7		1	1	1		1	20	0		3	0	2
4:15:00 PM	4:30:00 PM		1	24	4		3	0	0		4	18	0		3	2	1
4:30:00 PM	4:45:00 PM		5	24	5		0	1	4		1	17	2		2	1	1
4:45:00 PM	5:00:00 PM		3	23	9		9	1	0		1	11	2		0	1	1

Heavy Vehicles

Time		North Approach Flinders Highway				East Approach Woodstock Giru Road				South Approach Flinders Highway				West Approach Glenn Road			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00:00 AM	6:15:00 AM																
6:15:00 AM	6:30:00 AM																
6:30:00 AM	6:45:00 AM																
6:45:00 AM	7:00:00 AM																
7:00:00 AM	7:15:00 AM		0	8	0		0	0	0		0	3	0		0	0	0
7:15:00 AM	7:30:00 AM		2	2	1		0	0	0		1	0	0		0	0	0
7:30:00 AM	7:45:00 AM		0	3	0		0	1	0		0	2	0		0	1	1
7:45:00 AM	8:00:00 AM		0	11	0		0	0	1		1	5	0		0	0	0
8:00:00 AM	8:15:00 AM		0	8	0		0	0	1		0	7	0		1	0	0
3:00:00 PM	3:15:00 PM		0	5	0		0	0	0		0	5	0		1	0	1
3:15:00 PM	3:30:00 PM		1	6	0		0	0	0		1	11	1		0	0	1
3:30:00 PM	3:45:00 PM		1	3	1		0	0	0		0	7	0		0	0	0
3:45:00 PM	4:00:00 PM		0	2	0		0	1	0		1	5	0		0	0	0
4:00:00 PM	4:15:00 PM		0	9	0		0	0	0		0	4	0		0	0	0
4:15:00 PM	4:30:00 PM		0	5	0		0	0	0		0	4	0		0	0	0
4:30:00 PM	4:45:00 PM		1	4	0		0	0	1		0	2	0		0	1	0
4:45:00 PM	5:00:00 PM		0	4	2		0	0	1		1	8	0		0	0	0

Intersection count for Project Green Poly - BESS, Flinders Highway/Woodstock-Giru Road/Glenn Road intersection

Total

Time		North Approach Flinders Highway				East Approach Woodstock Giru Road				South Approach Flinders Highway				West Approach Glenn Road				
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**Total 15 min**
6:00:00 AM	6:15:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00 AM	6:30:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00 AM	6:45:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00 AM	7:00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00 AM	7:15:00 AM	0	4	25	4	0	2	0	2	0	3	18	0	0	0	0	4	62
7:15:00 AM	7:30:00 AM	0	6	24	1	0	8	0	1	0	3	25	4	0	2	0	4	78
7:30:00 AM	7:45:00 AM	0	0	28	3	0	11	1	1	0	0	18	0	0	2	3	2	69
7:45:00 AM	8:00:00 AM	0	3	35	3	0	5	1	5	0	5	24	4	0	0	0	3	88
8:00:00 AM	8:15:00 AM	0	1	29	1	0	2	2	2	0	5	22	1	0	2	2	2	71
8:30:00 AM	8:45:00 AM	0	0	34	7	0	4	0	3	0	0	23	0	0	2	0	1	74
8:45:00 AM	9:00:00 AM	0	5	22	1	0	3	0	4	0	3	26	2	0	1	0	1	68
3:00:00 PM	3:15:00 PM	0	0	34	4	0	0	0	1	0	1	26	1	0	3	2	5	77
3:15:00 PM	3:30:00 PM	0	4	27	5	0	1	0	1	0	2	31	1	0	0	0	3	75
3:30:00 PM	3:45:00 PM	0	4	24	7	0	4	0	2	0	2	20	0	0	0	0	0	63
3:45:00 PM	4:00:00 PM	0	1	19	3	0	3	1	1	0	3	31	2	0	0	0	0	64
4:00:00 PM	4:15:00 PM	0	0	29	7	0	1	1	1	0	1	24	0	0	3	0	2	69
4:15:00 PM	4:30:00 PM	0	1	29	4	0	3	0	0	0	4	22	0	0	3	2	1	69
4:30:00 PM	4:45:00 PM	0	6	28	5	0	0	1	5	0	1	19	2	0	2	2	1	72
4:45:00 PM	5:00:00 PM	0	3	27	11	0	9	1	1	0	2	19	2	0	0	1	1	77
5:00:00 PM	5:15:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00 PM	6:00:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak flow (veh/hr)	AM	0	24	140	12	0	44	8	20	0	20	100	16	0	8	12	16
	PM	0	24	116	44	0	36	4	20	0	16	96	8	0	12	8	8
Peak flow factor	AM		41.7%	82.9%	66.7%		59.1%	50.0%	45.0%		65.0%	89.0%	56.3%		75.0%	41.7%	68.8%
	PM		41.7%	97.4%	61.4%		36.1%	75.0%	35.0%		50.0%	87.5%	50.0%		66.7%	62.5%	62.5%
Surveyed saturation flow rate (veh/hr)	AM		Choose critical movement														
	PM		Only fill 1 out of 3 cells				to calculate area type factor				for the entire approach						
Area type factor	AM			0.88				0.99				0.81				1.07	
	PM			1.00				1.24				0.84				1.06	
Modelled saturation flow rate (veh/hr)	AM			1356				1857				1454				1784	
	PM			1602				1966				1449				1901	
Other notes	AM																
	PM																

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