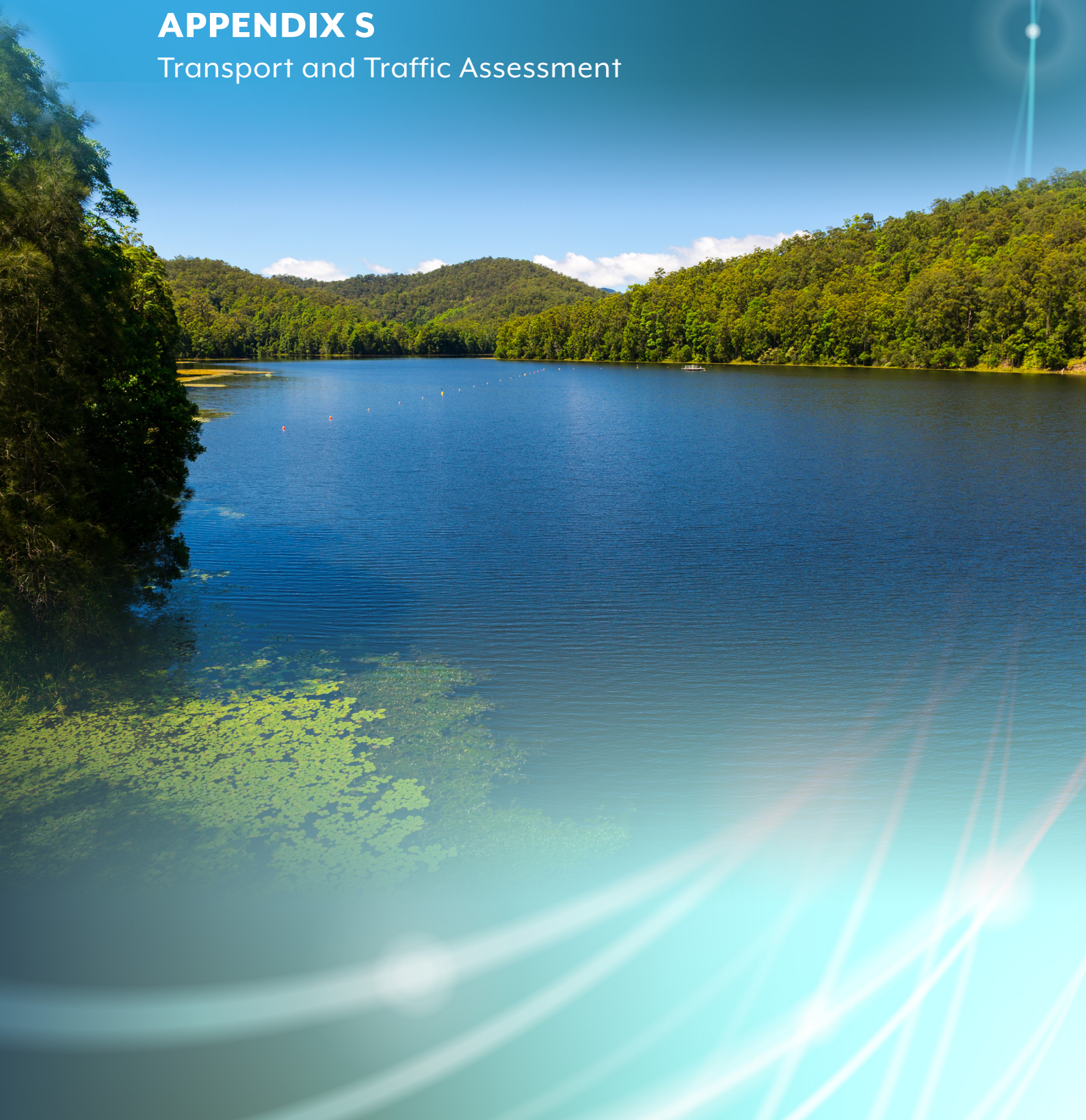


# **APPENDIX S**

## Transport and Traffic Assessment





# **Clarrie Hall Dam Raising Traffic Impact Assessment**

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Prepared for KBR

July 2024

# Clarrie Hall Dam Raising

## Traffic Impact Assessment

KBR

E230044 RP#1

July 2024

| Version | Date          | Prepared by | Approved by    | Comments                              |
|---------|---------------|-------------|----------------|---------------------------------------|
| 1       | 28 March 2024 | John Mai    | Abdullah Uddin | Draft                                 |
| 2       | 3 May 2024    | John Mai    | Abdullah Uddin | Final - KBR comments incorporated     |
| 3       | 27 May 2024   | John Mai    | Abdullah Uddin | Final - Council comments incorporated |
| 4       | 18 June 2024  | John Mai    | Abdullah Uddin | Final – comments incorporated         |
| 5       | 24 July 2024  | John Mai    | Abdullah Uddin | Final                                 |

Approved by



**Abdullah Uddin**  
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24 July 2024

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# Executive Summary

This traffic impact assessment has been conducted to support the preparation of the Environmental Impact Statement (EIS) for the Clarrie Hall Dam Raising (the Proposal), carried out by Kellogg Brown & Root (KBR) on behalf of Tweed Shire Council.

The Proposal consists of construction works associated with the raising of the dam wall by 8.5 metres (m) and ancillary works including re-establishing the quarry used for construction of the dam, the replacement of McCabes bridge and realignment of about 1,000 m of Commissioners Creek Road, realignment of Clarrie Hall Dam Road, installation of a concrete batching plant, accommodation facilities, relocation of recreational facilities, relocation of power lines and upgrading the intersection of Clarrie Hall Dam Road and Kyogle Road.

The operational footprint for the proposed full supply level (FSL) would be approximately 209 hectares (ha) and approximately 248 ha for the area between the proposed FSL and the probable maximum flood.

The construction activities are anticipated to last for approximately 18 months. This report evaluates the construction impacts associated with the above with two options considered for the locations of the concrete batching plant and staff accommodation. These are shown below, with specific impact considerations and necessary upgrades to be confirmed upon finalisation of the plans for each option:

- Option 1 consists of an accommodation camp on Tarcoola Lane and a concrete batching plant on Clarrie Hall Dam Road.
- Option 2 consists of an accommodation camp on Clarrie Hall Dam Road and a concrete batching plant on Tarcoola Lane.

The primary construction and operational traffic impacts outlined in this assessment are:

- All key intersections experience Level of Service (LOS) A during peak hours for all proposed options and scenarios.
- Basic left turn (BAL) and basic right turn (BAR) treatments will be necessary for all intersections, except for Kyogle Road/Clarrie Hall Dam Road under Option 1, which requires a shortened auxiliary left turn (AUL(s)) treatment and BAR treatment.
- Additional intersection upgrades would be required to facilitate the manoeuvring of construction vehicles at Kyogle Road/Tarcoola Lane, Kyogle Road/Clarrie Hall Dam Road, and Kyogle Road/Doon Doon Road.
- Vegetation clearance is required at Kyogle Road/Clarrie Hall Dam Road and Kyogle Road/Doon Doon Road to ensure unobstructed sight lines for turning traffic.
- Impacts on public transport, pedestrian, and cyclist movements are anticipated to be minimal. As part of the approval, a Construction Traffic Management Plan (CTMP) will be prepared which would include specific guidelines during construction e.g. haulage route, drivers code of conduct etc to address and alleviate potential safety conflicts with road users, including school buses along the primary transport route. This includes not allowing any construction related heavy vehicles along Kyogle Road passing the schools during the school pick up and drop off times, i.e. 8:00 am–9:30 am and 2:30 pm–4:00 pm during NSW school terms.

There will be minimal traffic generation during the operational stage of the dam and unlikely to have any noticeable impact at the external road network. The total estimated vehicles are four trips per day for the schedule maintenance of the dam, which has been documented in Section 5.9 of this report.



# Abbreviations

| Abbreviation | Definition                                                                                               |
|--------------|----------------------------------------------------------------------------------------------------------|
| AUL(s)       | Shortened auxiliary left turn treatment                                                                  |
| BAL          | Basic left turn treatment                                                                                |
| BAR          | Basic right turn treatment                                                                               |
| CBP          | Concrete batching plant                                                                                  |
| CTMP         | Construction Traffic and Management Plan                                                                 |
| DA           | Development Application                                                                                  |
| DEL          | Average Delay                                                                                            |
| DOS          | Degree of Saturation                                                                                     |
| DP           | Deposited Plan                                                                                           |
| DPHI         | NSW Department of Planning, Housing and Infrastructure (formerly Department of Planning and Environment) |
| EIS          | Environmental Impact Statement                                                                           |
| FSL          | Full supply level                                                                                        |
| ha           | Hectares                                                                                                 |
| km           | Kilometre                                                                                                |
| LGA          | Local government area                                                                                    |
| LOS          | Level of Service                                                                                         |
| m            | Metres                                                                                                   |
| NHVR         | National Heavy Vehicle Regulator                                                                         |
| PMF          | Probable maximum flood                                                                                   |
| Q95          | 95% queue lengths                                                                                        |
| RMS          | NSW Roads and Maritime Services, now TfNSW                                                               |
| SEARs        | Secretary's environmental assessment requirements                                                        |
| SRD SEPP     | State Environmental Planning Policy (State and Regional Development) 2011                                |
| SSD          | State significant development                                                                            |
| SSI          | State significant infrastructure                                                                         |
| TCP          | Traffic Control Plan                                                                                     |
| TfNSW        | Transport for New South Wales                                                                            |
| TIA          | Traffic Impact Assessment                                                                                |
| TMC          | Transport Management Centre                                                                              |

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# 1 Introduction

## 1.1 Project description

Clarrie Hall Dam was constructed in 1983 by the NSW Department of Public Works and is owned and operated by Tweed Shire Council for the primary purpose of providing a drinking water supply to the Tweed Shire region. Tweed Shire Council propose to raise the wall of Clarrie Hall Dam by 8.5 metres (m) to a height of 70 m Australian Height Datum (AHD) (RL 70 m). This will increase the capacity of the dam from 16,000 megalitres (ML) to approximately 42,300 ML (the Proposal).

Due to increasing demand for water as a result of projected population growth and the increasing uncertainty of water supply yield associated with climate change, there is a requirement to augment the Tweed District water supply by 2028.

The purpose of the Proposal is to ensure water security for the Tweed Shire region until at least 2065.

The former Department of Planning and Environment (DPE) – now referred to as the Department of Planning, Housing and Infrastructure (DPHI) recently released the Far North Coast Regional Water Strategy (FNCRWS) (DPE, 2023), which provides a 20-year Far North Coast region-specific strategy to improve the security and certainty of water resources. The raising of Clarrie Hall Dam is discussed in the FNCRWS and would assist Council to achieve some of the objectives of the FNCRWS.

Clarrie Hall Dam is located on Doon Doon Creek, a third-order stream forming a tributary of the Tweed River. The dam is located in Doon Doon, approximately 15 kilometres (km) south-west of Murwillumbah and 4 km south-west of Uki in the Tweed Shire Local Government Area (LGA). The dam has a catchment area of approximately 60 square kilometres and a storage capacity of 16,000 ML.

The Tweed District water supply is currently a run-of-river supply augmented by releases from Clarrie Hall Dam down Doon Doon Creek via release valves in the outlet structure within the dam to the Tweed River. Raw water is drawn from upstream of Bray Park Weir, effectively a saltwater barrage, in the Tweed River. In periods of low flow in the river, flows are augmented by releases from Clarrie Hall Dam to ensure availability of water for the Tweed District water supply.

Access to the dam wall and spillway area is from Clarrie Hall Dam Road, which runs south from Kyogle Road. The southern extent of Clarrie Hall Dam is accessed from Crams Farm, located off Commissioners Creek Road.

The majority of the Doon Doon sub-catchment of the Tweed River Catchment consists of rural and agricultural land uses (more than 70% of land is zoned 1a Rural).

## 1.2 Project overview

The Proposal would include the following main activities and elements:

- raising the dam wall by 8.5 m
- a new spillway channel constructed higher in the left abutment with a flip bucket at the downstream end
- re-establishment of the quarry used to construct the existing dam for the purpose of sourcing rock material to raise the dam wall
- construction of associated haul roads to transport quarry material for the proposed raising of the dam wall
- establishment of a construction area for plant, equipment, storage, material handling and offices
- establishment of stockpile sites associated with construction

- construction of work compounds and site offices
- establishment of materials storage and handling facilities
- construction of workers accommodation
- construction of a concrete batching plant
- realignment of Clarrie Hall Dam Road higher in the right abutment
- raising of the existing intake tower and bridge
- decommissioning of existing recreational facilities at the dam wall area
- construction of new dam operational facilities including signage, car parking, security fences, lighting, monitoring equipment and a boat ramp
- removing or reconstructing impacted recreational infrastructure and facilities at Crams Farm
- upgrading the Kyogle Road and Clarrie Hall Dam Road intersection
- replacing McCabes Bridge and realignment of Commissioners Creek Road
- relocating existing power and telecommunications utilities
- construction of new recreation facilities including an amenities block, public shelters, viewing areas, interpretation signage, paths, car parks, and landscaping.

The detailed design will need to check the existing tunnel, valves and control systems remain suitable for new design flow velocities and pressures from the raised dam and their condition is suitable for extended service life.

The upgraded dam operational footprint would increase the area of inundation to below the RL 70 m contour, which is the waterline boundary at full supply level (FSL).

The operational disturbance areas include the following:

- area of inundation increased to the area below the RL 70 m contour, which is the waterline boundary at FSL
- area between FSL and PMF
- downstream areas due to changes in flow.

An overview of the elements of the Proposal is provided in Table 1.1. Further details of the Proposal are provided in Chapter 3 of the environmental impact statement (EIS).

**Table 1.1**      **Proposal summary**

| Proposal element         | Summary of the Proposal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operation</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Description              | Raising the embankment wall of Clarrie Hall Dam by 8.5 m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Operational footprint    | Approximately 209 hectares (ha) for the proposed FSL.<br>Approximately 248 ha for the area between the proposed FSL and the PMF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dam wall infrastructure  | <ul style="list-style-type: none"> <li>Increasing the base width of the valley-side abutment and raising the crest of the concrete faced rockfill embankment to RL 70 m.</li> <li>Constructing a new concrete lined spillway higher on the west abutment.</li> <li>Extending the upstream concrete face to the new crest height.</li> <li>Raising the intake tower and access bridge.</li> <li>Constructing a new section of the Clarrie Hall Dam Road to provide access to the east abutment of the dam wall.</li> <li>Establishing new recreation and operational facilities including an amenities block, public shelters, viewing areas, interpretation signage, paths, car parks, landscaping, security fences, lighting, monitoring equipment and a boat ramp.</li> </ul> |
| Ancillary works          | <ul style="list-style-type: none"> <li>Upgrading the intersection of Clarrie Hall Dam Road and Kyogle Road.</li> <li>Replacing McCabes Bridge over Doon Doon Creek.</li> <li>Realigning an approximately 1,000 m section of Commissioners Creek Road.</li> <li>Removing or reconstructing impacted infrastructure and facilities at Crams Farm.</li> <li>Realigning overhead power lines and Telstra assets.</li> </ul>                                                                                                                                                                                                                                                                                                                                                         |
| <b>Construction</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Construction impact area | Approximately 49.6 ha, consisting of 26.2 ha at the dam wall, 6.6 ha of construction compound and workforce accommodation areas and 16.8 ha of ancillary sites for road realignments and relocating overhead power lines. The removal of the existing overhead power line is not included in the impact area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Workforce                | Estimated peak of 180 persons at the main dam wall site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Cut/fill                 | Approximately 100,000 m <sup>3</sup> deficit of fill material will be derived from the quarry located 400 m from the existing dam.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Ancillary works          | <ul style="list-style-type: none"> <li>Constructing access roads to construction areas and establishing the construction site.</li> <li>Re-establishing the quarry used to construct the existing dam.</li> <li>Establishing a concrete batching plant.</li> <li>Establishing construction compounds including site offices and areas for materials stockpiling.</li> <li>Establishing a workforce accommodation site compound.</li> </ul>                                                                                                                                                                                                                                                                                                                                      |
| Dewatering               | Lowering dam storage by 300 millimetres (mm) below FSL during construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Property                 | Permanent and temporary property adjustments and property access refinements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

It is anticipated that construction would start in 2026, subject to obtaining all necessary approvals.

The project is State significant infrastructure and is subject to approval by the NSW Minister for Planning and Public Spaces under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

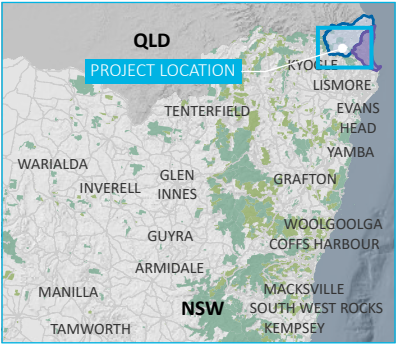
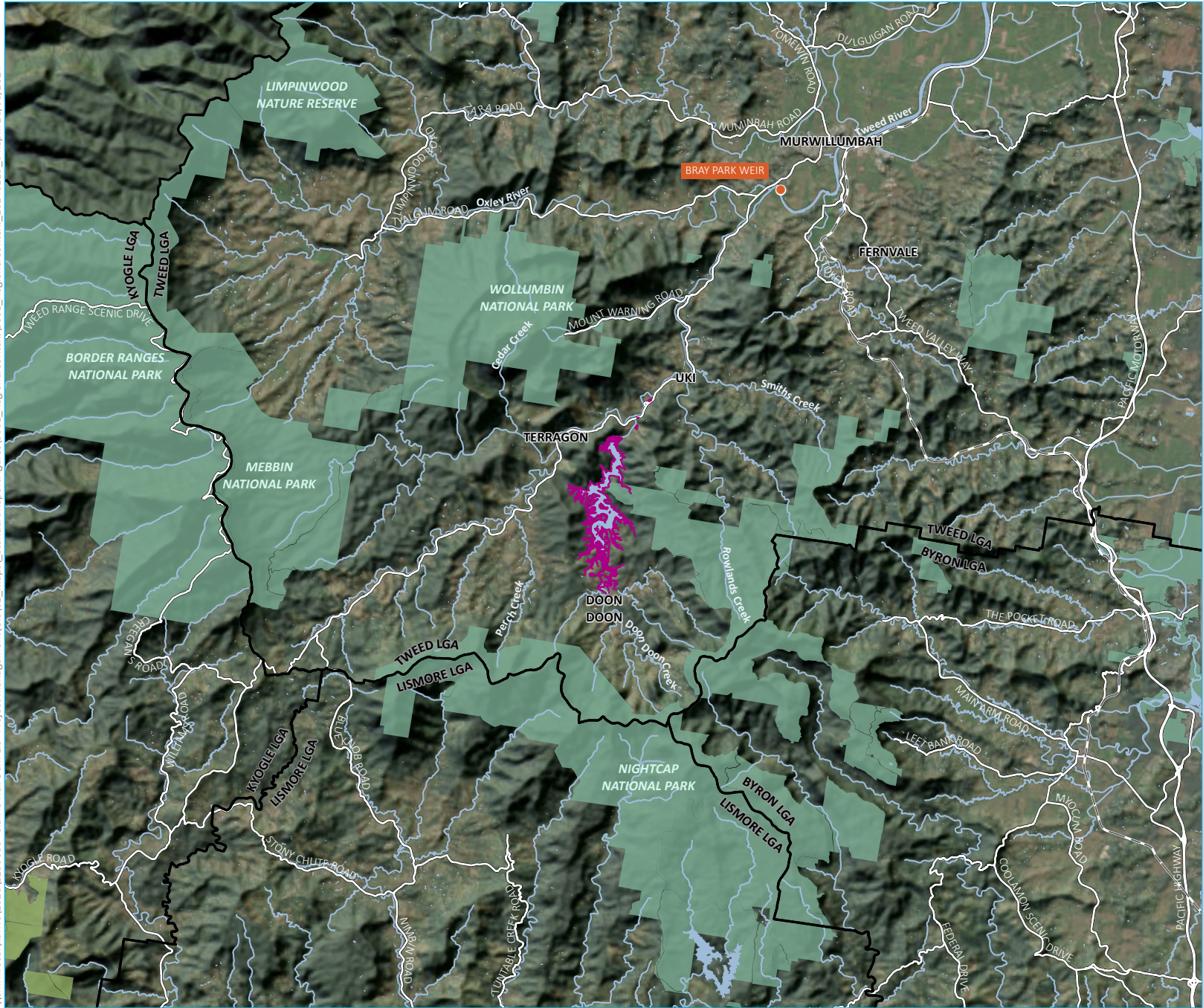
Further information on the location of the project, a description of the project and statutory context is provided in the EIS.



### 1.3 Proposal location

Clarrie Hall Dam is in the Tweed Shire Local Government Area (LGA), 15 km south-west of Murwillumbah in northern New South Wales (NSW). The dam is also 36 km south-west of Tweed Heads, as shown in Figure 1.1. McCabes Bridge is located south of Clarrie Hall Dam, as shown in Figure 1.2.

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- KEY**
- Proposed construction disturbance footprint
  - Bray Park weir
  - Existing environment
  - Rail line
  - Major road
  - Named watercourse
  - Waterbody
  - NPWS reserve
  - State forest
  - Local government area
- INSET KEY**
- Major road
  - NPWS reserve
  - State forest
  - Brunswick catchment
  - Tweed catchment

Regional context

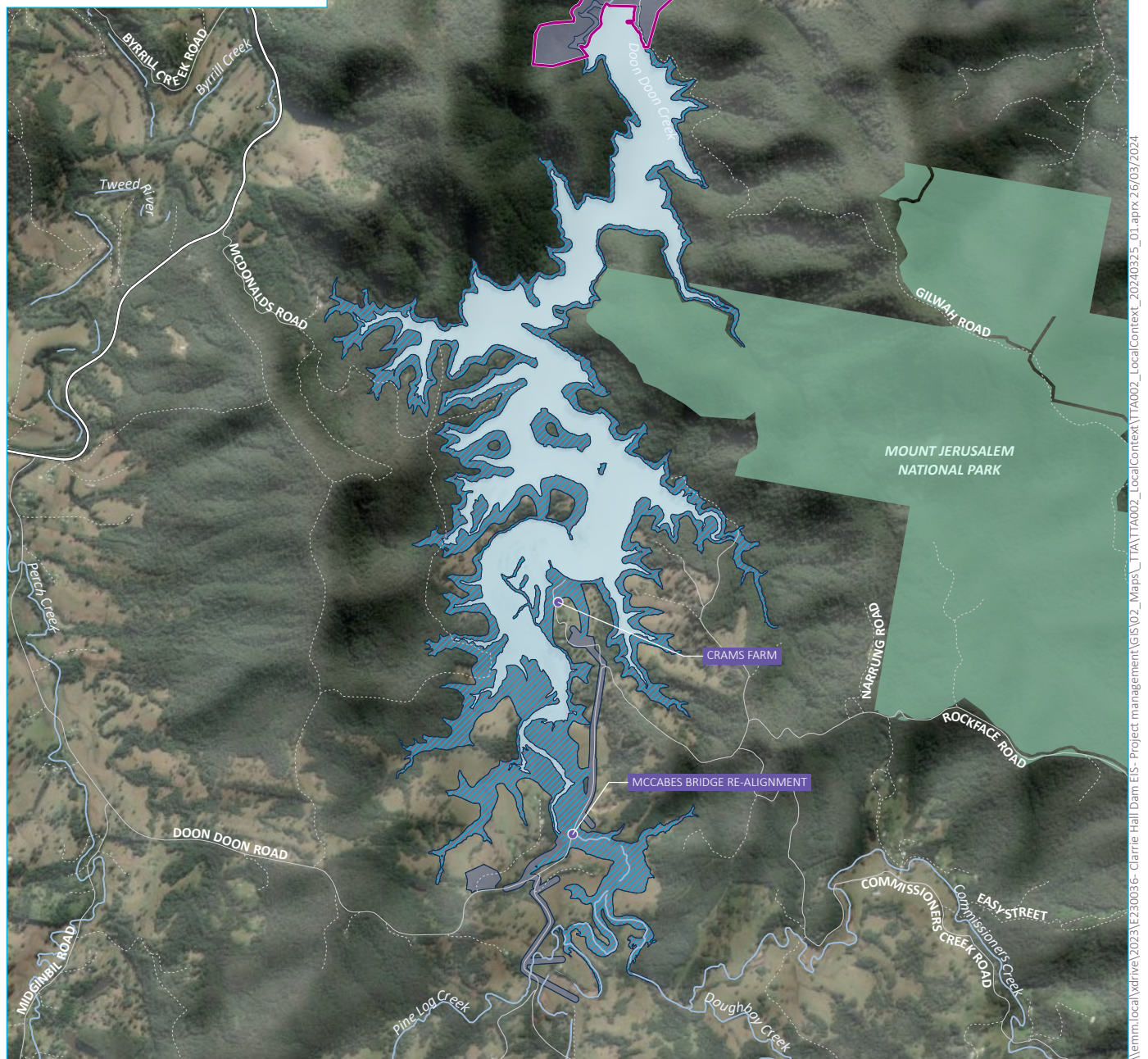
Clarrie Hall Dam EIS  
Transport & Traffic Assessment  
Figure 1.1



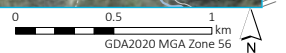
Source: EMM (2024); KBR (2023); ABS (2021); DCSSS (2023); ESRI (2024); GA (2009)







Source: EMM (2024); KBS (2024); DCSSS (2023); ESRI (2024); GA (2011)



## KEY

- Proposed construction disturbance footprint
- Existing inundation
- ▨ Inundation to FSL (61.5- 70 m AHD)
- Infrastructure upgrade location

- Existing environment
- Major road
- Minor road
- Vehicular track
- Named watercourse
- NPWS reserve

## Local context

Clarrie Hall Dam EIS  
Transport & Traffic Assessment  
Figure 1.2

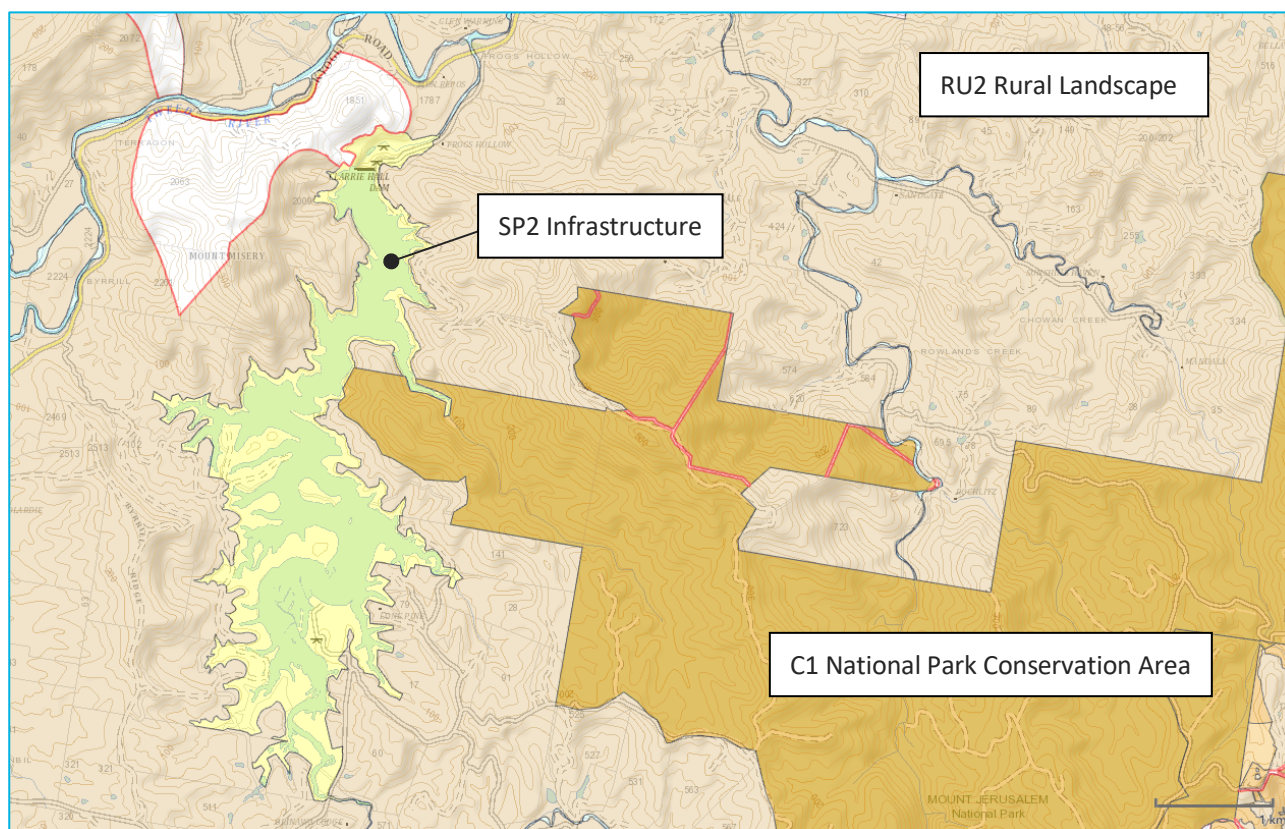


## 1.4 Surrounding land use

The area surrounding the site currently consists of RU2 Rural Landscape (for uses including primary industry production and agri-tourism/eco-tourism), C1 National Park Conservation Area and SP2 Infrastructure (for water supply) (Figure 1.3). Land tenure information is provided in the EIS.

The closest town to the site is Uki, located 4 km north-east of the site. Uki has local shops, a hotel and a primary school.

Recreational uses at the dam wall area include picnic areas, amenities and viewing platforms. South of the dam, Crams Farm Reserve is a large recreation area that includes picnic tables, shelters and a community hall that is available for functions.



Source: NSW Government ePlanning Spatial Viewer

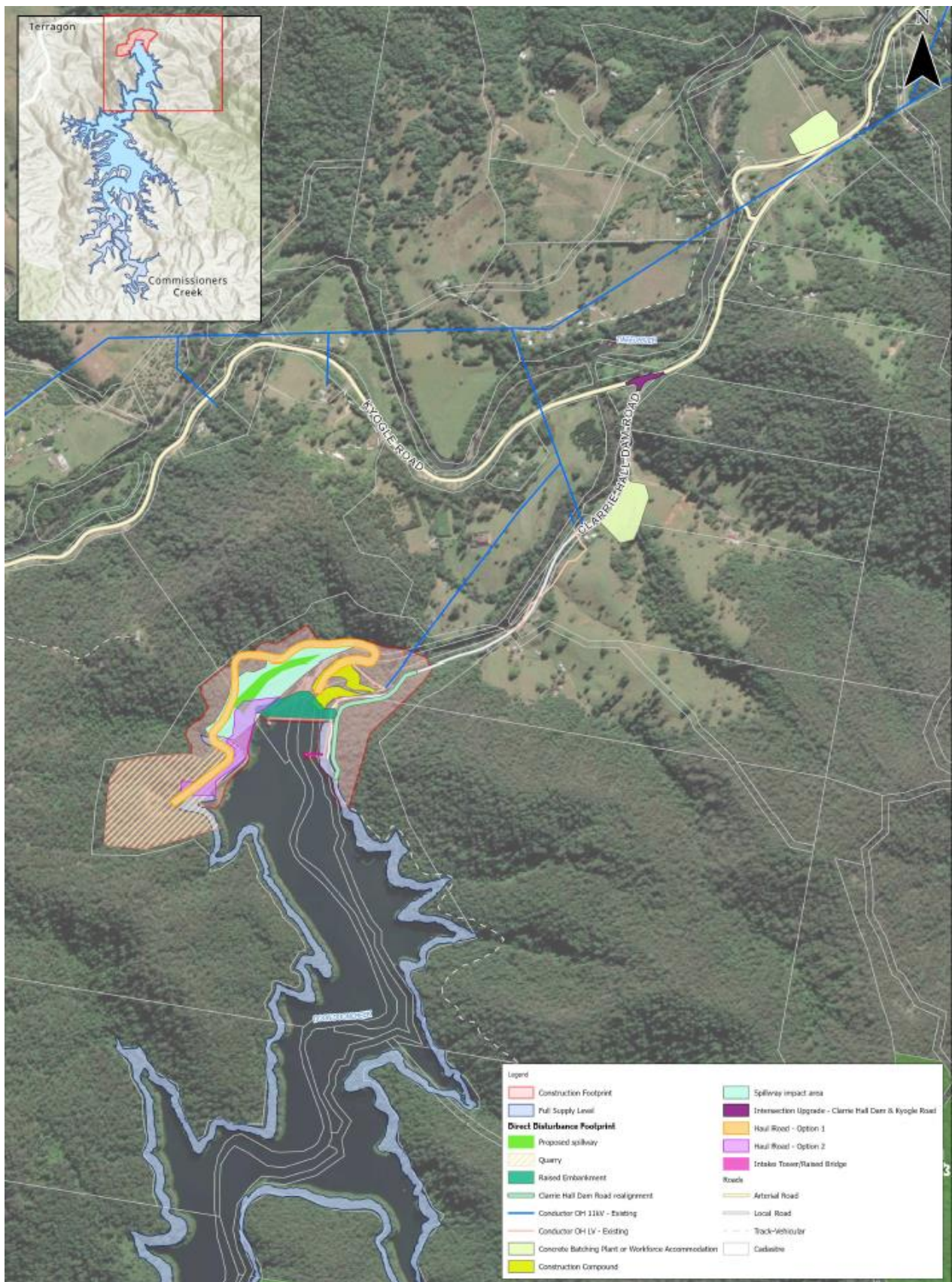
**Figure 1.3** Surrounding land uses

## 1.5 Proposal impact areas

A footprint of the Proposal has been defined to facilitate the assessment of direct impacts from the Proposal. This includes impacts during both construction and operation. The Proposal footprint areas are given in Table 1.1, and illustrated in Figure 1.4, Figure 1.5 and Figure 1.6. The footprints are described as follows:

- **Construction footprint:** areas where vegetation clearing and/or ground disturbance is required for construction of the dam, pipeline and ancillary facilities. The total site area is approximately 49.6 ha, consisting of 26.2 ha at the dam wall, 6.6 ha of construction compound and workforce accommodation areas and 16.8 ha of ancillary sites for road realignments and relocating overhead power lines.
- **Operational footprint:** areas where there will be permanent operational elements or easements. The operation footprint includes the inundation area, being the area defined by the proposed full supply level (FSL) for the Proposal.

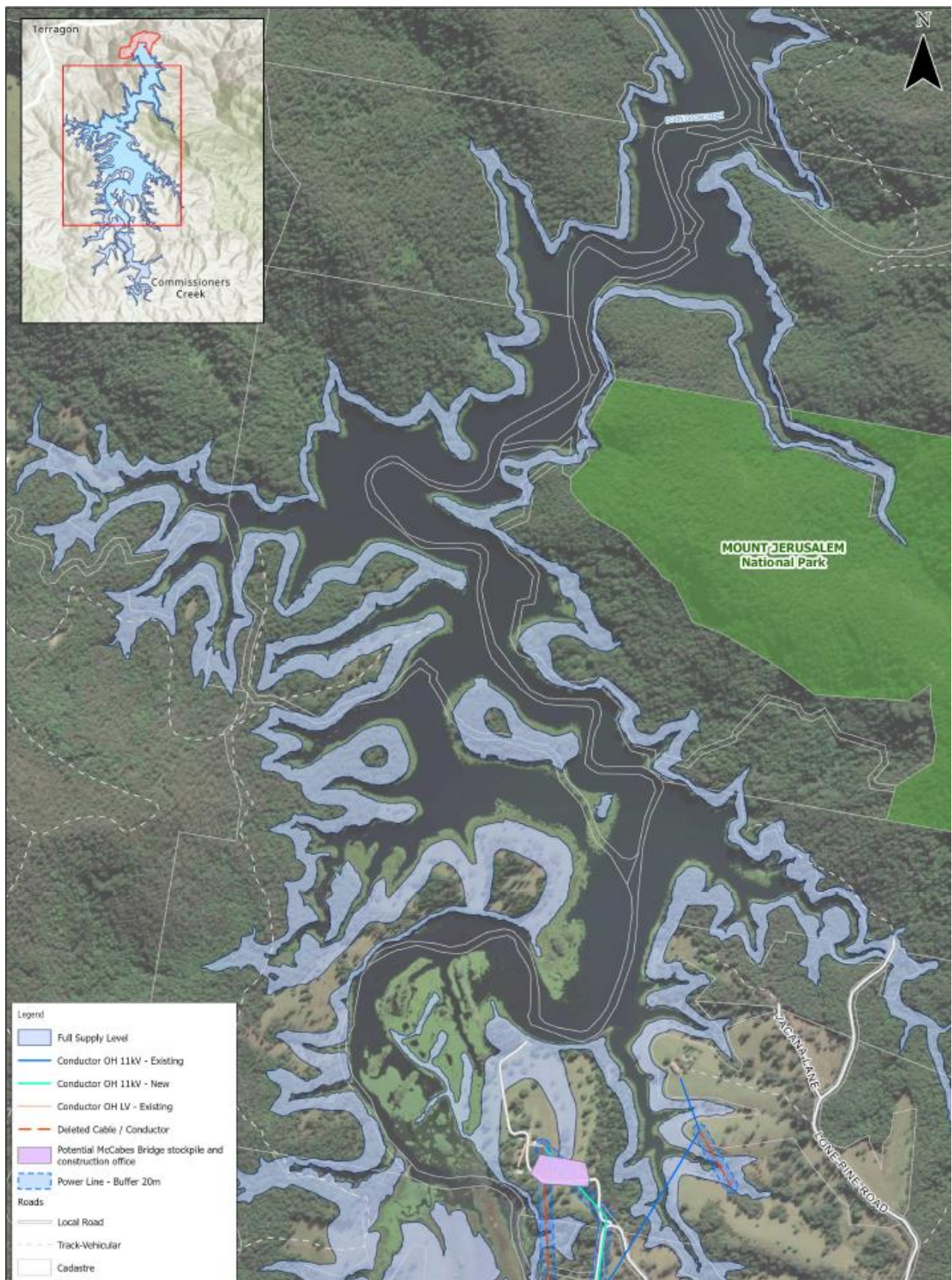




Source: KBR

**Figure 1.4** Proposal construction and operation disturbance footprint (north)

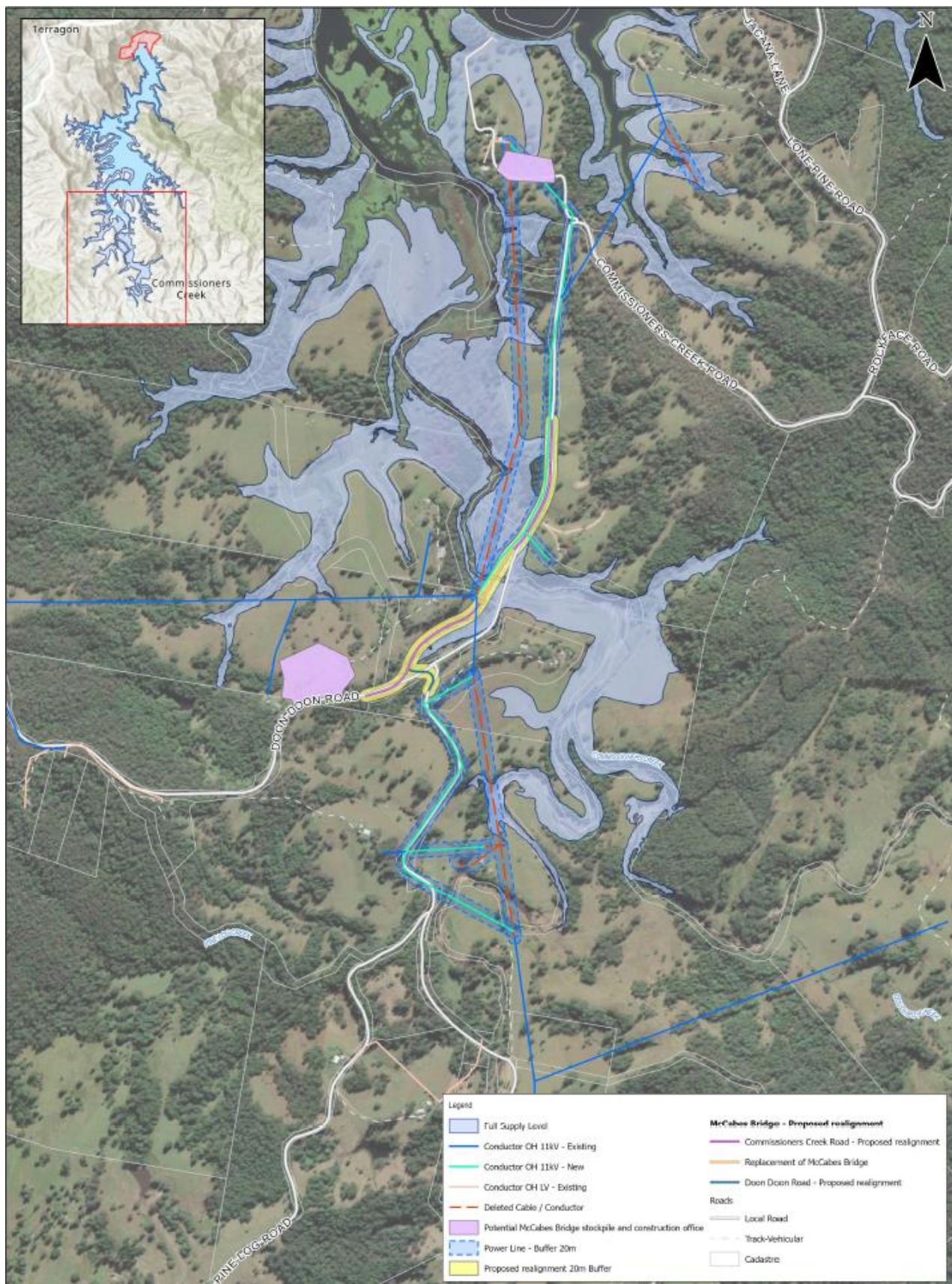




Source: KBR

**Figure 1.5** Proposal construction and operation disturbance footprint (middle)





Source: KBR

**Figure 1.6** Proposal construction and operation disturbance footprint (south)

## 1.6 Purpose and scope of this document

The EIS has been prepared to support an application for approval of the project in accordance with Division 5.2 of the EP&A Act. It addresses the Secretary's environmental assessment requirements (SEARs) issued by the DPHI.

This traffic impact assessment (TIA) has been prepared as part of the EIS to assess the potential traffic and transport impacts from constructing and operating the project. The report:

- addresses the relevant SEARs listed in Section 2.1
- describes the existing environment with respect to traffic and transport
- assesses the impacts of constructing and operating the project on traffic and transport
- recommends measures to mitigate and manage the impacts identified.

A visual inspection of the affected roads, including Kyogle Road, Doon Doon Road, Commissioners Creek Road and Clarrie Hall Dam Road, were undertaken between 14 to 16 February 2023, to confirm the current general road widths and traffic conditions for these routes. Photographs have been taken at the key Proposal access intersections.



## 2 Assessment guidelines and requirements

This TIA has been prepared generally in accordance with the requirements of the NSW Roads and Traffic Authority (RTA) (now Transport for NSW (TfNSW)) *Guide to Traffic Generating Developments* (2002) and incorporates:

- a background traffic data review
- site inspection and current traffic surveys
- swept path intersection analyses
- SIDRA intersection analyses
- future road upgrade requirements and maintenance impacts
- reporting investigations and analyses.

### 2.1 Secretary's Environmental Assessment Requirements (SEARs)

This TIA has been prepared in accordance with the SEARs for the Clarrie Hall Dam Raising Proposal, issued 31 May 2024 as well as relevant government agency requirements, guidelines and policies, and in consultation with the relevant government agencies. This TIA has been prepared in accordance with the requirements of the NSW *Guide to Traffic Generating Developments* (RTA, 2002).

Table 2.1 lists the matters relevant to this assessment and where they are addressed in this report.

**Table 2.1** Traffic related SEARs items

| SEARs                                                                                                                                                                               | Section addressed                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| The Proponent must prepare a Traffic Impact Assessment in accordance with the current guidelines. The Traffic Impact Assessment is to address, but not be limited to the following: |                                                                                                                                                |
| (a) intersection sight distances at key intersections along the primary haul route                                                                                                  | Section 5.4                                                                                                                                    |
| (b) turning paths for the largest vehicle at key intersections                                                                                                                      | Section 5.5 and Appendix D                                                                                                                     |
| (c) details of any proposed improvements to affected intersections                                                                                                                  | Chapter 6                                                                                                                                      |
| (d) existing and proposed site access standards                                                                                                                                     | Austroads rural roads design standards will be used for existing and proposed site accesses discussed in Section 4.3 and assessed in Chapter 5 |
| (e) details of servicing and parking arrangements                                                                                                                                   | Section 5.11                                                                                                                                   |
| (f) impact on public transport (public and school bus routes)                                                                                                                       | Section 5.6                                                                                                                                    |
| (g) impacts of road traffic noise and dust generated along the primary haul route/s.                                                                                                | Refer to Noise and Vibration and Air Quality Assessments.                                                                                      |

To inform preparation of the SEARs, the Department of Planning, Housing and Infrastructure (DPHI) invited relevant government agencies to advise on matters to be addressed in the EIS. These matters were taken into account by the Secretary for DPHI when preparing the SEARs.

## 2.2 Transport for NSW (TfNSW)

TfNSW provided their comments for the Proposal in its letter dated 6 December 2023.

Table 2.2 lists TfNSW's comments and where they are addressed in this report.

**Table 2.2 TfNSW comments and EMM responses**

| TfNSW comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Section addressed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TfNSW requests that a Traffic Impact Assessment (TIA) be prepared by suitably qualified person/s in accordance with the Austroads Guide to Traffic Management Part 12, the complementary TfNSW Supplement and RTA Guide to Traffic Generating Developments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | This TIA has been prepared by a qualified Traffic Engineer in accordance with the Austroads Guide to Traffic Management Part 12, the complementary TfNSW Supplement and RTA Guide to Traffic Generating Developments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| A map of the surrounding road network identifying the site access, nearby accesses, intersections and transport related facilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Figure 3.2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>The total impact of existing and proposed development on the road network with consideration for a 10 year horizon. This should include:</p> <ul style="list-style-type: none"><li>Identify Annual Average Daily Traffic (AADT) volumes with percentage heavy vehicles along the transport route/s and diagrammatically demonstrate AM and PM peak hour movements at key intersections.</li><li>Background traffic data from published sources and/or recent survey data. The source of data and any assumptions are to be clearly explained and justified, including the growth rate applied to the future horizon.</li><li>The volume and distribution of existing and proposed trips to be generated by the construction, operational and decommission phases of the development. This should identify the maximum daily and hourly demands generated by the development, particularly where they coincide with the network peak hour.</li><li>The type and frequency of design vehicles accessing the development site.</li></ul> | <p>The proposed construction work will last approximately 18 months and there will be very minimal traffic during the operational stage of this project. Hence, traffic analysis for 10 year horizon is not required.</p> <ul style="list-style-type: none"><li>Traffic volumes are showing diagrammatically between Figure 3.4 and Figure 3.7.</li><li>Traffic data source is explained in Section 3.2 and growth of background traffic is outlined in Section 4.8.</li><li>Construction traffic volumes and distribution are outlined in Sections 4.9 and 4.10. Operational traffic is discussed in Section 5.9. There is no decommission phase in this project.</li><li>The maximum size of vehicle is discussed in Section 5.5.</li></ul> |
| <p>Details of the road geometry and alignment along the identified transport route/s, including existing formations, crossings, intersection treatments and any identified hazards. This should include</p> <ul style="list-style-type: none"><li>Available sight distances at the site access and nearby intersections and any constraint to achieving the required sight distance for the posted speed limit.</li><li>An assessment of turn treatment warrants in accordance with the Austroads Guide to Traffic Management Part 6 and Austroads Guide to Road Design Part 4A for intersections along the identified transport route/s, identifying the existence of the minimum basic turn treatments and addressing the need for any warranted higher order treatments.</li><li>Swept path analysis demonstrating the largest design vehicle entering and leaving the development, and moving in each direction through intersections along the proposed transport route/s.</li></ul>                                                | <ul style="list-style-type: none"><li>The sight distance assessment is outlined in Section 5.4.</li><li>Austroads turn treatment assessment is undertaken in Section 5.2.</li><li>Swept path assessment is undertaken in Appendix D.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Capacity analysis using SIDRA or other relevant application, to identify an acceptable Level of Service (LOS) at intersections with the classified (State) road/s, and where relevant, analysis of any other intersections along the proposed transport route/s.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SIDRA analysis is undertaken in Section 5.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| A review of crash data along the identified transport route/s for the most recent 5 year reporting period and an assessment of road safety along the proposed transport route/s considering the safe systems principles adopted under Future Transport 2056.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Crash data analysis is undertaken in Section 3.3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Table 2.2** TfNSW comments and EMM responses

| TfNSW comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Section addressed                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Strategic (2D) design drawings of all proposed road works and the site access demonstrating scope, estimated cost and constructability of works required to mitigate the impacts of the development on road safety, traffic efficiency and the integrity of transport infrastructure. Works must be appropriately designed for the existing posted speed limit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Designs for Kyogle Road/Clarrie Hall Dam intersection will be provided as part of the construction design package, if required.                                                                                         |
| Site plan demonstrating site access, internal manoeuvring, servicing and parking areas consistent with the relevant parts of AS2890 and Council requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Site plans are shown in between Figure 1.4 and Figure 1.6.                                                                                                                                                              |
| Details of measures to address impacts and/or provide connections for public transport services and active transport modes, such as, public and school bus services, walking and cycling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Section 6.                                                                                                                                                                                                              |
| Details of measures to ameliorate the impacts of road traffic noise, dust, and/or glare generated along the proposed transport route/s.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Refer to acoustic and air quality reports.                                                                                                                                                                              |
| <p>Details of any Traffic Management Plan (TMP) proposed to address the construction and operation phases of the proposed development. The TMP should be prepared and implemented in accordance with Australian Standard 1742.3 and the Work Health and Safety Regulation 2017. It is recommended that any TMP include, but not necessarily limited to, the following:</p> <ul style="list-style-type: none"> <li>• A map of the primary transport route/s highlighting critical locations.</li> <li>• An induction process for vehicle operators and regular toolbox meetings.</li> <li>• Procedures for travel through residential areas, school zones and/or bus route/s.</li> <li>• any proposed temporary measures such a Traffic Guidance Scheme (TGS)</li> <li>• A Driver Code of Conduct for heavy vehicle operators.</li> <li>• A complaint resolution and disciplinary procedure.</li> </ul> | A Construction Traffic Management Plan (CTMP) will be prepared in accordance with the approval conditions (Section 5.10).                                                                                               |
| Community consultation measures proposed for peak periods.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Community consultation will be undertaken by Tweed Shire Council and/or the detailed design and construction contractor. Consultation requirements would be included in the Construction Environmental Management Plan. |
| Where road safety concerns are identified at a specific location along the proposed haulage routes, TfNSW suggests that the TIA be supported by a targeted Road Safety Audit undertaken by suitably qualified persons in accordance with the Austroads Guidelines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | There is no specific road safety issues along the haulage route, hence any Road Safety Audit is not required.                                                                                                           |

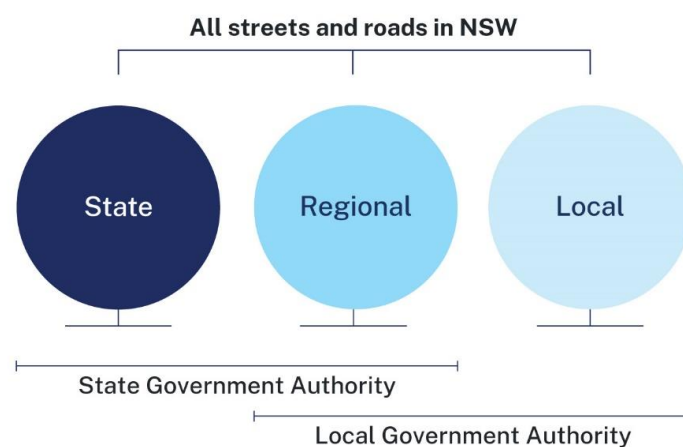


## 3 Existing transportation facilities

### 3.1 Road network

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy (Figure 3.1):

- Where a road is classified as an Auslink-National Highway, the responsible road management agency is usually either the State or the Commonwealth Government.
- Where a road is classified as a Regional Road, the responsible road management agency is usually either the NSW Government or the local council.
- Where a road is classified as a local road, the responsible road management agency is usually the local council.



**Figure 3.1** Road hierarchy

The road network classification in the vicinity of the Proposal area is shown in Figure 3.2.

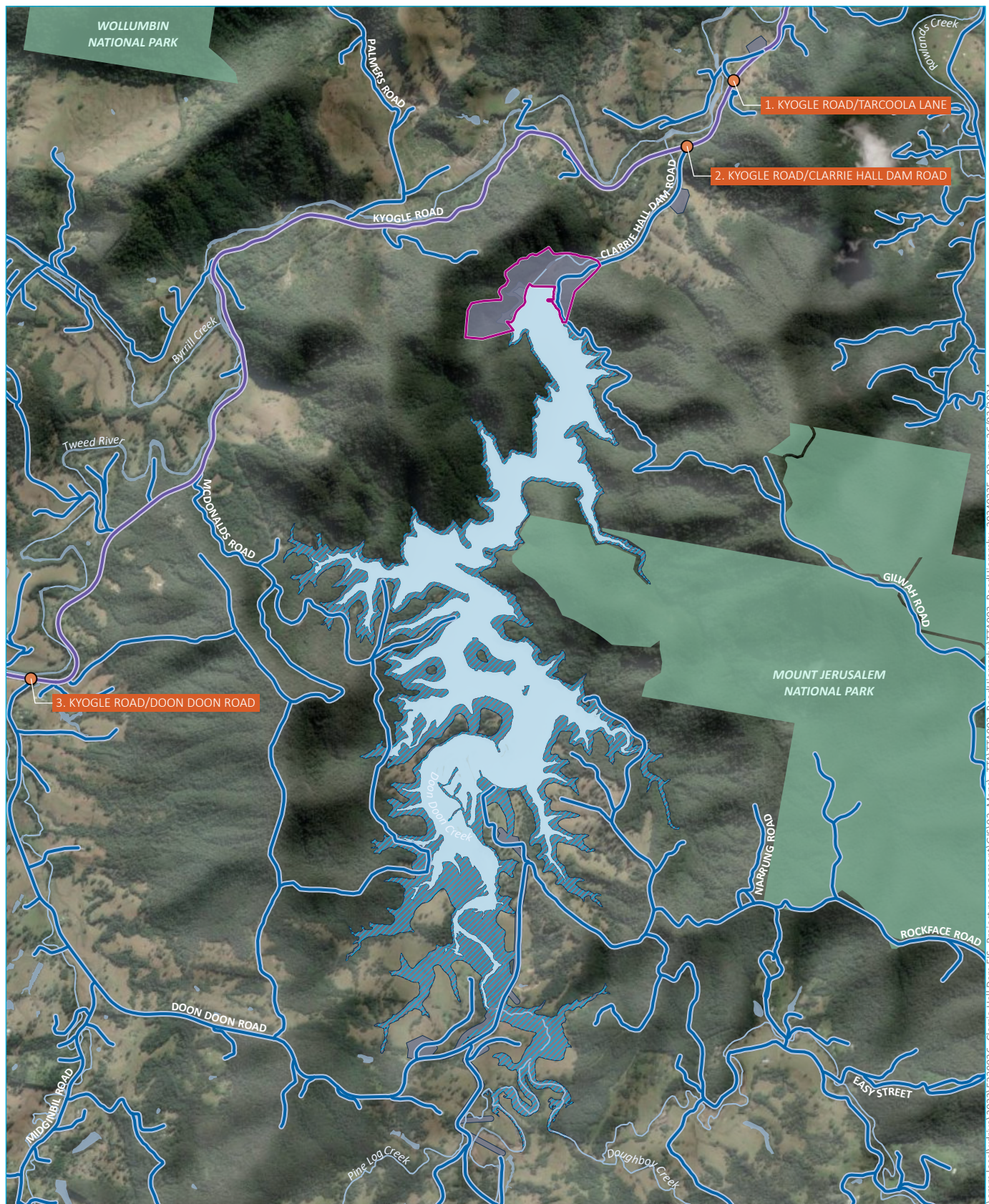
#### 3.1.1 Key roads and intersections

The communities near the Proposal area are linked by a network of state roads and local government roads managed by Tweed Shire Council. Kyogle Road forms the most direct route from Murwillumbah to Uki and would be the main transport route for material and people to Clarrie Hall Dam.

The key intersections (shown in Figure 3.2) that have been assessed for their Proposal related traffic impacts are:

- Kyogle Road and future accommodation village or concrete batching plant access road (currently 'Tarcoola Lane') ('intersection 1')
- Kyogle Road and Clarrie Hall Dam Road ('intersection 2' – see Table 3.7)
- Kyogle Road and Doon Doon Road ('intersection 3' – see Table 3.8).

An overview of the key roads – Kyogle Road, Doon Doon Road, Commissioners Creek Road, Clarrie Hall Dam Road and Tarcoola Lane – is provided in Table 3.1, Table 3.2, Table 3.3, Table 3.4 and Table 3.5 respectively. An overview of intersections 1, 2 and 3 is provided in Table 3.6, Table 3.7 and Table 3.8.



Source: EMM (2024); KBS (2023); DCSSS (2023); ESRI (2024); GA (2011)

## KEY

- Study area
- Proposed construction disturbance footprint
- Existing inundation
- Inundation to FSL (61.5- 70 m AHD)
- Key intersection
- Road classification
- Regional road
- Local road

- Existing environment
- Rail line
- Named watercourse
- Waterbody
- NPWS reserve

## Road network classification

Clarrie Hall Dam EIS  
Transport & Traffic Assessment  
Figure 3.2



**Table 3.1**      **Kyogle Road**

| Aspect               | Description                                                                          |
|----------------------|--------------------------------------------------------------------------------------|
| Road classification  | Regional road.                                                                       |
| Alignment            | From Murwillumbah (north-east) to Kyogle (south-west).                               |
| Number of lanes      | One lane in each direction, with more lanes at some intersections.                   |
| Carriageway type     | Sealed road.                                                                         |
| Carriageway width    | Approximately 7 m with 3.5 m travel lanes in each direction.                         |
| Posted speed limit   | 80 kilometres per hour (km/h) in rural sections and 50 km/h in urban areas.          |
| Heavy vehicle access | 19 m long vehicles up to 50 tonnes (t).                                              |
| Traffic function     | Carries regional and local traffic.                                                  |
| Additional comments  | Some sections of the road were damaged by the 2022 flood but are now fully repaired. |



**Plate 3.1**      **Kyogle Road, looking south-west towards Doon Doon Road**



**Table 3.2**      **Doon Doon Road**

| Aspect               | Description                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------|
| Road classification  | Local road.                                                                                                    |
| Alignment            | From Kunghur (north-west) to Doon Doon (south-east).                                                           |
| Number of lanes      | One lane in each direction.                                                                                    |
| Carriageway type     | Sealed between Kyogle Rd and Commissioners Creek Rd and unsealed further towards the south-east.               |
| Carriageway width    | Approximately 6.5 m.                                                                                           |
| Posted speed limit   | 80 km/h.                                                                                                       |
| Heavy vehicle access | 19 m long vehicles up to 50 t.                                                                                 |
| Traffic function     | Carries local traffic.                                                                                         |
| Additional comments  | Some narrower sections of Doon Doon Road may require opposing vehicles to slow down or give way while passing. |



**Plate 3.2**      **Doon Doon Road, looking south**

**Table 3.3**      **Commissioners Creek Road**

| Aspect               | Description                                                                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Road classification  | Local road.                                                                                                                                                                                  |
| Alignment            | From Doon Doon (north-west) then following Commissioners Creek towards the south-east.                                                                                                       |
| Number of lanes      | One lane in each direction.                                                                                                                                                                  |
| Carriageway type     | Sealed road between Doon Doon Road and Commissioners Creek and unsealed road after the bridge crossing at Commissioners Creek.                                                               |
| Carriageway width    | Approximately 6 m.                                                                                                                                                                           |
| Posted speed limit   | 80 km/h.                                                                                                                                                                                     |
| Heavy vehicle access | 19 m long vehicles up to 50 t.                                                                                                                                                               |
| Traffic function     | Carries local traffic.                                                                                                                                                                       |
| Additional comments  | Some narrower sections of Commissioners Creek Road may require opposing vehicles to slow down or give way while passing. McCabes Bridge is a single lane bridge on Commissioners Creek Road. |



**Plate 3.3**      **Commissioners Creek Road, looking south-west towards Doon Doon Road**



**Table 3.4**      **Clarrie Hall Dam Road**

| Aspect               | Description                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Road classification  | Local road.                                                                                                                          |
| Alignment            | From Kyogle Road (north) to Clarrie Hall Dam (south).                                                                                |
| Number of lanes      | One lane in each direction.                                                                                                          |
| Carriageway type     | Sealed road.                                                                                                                         |
| Carriageway width    | Approximately 7 m.                                                                                                                   |
| Posted speed limit   | 80 km/h.                                                                                                                             |
| Heavy vehicle access | 19 m long vehicles up to 50 t.                                                                                                       |
| Traffic function     | Carries local and recreational traffic. This road is also used by Council operations staff for operation and maintenance of the Dam. |



**Plate 3.4**      **Clarrie Hall Dam Road, looking south towards Clarrie Hall Dam**



**Table 3.5**      **Tarcoola Lane**

| Aspect               | Description                                                                                                                                                                             |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Road classification  | Local road.                                                                                                                                                                             |
| Alignment            | From Kyogle Road (west), ending in a cul-de-sac approximately 200 m away from Kyogle Road.                                                                                              |
| Number of lanes      | One lane in each direction.                                                                                                                                                             |
| Carriageway type     | Sealed road.                                                                                                                                                                            |
| Carriageway width    | Approximately 4.5 m.                                                                                                                                                                    |
| Speed limit          | 50 km/h.                                                                                                                                                                                |
| Heavy vehicle access | 19 m long vehicles up to 50 t.                                                                                                                                                          |
| Traffic function     | The road down to the Tweed River (including a bridge over the river) from the end of the cul-de-sac on Tarcoola Lane is a private road for residents on the northern side of the river. |
| Additional comments  | Some narrower sections of Tarcoola Lane may require opposing vehicles to slow down or give way while passing.                                                                           |



**Plate 3.5**      **Tarcoola Lane, looking north**

**Table 3.6**      **Kyogle Road/Tarcoola Lane intersection**

| Aspect                  | Description                                                           |
|-------------------------|-----------------------------------------------------------------------|
| Location from the site  | 1.95 km north-east of the site.                                       |
| Intersection control    | Priority controlled (give way) T-intersection.                        |
| Major Road              | Kyogle Road.                                                          |
| South-west Approach     | One approach lane and one departure lane.                             |
| North-east Approach     | One approach lane and one departure lane.                             |
| North-west Approach     | One approach lane and one departure lane.                             |
| Pedestrian Connectivity | None.                                                                 |
| Traffic function        | Predominantly carries regional and local traffic.                     |
| Speed limit             | 60 km/h on Kyogle Road and 50 km/h on Tarcoola Lane.                  |
| Intersection layout     | Basic left turn treatment (BAL) and basic right turn treatment (BAR). |

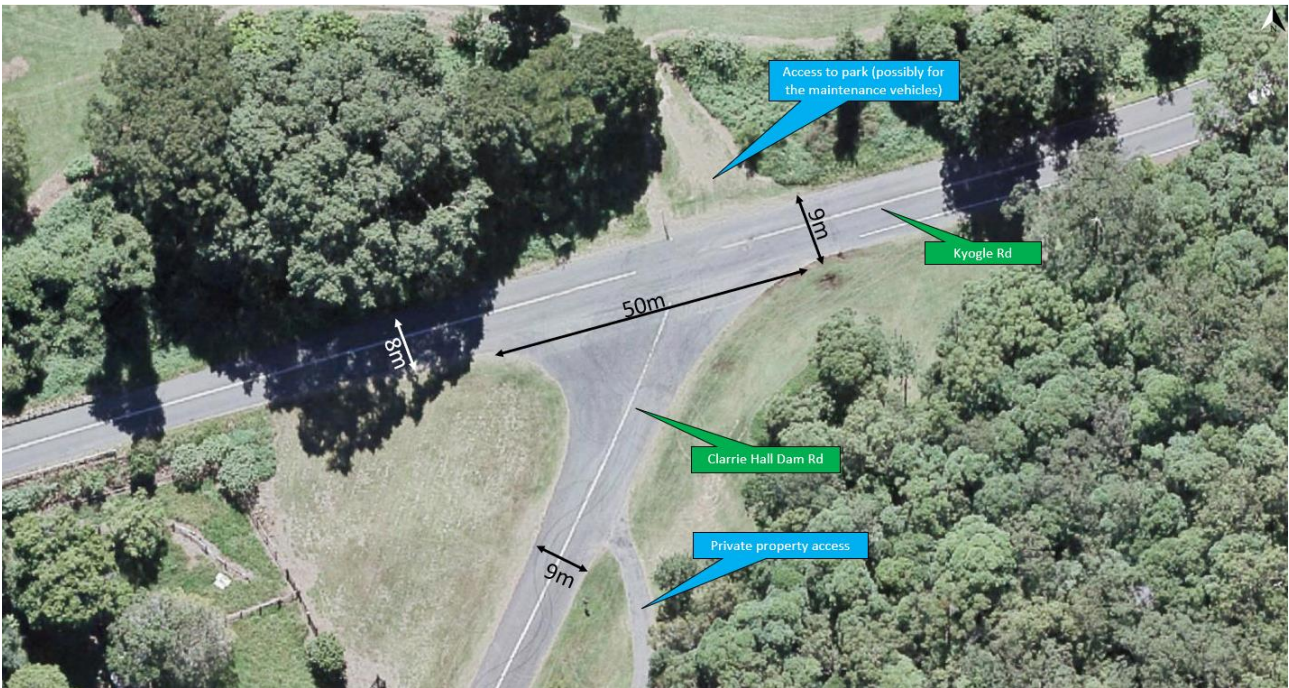


**Plate 3.6**      **Aerial view of Kyogle Road/Tarcoola Lane intersection**



**Table 3.7**      **Kyogle Road/Clarrie Hall Dam Road Intersection**

| Aspect                  | Description                                                                                                          |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|
| Location from the site  | 1.35 km north-east of the site.                                                                                      |
| Intersection control    | Priority controlled (give way) T-intersection.                                                                       |
| Major Road              | Kyogle Road.                                                                                                         |
| South Approach          | One approach lane and one departure lane.                                                                            |
| East Approach           | One approach lane and one departure lane.                                                                            |
| West Approach           | One approach lane and one departure lane.                                                                            |
| Pedestrian Connectivity | None.                                                                                                                |
| Traffic function        | Predominantly carries regional and local traffic.                                                                    |
| Speed limit             | 80 km/h from Kyogle Road west approach, 60 km/h from Kyogle Road east approach and 80 km/h on Clarrie Hall Dam Road. |

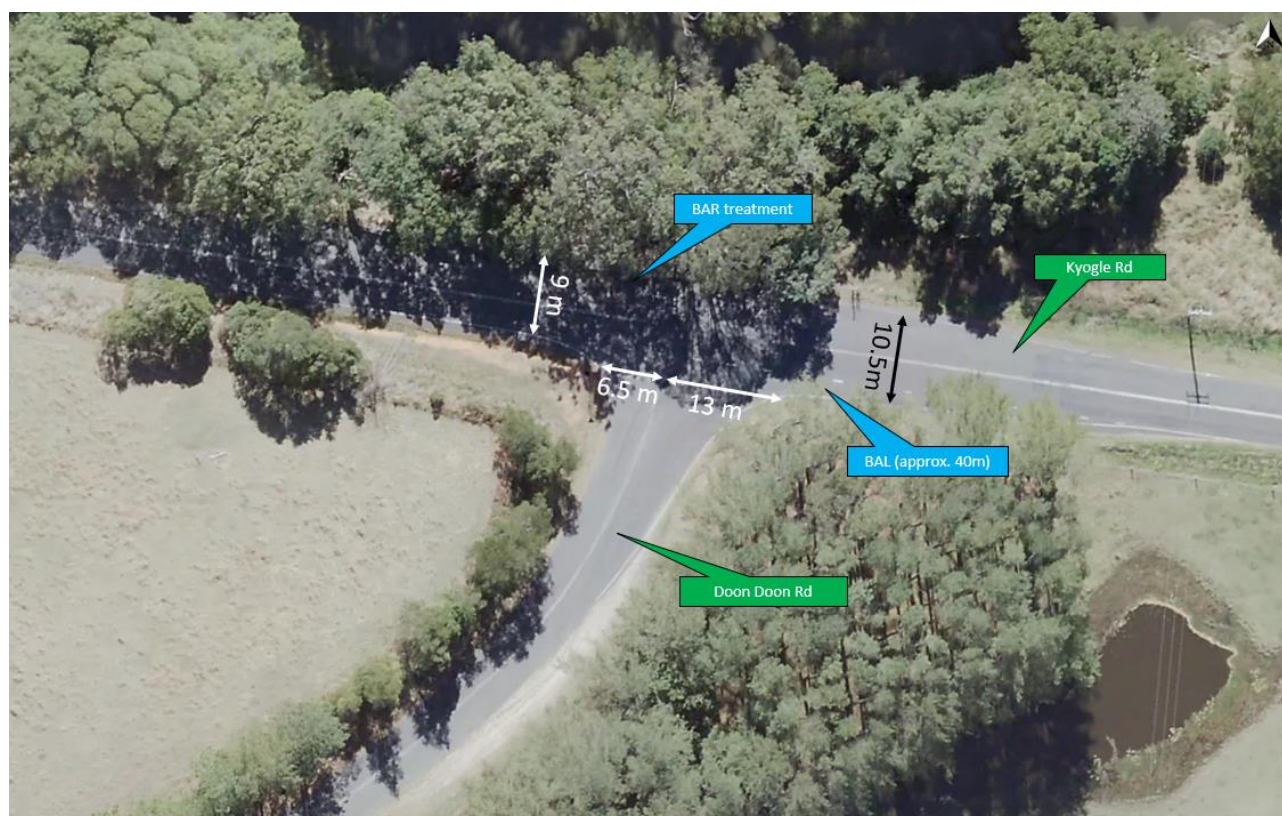


**Plate 3.7**      **Aerial view of Kyogle Road/Clarrie Hall Dam Road Intersection**



**Table 3.8**      **Kyogle Road/Doon Doon Road Intersection**

| Aspect                  | Description                                       |
|-------------------------|---------------------------------------------------|
| Location from the site  | 4.7 km south-west of the site.                    |
| Intersection control    | Priority controlled (give way) T-intersection.    |
| Major Road              | Kyogle Road.                                      |
| South Approach          | One approach lane and one departure lane.         |
| East Approach           | One approach lane and one departure lane.         |
| West Approach           | One approach lane and one departure lane.         |
| Pedestrian Connectivity | None.                                             |
| Traffic function        | Predominantly carries regional and local traffic. |
| Speed limit             | 80 km/h.                                          |
| Intersection layout     | BAL and BAR.                                      |



**Plate 3.8**      **Aerial view of Kyogle Road/Doon Doon Road Intersection**

### 3.1.2 McCabes Bridge

McCabes Bridge is located approximately 6 km south-east of Kyogle Road via Doon Doon Road. The existing bridge is approximately 20 m long and 4 m wide. As it is a single lane bridge, currently two-way vehicular movement is not possible (Plate 3.9).



**Plate 3.9**      **McCabes Bridge**

As part of the Proposal, realignment of Commissioners Creek Road will occur, along with a new bridge north of the existing bridge. The proposed replacement bridge and realignment of Commissioners Creek Road would include:

- a two-lane reinforced concrete bridge raised approximately 5.5 m above the existing bridge level
- three 18 m spans
- a width of 8.4 m
- a length of 50 m.

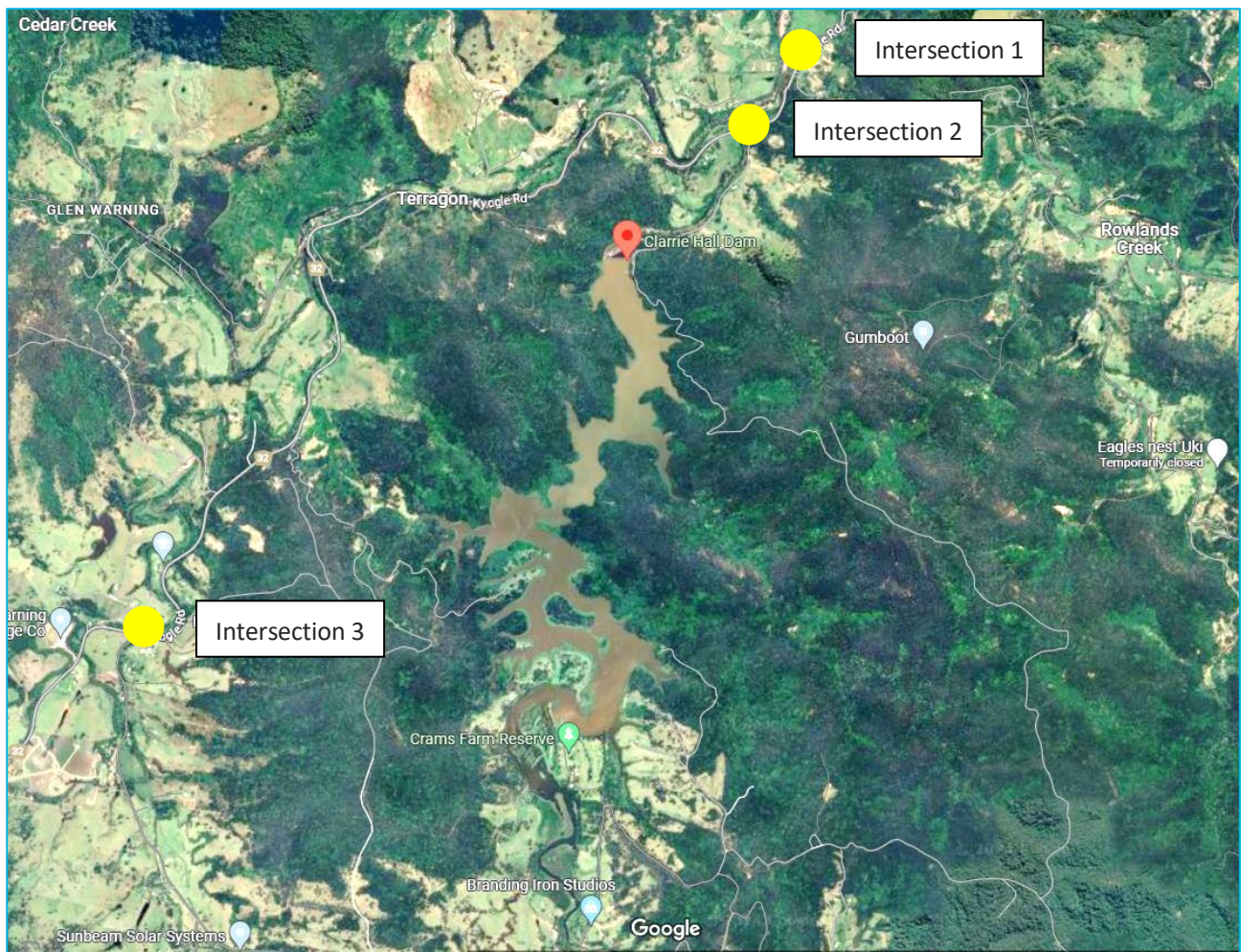
## 3.2 Existing traffic volumes

### 3.2.1 Intersection count

As noted in Section 3.1, the following three intersections (shown in Figure 3.9, and conceptually in Figure 4.3) were identified as the key intersections for this construction access and traffic impact assessment:

- Kyogle Road and future accommodation village or concrete batching plant access road (currently 'Tarcoola Lane') (intersection 1)
- Kyogle Road and Clarrie Hall Dam Road (intersection 2)
- Kyogle Road and Doon Doon Road (intersection 3).





**Figure 3.3 Key Proposal-related intersections (1, 2 and 3)**

Intersection surveys were undertaken by EMM on 14–16 February 2023. The respective network peak hours were determined to be:

- 8:00 am to 9:00 am
- 4:00 pm to 5:00 pm.

The Kyogle Road/Tarcoola Lane intersection was not surveyed during the time of the survey, since the proposed location of the accommodation village/concrete batching plant was unknown at the time of the survey. Hence, this intersection data has been extrapolated from the traffic count data at the nearby Kyogle Road/Clarrie Hall Dam Road intersection. Furthermore, due to the low number of properties currently on Tarcoola Lane, it will be assumed that there is very minor light vehicle for each turning movement into and out of Tarcoola Lane during both the AM and PM peak.

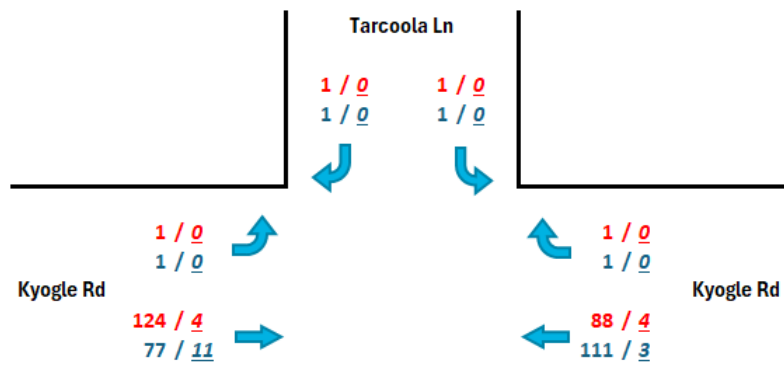
Figure 3.4 presents the peak hour traffic volumes at these intersections, for light and heavy vehicles. The traffic survey data can be found in Appendix A.



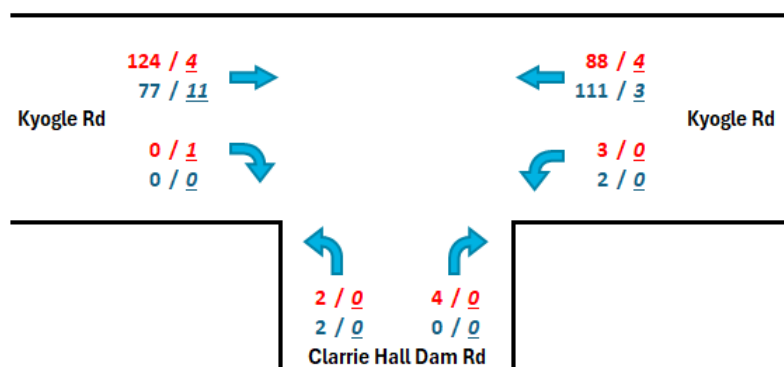
AM Peak Hour: Light Vehicles / Heavy Vehicles

PM Peak Hour: Light Vehicles / Heavy Vehicles

Existing 2023 scenario (Kyogle Road/Tarcoola Lane, intersection 1)



Existing 2023 scenario (Kyogle Road/Clarrie Hall Dam Road, intersection 2)



Existing 2023 scenario (Kyogle Road/Doon Doon Road, intersection 3)

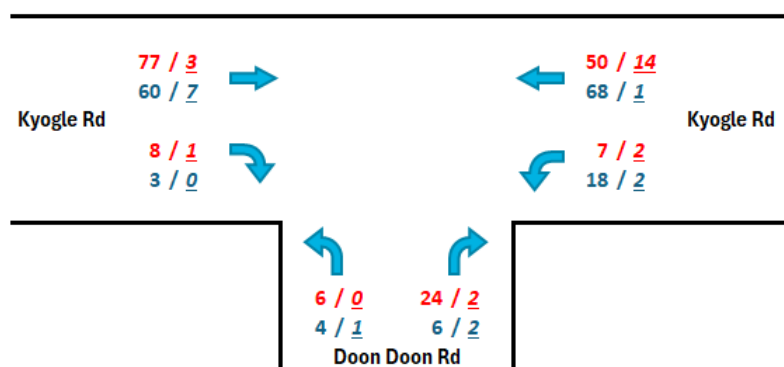


Figure 3.4 Existing peak hour traffic volumes at intersections 1, 2 and 3

### 3.2.2 Tube count

Traffic volumes have been measured using site survey and weekly tube counts, conducted at four locations on Kyogle Road, Clarrie Hall Dam Road, and Commissioners Creek Road, between 12:00 pm Friday, 10 February 2023 to 12:00 pm Friday, 17 February 2023. A summary of the tube count results is provided in Figure 3.5 and Figure 3.7. The complete traffic survey results are provided in Appendix B.

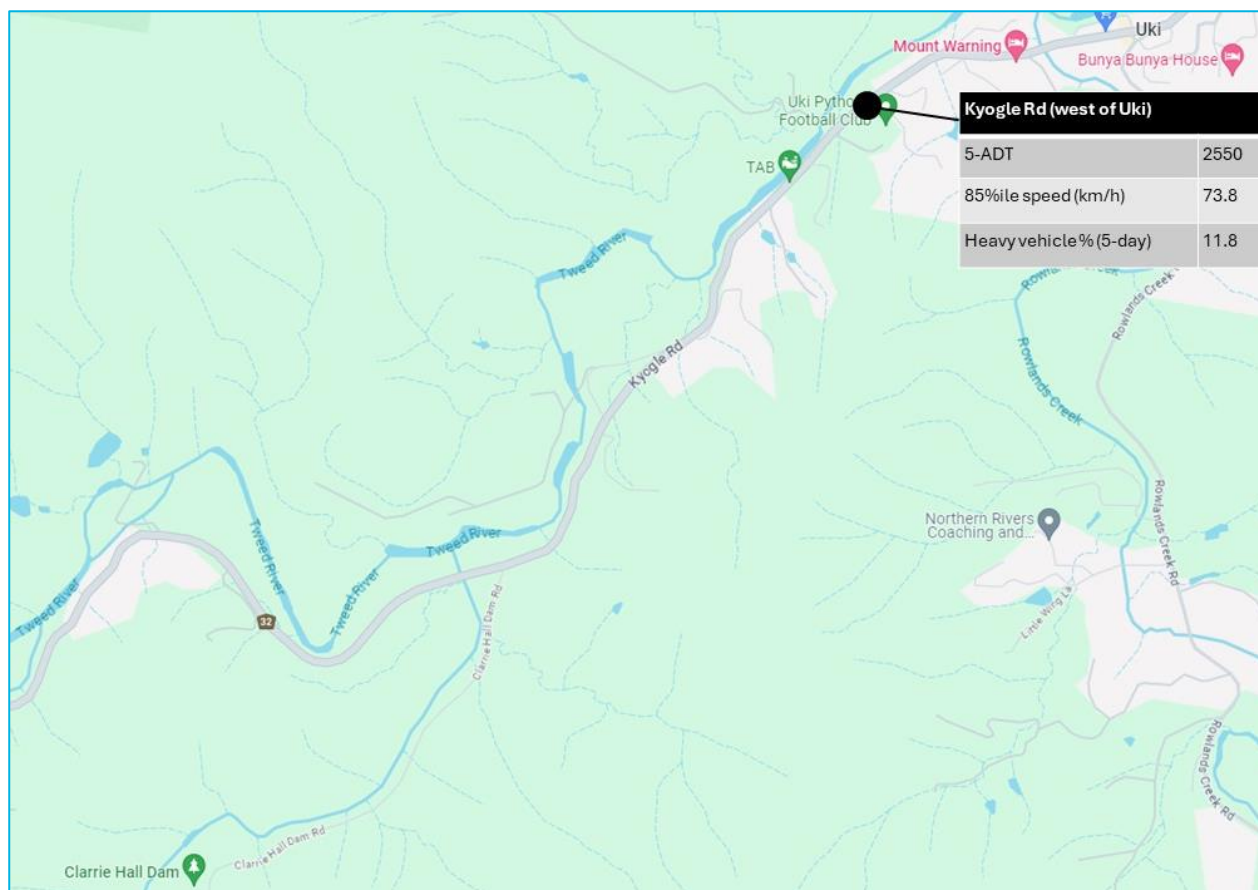


Figure 3.5 Traffic volumes via tube counts at Kyogle Road, west of Uki

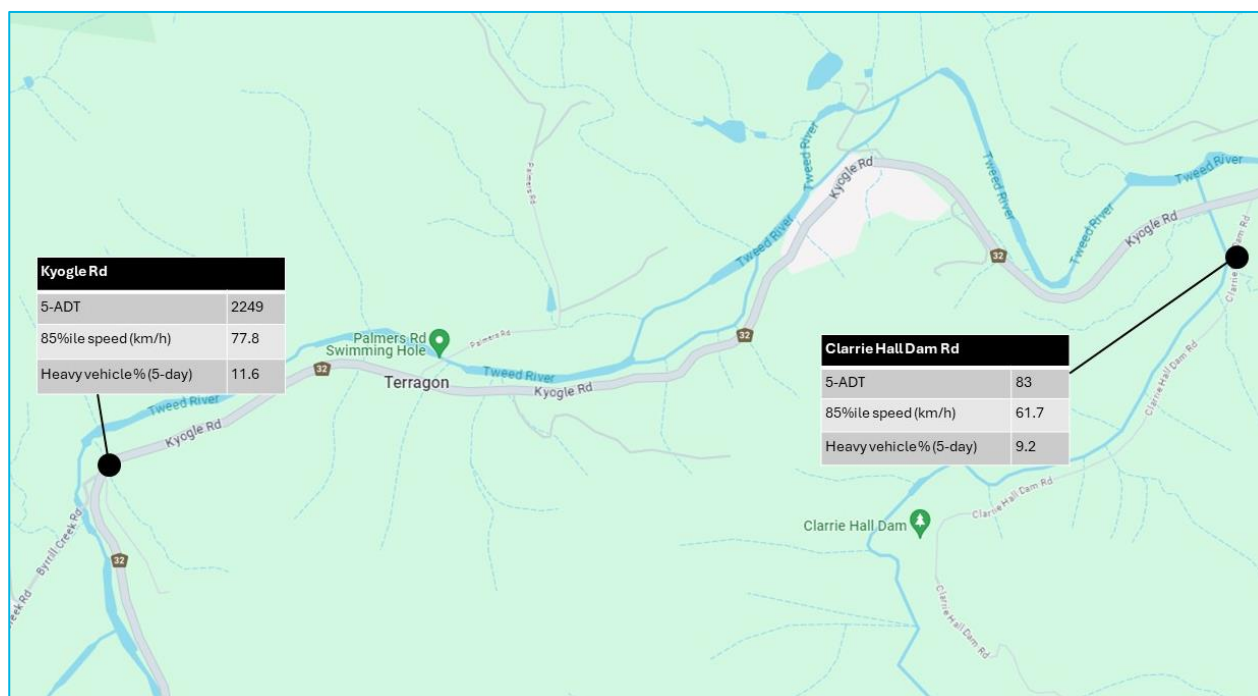
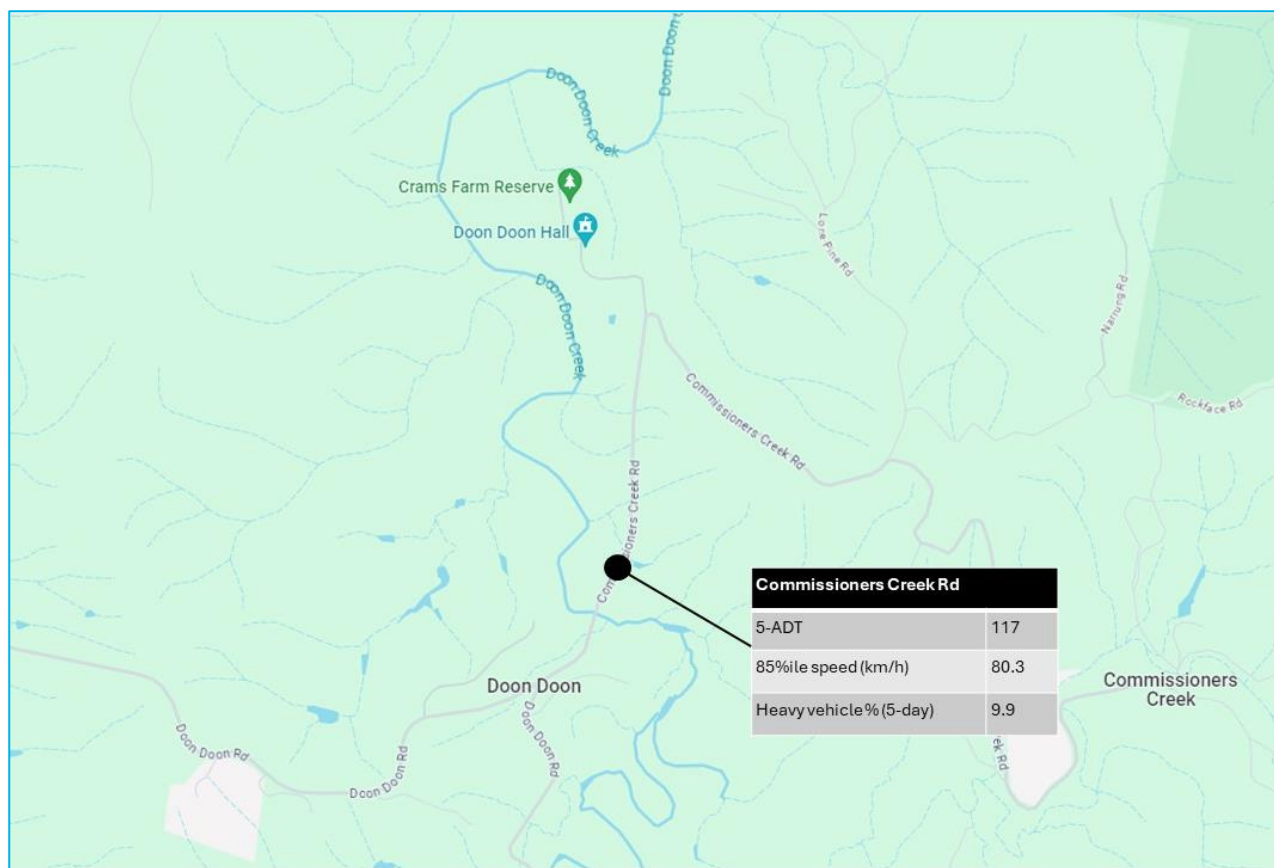


Figure 3.6 Traffic volumes via tube counts at Kyogle Road and Clarrie Hall Dam Road



**Figure 3.7 Traffic volumes via tube counts at Commissioners Creek Road**

The tube-count traffic volume data discussed in Section 3.2.2 indicates that there are less than 270 vehicles per hour at any given time along Kyogle Road, and a peak average across weekdays of 202 vehicles per hour. The data also indicates that approximately 90% of vehicles are light vehicles and 10% are trucks or other heavy vehicles (including semi-trailers).

### 3.3 Crash data analysis

Crash data from TfNSW Centre for Road Safety interactive history database between 2018 and 2022 has been studied along the main traffic routes – Kyogle Road, Doon Doon Road, Commissioners Creek Road, Clarrie Hall Dam Road and Tarcoola Lane – and is presented in Figure 3.8 and Figure 3.9. The crashes are categorised based on the severity of the crashes as follows:

- fatal
- serious injury
- moderate injury
- minor/other injury
- non-casualty (e.g. towaway).

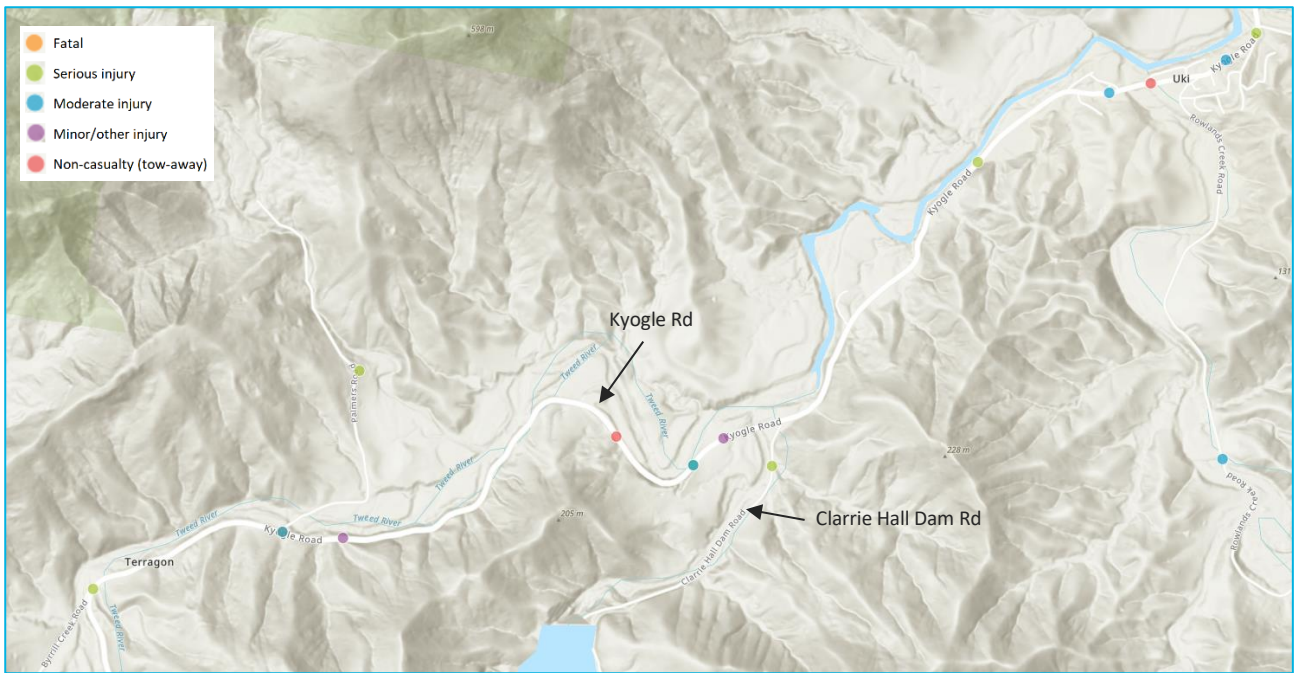
Table 3.9 presents the details of the crashes.



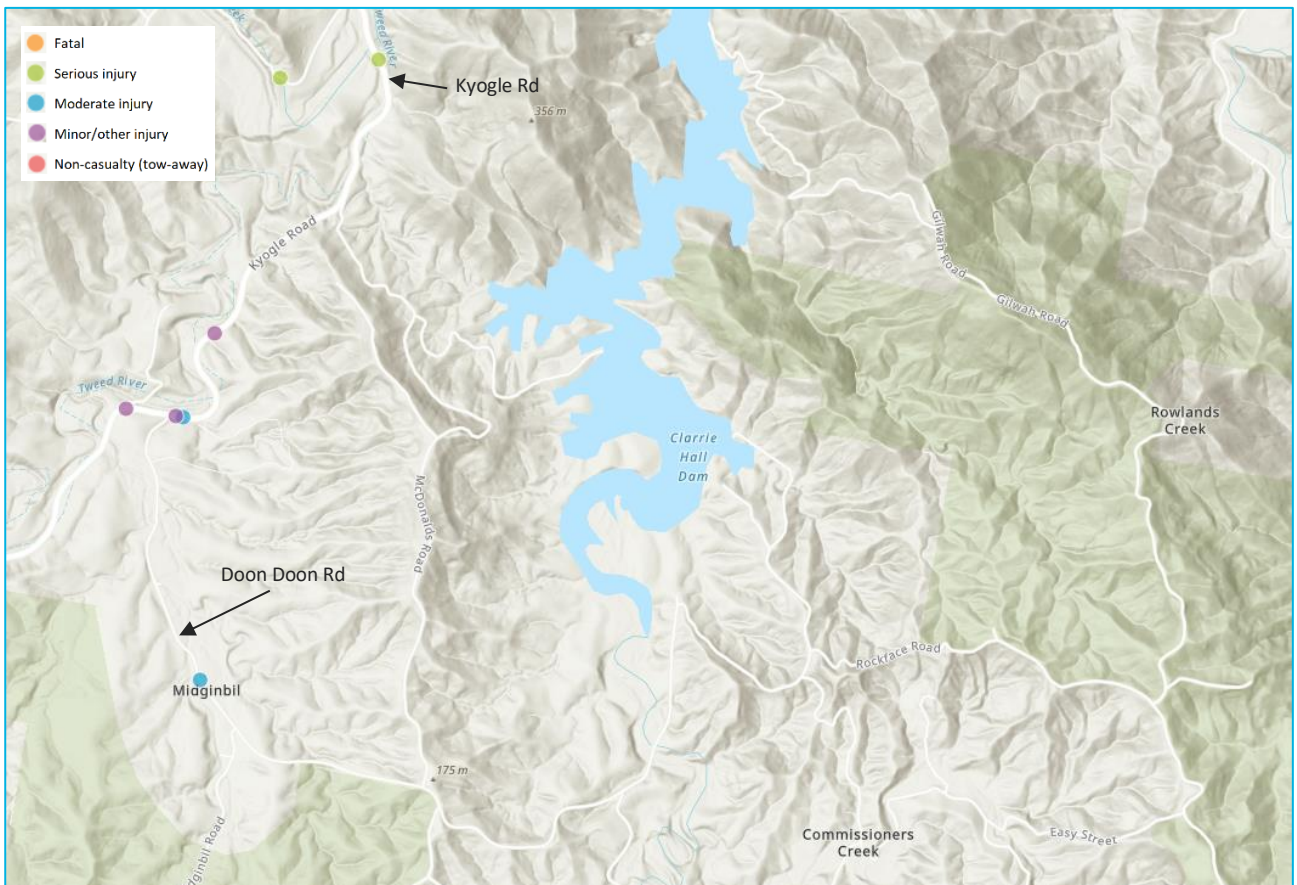
**Table 3.9**      **Summary of crash history**

| Road                                                                                                | Report year | Degree of crash    | Total | Cause of crashes |         |                   |
|-----------------------------------------------------------------------------------------------------|-------------|--------------------|-------|------------------|---------|-------------------|
|                                                                                                     |             |                    |       | Speed            | Fatigue | Involving a truck |
| Kyogle Road, Uki to Doon Doon Road intersection                                                     | 2018        | Fatal              | 1     | 1                | 0       | 1                 |
|                                                                                                     |             | Serious injury     | 1     | 1                | 0       | 0                 |
|                                                                                                     |             | Moderate injury    | 1     | 1                | 1       | 0                 |
|                                                                                                     |             | Minor/other injury | 2     | 1                | 0       | 0                 |
|                                                                                                     | 2019        | Moderate injury    | 2     | 0                | 1       | 0                 |
|                                                                                                     | 2020        | Serious injury     | 2     | 0                | 0       | 0                 |
|                                                                                                     | 2021        | Moderate injury    | 1     | 0                | 0       | 0                 |
|                                                                                                     |             | Non-casualty       | 2     | 1                | 0       | 0                 |
|                                                                                                     | 2022        | Serious injury     | 1     | 0                | 0       | 0                 |
|                                                                                                     |             | Moderate injury    | 2     | 0                | 0       | 0                 |
|                                                                                                     |             | Minor/other injury | 2     | 1                | 1       | 0                 |
| Clarrie Hall Dam Road                                                                               | 2018        | -                  |       |                  |         |                   |
|                                                                                                     | 2019        | Serious injury     | 1     | 1                | 0       | 0                 |
|                                                                                                     | 2020        | -                  |       |                  |         |                   |
|                                                                                                     | 2021        | -                  |       |                  |         |                   |
|                                                                                                     | 2022        | -                  |       |                  |         |                   |
| Doon Doon Road and Commissioners Creek Road to the southern side of lake formed by Clarrie Hall Dam | 2018        | Moderate injury    | 1     | 0                | 0       | 0                 |
|                                                                                                     | 2019        | -                  |       |                  |         |                   |
|                                                                                                     | 2020        | -                  |       |                  |         |                   |
|                                                                                                     | 2021        | -                  |       |                  |         |                   |
|                                                                                                     | 2022        | -                  |       |                  |         |                   |

Source: [www.transport.nsw.gov.au/roadsafety/statistics/interactive-crash-statistics/lga-view-crashes-map](http://www.transport.nsw.gov.au/roadsafety/statistics/interactive-crash-statistics/lga-view-crashes-map)



**Figure 3.8** Crash history on Kyogle Road and Clarrie Hall Dam Road, 2018–2022



**Figure 3.9** Crash history on Kyogle Road and Doon Doon Road, 2018–2022

The above crash data shows that there were a total of 19 crashes in the study area and 37% of all crashes (7 in total) involved speeding. The fatal accident in 2018 involved speeding and a truck at a T-intersection. Furthermore, the majority of crashes involved a vehicle running off the road on a bend.

Overall, 19 crashes over 5-year period is relatively minor, which does not indicate any major road safety issues along this section of Kyogle Road.

### 3.4 Public transport facilities

#### 3.4.1 General bus services

Given the regional location, public transport in the area is sparse. The following two bus operators provide regular public bus transportation between Murwillumbah and Uki along Kyogle Road:

- Murwillumbah Bus Company (route 625, once daily)
- Gosel's Bus Service (route 630, twice daily return bus service between Murwillumbah and Nimbin).

#### 3.4.2 School bus services

Gosel's Bus Service provides a dedicated school bus service in the Tweed Shire, on route 305, which runs along Doon Road/Commissioners Creek Road, then to Uki and Murwillumbah along Kyogle Road.

The following two schools between Uki and the intersection with Doon Doon Road, are serviced by routes 625, 630 and 305:

- Uki Public School
- Aetaomah Steiner School.

### 3.5 Bicycle network

During the site inspection, one or two recreational cyclists were observed. There is no bicycle network that reaches past Murwillumbah.

### 3.6 Pedestrian facilities

Due to the remote and rural nature of the site, there is no pedestrian infrastructure within the vicinity of the site.



## 4 Description of Proposal

### 4.1 Proposal overview

In 2018, a detailed concept design was prepared by NSW Public Works Advisory (PWA).

The Proposal includes:

- constructing access roads to construction areas and establishing the construction site
- re-establishing the quarry used to construct the existing dam
- removing and storing parapet walls for reuse
- increasing the base width of the valley-side abutment and raising the crest of the concrete faced rockfill embankment to RL 70 m
- constructing a new concrete lined spillway higher on the west abutment
- extending the upstream concrete face to the new crest height
- raising the intake tower and access bridge
- constructing a new section of the Clarrie Hall Dam Road to provide access to the east abutment of the dam wall
- establishing new recreation and operational facilities including an amenities block, public shelters, viewing areas, interpretation signage, paths, car parks, landscaping, security fences, lighting, monitoring equipment and a boat ramp
- upgrading the Kyogle Road and Clarrie Hall Dam Road intersection
- replacing McCabes Bridge and realigning Commissioners Creek Road
- removing or reconstructing impacted infrastructure and facilities at Crams Farm
- relocating Telstra assets
- realigning powerline easements along Doon Doon Road and Commissioners Creek Road.

For these works, the following construction infrastructure, plant and equipment are required:

- temporary contractor's and principal's office, amenities and associated work areas
- plant and heavy equipment
- truck and vehicle access and parking
- materials storage areas
- onsite concrete batching facility – a typical on-site concrete batching facility would likely consist of a trailer-mounted concrete mixer, cement bins, sand and aggregate stockpiles and a storage container for various equipment and tools

- rock crusher, which would consist of a tracked mobile crushing unit, conveyor belts, feeder, and engine
- crane
- road access to the construction area
- road access to and from the quarry
- realignment of Clarrie Hall Dam Road.

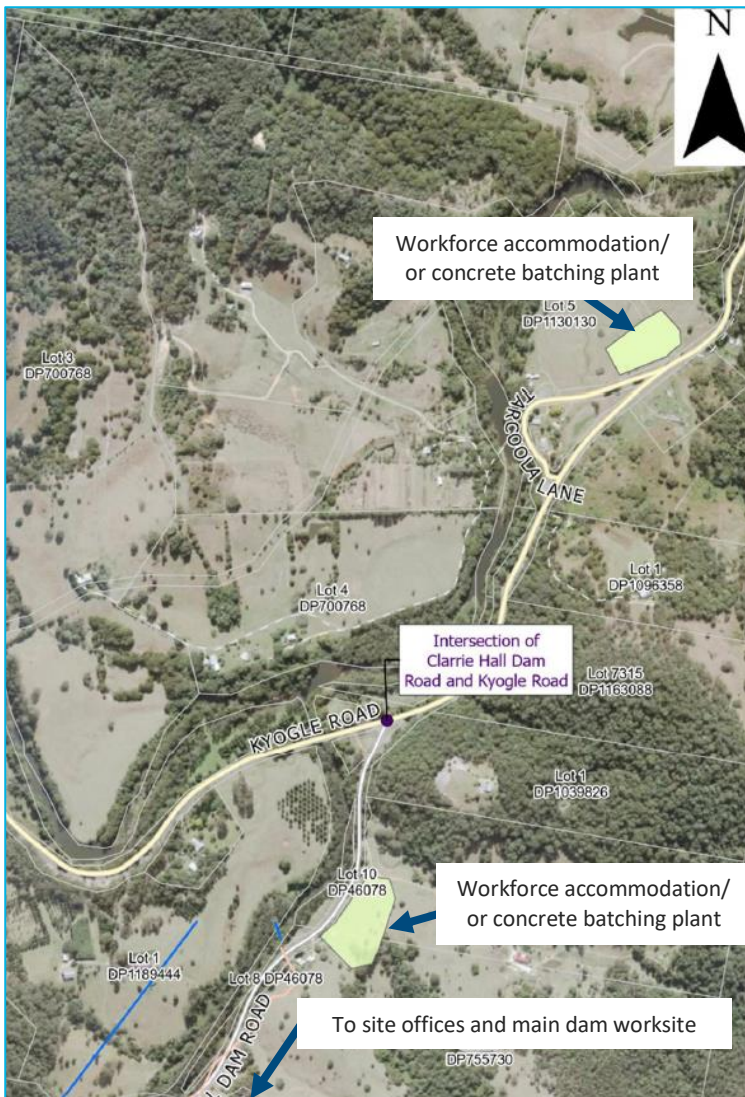
## 4.2 Accommodation camp and concrete batching plant (CBP)

Several options have been identified for locating staff accommodation, the concrete batching plant (CBP) and site offices during construction. This report undertakes two options for the location of the workers' accommodation and concrete batching plant are shown in Table 4.1.

The construction compound area is to be located downstream of the embankment. Workforce accommodation will either be located on the northern side of Tarcoola Lane, towards the eastern connection with Kyogle Road or will be located on the eastern side of Clarrie Hall Dam Road for easy access to the main dam worksite. The concrete batching plant will either be accessed via Clarrie Hall Dam Road, in the vicinity of the main construction area, or alternatively will be accessed off Tarcoola Lane to the northeast of the Clarrie Hall Dam Road.

Regarding the CBP, concrete materials, sands and other cement components will come from external sources, so there will be truck movements related to external deliveries. Having a location just outside of the main site (either off Clarrie Hall Dam Road or Tarcoola Lane) allows these vehicles to deliver without needing to access the main works site. Of the concrete produced, 70% would be used for the spillway, 25% for the raised embankment, 2% for the intake tower and 3% for McCabes Bridge.

Assessment of worker numbers per activity based on the concept design construction schedule has been used to estimate a peak workforce of around 180 persons at the main dam site and 35 persons at McCabes bridge construction site. It is estimated that an accommodation facility for 110 personnel would be required during construction.



**Figure 4.1** Potential locations of site offices, CBP and workers' accommodation

The Kyogle Road and Clarrie Hall Dam Road intersection is the primary access road to the Proposal's construction site. An assessment of the Proposal-related intersections to accommodate construction workforce access and transport of materials has been conducted as part of this assessment (Section 5.1).

### 4.3 Access road upgrades

New access roads and access road upgrades are required to allow construction and operational access to the Proposal, including:

- access to the spillway excavation and quarry zones for the construction related vehicles
- upgrading a section of Clarrie Hall Dam Road to ensure alignment of the road with the new FSL
- replacing McCabes Bridge and realignment of Commissioners Creek Road.



The following are not part of the Proposal but may require upgrading to facilitate construction related vehicles:

- upgrading Kyogle Road/Clarrie Hall Dam Road intersection, the primary access road to the Proposal's construction site
- upgrading Kyogle Road/Tarcoola Lane, Kyogle Road/Clarrie Hall Dam Road and Kyogle Road/Doon Doon Road intersections.

Upon completion of works, access to and safety of public infrastructure would be improved due to the upgrade of Clarrie Hall Dam Road, Kyogle Road and McCabes Bridge as well as the Commissioners Creek Road realignment.

#### 4.4 Workforce

The construction workforce consists of:

- local workers that **do not** need to stay at the accommodation camp
- fly in-fly out workers that **do** need to stay at the accommodation camp.

The peak workforce at the main dam site will comprise approximately 180 workers, with the accommodation camp assumed to accommodate a maximum of 110 persons at a given time. McCabes Bridge construction workforce has been assumed at a nominal 35 persons.

A fly in-fly out style roster has been assumed at a ratio of 2:1 weeks (14:7 days), working 12 hours shifts, and a minimum of 6 days per week.

Conservatively, it has been assumed that the local workforce would travel by individual light vehicles, with no ride sharing.

For the construction workforce staying in the accommodation camp that travel to the construction sites, it has been conservatively assumed that 60% of the construction workforce travel in light vehicles as drivers, with the remaining 40% ride sharing. Out of a maximum workforce of 110 persons that stay on the accommodation camp at any given time, this implies that 66 workers travel in light vehicles as drivers while the remaining 44 workers ride share with their colleagues. This assumption is considered to be more conservative than using shuttle buses to transport workers.

#### 4.5 Construction hours

In undertaking this assessment, it has been assumed that construction activity would occur during the hours between 7:00 am to 6:00 pm, seven days per week. This means staff will arrive between 6:00 am to 7:00 am and leave the site between 6:00 am to 7:00 pm, which is generally outside the commuter peak hour.

#### 4.6 Construction staging

The proposed stages and sequencing of construction include:

1. establishing site compounds, parking, offices and materials stockpile areas
2. site establishing, including clearing and grubbing
3. clearing and construction access roads
4. decommissioning the amenities block, viewing areas, recreation areas and other infrastructure, and electrical supply where required

5. removing the existing concrete parapet wall from the current dam embankment including removal and storage of the recyclable precast concrete panels
6. removing the crest pavement from the existing embankment to expose underlying rockfill
7. excavating the left and right abutments for the upstream concrete toe slab extension
8. stripping the foundation downstream of the existing embankment for the raised embankment footprint including removal of concrete gutter and seepage weir
9. demolishing the concrete walls at the existing spillway entrance and disposal of waste
10. excavating the new spillway channel higher in the left abutment (some blasting may be required in the lower downstream areas)
11. excavating the new permanent access road higher in the right abutment
12. stockpiling suitable rock from the spillway excavation, and disposing of the remainder
13. establishing haul routes between the old quarry and the dam site
14. constructing the upstream concrete toe slab extension in both the left and right abutments
15. installing the grout curtain extension through the upstream toe slab extension on the left and right abutments (no blasting is envisaged, but slope correction may be required)
16. stripping of the old quarry site and excavation of suitable rockfill (excavation of the quarry would probably require some blasting)
17. establishing a large crane or other means to transfer rock delivered from the quarry across the length of the raised embankment as required
18. placing and compacting rockfill on the raised embankment (within configured zones as per the design)
19. extending the upstream concrete face slabs (possibly by slip forming)
20. constructing the concrete sill, floor and walls for the raised spillway (including anchors and drainage)
21. installing large rock protection below the flip bucket downstream of the new spillway channel and entry to the creek
22. installing precast concrete parapet wall units obtained from the existing embankment on to the raised embankment, and connecting the parapet wall units to the raised upstream concrete face slabs
23. supplying and installing new precast concrete parapet walls on the ends of the raised embankment
24. removing the existing intake tower house and tower access bridge deck
25. demolishing the existing intake tower deck
26. raising the concrete intake tower

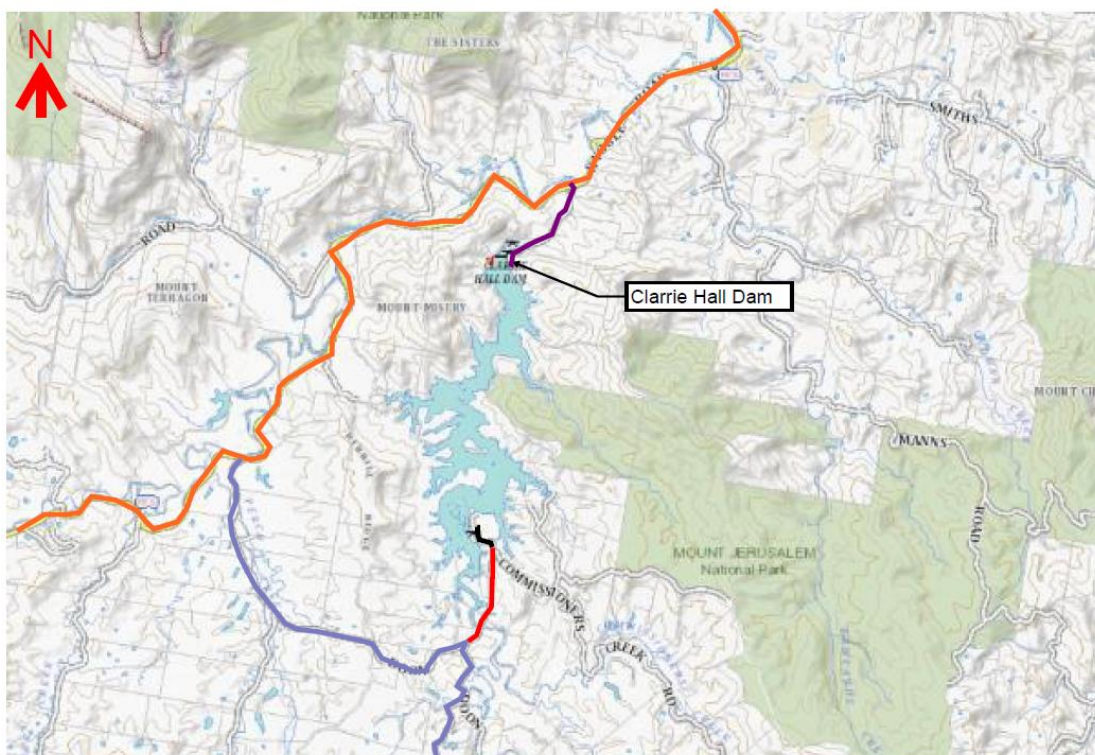
27. raising the existing concrete pier, construction of a new concrete pier and construction of new concrete abutment support
28. constructing the raised concrete tower deck
29. constructing the raised bridge deck
30. constructing a new tower house
31. installing all mechanical equipment including additional shutters, trash racks and the crane in the raised tower
32. reinstating electrical supply
33. constructing a new permanent access road and seal on the right abutment to join the raised tower bridge and down to the new boat ramp location
34. removing temporary access and haul roads
35. rehabilitating construction areas (including landscaping)
36. disestablishing.

It is expected that construction would take approximately 18 months in total, with the year of construction commencement being 2026. The construction of McCabes Bridge is expected to have a duration of 6 to 12 months, overlapping with the main construction works at Clarrie Hall Dam.

#### 4.7 Traffic routes

The communities near the site are linked by a network of regional roads and local government roads managed by Tweed Shire Council. Kyogle Road forms the most direct route from Murwillumbah to the site and would be the main transport route for material and people to Clarrie Hall Dam and McCabes Bridge construction sites.





**Figure 4.2** Local roads

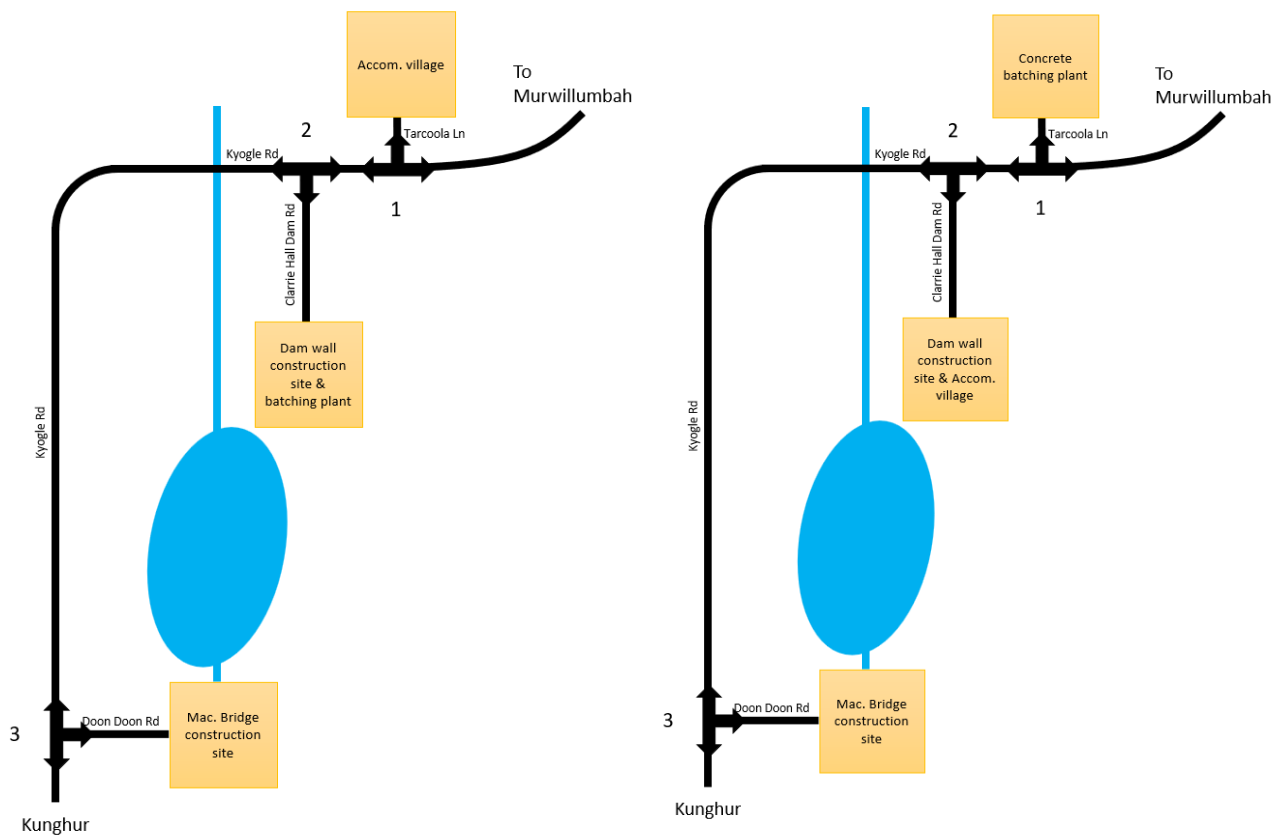
The roads highlighted in Figure 4.2 are:

- Kyogle Road (**orange**)
- Clarrie Hall Dam Road (**purple**)
- Doon Doon Road (**light purple**)
- Commissioners Creek Road (**red**)
- Crams Farm Reserve Access Road (**black**): 2.5 m wide single lane private road.

As stated earlier, the key intersections that would use the construction traffic are:

- Kyogle Road and the future accommodation village or concrete batching plant access road (via 'Tarcoola Lane') ('intersection 1')
- Kyogle Road and Clarrie Hall Dam Road ('intersection 2')
- Kyogle Road and Doon Doon Road ('intersection 3').

The anticipated project schedule, work hours, roster and workforce numbers are used as the basis for defining the 'peak month' for traffic and estimating project-related construction traffic movements, through intersections 1, 2 and 3. These movements, and their respective routes with respect to the key roads, work sites and intersections, are conceptualised as follows, in Figure 4.3. The external and local traffic routes A to F were defined, as illustrated in Figure 4.4 and Figure 4.5, for the different construction phase vehicles, their origins and destinations, for each of the two options mentioned below.



**Option 1** – CBP located off Clarrie Hall Dam Road, just north of the main dam work site, and accommodation village located off Tarcoola Lane, to the northeast

**Option 2** – Accommodation village located off Clarrie Hall Dam Road, just north of the main dam work site, and CBP located off Tarcoola Lane, to the northeast.

**Figure 4.3** Transport routes schematic, showing the key project-related roads and intersections assessed, for option 1 (left) and option 2 (right)

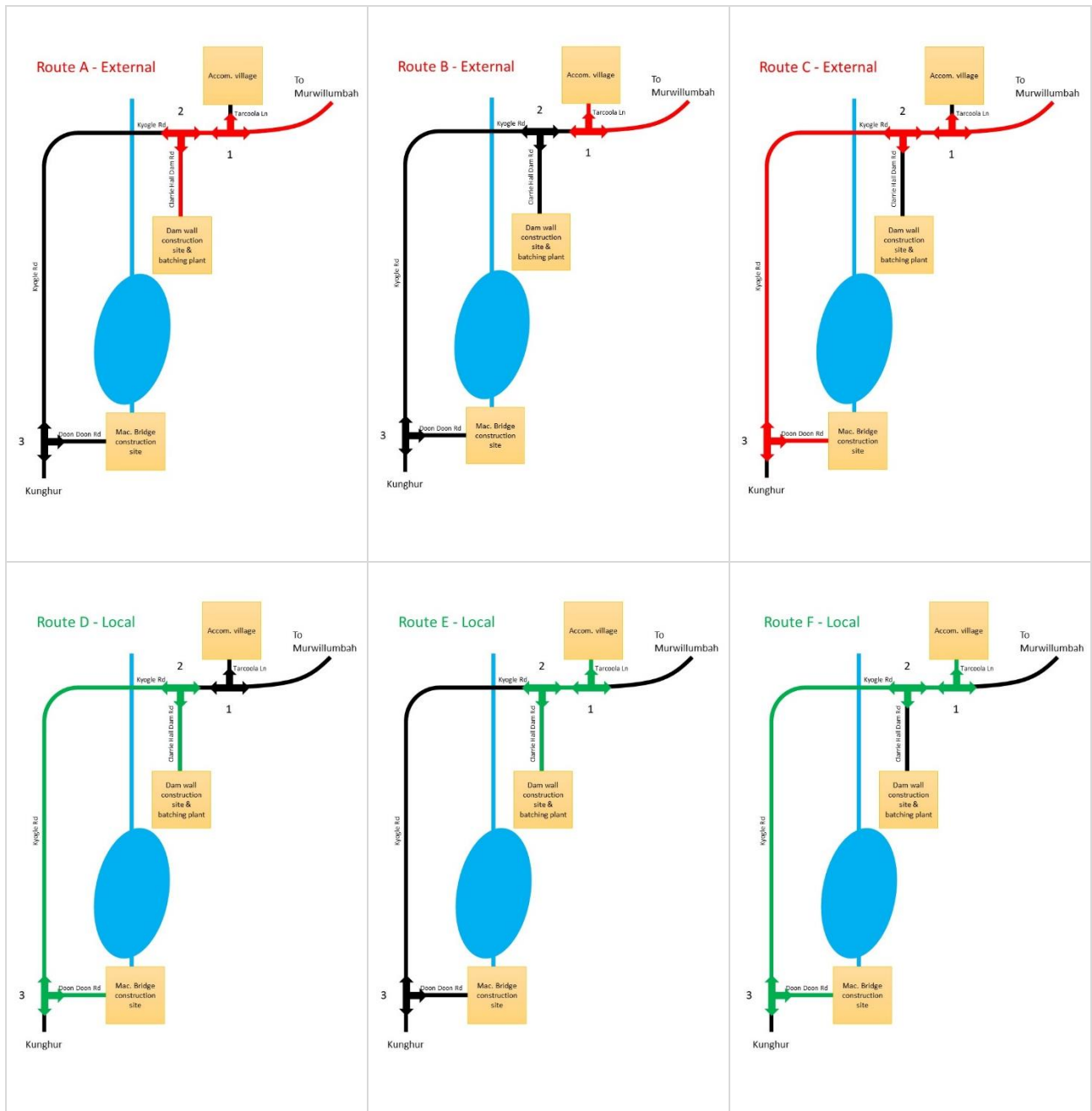


Figure 4.4 Option 1 – transport routes (A, B, C, D, E, F)



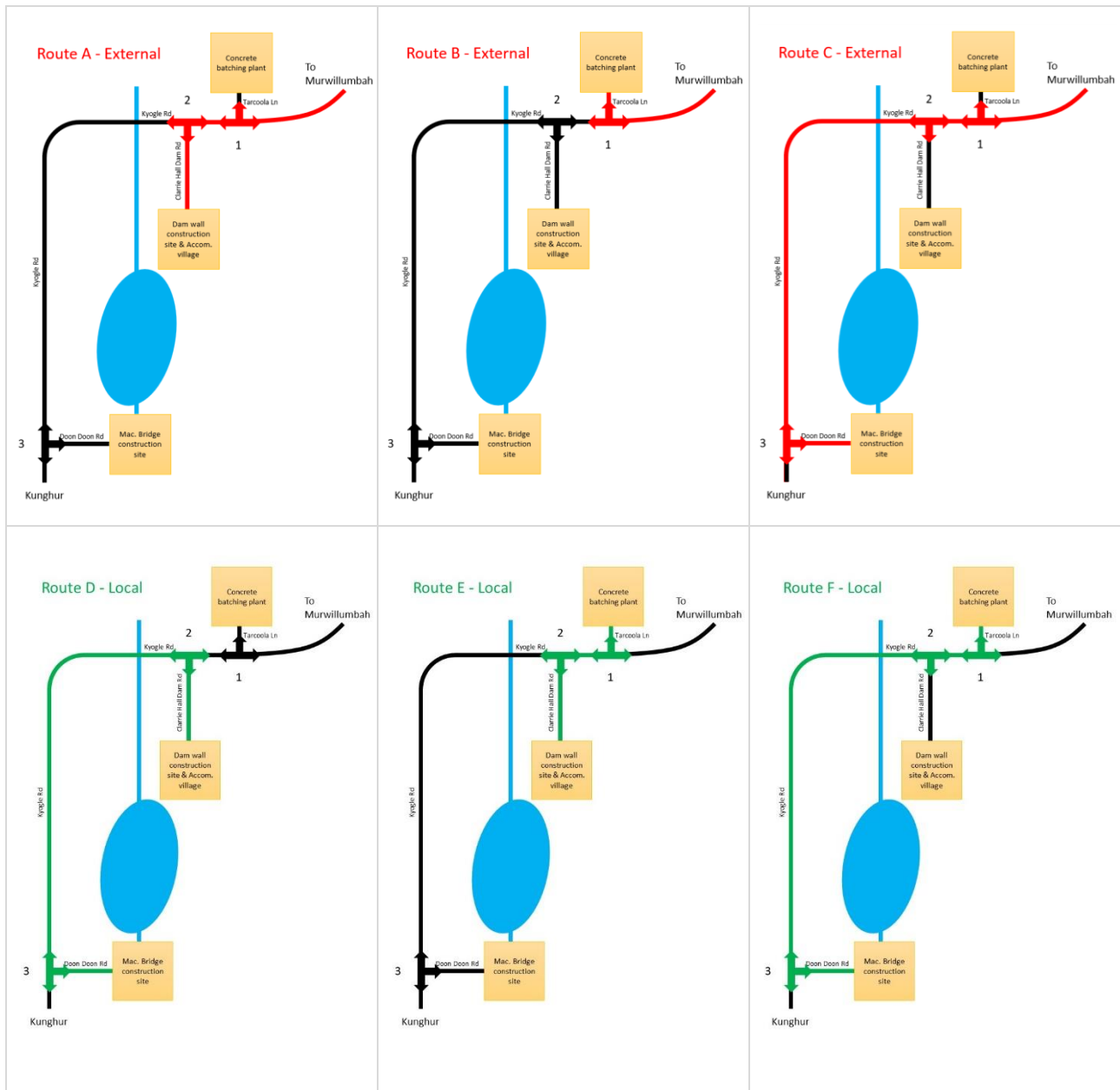


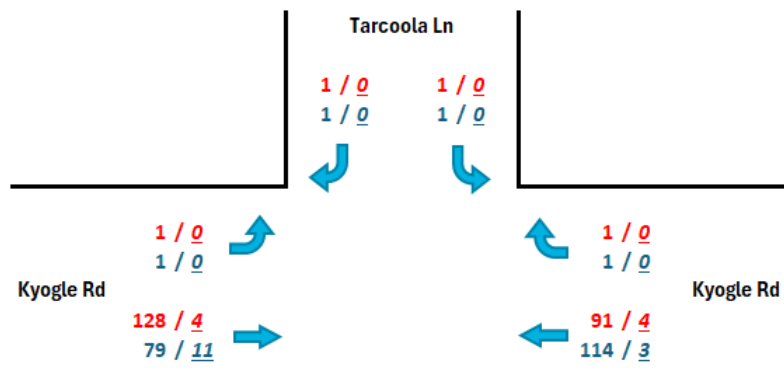
Figure 4.5 Option 2 – transport routes (A, B, C, D, E, F)

## 4.8 2026 baseline traffic volumes

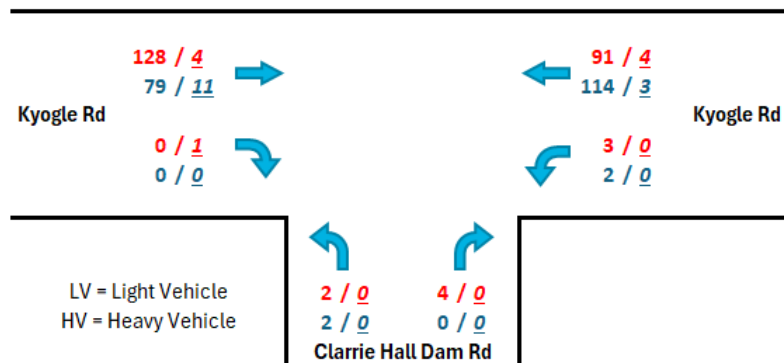
Baseline traffic volumes were determined during a site survey and intersection count conducted in 2023 (Section 3.2), and a linear growth rate of 1% per annum applied to approximate baseline traffic volumes for the anticipated year of construction in 2026. A 1% per annum linear growth rate for local and regional roads is considered to be conservative as there is no other major development nearby to the dam site that may influence the existing traffic.

The 2026 baseline traffic volumes are shown in Figure 4.6.

2026 baseline scenario (Kyogle Road/Tarcoola Lane, intersection 1)



2026 baseline scenario (Kyogle Road/Clarrie Hall Dam Road, intersection 2)



2026 baseline scenario (Kyogle Road/Doon Doon Road, intersection 3)

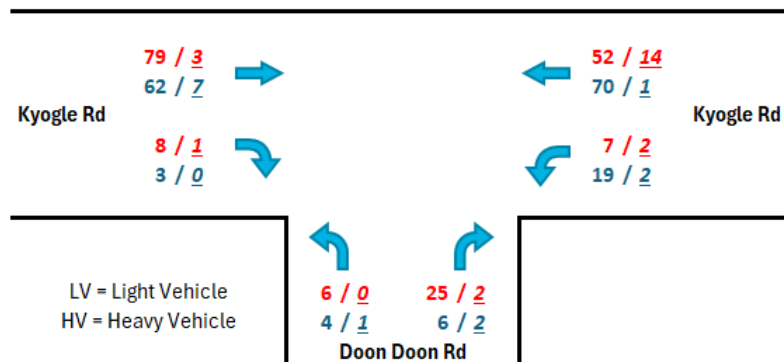


Figure 4.6 2026 baseline peak hour traffic volumes at intersections 1, 2 and 3

These baseline traffic volumes provide the background traffic volumes, on which the construction traffic volumes will be added in Section 4.10. Considering the low number of properties on Tarcoola Lane, it is assumed there are minimal traffic movements to and from Tarcoola Lane in the baseline scenario.

## 4.9 Construction traffic and distribution

Construction traffic generally comprises:

- heavy vehicle traffic associated with the delivery of accommodation buildings, site offices, establishment of the concrete batching plant and the delivery of other plant, equipment and bulk materials to site
- heavy vehicle traffic associated with the supply of feed materials to the concrete batching plant, and delivery of concrete across the Proposal's construction sites
- heavy vehicles associated with service of the construction phase, e.g. provision of fuel, waste collection services
- light vehicle traffic associated with external clients, visitors and representatives
- light vehicle traffic associated with the workforce commuting to site from external locations
- light vehicle traffic associated with workers commuting from the accommodation village to the sites.

Virtually all traffic – heavy and light – is anticipated to be travelling to site from the east, via Uki; little to no construction traffic is expected to come from the west, i.e. west of Kunghur via Kyogle Road. Sand and other suppliers are assumed to travel via coastal arterial roads (M1) and Tweed Valley Way.

Using the draft construction phase schedule and the above assumptions, the peak construction month, which sees the most project-related traffic on the public road network, has been determined to be month 11 of 18. Anticipated traffic volumes in this peak month have been used as the basis for modelling intersection performance (Section 5.1).

## 4.10 Construction traffic volumes

The construction traffic volumes are generated from a number of concurrent sources, including:

- Clarrie Hall Dam wall construction
- McCabes Bridge reconstruction
- concrete batching plant
- accommodation village.

The construction traffic volumes on the individual roads in the road network have been tabulated based on the distribution from all different types of construction traffic. A summary of the construction traffic volumes on the road network for both Option 1 and Option 2 are presented in Table 4.1 and Table 4.2 respectively. The traffic volumes at the key intersections both Option 1 and Option 2 are shown in Figure 4.7 and Figure 4.8.



**Table 4.1 Construction traffic volumes – Option 1**

| Road                                                                              | Direction  | AM Peak |    | PM Peak |    | Daily Vehicle |     |
|-----------------------------------------------------------------------------------|------------|---------|----|---------|----|---------------|-----|
|                                                                                   |            | LV      | HV | LV      | HV | LV            | HV  |
| Kyogle Road (east of Tarcoola Lane)                                               | Eastbound  | 0       | 8  | 101     | 21 | 156           | 123 |
|                                                                                   | Westbound  | 101     | 29 | 0       | 0  | 156           | 123 |
| Kyogle Road (between Clarrie Hall Dam Road and Tarcoola Lane)                     | Eastbound  | 0       | 6  | 167     | 20 | 167           | 117 |
|                                                                                   | Westbound  | 167     | 26 | 0       | 0  | 167           | 117 |
| Kyogle Road (between Doon Doon Road and Clarrie Hall Dam Road)                    | Eastbound  | 0       | 4  | 52      | 20 | 52            | 102 |
|                                                                                   | Westbound  | 52      | 24 | 0       | 0  | 52            | 102 |
| Clarrie Hall Dam Road (between Kyogle Road and concrete batching plant)           | Northbound | 0       | 10 | 115     | 0  | 115           | 35  |
|                                                                                   | Southbound | 115     | 10 | 0       | 0  | 115           | 35  |
| Doon Doon Road (near Kyogle Road)                                                 | Northbound | 0       | 4  | 52      | 20 | 52            | 102 |
|                                                                                   | Southbound | 52      | 24 | 0       | 0  | 52            | 102 |
| Tarcoola Lane                                                                     | Northbound | 0       | 3  | 66      | 0  | 121           | 6   |
|                                                                                   | Southbound | 66      | 2  | 0       | 1  | 121           | 6   |
| Clarrie Hall Dam Road (between concrete batching plant and dam construction site) | Northbound | 0       | 12 | 110     | 12 | 110           | 100 |
|                                                                                   | Southbound | 110     | 12 | 0       | 12 | 110           | 100 |

Note: LV = light vehicle, HV = heavy vehicle

**Table 4.2 Construction traffic volumes – Option 2**

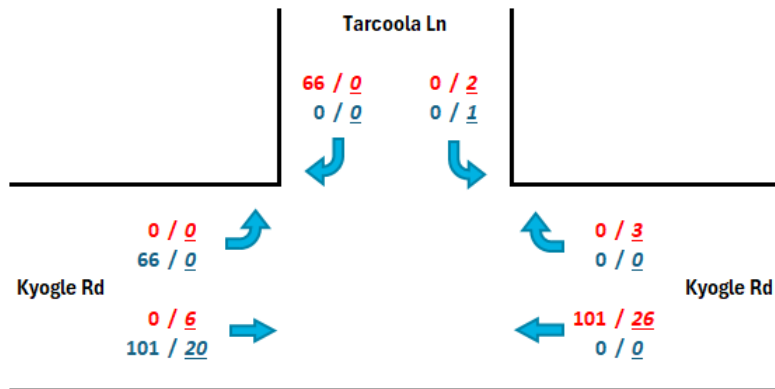
| Road                                                                            | Direction  | AM Peak |    | PM Peak |    | Daily Vehicle |     |
|---------------------------------------------------------------------------------|------------|---------|----|---------|----|---------------|-----|
|                                                                                 |            | LV      | HV | LV      | HV | LV            | HV  |
| Kyogle Road (east of Tarcoola Lane)                                             | Eastbound  | 0       | 8  | 101     | 21 | 156           | 123 |
|                                                                                 | Westbound  | 101     | 29 | 0       | 0  | 156           | 123 |
| Kyogle Road (between Clarrie Hall Dam Road and Tarcoola Lane)                   | Eastbound  | 0       | 18 | 96      | 33 | 151           | 208 |
|                                                                                 | Westbound  | 96      | 39 | 0       | 12 | 151           | 208 |
| Kyogle Road (between Doon Doon Road and Clarrie Hall Dam Road)                  | Eastbound  | 0       | 4  | 52      | 20 | 52            | 102 |
|                                                                                 | Westbound  | 52      | 24 | 0       | 0  | 52            | 102 |
| Clarrie Hall Dam Road (between Kyogle Road and accommodation village)           | Northbound | 10      | 14 | 54      | 13 | 119           | 106 |
|                                                                                 | Southbound | 54      | 15 | 10      | 12 | 119           | 106 |
| Doon Doon Road (near Kyogle Road)                                               | Northbound | 0       | 4  | 52      | 20 | 52            | 102 |
|                                                                                 | Southbound | 52      | 24 | 0       | 0  | 52            | 102 |
| Tarcoola Lane                                                                   | Northbound | 5       | 22 | 0       | 12 | 5             | 135 |
|                                                                                 | Southbound | 0       | 22 | 5       | 12 | 5             | 135 |
| Clarrie Hall Dam Road (between accommodation village and dam construction site) | Northbound | 0       | 12 | 110     | 12 | 110           | 100 |
|                                                                                 | Southbound | 110     | 12 | 0       | 12 | 110           | 100 |

Note: LV = light vehicle, HV = heavy vehicle

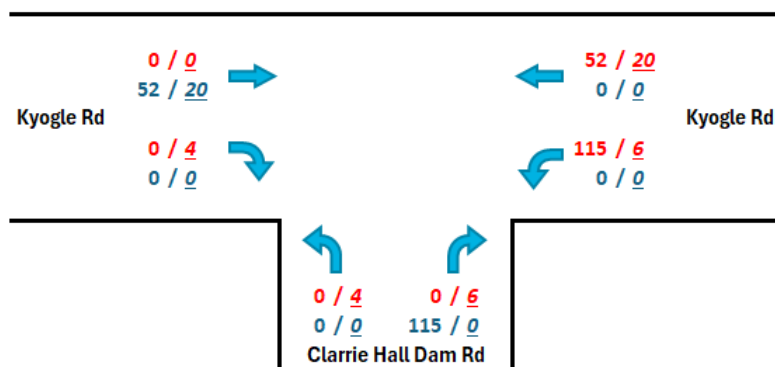
AM Peak Hour: Light Vehicles / Heavy Vehicles

PM Peak Hour: Light Vehicles / Heavy Vehicles

Kyogle Road/Tarcoola Lane (Intersection 1)



Kyogle Road/Clarrie Hall Dam Road (Intersection 2)



Kyogle Road/Doon Doon Road (Intersection 3)

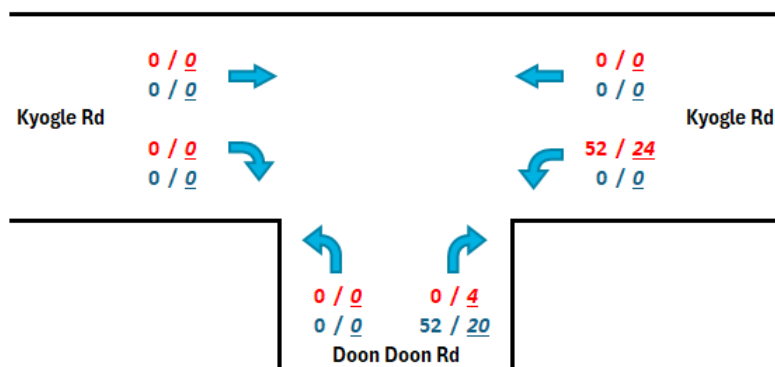


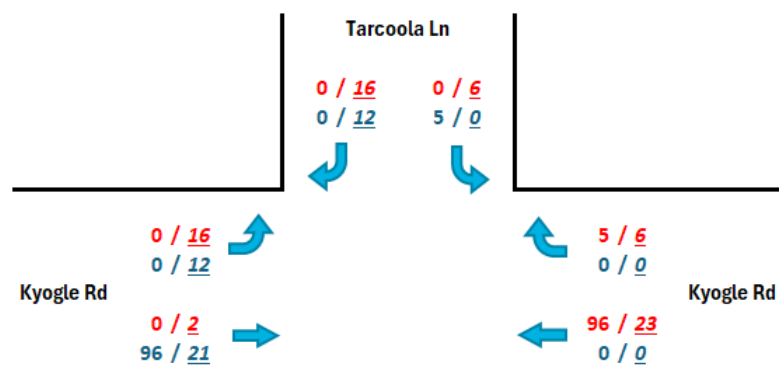
Figure 4.7 Option 1 – Construction peak hour traffic volumes at intersections 1, 2 and 3



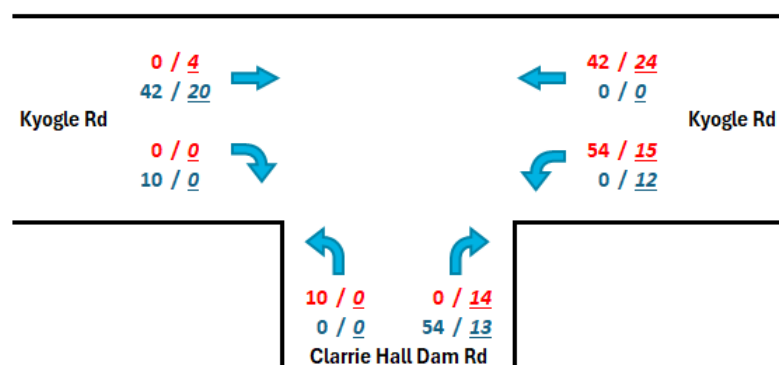
AM Peak Hour: Light Vehicles / Heavy Vehicles

PM Peak Hour: Light Vehicles / Heavy Vehicles

#### Kyogle Road/Tarcoola Lane (Intersection 1)



#### Kyogle Road/Clarrie Hall Dam Road (Intersection 2)



#### Kyogle Road/Doon Doon Road (Intersection 3)

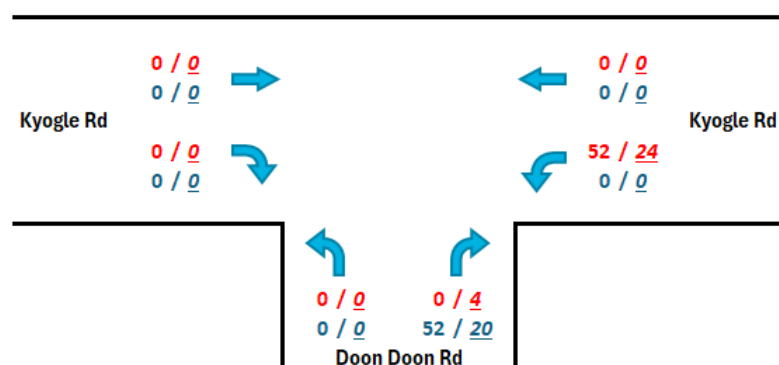


Figure 4.8 Option 2 – Construction peak hour traffic volumes at intersections 1, 2 and 3

#### 4.11 2026 baseline + construction traffic volumes

The construction traffic volumes for both Option 1 and Option 2 have been added to the 2026 baseline traffic volumes and are presented in Table 4.3 and Table 4.4 respectively.

**Table 4.3**      **2026 baseline + construction traffic volumes – Option 1**

| Road                                                                    | Direction  | AM  |    | PM  |    |
|-------------------------------------------------------------------------|------------|-----|----|-----|----|
|                                                                         |            | LV  | HV | LV  | HV |
| Kyogle Road (east of Tarcoola Lane)                                     | Eastbound  | 129 | 12 | 181 | 32 |
|                                                                         | Westbound  | 193 | 33 | 115 | 3  |
| Kyogle Road (between Clarrie Hall Dam Road and Tarcoola Lane)           | Eastbound  | 129 | 10 | 247 | 31 |
|                                                                         | Westbound  | 259 | 30 | 115 | 3  |
| Kyogle Road (between Doon Doon Road and Clarrie Hall Dam Road)          | Eastbound  | 128 | 9  | 131 | 31 |
|                                                                         | Westbound  | 145 | 28 | 116 | 3  |
| Clarrie Hall Dam Road (between Kyogle Road and concrete batching plant) | Northbound | 6   | 10 | 117 | 0  |
|                                                                         | Southbound | 118 | 11 | 2   | 0  |
| Doon Doon Road (near Kyogle Road)                                       | Northbound | 31  | 6  | 62  | 23 |
|                                                                         | Southbound | 67  | 27 | 22  | 2  |
| Tarcoola Lane                                                           | Northbound | 2   | 3  | 68  | 0  |
|                                                                         | Southbound | 68  | 2  | 2   | 1  |

Note: LV = light vehicle, HV = heavy vehicle.

**Table 4.4**      **2026 baseline + construction traffic volumes – Option 2**

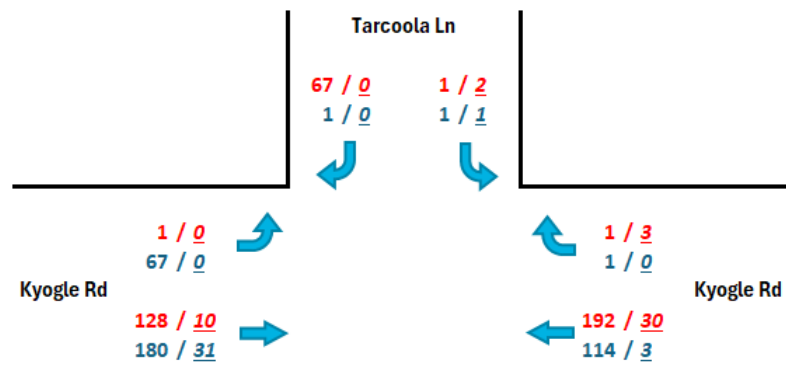
| Road                                                                  | Direction  | AM  |    | PM  |    |
|-----------------------------------------------------------------------|------------|-----|----|-----|----|
|                                                                       |            | LV  | HV | LV  | HV |
| Kyogle Road (east of Tarcoola Lane)                                   | Eastbound  | 129 | 12 | 181 | 32 |
|                                                                       | Westbound  | 193 | 33 | 115 | 3  |
| Kyogle Road (between Clarrie Hall Dam Road and Tarcoola Lane)         | Eastbound  | 129 | 22 | 176 | 44 |
|                                                                       | Westbound  | 188 | 43 | 115 | 15 |
| Kyogle Road (between Doon Doon Road and Clarrie Hall Dam Road)        | Eastbound  | 128 | 9  | 131 | 31 |
|                                                                       | Westbound  | 145 | 28 | 116 | 3  |
| Clarrie Hall Dam Road (between Kyogle Road and accommodation village) | Northbound | 16  | 14 | 56  | 13 |
|                                                                       | Southbound | 57  | 16 | 12  | 12 |
| Doon Doon Road (near Kyogle Road)                                     | Northbound | 31  | 6  | 62  | 23 |
|                                                                       | Southbound | 67  | 27 | 22  | 2  |
| Tarcoola Lane                                                         | Northbound | 7   | 22 | 2   | 12 |
|                                                                       | Southbound | 2   | 22 | 7   | 12 |

Note: LV = light vehicle, HV = heavy vehicle.

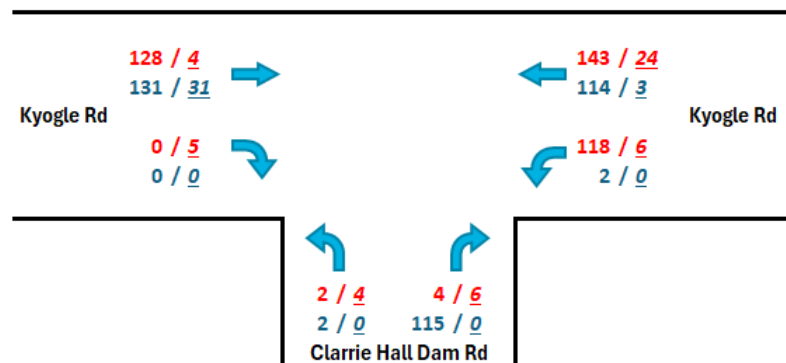
AM Peak Hour: Light Vehicles / Heavy Vehicles

PM Peak Hour: Light Vehicles / Heavy Vehicles

#### Kyogle Road/Tarcoola Lane (Intersection 1)



#### Kyogle Road/Clarrie Hall Dam Road (Intersection 2)



#### Kyogle Road/Doon Doon Road (Intersection 3)

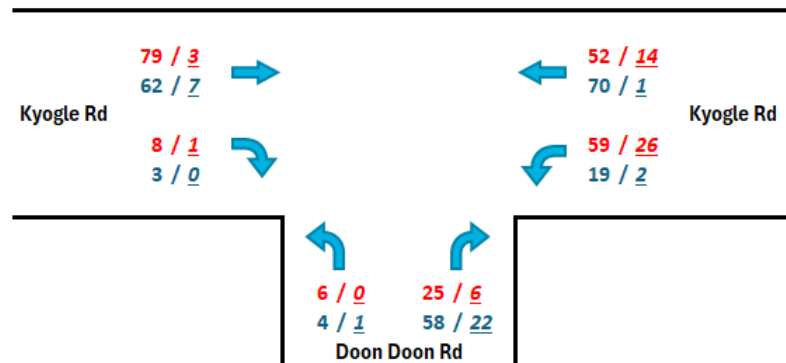


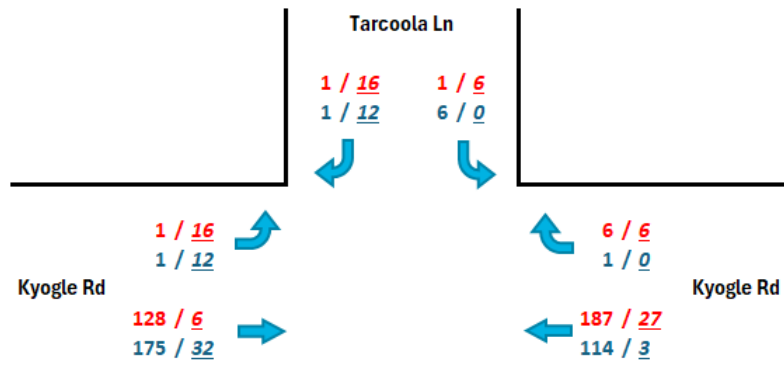
Figure 4.9 Option 1 – 2026 baseline + construction peak hour traffic volumes at intersections 1, 2 and 3



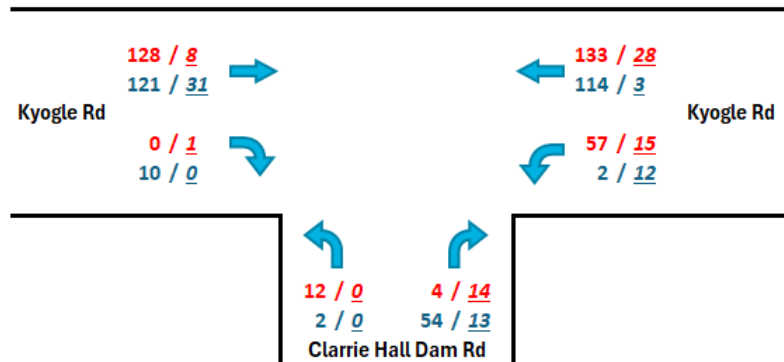
AM Peak Hour: Light Vehicles / Heavy Vehicles

PM Peak Hour: Light Vehicles / Heavy Vehicles

#### Kyogle Road/Tarcoola Lane (Intersection 1)



#### Kyogle Road/Clarrie Hall Dam Road (Intersection 2)



#### Kyogle Road/Doon Doon Road (Intersection 3)

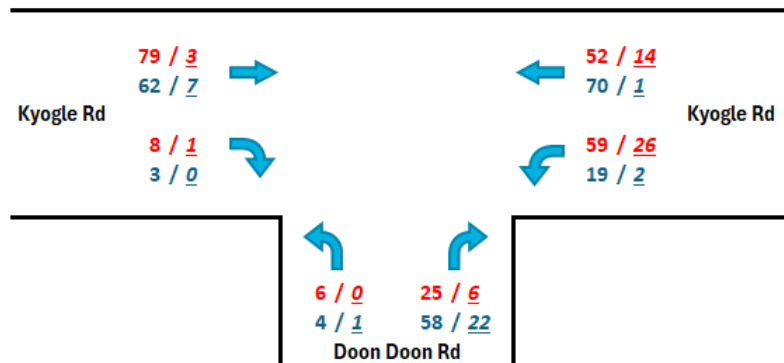


Figure 4.10 Option 2 – 2026 baseline + construction peak hour traffic volumes at intersections 1, 2 and 3

#### 4.12 Cumulative traffic

No other major works or projects have been identified in the locality, coinciding with the construction phase timeframe; as such, no cumulative traffic impact assessment is required.

## 5 Traffic impact assessment

### 5.1 Intersection performance during construction

#### 5.1.1 Traffic assessment options

As noted in Section 4.2, due to the uncertainty of the locations of the accommodation village and CBP, traffic assessment has been undertaken for the following two options:

- Option 1: CBP located off Clarrie Hall Dam Road, just north of the main dam work site, and accommodation village located off Tarcoola Lane, to the north-east.
- Option 2: this option is reversed to Option 1, i.e. accommodation village located off Clarrie Hall Dam Road, just north of the main dam work site, and CBP located off Tarcoola Lane, to the north-east.

#### 5.1.2 Intersection modelling

The estimated traffic volumes at the key intersections have been modelled with the SIDRA Intersection 9.1 software, a micro-analytical tool for individual intersections and linked intersection-network modelling. Modelling is based on the total baseline and peak construction traffic volumes described in Section 4.8 and Section 4.11. 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 a roundabout and signalised intersection, this is the average delay in seconds encountered by all vehicles passing through the intersection. For a priority-controlled intersection (stop or give way), this is the average delay experienced by vehicles on the worst approach. 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 period. It transforms the average delay into measurable distance units.

The LOS is a good indicator of overall performance for individual intersections, with each level summarised in Table 5.1.

**Table 5.1** Intersection LOS standards

| Level of service | Average delay (seconds per vehicle) | Traffic signals, roundabout                     | Priority intersection (‘Stop’ and ‘Give Way’) |
|------------------|-------------------------------------|-------------------------------------------------|-----------------------------------------------|
| A                | <14                                 | Good operation.                                 | Good operations.                              |
| B                | 15 to 28                            | Good with acceptable delays and spare capacity. | Acceptable delays and spare capacity.         |
| C                | 29 to 42                            | Satisfactory.                                   | Satisfactory, but accident study required.    |
| D                | 43 to 56                            | Operating near capacity.                        | Near capacity and accident study required.    |

**Table 5.1**      **Intersection LOS standards**

| Level of service | Average delay (seconds per vehicle) | Traffic signals, roundabout                                                                                        | Priority intersection ('Stop' and 'Give Way')                       |
|------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| E                | 57 to 70                            | At capacity. At traffic signals, incidents will cause extensive delays.<br>Roundabouts require other control mode. | At capacity, required other control mode.                           |
| F                | >71                                 | Unsatisfactory with excessive queuing.                                                                             | Unsatisfactory with excessive queuing; required other control mode. |

Source: RTA Guide to Traffic Generating Development (RTA 2002).

SIDRA modelling has been conducted for the following scenarios:

- 2026 Baseline: surveyed traffic volumes only, with 1% per annum linear growth (Figure 4.6).
- 2026 Baseline + Construction (Option 1): combined surveyed and construction traffic volumes for Option 1 (Figure 4.9).
- 2026 Baseline + Construction (Option 2): combined surveyed and construction traffic volumes for Option 2 (Figure 4.10).

The modelling results for these scenarios for the key intersections are presented in Table 5.2, Table 5.3 and Table 5.4. The details of the SIDRA results are attached in Appendix C.

Although the background road network peak (e.g. 8–9 am and 4–5 pm) do not coincide with the Proposal's construction peak (e.g. 6–7 am and 6–7 pm), the Proposal peak volumes have been used in the network peak. Hence, the traffic analysis is conservative.

### 5.1.3 Intersection 1 – Kyogle Road/Tarcoola Lane intersection

The intersection performance of Kyogle Road/Tarcoola Lane is provided in Table 5.2.

**Table 5.2**      **2026 SIDRA modelling result for Kyogle Road/Tarcoola Lane intersection**

| Control: Priority controlled (give way) | AM peak   |                     |         |       |                           | PM Peak            |                     |         |       |                                          |
|-----------------------------------------|-----------|---------------------|---------|-------|---------------------------|--------------------|---------------------|---------|-------|------------------------------------------|
|                                         | Scenarios | Intersection volume | DEL (s) | LOS   | DOS                       | Q95 (m) (approach) | Intersection volume | DEL (s) | LOS   | DOS                                      |
| Baseline                                | 243       | 5.6                 | A       | 0.073 | 0.1 (north-west approach) | 222                | 5.6                 | A       | 0.065 | 0.0                                      |
| Baseline + Option 1                     | 458       | 6.8                 | A       | 0.135 | 2.0 (north-west approach) | 420                | 6.2                 | A       | 0.163 | 0.1 (north-east and north-west approach) |
| Baseline + Option 2                     | 422       | 9.4                 | A       | 0.138 | 1.8 (north-west approach) | 376                | 8.8                 | A       | 0.135 | 1.1 (north-west approach)                |

Key findings:

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DoS <0.2 for all scenarios.
- In the highest traffic scenario, the intersection still has approximately 80% additional capacity after accommodating the additional traffic generated by all elements of the Proposal.

#### 5.1.4 Intersection 2 – Kyogle Road/Clarrie Hall Dam Road intersection

The intersection performance of Kyogle Road/Clarrie Hall Dam Road is provided in Table 5.3.

**Table 5.3 2026 SIDRA modelling result for Kyogle Road/Clarrie Hall Dam Road intersection**

| Control: Priority controlled (give way) | AM peak             |                     |         |     |       | PM Peak                            |                     |         |     |       |                                    |
|-----------------------------------------|---------------------|---------------------|---------|-----|-------|------------------------------------|---------------------|---------|-----|-------|------------------------------------|
|                                         | Scenarios           | Intersection volume | DEL (s) | LOS | DOS   | Q95 (m) (approach)                 | Intersection volume | DEL (s) | LOS | DOS   | Q95 (m) (approach)                 |
|                                         | Baseline            | 249                 | 9.3     | A   | 0.074 | 0.1 (west and south-west approach) | 224                 | 8.3     | A   | 0.065 | 0.1 (west and south-west approach) |
|                                         | Baseline + Option 1 | 467                 | 12.0    | A   | 0.169 | 0.9 (south-west approach)          | 420                 | 8.4     | A   | 0.126 | 3.0 (south-west approach)          |
|                                         | Baseline + Option 2 | 421                 | 10.8    | A   | 0.142 | 1.4 (south-west approach)          | 381                 | 8.4     | A   | 0.100 | 2.3 (south-west approach)          |

Key findings:

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DoS <0.2 for all scenarios.
- In the highest traffic scenario, the intersection still has approximately 80% additional capacity after accommodating the additional traffic generated by all elements of the Proposal.

#### 5.1.5 Intersection 3 – Kyogle Road/Doon Doon Road intersection

The intersection performance of Kyogle Road/Doon Doon Road is provided in Table 5.4.

**Table 5.4 2026 SIDRA modelling result for Kyogle Road/Doon Doon Road intersection**

| Control:<br>Priority<br>controlled<br>(give way) | AM peak                |                        |         |     |       | PM Peak                 |                        |         |     |       |                         |
|--------------------------------------------------|------------------------|------------------------|---------|-----|-------|-------------------------|------------------------|---------|-----|-------|-------------------------|
|                                                  | Scenarios              | Intersection<br>volume | DEL (s) | LOS | DOS   | Q95 (m)<br>(approach)   | Intersection<br>volume | DEL (s) | LOS | DOS   | Q95 (m)<br>(approach)   |
|                                                  | Baseline               | 209                    | 7.4     | A   | 0.052 | 0.8 (south<br>approach) | 186                    | 7.8     | A   | 0.051 | 0.4 (south<br>approach) |
|                                                  | Baseline +<br>Option 1 | 294                    | 8.0     | A   | 0.099 | 1.0 (south<br>approach) | 262                    | 8.0     | A   | 0.092 | 2.7 (south<br>approach) |



**Table 5.4** 2026 SIDRA modelling result for Kyogle Road/Doon Doon Road intersection

| Control:<br>Priority<br>controlled<br>(give way) | AM peak                |                        |         |     |       | PM Peak                 |                        |         |     |       |                         |
|--------------------------------------------------|------------------------|------------------------|---------|-----|-------|-------------------------|------------------------|---------|-----|-------|-------------------------|
|                                                  | Scenarios              | Intersection<br>volume | DEL (s) | LOS | DOS   | Q95 (m)<br>(approach)   | Intersection<br>volume | DEL (s) | LOS | DOS   | Q95 (m)<br>(approach)   |
|                                                  | Baseline +<br>Option 2 | 294                    | 8.0     | A   | 0.099 | 1.0 (south<br>approach) | 262                    | 8.0     | A   | 0.092 | 2.7 (south<br>approach) |

**Key findings:**

- In AM and PM, the intersection performs satisfactorily within capacity with LOS A and DoS <0.1 for all scenarios.
- In the highest traffic scenario, the intersection still has approximately 90% additional capacity after accommodating the additional traffic generated by all elements of the Proposal.
- For Option 1 and 2, the SIDRA results are similar due to the same volumes of construction traffic accessing this intersection for both the options.

Overall, the intersections analysed will be able to cater for the Proposal's construction traffic without any significant queuing or delays.

## 5.2 Warrants for basic, auxiliary and channelised turn treatments

Intersection operations are assessed from a combination of the peak hourly through and turning traffic movements that occur at each intersection. There are several types of turning lanes/turn treatments at an intersection such as basic, auxiliary lane and channelised which are described as:

- a basic turn treatment (BAL/BAR) where turning vehicles may share the lane with through traffic movements
- an auxiliary lane turn treatment (AUL/CHR(S)) where a separate lane is provided to enable the turn to be performed in an additional lane
- a channelised turn treatment (CHL/CHR) which provides a traffic island to enhance the safety of right-turning or left-turning vehicles.

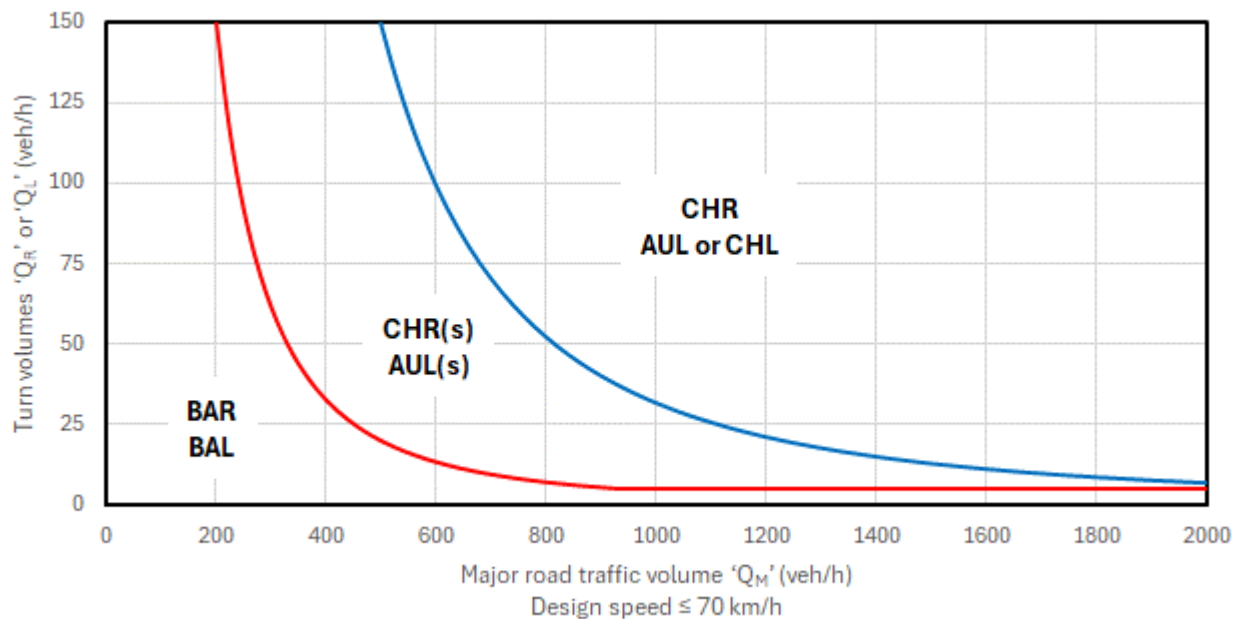
The need for additional intersection turning lanes is determined in accordance with the current intersection design standards (Austroads, 2017) *Guide to Road Design Part 4, Intersections and Crossings General* (Figure A.10, Figure 5.2), where:

- 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.
- 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 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.

Austrroads recommends that intersections should be designed for a travel speed 10 km/h greater than the posted speed limit.

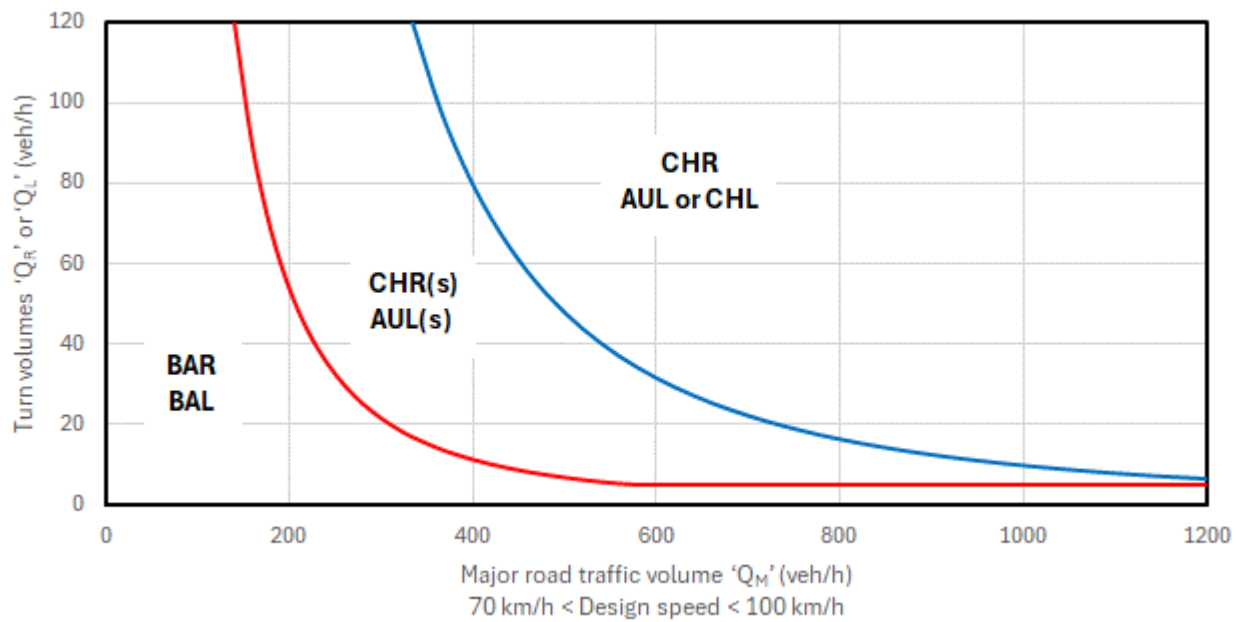
### 5.2.1 Relevant turn treatment warrants

As Kyogle Road near Tarcoola Lane has a posted speed limit of 60 km/h, the intersection (including any requirements for turning bays) should be designed for 70 km/h. Figure 5.1 contains the graphs for the selection of turn treatments on roads with a design speed less than or equal to 70 km/h, which is appropriate for the Kyogle Road near Tarcoola Lane. For a design speed that is equal to or less than 70 km/h, the requirements for additional left or right turn traffic lanes are measured from Figure 5.1.



**Figure 5.1** Austroads warrant design charts for rural intersection turning lanes for design speeds less than or equal to 70 km/h

As Kyogle Road near Clarrie Hall Dam Road and Doon Doon Road has a posted speed limit of 80 km/h, the intersection (including any requirements for turning bays) should be designed for 90 km/h. Figure 5.2 contains the graphs for the selection of turn treatments on roads with a design speed between 70 km/h to 100 km/h, which is appropriate for the Kyogle Road near Clarrie Hall Dam Road and Doon Doon Road. For a design speed between 70 km/h and 100 km/h, the requirements for additional left or right turn traffic lanes are measured from Figure 5.2.



**Figure 5.2** Austroads warrant design charts for rural intersection turning lanes for design speeds between 70 km/h and 100 km/h

The intersection peak hourly turning traffic volumes for the warrant assessment for the baseline + option 1 and baseline + option 2 traffic scenarios are summarised from Table 5.5 to Table 5.10. The baseline + option 1 and baseline + option 2 traffic scenarios are also summarised graphically from Figure 5.3 to Figure 5.11.

### 5.2.2 Kyogle Road/Tarcoola Lane intersection

At Kyogle Road/Tarcoola Lane intersection, there are existing BAL and BAR treatments provided, as shown in Plate 5.1.



**Plate 5.1** Kyogle Road at Tarcoola Lane (looking east)

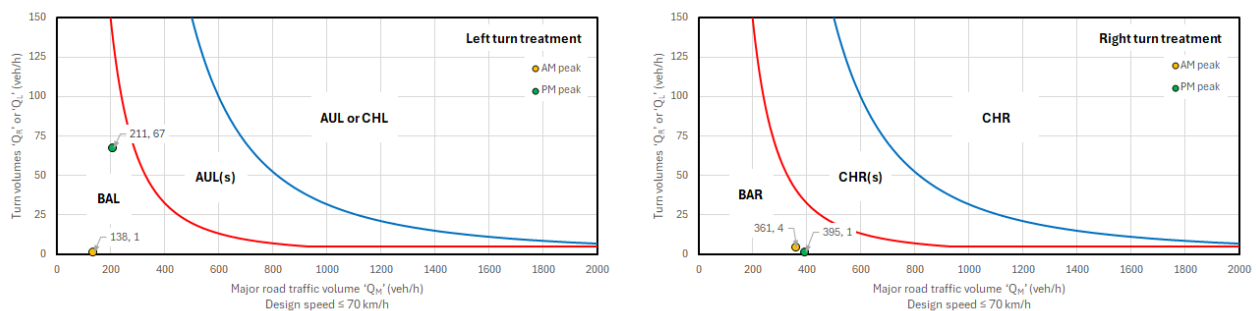
The existing intersection design has basic left (BAL) and basic right (BAR) turn treatments to cater for left and right turning movements respectively. When the Proposal's construction traffic is added to the 2026 baseline traffic volumes, there is no change required to the existing intersection design regardless of whether Option 1 (Table 5.5 and Figure 5.3) or Option 2 (Table 5.6 and Figure 5.4) is adopted.

**Table 5.5** 2026 baseline + construction traffic turn treatment warrant for Kyogle Road/Tarcoola Lane intersection – Option 1

| Movement                   | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|----------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road  | AM        | 138                       | 1                      | BAL                     |
|                            | PM        | 211                       | 67                     | BAL                     |
| Right turn from major road | AM        | 361                       | 4                      | BAR                     |
|                            | PM        | 395                       | 1                      | BAR                     |

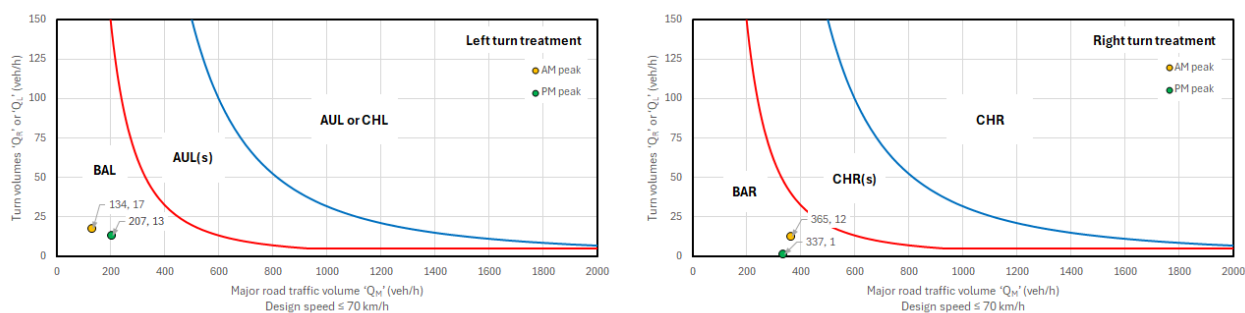
**Table 5.6** 2026 baseline intersection + Proposal turn treatment warrant for Kyogle Road/Tarcoola Lane intersection – Option 2

| Movement                   | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|----------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road  | AM        | 134                       | 17                     | BAL                     |
|                            | PM        | 207                       | 13                     | BAL                     |
| Right turn from major road | AM        | 365                       | 12                     | BAR                     |
|                            | PM        | 337                       | 1                      | BAR                     |



**Figure 5.3** Option 1 – Austroads turn treatment warrant assessment for Kyogle Road/Tarcoola Lane intersection – (2026 baseline + construction traffic)





**Figure 5.4** Option 2 – Austroads turn treatment warrant assessment for Kyogle Road/Tarcoola Lane intersection – (2026 baseline + construction traffic)

The above analysis shows that a BAR and BAL treatment is required for this intersection. The current geometry of this intersection already provides a BAR and BAL treatments, hence no further turn treatment upgrade is necessary.

### 5.2.3 Kyogle Road/Clarrie Hall Dam Road intersection

The current configuration of the Kyogle Road/Clarrie Hall Dam Road intersection is shown in Plate 5.2. The intersection has a large geometry, which will be able to easily facilitate heavy vehicle movements. There are many tyre marks at Clarrie Hall Dam, possibly due to the illegal activities due to large geometry of this intersection. The large geometry facilitates a de facto left turn lane (BAL), however, there is no dedicated treatment to facilitate a right turn movement at this intersection.



**Plate 5.2** Kyogle Road at Clarrie Hall Dam Road (looking east)

Kyogle Road/Clarrie Hall Dam Road intersection will require intersection upgrades to cater for the Proposal.

For Option 1 (Table 5.7 and Figure 5.8):

- A shortened auxiliary left (AUL(s)) turn treatment will be required for the 2026 baseline + project scenario for left turning traffic from Kyogle Road (westbound) to Clarrie Hall Dam Road, based on the current assumptions regarding concurrent development and an accommodation camp being located on Tarcoola Lane. An example of AUL(s) is shown below.

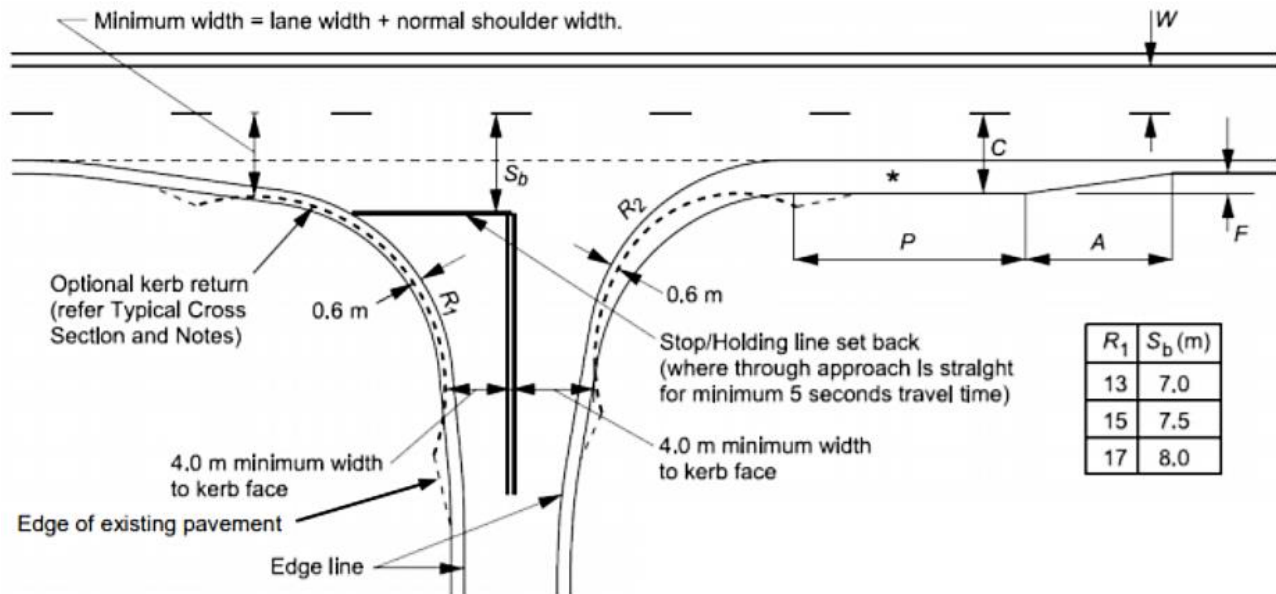
**Figure 5.5**      **AUL(s) turn treatment**

- Figure 7.1: Basic right (BAR) turn treatment on a two-lane rural road**

### Figure 5.6 BAR turn treatment

For Option 2 (Table 5.8 and Figure 5.9):

- A basic left (BAL) turn treatment will be required for the 2026 baseline + project scenario for left turning traffic from Kyogle Road (westbound) to Clarrie Hall Dam Road (Figure 5.7).
- A basic right (BAR) turn treatment will be required for the 2026 baseline + project scenario for right turning traffic from Kyogle Road (eastbound) to Clarrie Hall Dam Road.



Source: Austroads

**Figure 5.7** BAL turn treatment

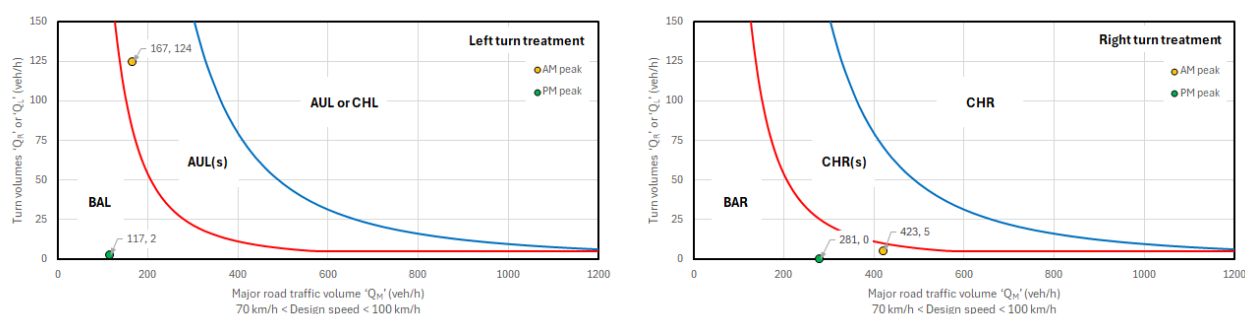
It is recommended that concept design is prepared to incorporate the turn treatment requirements of in the preferred option in accordance with the current intersection design standard *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*.

**Table 5.7** 2026 baseline + construction traffic turn treatment warrant for Kyogle Road/Clarrie Hall Dam Road intersection – Option 1

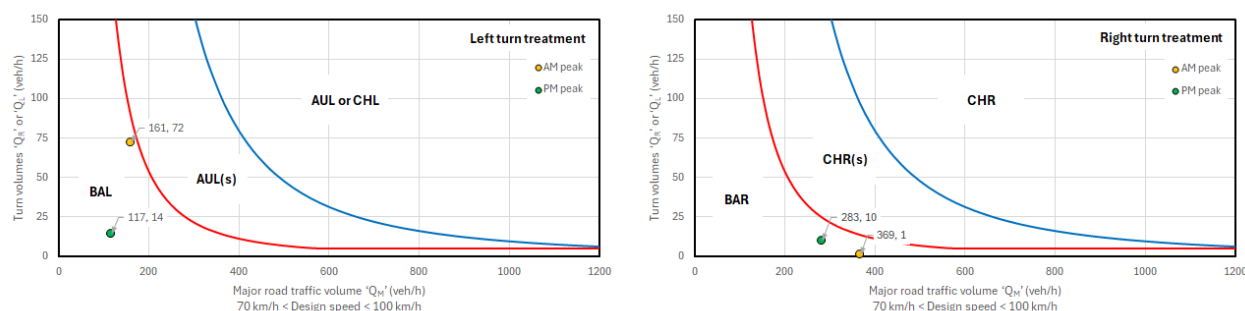
| Movement                   | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|----------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road  | AM        | 167                       | 124                    | AUL(s)                  |
|                            | PM        | 117                       | 2                      | BAL                     |
| Right turn from major road | AM        | 423                       | 5                      | BAR                     |
|                            | PM        | 281                       | 0                      | BAR                     |

**Table 5.8** 2026 baseline + construction traffic turn treatment warrant for Kyogle Road/Clarrie Hall Dam Road intersection – Option 2

| Movement                   | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|----------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road  | AM        | 161                       | 72                     | BAL                     |
|                            | PM        | 117                       | 14                     | BAL                     |
| Right turn from major road | AM        | 369                       | 1                      | BAR                     |
|                            | PM        | 283                       | 10                     | BAR                     |



**Figure 5.8** Option 1 – Austroads turn treatment warrant assessment for Kyogle Road/Clarrie Hall Dam Road intersection (2026 baseline + project traffic)



**Figure 5.9** Option 2 – Austroads turn treatment warrant assessment for Kyogle Road/Clarrie Hall Dam Road intersection (2026 baseline + project traffic)



### 5.2.4 Kyogle Road/Doon Doon Road intersection

At Kyogle Road/Doon Doon Road intersection, there are existing BAL and BAR treatments provided, as shown in Plate 5.3.



**Plate 5.3** Kyogle Road at Doon Doon Road (looking east)

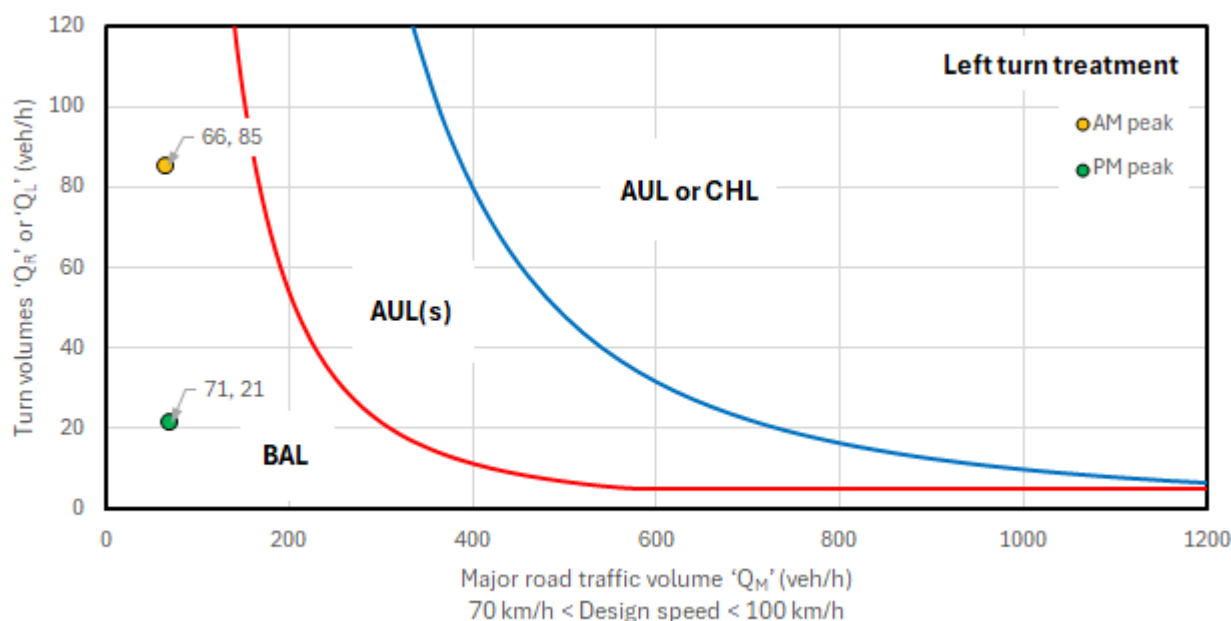
The existing intersection design has a basic left (BAL) turn treatment to cater for left turning movements. When the project’s construction traffic is added to the 2026 baseline traffic volumes, there is no change required to the turn treatment requirement regardless of whether Option 1 (Table 5.5 and Figure 5.10) or Option 2 (Table 5.10 and Figure 5.11) is adopted.

**Table 5.9** 2026 baseline + project traffic turn treatment warrant for Kyogle Road/Doon Doon Road intersection – Option 1

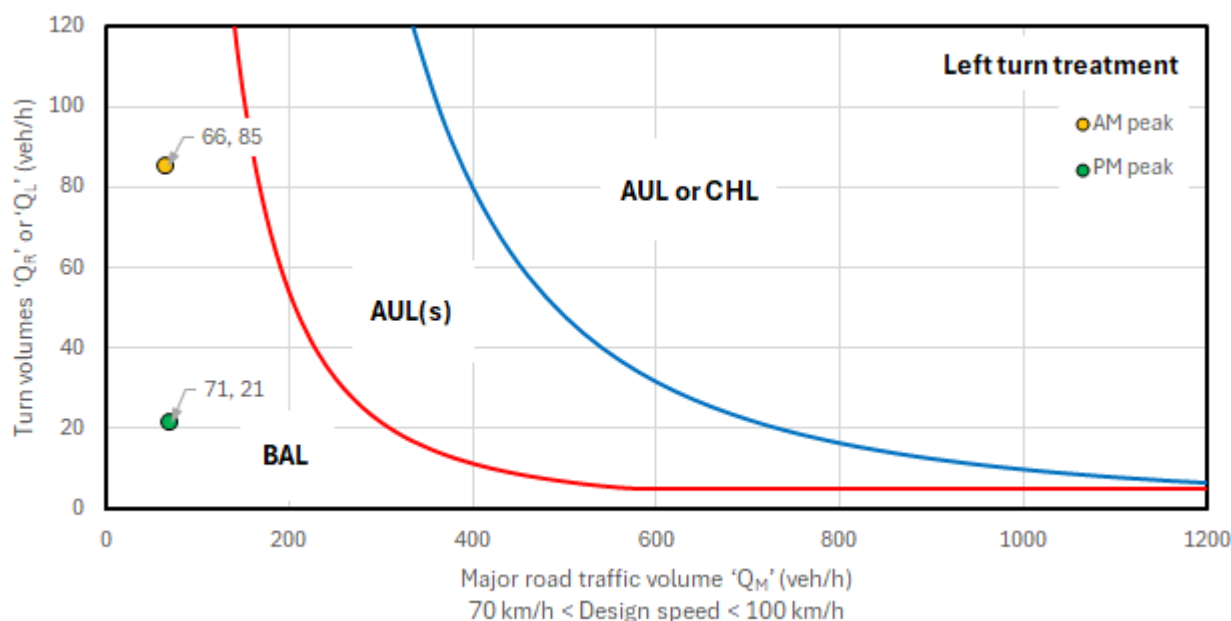
| Movement                  | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|---------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road | AM        | 66                        | 85                     | BAL                     |
|                           | PM        | 71                        | 21                     | BAL                     |

**Table 5.10** 2026 baseline + project traffic turn treatment warrant for Kyogle Road/Doon Doon Road intersection – Option 2

| Movement                  | Peak hour | Major road traffic volume | Turning traffic volume | Turn treatment required |
|---------------------------|-----------|---------------------------|------------------------|-------------------------|
| Left turn from major road | AM        | 66                        | 85                     | BAL                     |
|                           | PM        | 71                        | 21                     | BAL                     |



**Figure 5.10** Option 1 – 2026 baseline + project traffic Austroads turn treatment warrant assessment for Kyogle Road/Doon Doon Road intersection



**Figure 5.11** Option 2 – 2026 baseline + project traffic Austroads turn treatment warrant assessment for Kyogle Road/Doon Doon Road intersection

### 5.3 Intersection upgrade at Kyogle Road/Clarrie Hall Dam Road

A design plan for Kyogle Road/Clarrie Hall Dam Road will be prepared as part of the construction design package, if required. As stated earlier, due to the large geometry of this intersection, vehicles can turn at an excessive speed. Hence, to improve safety, BB centre line marking is recommended on Clarrie Hall Dam Road, which will eliminate any anti-social behaviour e.g. burnouts.

## 5.4 Road sight distance safety assessment at Kyogle Road

In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), all unsignalised T-intersections need to have clear visibility between the through traffic travelling on the major road and the turning traffic exiting from the minor road, so that the turning traffic can observe gaps to turn safely to merge with the major road traffic. This visibility measurement is called sight distance.

The safe intersection sight distance (SISD) at the intersection is assessed in further detail below and varies according to the design speed of the road. Normally a design speed 10 km/h higher than the posted speed limit is used to calculate the SISD.

Kyogle Road has a speed limit of 60 km/h near Tarcoola Lane and therefore a presumed design speed of 70 km/h is considered. In accordance with Austroads (2017), for a road with a design speed of 70 km/h, the minimum SISD required for a general minimum 2 second driver reaction time is 151 m. A two second drivers' reaction time is considered appropriate given local roads generally carries local traffic where motorists are generally aware of the road environment.

Kyogle Road has a speed limit of 80 km/h near Clarrie Hall Dam Road and Doon Doon Road, and therefore a presumed design speed of 90 km/h is considered. In accordance with Austroads (2017), for a road with a design speed of 90 km/h, the minimum SISD required for a general minimum 2 second driver reaction time is 214 m.

### 5.4.1 Kyogle Road/Tarcoola Lane intersection

The sight distances along Kyogle Road at Clarrie Hall Dam Road have been estimated based on the line of sight, as shown in Figure 5.12. Based on the sight distance analysis, the sight distances to the left (180 m) and to the right (160 m) meet the minimum requirement (151 m) as stipulated in Austroads (2017).



**Figure 5.12** Sight distance from Tarcoola Lane to Kyogle Road



### 5.4.2 Kyogle Road/Clarrie Hall Dam Road intersection

The sight distances along Kyogle Road at Clarrie Hall Dam Road have been estimated based on the line of sight, as shown in Figure 5.13. Based on the sight distance analysis, the sight distances to the left (187 m) and to the right (185 m) do not meet the minimum requirement (214 m) as stipulated in Austroads (2017). For both the sight distances to the left and right, there is some overgrown roadside vegetation that can be cleared for better visibility.



Sight distance to the left (187 m)

Sight distance to the right (185 m)

**Figure 5.13** Sight distance from Clarrie Hall Dam Road to Kyogle Road

### 5.4.3 Kyogle Road/Doon Doon Road intersection

The sight distances along Kyogle Road at Doon Doon Road have been estimated based on the line of sight, as shown in Figure 5.14. Based on the sight distance analysis, the sight distance to the right (230 m) does meet the minimum requirement (214 m) as stipulated in Austroads (2017). However, the sight distance to the left (192 m) does not meet the minimum requirement (214 m). To the left, there is some overgrown roadside vegetation that can be cleared for better visibility.





**Figure 5.14** Sight distance from Doon Doon Road to Kyogle Road

## 5.5 Swept path assessments

Swept path assessments have been performed for the following intersections:

- Kyogle Road/Tarcoola Lane
- Kyogle Road/Clarrie Hall Dam Road
- Kyogle Road/Doon Doon Road.

As the maximum allowable heavy vehicle along Kyogle Road is 19 m long semi-trailer, swept path assessments have been undertaken by using this vehicle. The swept path analyses show that minor upgrades will be required for all three intersections to allow for 19 m semi-trailers to turn without interfering with other traffic movements.

Furthermore, localised road widening is recommended in the vicinity of the intersection on Tarcoola Lane and Doon Doon Road to allow heavy vehicles to safely pass each other.

Due to the narrow road width on Tarcoola Lane, it is recommended that Option 1 is implemented over Option 2, as this will reduce the instances of conflicting opposing heavy vehicle movements. In Option 1, light vehicles travelling from the accommodation camp will predominantly travel in one direction along Tarcoola Lane in each of the peak hours as they travel to and from the construction sites, which also reduces instances of conflicting traffic movements. Furthermore, heavy vehicle turning movements will be reduced at Kyogle Road/Tarcoola Lane intersection if Option 1 is selected, since the concrete batching plant will be located closer to the main dam construction site on Clarrie Hall Dam Road.

The swept path assessments are shown in Appendix D.

## 5.6 Impacts on public transport, pedestrians and cyclists

The proposal is unlikely to have any significant impact on the existing public transport operation, given the low frequency of public transport in the area as stated in Section 3.4.1.

Due to the rural nature of the site, there is limited pedestrian activities along the haulage route, except the Uki village. A traffic management plan will be prepared, which will provide management measures for driving through Uki and to and from the site.

There is no bicycle infrastructure at the vicinity of the site. The proposal is unlikely to have any significant impact to the cyclists.

## 5.7 Impacts on the school traffic

To minimise any interaction with school traffic, mitigation includes not allowing heavy vehicle operation along Kyogle Road to/from the site during school terms in NSW between 8:00 am to 9:30 am and 2:30 pm to 4:00 pm.

## 5.8 Transportation of dangerous goods

For any transportation of dangerous goods, necessary approval will be sought from National Heavy Vehicle Regulator (NHVR). The [NHVR website](#) stipulates that it is a legislative requirement that all road tank vehicles intended to transport dangerous goods must meet the requirements set out in Chapter 6.9 of the Australian Dangerous Goods (ADG) Code. Operators must obtain a Performance Based Standard (PBS) vehicle approval from the NHVR and approval from the Competent Authority in the jurisdiction they wish to operate for the carriage of dangerous goods. NHVR (2018) describes the requirements for PBS approved tankers carrying dangerous goods.

The transport of hazardous or dangerous goods generated during construction would be in accordance with State Environmental Planning Policy No. 33 – *Hazardous and Offensive Development* with relevant mitigation and management measures to be provided within management plans.

## 5.9 Traffic impacts during operational stage

Once completed and operational, the dam will generate some traffic generation on regular basis, primarily by the operational and maintenance crews. Assuming a scheduled maintenance will generate up to 4 trips per day (4 inbound and 4 outbound), comprising:

- up to 3 staff vehicles per day (3 inbound and 3 outbound)
- up to one heavy vehicle per day for transporting replacement parts and equipment, as needed.

Further to above, the dam may attract some regular visitors, primarily during the weekends and school holidays where traffic volumes on the road network are significantly lower than the usual.

Therefore, the additional traffic generated by the operational stage of the dam by the maintenance crews and visitors are minimal. The additional traffic will be absorbed in daily fluctuation of traffic and will not be noticeable.

## 5.10 Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be prepared by the construction contractor by detailing the volume and type of light vehicles at each construction stage, along with construction workers safety and protocol. The CRMP will include all traffic mitigation measure outlined in Section 4.

## 5.11 Vehicle parking provision

Parking will be provided within the construction sites and the accommodation village. No vehicles will be parked on public roads for the duration of the project.

## 6 Mitigation measures

The proposed traffic management mitigation measures for the construction phase of the Proposal are outlined in Table 6.1. Due to the minor volumes of traffic generation, there is no mitigation measure for operational stage of the project.

**Table 6.1 Construction phase mitigation measures**

| Requirement                                                                       | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Timing                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Kyogle Road/Clarrie Hall Dam intersection upgrade                                 | <p>The need for a basic right turn treatment (BAR) on Kyogle Road west approach, and a shortened auxiliary left turn treatment (AUL(s)) on Kyogle Road east approach will be determined during detailed design and designed accordingly, if required.</p> <p>When the locations of the accommodation camp and CBP are confirmed during detailed design, if a lower order treatment is required at this intersection a BAR and BAL treatment will be provided.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Detailed design</p> <p>Pre-construction</p> |
| Worksite traffic control and confirmation of other management measures            | <p>A detailed construction traffic management plan (CTMP) will be developed in consultation with Tweed Shire Council, prior to the commencement of road upgrades and construction of the Proposal. The CTMP will include details on access routes to the site and traffic and access management including, but not limited to:</p> <ul style="list-style-type: none"> <li>informing drivers about the school bus routes along Kyogle Road</li> <li>direction to avoid compression braking near residential receptors</li> <li>direction to avoid heavy vehicle trips during school zone times (8.00 am–9.30 am and 2.30 pm–4.00 pm)</li> <li>in consultation with relevant councils and road authorities, install school bus signs at suitable locations along construction routes if necessary to warn heavy vehicle drivers of student drop-off and pick-up areas</li> <li>responding to local climate conditions that may affect road safety such as fog, dust and wet weather.</li> </ul> <p>The CTMP will be prepared by suitably qualified persons in accordance with the TfNSW 2022 <i>Traffic Control at Work Sites Manual</i>.</p> | Pre-construction                               |
| Vegetation clearing                                                               | Existing overgrown vegetation on Kyogle Road with its intersections of Clarrie Hall Dam Road and Doon Doon Road to be cleared to achieve the required sight distance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Pre-construction                               |
| Adequate road width on Tarcoola Lane, Doon Doon Road and Commissioners Creek Road | <p>The CTMP will include:</p> <ul style="list-style-type: none"> <li>Drivers are to pass opposing traffic on Tarcoola Lane, Doon Doon Road and Commissioners Creek Road where there is adequate road width. It is acknowledged that there are some narrower sections of road where drivers will need to take care when passing.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Pre-construction                               |
| Road maintenance                                                                  | A road maintenance program will be developed in consultation with the relevant road authorities to be undertaken during construction and will include route inspections of all the affected local roads. Any new road pavement damage which occurs to these roads during the project construction period from construction activities, which represent a potential traffic safety risk to the travelling public, will be restored to their pre-construction condition at the completion of construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Pre-construction and during construction       |
| Heavy vehicle movement restriction during school hours                            | Heavy vehicles will not travel through Kyogle Road, Doon Doon Road and Commissioners Creek Road from 8:00 am to 9:30 am and 2:30 pm to 4:00 pm.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | During construction                            |

The above recommendations and mitigation measures will be implemented as part of the conditions of consent of this project.



## 7 Conclusion

This traffic impact assessment has been undertaken to support the EIS for the Clarrie Hall Dam raising and McCabes bridge construction to be completed by Tweed Shire Council.

Two options for the CBP and staff accommodation have been assessed and any resultant upgrades required will be confirmed during detailed design.

The key construction and operational traffic impacts identified by this assessment are as follows:

- All key intersections operate at LOS A in peak hours for all options proposed and all scenarios.
- A basic left turn (BAL) and basic right turn (BAR) treatment will be required for all intersections, except for Kyogle Road/Clarrie Hall Dam Road under Option 1 (Section 5.2.3), where a shortened auxiliary left turn (AUL(s)) treatment and BAR treatment will be required.
- Due to the narrowness of the roads, further intersection upgrades will be required to enable construction vehicles to turn at Kyogle Road/Tarcoola Lane, Kyogle Road/Clarrie Hall Dam Road and Kyogle Road/Doon Doon Road as shown in Appendix D.
- Vegetation at Kyogle Road/Clarrie Hall Dam Road and Kyogle Road/Doon Doon Road will require clearing to ensure clear sight lines for turning traffic.
- Impacts to public transport, pedestrian and cyclist movements will be negligible. Detailed traffic management requirements would be specified in the project's CTMP to manage and mitigate potential traffic safety conflicts with road users including school buses along the haulage route.

## References

Austroads. (2016). *Guide to Road Design Part 3: Geometric Design*.

Austroads. (2016). *Guide to Traffic Management Part 3: Traffic Studies and Analysis*.

Austroads. (2017). *Guide to Road Design Part 4: Intersections and Crossings - General*.

Austroads. (2017). *Guide to Road Design Part 4A: Unsignalised & Signalised Intersections*.

RTA. (2002). *Guide to Traffic Generating Developments*.

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# Appendix A

## Traffic survey data

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## A.1 Kyogle Road/Clarrie Hall Dam Road intersection

The intersection counts for Kyogle Road/Clarrie Hall Dam Road were taken in February 2023 and are shown in Table A.1 and Table A.2.

**Table A.1** Light vehicle traffic survey volumes at Kyogle Road/Clarrie Hall Dam Road

| Time         |            | Kyogle Road east approach |           | Clarrie Hall Dam Road south approach |           | Kyogle Road west approach |           |
|--------------|------------|---------------------------|-----------|--------------------------------------|-----------|---------------------------|-----------|
| Period start | Period end | Westbound                 | Left turn | Right turn                           | Left turn | Right turn                | Eastbound |
| 7:00:00 AM   | 7:15:00 AM | 10                        | 1         | 0                                    | 1         | 1                         | 14        |
| 7:15:00 AM   | 7:30:00 AM | 19                        | 0         | 1                                    | 0         | 0                         | 20        |
| 7:30:00 AM   | 7:45:00 AM | 10                        | 0         | 0                                    | 0         | 0                         | 25        |
| 7:45:00 AM   | 8:00:00 AM | 13                        | 1         | 0                                    | 0         | 0                         | 23        |
| 8:00:00 AM   | 8:15:00 AM | 25                        | 1         | 1                                    | 1         | 0                         | 21        |
| 8:15:00 AM   | 8:30:00 AM | 21                        | 1         | 1                                    | 0         | 0                         | 41        |
| 8:30:00 AM   | 8:45:00 AM | 18                        | 0         | 0                                    | 0         | 0                         | 41        |
| 8:45:00 AM   | 9:00:00 AM | 24                        | 1         | 2                                    | 1         | 0                         | 21        |
| 4:00:00 PM   | 4:15:00 PM | 32                        | 1         | 0                                    | 0         | 0                         | 16        |
| 4:15:00 PM   | 4:30:00 PM | 26                        | 1         | 0                                    | 0         | 0                         | 19        |
| 4:30:00 PM   | 4:45:00 PM | 30                        | 0         | 0                                    | 1         | 0                         | 18        |
| 4:45:00 PM   | 5:00:00 PM | 23                        | 0         | 0                                    | 1         | 0                         | 24        |
| 5:00:00 PM   | 5:15:00 PM | 25                        | 0         | 0                                    | 0         | 0                         | 22        |
| 5:15:00 PM   | 5:30:00 PM | 17                        | 0         | 0                                    | 0         | 0                         | 20        |
| 5:30:00 PM   | 5:45:00 PM | 13                        | 0         | 0                                    | 0         | 0                         | 17        |
| 5:45:00 PM   | 6:00:00 PM | 15                        | 0         | 0                                    | 0         | 0                         | 11        |



**Table A.2      Heavy vehicle traffic survey volumes at Kyogle Road/Clarrie Hall Dam Road**

| Time         |            | Kyogle Road east approach |           | Clarrie Hall Dam Road south approach |           | Kyogle Road west approach |           |
|--------------|------------|---------------------------|-----------|--------------------------------------|-----------|---------------------------|-----------|
| Period start | Period end | Westbound                 | Left turn | Right turn                           | Left turn | Right turn                | Eastbound |
| 7:00:00 AM   | 7:15:00 AM | 3                         | 0         | 0                                    | 0         | 0                         | 1         |
| 7:15:00 AM   | 7:30:00 AM | 3                         | 0         | 0                                    | 0         | 0                         | 2         |
| 7:30:00 AM   | 7:45:00 AM | 1                         | 0         | 0                                    | 0         | 0                         | 4         |
| 7:45:00 AM   | 8:00:00 AM | 4                         | 0         | 0                                    | 0         | 0                         | 4         |
| 8:00:00 AM   | 8:15:00 AM | 4                         | 0         | 0                                    | 0         | 0                         | 2         |
| 8:15:00 AM   | 8:30:00 AM | 0                         | 0         | 0                                    | 0         | 1                         | 0         |
| 8:30:00 AM   | 8:45:00 AM | 0                         | 0         | 0                                    | 0         | 0                         | 1         |
| 8:45:00 AM   | 9:00:00 AM | 0                         | 0         | 0                                    | 0         | 0                         | 1         |
| 4:00:00 PM   | 4:15:00 PM | 2                         | 0         | 0                                    | 0         | 0                         | 6         |
| 4:15:00 PM   | 4:30:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 0         |
| 4:30:00 PM   | 4:45:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 3         |
| 4:45:00 PM   | 5:00:00 PM | 1                         | 0         | 0                                    | 0         | 0                         | 2         |
| 5:00:00 PM   | 5:15:00 PM | 1                         | 0         | 0                                    | 0         | 0                         | 0         |
| 5:15:00 PM   | 5:30:00 PM | 1                         | 0         | 0                                    | 0         | 0                         | 0         |
| 5:30:00 PM   | 5:45:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 0         |
| 5:45:00 PM   | 6:00:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 1         |

## A.2 Kyogle Road/Doon Doon Road intersection

The intersection counts for Kyogle Road/Clarrie Hall Dam Road were taken in February 2023 and are shown in Table A.3 and Table A.4.

**Table A.3** Light vehicle traffic survey volumes at Kyogle Road/Doon Doon Road

| Time         |            | Kyogle Road east approach |           | Clarrie Hall Dam Road south approach |           | Kyogle Road west approach |           |
|--------------|------------|---------------------------|-----------|--------------------------------------|-----------|---------------------------|-----------|
| Period start | Period end | Westbound                 | Left turn | Right turn                           | Left turn | Right turn                | Eastbound |
| 7:00:00 AM   | 7:15:00 AM | 8                         | 0         | 2                                    | 1         | 0                         | 5         |
| 7:15:00 AM   | 7:30:00 AM | 7                         | 4         | 0                                    | 1         | 0                         | 10        |
| 7:30:00 AM   | 7:45:00 AM | 12                        | 1         | 6                                    | 0         | 1                         | 13        |
| 7:45:00 AM   | 8:00:00 AM | 6                         | 1         | 3                                    | 1         | 0                         | 13        |
| 8:00:00 AM   | 8:15:00 AM | 9                         | 1         | 3                                    | 0         | 1                         | 18        |
| 8:15:00 AM   | 8:30:00 AM | 10                        | 2         | 5                                    | 1         | 1                         | 24        |
| 8:30:00 AM   | 8:45:00 AM | 15                        | 2         | 14                                   | 2         | 2                         | 14        |
| 8:45:00 AM   | 9:00:00 AM | 16                        | 2         | 2                                    | 3         | 4                         | 21        |
| 4:00:00 PM   | 4:15:00 PM | 23                        | 3         | 0                                    | 1         | 0                         | 21        |
| 4:15:00 PM   | 4:30:00 PM | 9                         | 7         | 2                                    | 1         | 1                         | 16        |
| 4:30:00 PM   | 4:45:00 PM | 18                        | 5         | 2                                    | 2         | 1                         | 10        |
| 4:45:00 PM   | 5:00:00 PM | 18                        | 3         | 2                                    | 0         | 1                         | 13        |
| 5:00:00 PM   | 5:15:00 PM | 13                        | 3         | 1                                    | 0         | 2                         | 10        |
| 5:15:00 PM   | 5:30:00 PM | 26                        | 3         | 3                                    | 0         | 0                         | 15        |
| 5:30:00 PM   | 5:45:00 PM | 20                        | 5         | 0                                    | 0         | 1                         | 8         |
| 5:45:00 PM   | 6:00:00 PM | 10                        | 5         | 6                                    | 2         | 0                         | 10        |

**Table A.4      Heavy vehicle traffic survey volumes at Kyogle Road/Doon Doon Road**

| Time         |            | Kyogle Road east approach |           | Clarrie Hall Dam Road south approach |           | Kyogle Road west approach |           |
|--------------|------------|---------------------------|-----------|--------------------------------------|-----------|---------------------------|-----------|
| Period start | Period end | Westbound                 | Left turn | Right turn                           | Left turn | Right turn                | Eastbound |
| 7:00:00 AM   | 7:15:00 AM | 2                         | 1         | 1                                    | 0         | 0                         | 0         |
| 7:15:00 AM   | 7:30:00 AM | 5                         | 0         | 0                                    | 0         | 0                         | 0         |
| 7:30:00 AM   | 7:45:00 AM | 2                         | 0         | 0                                    | 0         | 0                         | 3         |
| 7:45:00 AM   | 8:00:00 AM | 0                         | 0         | 1                                    | 0         | 1                         | 1         |
| 8:00:00 AM   | 8:15:00 AM | 4                         | 0         | 0                                    | 0         | 0                         | 0         |
| 8:15:00 AM   | 8:30:00 AM | 4                         | 1         | 1                                    | 0         | 0                         | 1         |
| 8:30:00 AM   | 8:45:00 AM | 3                         | 0         | 1                                    | 0         | 1                         | 2         |
| 8:45:00 AM   | 9:00:00 AM | 3                         | 1         | 0                                    | 0         | 0                         | 0         |
| 4:00:00 PM   | 4:15:00 PM | 0                         | 2         | 0                                    | 0         | 0                         | 1         |
| 4:15:00 PM   | 4:30:00 PM | 0                         | 0         | 2                                    | 1         | 0                         | 0         |
| 4:30:00 PM   | 4:45:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 4         |
| 4:45:00 PM   | 5:00:00 PM | 1                         | 0         | 0                                    | 0         | 0                         | 2         |
| 5:00:00 PM   | 5:15:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 0         |
| 5:15:00 PM   | 5:30:00 PM | 0                         | 1         | 0                                    | 0         | 0                         | 1         |
| 5:30:00 PM   | 5:45:00 PM | 0                         | 1         | 0                                    | 0         | 0                         | 0         |
| 5:45:00 PM   | 6:00:00 PM | 0                         | 0         | 0                                    | 0         | 0                         | 0         |

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# Appendix B

## Tube counts

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## **MetroCount Traffic Executive** **Weekly Vehicle Counts (Virtual Week)**

### **VirtWeeklyVehicle-867 -- English (ENA)**

#### **Datasets:**

**Site:** [270] M.R.142 west of Uki at 50/80 kph sign.  
**Attribute:**  
**Direction:** 8 - East bound A>B, West bound B>A. **Lane:** 0  
**Survey Duration:** 12:00 Friday, 10 February 2023 => 14:58 Friday, 17 February 2023,  
**Zone:**  
**File:** 270 0 2023-02-17 1458.EC0 (Plus )  
**Identifier:** KB004E35 MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v5.07)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023 (7)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = East, Lane = 0-16  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 17715 / 18054 (98.12%)

# Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-867

Site:

270.0.1EW

Description:

M.R.142 west of Uki at 50/80 kph sign.

Filter time:

12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023

Scheme:

Vehicle classification (AustRoads94)

Filter:

Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

|           | Mon           | Tue           | Wed           | Thu           | Fri           | Sat           | Sun           | Averages<br>1 - 5 | 1 - 7  |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|--------|
| Hour      |               |               |               |               |               |               |               |                   |        |
| 0000-0100 | 4.0           | 4.0           | 6.0           | 1.0           | 9.0           | 5.0           | 9.0           | 4.8               | 5.4    |
| 0100-0200 | 2.0           | 1.0           | 4.0           | 5.0           | 0.0           | 6.0           | 2.0           | 2.4               | 2.9    |
| 0200-0300 | 2.0           | 0.0           | 2.0           | 2.0           | 1.0           | 1.0           | 4.0           | 1.4               | 1.7    |
| 0300-0400 | 1.0           | 2.0           | 0.0           | 1.0           | 4.0           | 2.0           | 3.0           | 1.6               | 1.9    |
| 0400-0500 | 7.0           | 7.0           | 4.0           | 9.0           | 7.0           | 3.0           | 3.0           | 6.8               | 5.7    |
| 0500-0600 | 33.0          | 36.0          | 35.0          | 39.0          | 33.0          | 14.0          | 8.0           | 35.2              | 28.3   |
| 0600-0700 | 102.0         | 108.0         | 114.0         | 106.0         | 105.0         | 43.0          | 20.0          | 107.0             | 85.4   |
| 0700-0800 | 183.0         | 166.0         | 170.0         | 163.0         | 156.0         | 71.0          | 51.0          | 167.6             | 137.1  |
| 0800-0900 | 195.0         | 222.0         | 238.0         | 257.0         | 211.0         | 157.0         | 125.0         | 224.6             | 200.7  |
| 0900-1000 | 147.0         | 185.0         | 164.0         | 144.0         | 191.0         | 220.0         | 147.0         | 166.2             | 171.1  |
| 1000-1100 | 140.0         | 164.0         | 149.0         | 159.0         | 153.0         | 233.0         | 196.0         | 153.0             | 170.6  |
| 1100-1200 | 169.0         | 196.0         | 163.0         | 172.0         | 188.0         | 246.0         | 202.0         | 177.6             | 190.9  |
| 1200-1300 | 147.0         | 201.0         | 171.0         | 151.0         | 190.0         | 291.0         | 251.0         | 172.0             | 200.3  |
| 1300-1400 | 194.0         | 160.0         | 179.0         | 205.0         | 231.0         | 241.0         | 234.0         | 193.8             | 206.3  |
| 1400-1500 | 215.0         | 216.0         | 222.0         | 217.0         | 290.0         | 216.0         | 199.0         | 232.0             | 225.0  |
| 1500-1600 | 194.0         | 206.0         | 192.0         | 202.0         | 220.0         | 199.0         | 227.0         | 202.8             | 205.7  |
| 1600-1700 | 214.0         | 203.0         | 219.0         | 233.0         | 228.0         | 156.0         | 183.0         | 219.4             | 205.1  |
| 1700-1800 | 162.0         | 161.0         | 213.0         | 172.0         | 169.0         | 150.0         | 152.0         | 175.4             | 168.4  |
| 1800-1900 | 125.0         | 104.0         | 134.0         | 114.0         | 143.0         | 132.0         | 107.0         | 124.0             | 122.7  |
| 1900-2000 | 61.0          | 57.0          | 100.0         | 77.0          | 65.0          | 102.0         | 75.0          | 72.0              | 76.7   |
| 2000-2100 | 54.0          | 29.0          | 60.0          | 45.0          | 58.0          | 62.0          | 48.0          | 49.2              | 50.9   |
| 2100-2200 | 31.0          | 27.0          | 25.0          | 31.0          | 39.0          | 57.0          | 37.0          | 30.6              | 35.3   |
| 2200-2300 | 18.0          | 12.0          | 14.0          | 21.0          | 38.0          | 25.0          | 17.0          | 20.6              | 20.7   |
| 2300-2400 | 7.0           | 10.0          | 9.0           | 10.0          | 14.0          | 24.0          | 9.0           | 10.0              | 11.9   |
| Totals    |               |               |               |               |               |               |               |                   |        |
| 0700-1900 | 2085.0        | 2184.0        | 2214.0        | 2189.0        | 2370.0        | 2312.0        | 2074.0        | 2208.4            | 2204.0 |
| 0600-2200 | 2333.0        | 2405.0        | 2513.0        | 2448.0        | 2637.0        | 2576.0        | 2254.0        | 2467.2            | 2452.3 |
| 0600-0000 | 2358.0        | 2427.0        | 2536.0        | 2479.0        | 2689.0        | 2625.0        | 2280.0        | 2497.8            | 2484.9 |
| 0000-0000 | 2407.0        | 2477.0        | 2587.0        | 2536.0        | 2743.0        | 2656.0        | 2309.0        | 2550.0            | 2530.7 |
| AM Peak   | 0800<br>195.0 | 0800<br>222.0 | 0800<br>238.0 | 0800<br>257.0 | 0800<br>211.0 | 1100<br>246.0 | 1100<br>202.0 |                   |        |
| PM Peak   | 1400<br>215.0 | 1400<br>216.0 | 1400<br>222.0 | 1600<br>233.0 | 1400<br>290.0 | 1200<br>291.0 | 1200<br>251.0 |                   |        |

## Class Speed Matrix

**ClassMatrix-868**

**Site:** 270.0.1EW

**Description:** M.R.142 west of Uki at 50/80 kph sign.

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023

**Scheme:** Vehicle classification (AustRoads94)

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

| Class   |       |      |      |      |      |      |      |      |      |      |      |      |            |
|---------|-------|------|------|------|------|------|------|------|------|------|------|------|------------|
|         | SV    | SVT  | TB2  | TB3  | T4   | ART3 | ART4 | ART5 | ART6 | BD   | DRT  | TRT  | Total      |
| km/h    | 1     | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |            |
| 10- 20  | 13    | 1    | 2    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 16 0.1%    |
| 20- 30  | 60    | 2    | 11   | 3    | .    | .    | 1    | .    | .    | 1    | .    | .    | 78 0.4%    |
| 30- 40  | 285   | 14   | 38   | 8    | 1    | 2    | .    | .    | 1    | .    | .    | .    | 349 2.0%   |
| 40- 50  | 1759  | 44   | 172  | 13   | 11   | 7    | 5    | 4    | 22   | 6    | 1    | .    | 2044 11.5% |
| 50- 60  | 4554  | 113  | 439  | 46   | 20   | 12   | 20   | 3    | 51   | 8    | 1    | .    | 5267 29.7% |
| 60- 70  | 5076  | 123  | 514  | 41   | 15   | 14   | 21   | 2    | 36   | 4    | .    | .    | 5846 33.0% |
| 70- 80  | 2582  | 77   | 305  | 7    | 2    | 16   | 14   | .    | 21   | 4    | .    | .    | 3028 17.1% |
| 80- 90  | 708   | 17   | 108  | 1    | .    | 2    | 2    | .    | 5    | .    | .    | .    | 843 4.8%   |
| 90-100  | 162   | 3    | 19   | .    | .    | .    | .    | .    | .    | .    | .    | .    | 184 1.0%   |
| 100-110 | 40    | .    | 8    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 48 0.3%    |
| 110-120 | 8     | .    | 2    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 10 0.1%    |
| 120-130 | .     | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 0 0.0%     |
| 130-140 | .     | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 0 0.0%     |
| 140-150 | 1     | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 1 0.0%     |
| 150-160 | 1     | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | .    | 1 0.0%     |
| Total   | 15249 | 394  | 1618 | 119  | 49   | 53   | 63   | 9    | 136  | 23   | 2    | 0    | 17715      |
|         | 86.1% | 2.2% | 9.1% | 0.7% | 0.3% | 0.3% | 0.4% | 0.1% | 0.8% | 0.1% | 0.0% | 0.0% |            |

### Speed Statistics by Hour

#### SpeedStatHour-869

**Site:** 270.0.1EW  
**Description:** M.R.142 west of Uki at 50/80 kph sign.  
**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023  
**Scheme:** Vehicle classification (AustRoads94)  
**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 17715

Posted speed limit = 80 km/h, Exceeding = 1087 (6.136%), Mean Exceeding = 86.74 km/h

Maximum = 155.0 km/h, Minimum = 11.7 km/h, Mean = 62.0 km/h

85% Speed = 73.80 km/h, 95% Speed = 81.2 km/h, Median = 61.74 km/h

20 km/h Pace = 50 - 70, Number in Pace = 11111 (62.72%)

Variance = 137.82, Standard Deviation = 11.74 km/h

#### Hour Bins

| Time | Bin          | Min  | Max   | Mean | Median | 85%  | 95%   | >PSL<br>80 km/h |
|------|--------------|------|-------|------|--------|------|-------|-----------------|
| 0000 | 38 0.215%    | 25.2 | 95.0  | 66.4 | 66.4   | 80.8 | 91.3  | 6 15.79%        |
| 0100 | 20 0.113%    | 50.3 | 113.6 | 69.9 | 67.6   | 83.6 | 112.2 | 3 15.00%        |
| 0200 | 12 0.068%    | 54.9 | 89.7  | 70.0 | 72.1   | 82.1 | 89.7  | 2 16.67%        |
| 0300 | 13 0.073%    | 45.8 | 97.8  | 70.0 | 72.0   | 85.9 | 97.8  | 4 30.77%        |
| 0400 | 40 0.226%    | 49.4 | 100.3 | 72.0 | 71.5   | 82.3 | 94.5  | 7 17.50%        |
| 0500 | 198 1.118%   | 48.0 | 111.2 | 75.3 | 75.2   | 88.2 | 95.6  | 61 30.81%       |
| 0600 | 598 3.376%   | 15.4 | 106.8 | 69.6 | 69.3   | 81.6 | 90.0  | 109 18.23%      |
| 0700 | 960 5.419%   | 14.4 | 106.7 | 64.1 | 64.6   | 74.7 | 81.2  | 60 6.250%       |
| 0800 | 1405 7.931%  | 21.1 | 115.9 | 62.0 | 61.9   | 71.5 | 78.4  | 56 3.986%       |
| 0900 | 1198 6.763%  | 21.4 | 106.8 | 59.7 | 59.6   | 70.6 | 77.2  | 36 3.005%       |
| 1000 | 1194 6.740%  | 14.3 | 103.4 | 60.3 | 60.5   | 71.8 | 77.8  | 43 3.601%       |
| 1100 | 1336 7.542%  | 20.0 | 105.4 | 59.0 | 58.5   | 69.4 | 77.8  | 48 3.593%       |
| 1200 | 1402 7.914%  | 25.3 | 108.0 | 60.7 | 60.3   | 72.2 | 78.3  | 53 3.780%       |
| 1300 | 1444 8.151%  | 21.3 | 103.5 | 59.7 | 59.8   | 71.3 | 77.6  | 50 3.463%       |
| 1400 | 1575 8.891%  | 14.0 | 118.9 | 60.4 | 60.3   | 70.7 | 77.5  | 54 3.429%       |
| 1500 | 1440 8.129%  | 22.2 | 107.3 | 60.6 | 60.5   | 71.6 | 78.1  | 60 4.167%       |
| 1600 | 1436 8.106%  | 19.2 | 108.1 | 62.3 | 61.9   | 75.0 | 83.2  | 110 7.660%      |
| 1700 | 1179 6.655%  | 11.7 | 155.0 | 63.2 | 63.2   | 75.8 | 82.4  | 89 7.549%       |
| 1800 | 859 4.849%   | 21.1 | 114.3 | 64.4 | 64.4   | 76.9 | 84.8  | 88 10.24%       |
| 1900 | 537 3.031%   | 18.2 | 116.9 | 63.6 | 64.4   | 76.1 | 83.2  | 49 9.125%       |
| 2000 | 356 2.010%   | 31.7 | 113.2 | 65.6 | 65.0   | 76.9 | 83.7  | 28 7.865%       |
| 2100 | 247 1.394%   | 30.5 | 108.3 | 67.5 | 66.8   | 78.7 | 87.6  | 33 13.36%       |
| 2200 | 145 0.819%   | 17.6 | 93.6  | 67.7 | 67.7   | 80.7 | 87.7  | 25 17.24%       |
| 2300 | 83 0.469%    | 15.3 | 146.7 | 69.3 | 67.7   | 80.6 | 95.8  | 13 15.66%       |
| ---- | 17715 100.0% | 11.7 | 155.0 | 62.0 | 61.7   | 73.8 | 81.2  | 1087 6.136%     |



## Speed Histogram

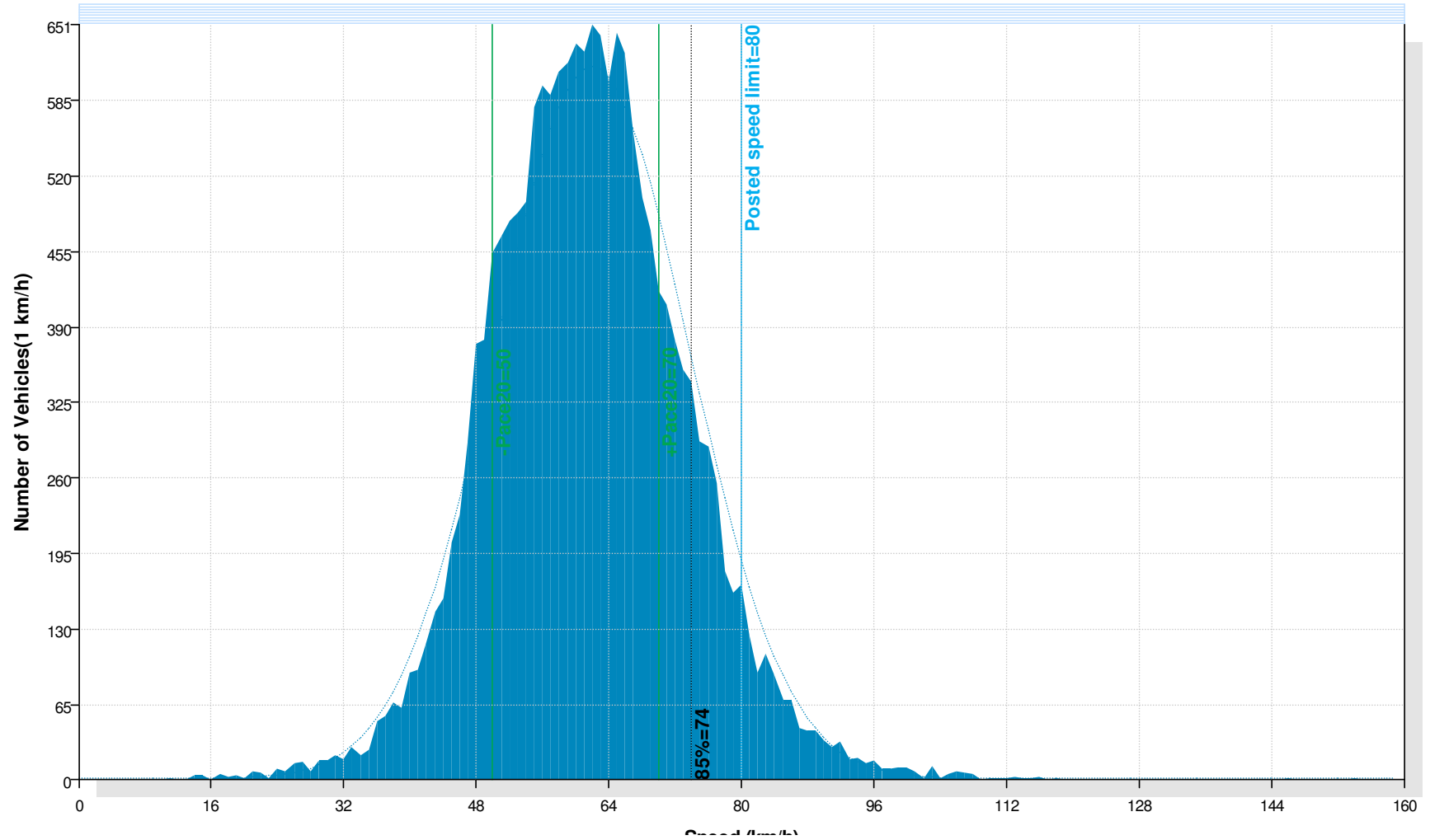
**SpeedHist-870** (Metric) **Site:** 270.0.1EW

**Description:** M.R.142 west of Uki at 50/80 kph sign.

**Filter time:** 12:00 Friday, 10 February 2023 => 14:58 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)



## Speed Bin Chart

**SpeedBin-871** (Metric) **Site:** 270.0.1EW

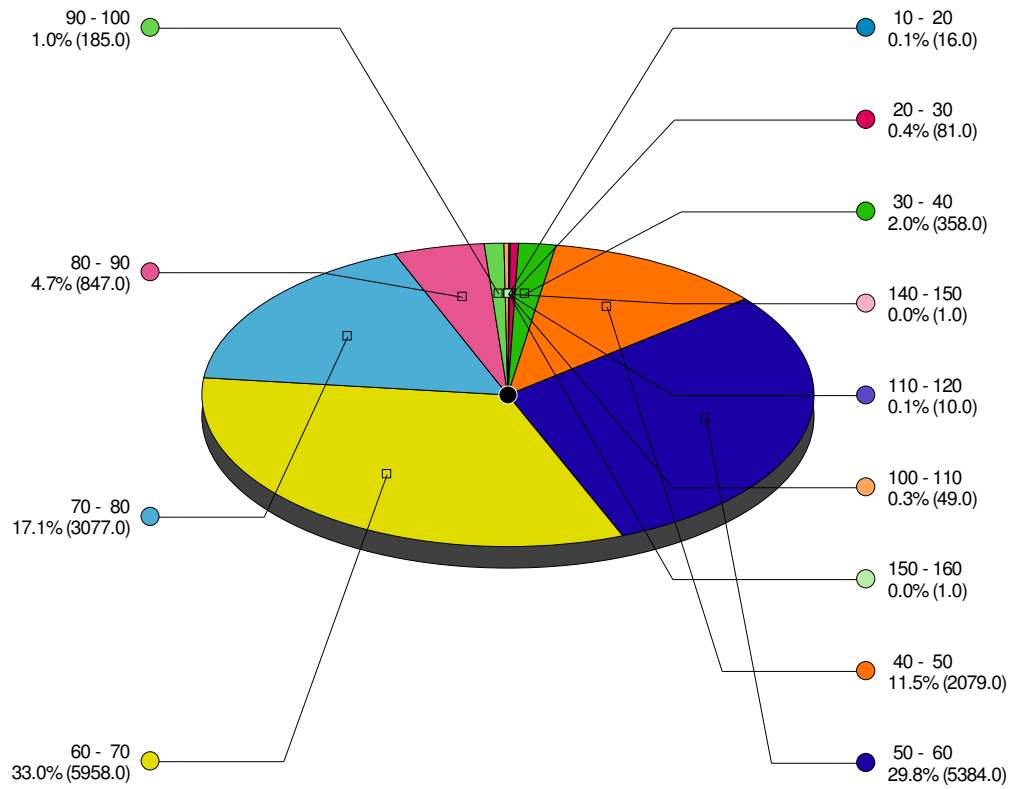
**Description:** M.R.142 west of Uki at 50/80 kph sign.

**Filter time:** 12:00 Friday, 10 February 2023 => 14:58 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=18046



## Class Bin Chart

**ClassBin-872** (Metric) **Site:** 270.0.1EW

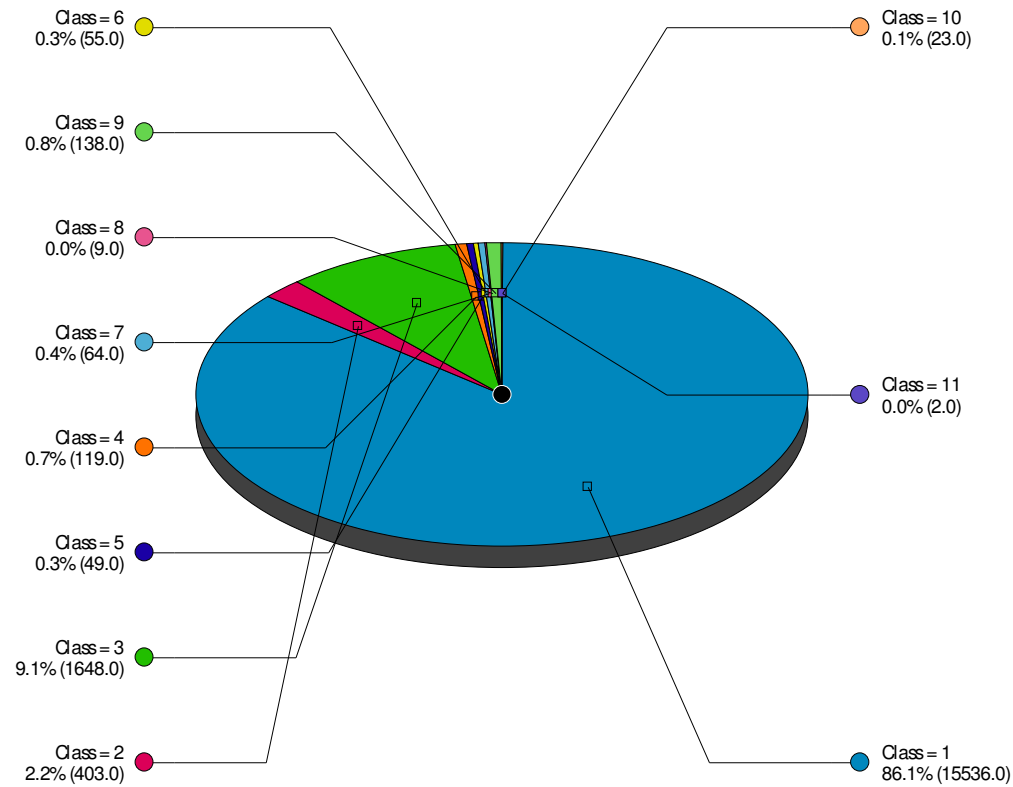
**Description:** M.R.142 west of Uki at 50/80 kph sign.

**Filter time:** 12:00 Friday, 10 February 2023 => 14:58 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=18046



## **MetroCount Traffic Executive** **Weekly Vehicle Counts (Virtual Week)**

### **VirtWeeklyVehicle-879 -- English (ENA)**

#### **Datasets:**

**Site:** [] M.R.142 Kyogle Road at No 2129 (80Kph)  
**Attribute:**  
**Direction:** 8 - East bound A>B, West bound B>A. **Lane:** 0  
**Survey Duration:** 12:00 Friday, 10 February 2023 => 14:56 Friday, 17 February 2023,  
**Zone:**  
**File:** 0 2023-02-17 1456.EC0 (Plus )  
**Identifier:** QQ49RYRP MC5900-X13 (c)MetroCount 09Nov16  
**Algorithm:** Factory default axle (v5.07)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023 (7)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = East, Lane = 0-16  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 15692 / 16049 (97.78%)



# Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-879

Site:

.0.1EW

Description:

M.R.142 at No 2129 (80Kphh)

Filter time:

12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023

Scheme:

Vehicle classification (AustRoads94)

Filter:

Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

|           | Mon    | Tue    | Wed    | Thu    | Fri    | Sat    | Sun    | Averages<br>1 - 5 | 1 - 7  |
|-----------|--------|--------|--------|--------|--------|--------|--------|-------------------|--------|
| Hour      |        |        |        |        |        |        |        |                   |        |
| 0000-0100 | 3.0    | 5.0    | 6.0    | 0.0    | 7.0    | 5.0    | 9.0    | 4.2               | 5.0    |
| 0100-0200 | 3.0    | 0.0    | 5.0    | 6.0    | 1.0    | 6.0    | 2.0    | 3.0               | 3.3    |
| 0200-0300 | 2.0    | 1.0    | 2.0    | 1.0    | 0.0    | 2.0    | 3.0    | 1.2               | 1.6    |
| 0300-0400 | 1.0    | 2.0    | 0.0    | 1.0    | 4.0    | 0.0    | 1.0    | 1.6               | 1.3    |
| 0400-0500 | 4.0    | 8.0    | 4.0    | 8.0    | 8.0    | 4.0    | 3.0    | 6.4               | 5.6    |
| 0500-0600 | 33.0   | 34.0   | 29.0   | 37.0   | 32.0   | 8.0    | 8.0    | 33.0              | 25.9   |
| 0600-0700 | 96.0   | 100.0  | 107.0  | 95.0   | 89.0   | 40.0   | 19.0   | 97.4              | 78.0   |
| 0700-0800 | 172.0  | 156.0  | 152.0  | 146.0  | 148.0  | 64.0   | 50.0   | 154.8             | 126.9  |
| 0800-0900 | 165.0  | 191.0  | 215.0  | 211.0  | 190.0  | 135.0  | 93.0   | 194.4             | 171.4  |
| 0900-1000 | 132.0  | 164.0  | 150.0  | 129.0  | 157.0  | 186.0  | 135.0  | 146.4             | 150.4  |
| 1000-1100 | 122.0  | 152.0  | 130.0  | 132.0  | 152.0  | 206.0  | 168.0  | 137.6             | 151.7  |
| 1100-1200 | 138.0  | 166.0  | 143.0  | 150.0  | 172.0  | 212.0  | 186.0  | 153.8             | 166.7  |
| 1200-1300 | 134.0  | 196.0  | 154.0  | 143.0  | 159.0  | 264.0  | 236.0  | 157.2             | 183.7  |
| 1300-1400 | 164.0  | 153.0  | 149.0  | 183.0  | 195.0  | 217.0  | 205.0  | 168.8             | 180.9  |
| 1400-1500 | 171.0  | 191.0  | 192.0  | 203.0  | 253.0  | 192.0  | 178.0  | 202.0             | 197.1  |
| 1500-1600 | 179.0  | 189.0  | 160.0  | 168.0  | 201.0  | 183.0  | 212.0  | 179.4             | 184.6  |
| 1600-1700 | 182.0  | 194.0  | 182.0  | 210.0  | 209.0  | 143.0  | 175.0  | 195.4             | 185.0  |
| 1700-1800 | 145.0  | 130.0  | 162.0  | 154.0  | 156.0  | 136.0  | 130.0  | 149.4             | 144.7  |
| 1800-1900 | 105.0  | 94.0   | 93.0   | 106.0  | 130.0  | 123.0  | 103.0  | 105.6             | 107.7  |
| 1900-2000 | 53.0   | 58.0   | 48.0   | 63.0   | 65.0   | 85.0   | 71.0   | 57.4              | 63.3   |
| 2000-2100 | 44.0   | 27.0   | 48.0   | 40.0   | 54.0   | 66.0   | 39.0   | 42.6              | 45.4   |
| 2100-2200 | 29.0   | 25.0   | 26.0   | 27.0   | 35.0   | 47.0   | 29.0   | 28.4              | 31.1   |
| 2200-2300 | 20.0   | 11.0   | 13.0   | 21.0   | 31.0   | 28.0   | 17.0   | 19.2              | 20.1   |
| 2300-2400 | 5.0    | 8.0    | 13.0   | 9.0    | 13.0   | 16.0   | 8.0    | 9.6               | 10.3   |
| Totals    |        |        |        |        |        |        |        |                   |        |
| 0700-1900 | 1809.0 | 1976.0 | 1882.0 | 1935.0 | 2122.0 | 2061.0 | 1871.0 | 1944.8            | 1950.9 |
| 0600-2200 | 2031.0 | 2186.0 | 2111.0 | 2160.0 | 2365.0 | 2299.0 | 2029.0 | 2170.6            | 2168.7 |
| 0600-0000 | 2056.0 | 2205.0 | 2137.0 | 2190.0 | 2409.0 | 2343.0 | 2054.0 | 2199.4            | 2199.1 |
| 0000-0000 | 2102.0 | 2255.0 | 2183.0 | 2243.0 | 2461.0 | 2368.0 | 2080.0 | 2248.8            | 2241.7 |
| AM Peak   | 0700   | 0800   | 0800   | 0800   | 0800   | 1100   | 1100   |                   |        |
|           | 172.0  | 191.0  | 215.0  | 211.0  | 190.0  | 212.0  | 186.0  |                   |        |
| PM Peak   | 1600   | 1200   | 1400   | 1600   | 1400   | 1200   | 1200   |                   |        |
|           | 182.0  | 196.0  | 192.0  | 210.0  | 253.0  | 264.0  | 236.0  |                   |        |

## Class Speed Matrix

**ClassMatrix-880**

**Site:** .0.1EW

**Description:** M.R.142 at No 2129 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023

**Scheme:** Vehicle classification (AustRoads94)

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

| Class   |         |          |          |          |         |           |           |           |           |          |           |           |            |
|---------|---------|----------|----------|----------|---------|-----------|-----------|-----------|-----------|----------|-----------|-----------|------------|
| km/h    | SV<br>1 | SVT<br>2 | TB2<br>3 | TB3<br>4 | T4<br>5 | ART3<br>6 | ART4<br>7 | ART5<br>8 | ART6<br>9 | BD<br>10 | DRT<br>11 | TRT<br>12 | Total      |
| 10- 20  | 6       | .        | 1        | 1        | .       | .         | .         | .         | .         | .        | .         | .         | 8 0.1%     |
| 20- 30  | 20      | .        | 5        | 1        | 1       | .         | .         | .         | .         | .        | .         | .         | 27 0.2%    |
| 30- 40  | 27      | 2        | 1        | 2        | .       | .         | .         | .         | .         | .        | .         | .         | 32 0.2%    |
| 40- 50  | 142     | 10       | 21       | 5        | 1       | .         | 2         | .         | .         | .        | .         | .         | 181 1.2%   |
| 50- 60  | 1690    | 64       | 194      | 28       | 9       | 3         | 7         | 3         | 24        | 4        | .         | .         | 2026 12.9% |
| 60- 70  | 5696    | 168      | 545      | 61       | 24      | 20        | 18        | 4         | 81        | 10       | 2         | .         | 6629 42.2% |
| 70- 80  | 4506    | 102      | 428      | 20       | 9       | 23        | 17        | .         | 23        | 4        | .         | .         | 5132 32.7% |
| 80- 90  | 1240    | 21       | 171      | 3        | 1       | 3         | 1         | .         | .         | 1        | 1         | .         | 1442 9.2%  |
| 90-100  | 152     | 2        | 33       | .        | .       | .         | .         | .         | .         | .        | .         | .         | 187 1.2%   |
| 100-110 | 17      | .        | 6        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 23 0.1%    |
| 110-120 | 4       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 4 0.0%     |
| 120-130 | 1       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 1 0.0%     |
| 130-140 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%     |
| 140-150 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%     |
| 150-160 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%     |
| Total   | 13501   | 369      | 1405     | 121      | 45      | 49        | 45        | 7         | 128       | 19       | 3         | 0         | 15692      |
|         | 86.0%   | 2.4%     | 9.0%     | 0.8%     | 0.3%    | 0.3%      | 0.3%      | 0.0%      | 0.8%      | 0.1%     | 0.0%      | 0.0%      |            |

### Speed Statistics by Hour

SpeedStatHour-881

Site: .0.1EW  
 Description: **M.R.142 at No 2129 (80Kphh)**  
 Filter time: **12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023**  
 Scheme: Vehicle classification (AustRoads94)  
 Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 15692

Posted speed limit = 80 km/h, Exceeding = 1657 (10.56%), Mean Exceeding = 85.01 km/h

Maximum = 120.9 km/h, Minimum = 11.0 km/h, Mean = 68.9 km/h

85% Speed = 77.76 km/h, 95% Speed = 83.88 km/h, Median = 68.58 km/h

20 km/h Pace = 58 - 78, Number in Pace = 11944 (76.12%)

Variance = 82.86, Standard Deviation = 9.10 km/h

### Hour Bins

| Time | Bin                 | Min         | Max          | Mean        | Median      | 85%         | 95%         | >PSL<br>80 km/h    |
|------|---------------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------------|
| 0000 | 35 0.223%           | 54.2        | 87.4         | 68.4        | 67.3        | 81.0        | 84.5        | 6 17.14%           |
| 0100 | 23 0.147%           | 35.9        | 107.6        | 63.4        | 63.4        | 73.6        | 101.4       | 1 4.348%           |
| 0200 | 11 0.070%           | 56.6        | 79.0         | 66.0        | 63.0        | 75.1        | 79.0        | 0 0.000%           |
| 0300 | 9 0.057%            | 59.1        | 89.0         | 75.3        | 77.8        | 88.5        | 89.0        | 4 44.44%           |
| 0400 | 39 0.249%           | 50.0        | 85.7         | 72.2        | 72.2        | 82.6        | 85.3        | 10 25.64%          |
| 0500 | 181 1.153%          | 49.9        | 105.8        | 77.0        | 77.2        | 86.5        | 92.8        | 68 37.57%          |
| 0600 | 546 3.479%          | 28.6        | 99.0         | 73.2        | 72.7        | 82.8        | 87.9        | 120 21.98%         |
| 0700 | 888 5.659%          | 21.3        | 101.5        | 71.2        | 71.0        | 81.5        | 87.1        | 174 19.59%         |
| 0800 | 1200 7.647%         | 17.8        | 96.6         | 69.9        | 69.8        | 78.6        | 84.1        | 147 12.25%         |
| 0900 | 1053 6.710%         | 25.9        | 112.0        | 69.6        | 69.5        | 78.1        | 83.2        | 108 10.26%         |
| 1000 | 1062 6.768%         | 25.4        | 106.2        | 68.8        | 68.8        | 77.6        | 83.7        | 113 10.64%         |
| 1100 | 1167 7.437%         | 23.7        | 105.7        | 67.6        | 67.3        | 76.8        | 83.4        | 99 8.483%          |
| 1200 | 1286 8.195%         | 27.5        | 116.2        | 68.4        | 68.0        | 77.4        | 83.7        | 115 8.942%         |
| 1300 | 1266 8.068%         | 11.0        | 104.8        | 66.8        | 67.1        | 75.8        | 81.0        | 81 6.398%          |
| 1400 | 1380 8.794%         | 40.9        | 120.9        | 67.7        | 67.1        | 75.2        | 81.0        | 83 6.014%          |
| 1500 | 1292 8.233%         | 16.7        | 95.9         | 67.8        | 67.7        | 76.0        | 82.2        | 94 7.276%          |
| 1600 | 1295 8.253%         | 28.6        | 109.4        | 69.0        | 68.9        | 77.6        | 83.2        | 125 9.653%         |
| 1700 | 1013 6.456%         | 27.2        | 99.7         | 69.2        | 68.8        | 78.1        | 83.9        | 105 10.37%         |
| 1800 | 754 4.805%          | 28.8        | 102.1        | 69.1        | 68.8        | 77.9        | 84.8        | 87 11.54%          |
| 1900 | 443 2.823%          | 44.1        | 93.6         | 68.6        | 67.9        | 78.2        | 84.9        | 48 10.84%          |
| 2000 | 318 2.027%          | 38.0        | 95.8         | 67.2        | 67.1        | 76.0        | 82.4        | 26 8.176%          |
| 2100 | 218 1.389%          | 44.4        | 103.4        | 68.6        | 68.2        | 76.9        | 85.0        | 23 10.55%          |
| 2200 | 141 0.899%          | 39.5        | 93.0         | 67.9        | 67.3        | 77.0        | 85.8        | 12 8.511%          |
| 2300 | 72 0.459%           | 41.7        | 94.0         | 68.4        | 69.7        | 79.4        | 83.5        | 8 11.11%           |
| ---- | <b>15692 100.0%</b> | <b>11.0</b> | <b>120.9</b> | <b>68.9</b> | <b>68.6</b> | <b>77.8</b> | <b>83.9</b> | <b>1657 10.56%</b> |

## Speed Histogram

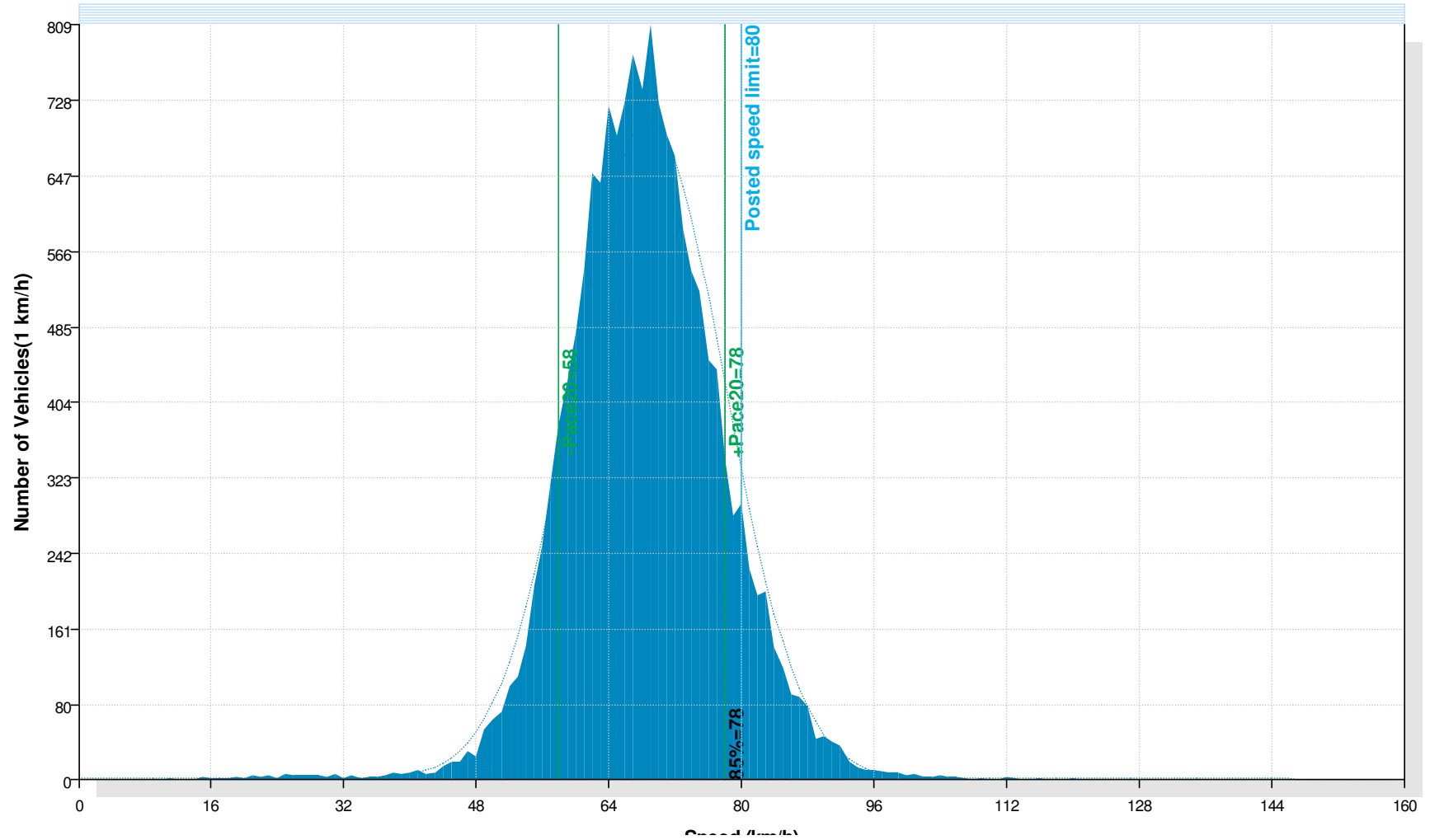
**SpeedHist-882** (Metric) **Site:** .0.1EW

**Description:** M.R.142 at No 2129 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:56 Friday, 17 February 2023

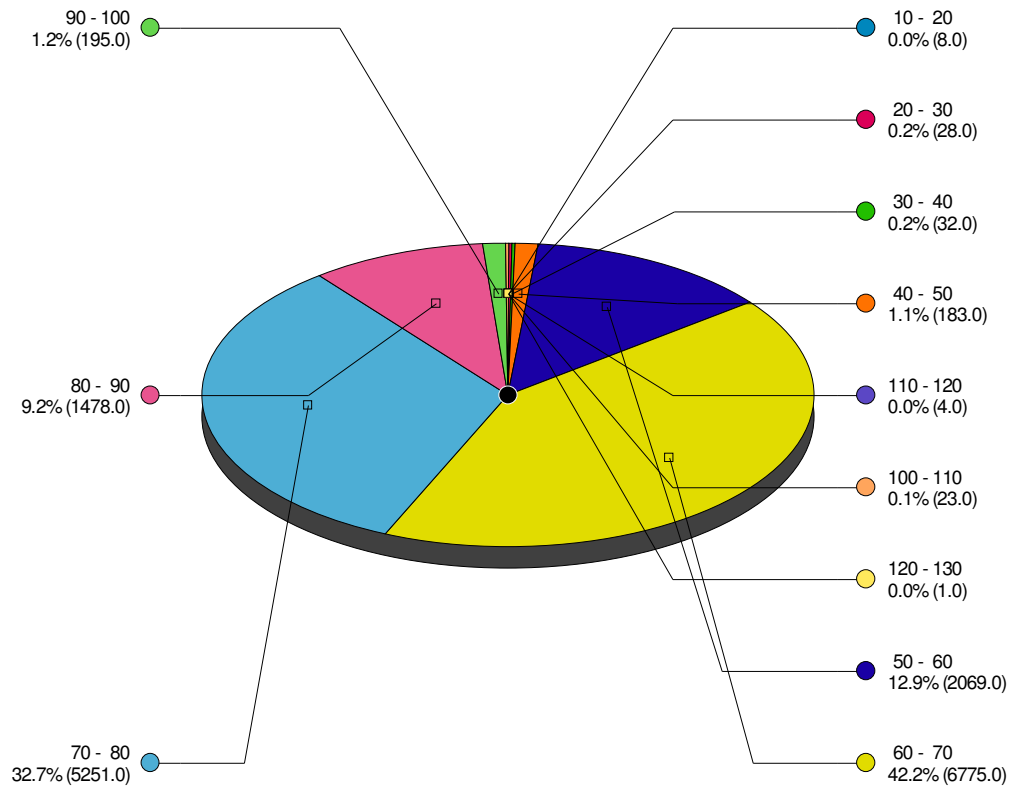
**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)



## Speed Bin Chart

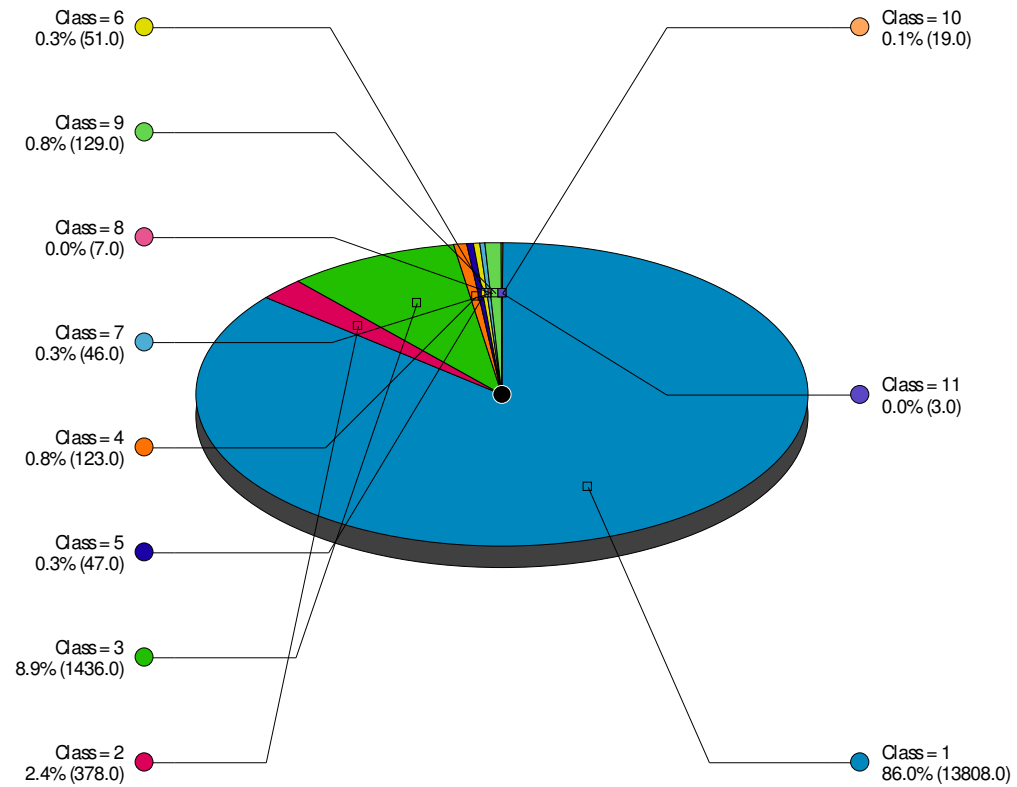
**SpeedBin-883** (Metric) **Site:** .0.1EW  
**Description:** M.R.142 at No 2129 (80Kph)  
**Filter time:** 12:00 Friday, 10 February 2023 => 14:56 Friday, 17 February 2023  
**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)  
**Scheme:** Vehicle classification (AustRoads94)  
Total=16047





## Class Bin Chart

**ClassBin-884** (Metric) **Site:** .0.1EW  
**Description:** M.R.142 at No 2129 (80Kphh)  
**Filter time:** 12:00 Friday, 10 February 2023 => 14:56 Friday, 17 February 2023  
**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)  
**Scheme:** Vehicle classification (AustRoads94)  
Total=16047



## **MetroCount Traffic Executive** **Weekly Vehicle Counts (Virtual Week)**

### **VirtWeeklyVehicle-873 -- English (ENA)**

#### **Datasets:**

**Site:** [] Clarie Hall Dam Road at No 23 (80Kph)  
**Attribute:**  
**Direction:** 7 - North bound A>B, South bound B>A. **Lane:** 0  
**Survey Duration:** 12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023,  
**Zone:**  
**File:** 0 2023-02-17 1454.EC0 (Plus )  
**Identifier:** VZ27MX8A MC5900-X13 (c)MetroCount 09Nov16  
**Algorithm:** Factory default axle (v5.07)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023 (7)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North, Lane = 0-16  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 653 / 674 (96.88%)

# Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-873

Site: .0.1NS  
Description: Clarie Hall Dam Road at No 23 (80Kph)  
Filter time: 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023  
Scheme: Vehicle classification (AustRoads94)  
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

|           | Mon          | Tue          | Wed          | Thu          | Fri          | Sat          | Sun          | Averages<br>1 - 5 | 1 - 7 |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------|
| Hour      |              |              |              |              |              |              |              |                   |       |
| 0000-0100 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 2.0          | 0.0          | 0.0               | 0.3   |
| 0100-0200 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 2.0          | 0.0          | 0.0               | 0.3   |
| 0200-0300 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 1.0          | 0.0               | 0.1   |
| 0300-0400 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 1.0          | 0.0          | 0.0               | 0.1   |
| 0400-0500 | 1.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.2               | 0.1   |
| 0500-0600 | 0.0          | 1.0          | 1.0          | 1.0          | 1.0          | 0.0          | 0.0          | 0.8               | 0.6   |
| 0600-0700 | 3.0          | 1.0          | 0.0          | 0.0          | 0.0          | 0.0          | 1.0          | 0.8               | 0.7   |
| 0700-0800 | 13.0         | 9.0          | 4.0          | 2.0          | 3.0          | 2.0          | 5.0          | 6.2               | 5.4   |
| 0800-0900 | 5.0          | 7.0          | 5.0          | 14.0         | 5.0          | 7.0          | 12.0         | 7.2               | 7.9   |
| 0900-1000 | 8.0          | 2.0          | 0.0          | 4.0          | 7.0          | 14.0         | 18.0         | 4.2               | 7.6   |
| 1000-1100 | 6.0          | 8.0          | 12.0         | 3.0          | 8.0          | 5.0          | 12.0         | 7.4               | 7.7   |
| 1100-1200 | 9.0          | 13.0         | 8.0          | 11.0         | 19.0         | 19.0         | 19.0         | 12.0              | 14.0  |
| 1200-1300 | 10.0         | 11.0         | 5.0          | 9.0          | 8.0          | 11.0         | 13.0         | 8.6               | 9.6   |
| 1300-1400 | 9.0          | 5.0          | 11.0         | 9.0          | 9.0          | 10.0         | 13.0         | 8.6               | 9.4   |
| 1400-1500 | 12.0         | 1.0          | 8.0          | 6.0          | 8.0          | 8.0          | 10.0         | 7.0               | 7.6   |
| 1500-1600 | 11.0         | 8.0          | 2.0          | 7.0          | 6.0          | 11.0         | 10.0         | 6.8               | 7.9   |
| 1600-1700 | 3.0          | 1.0          | 5.0          | 4.0          | 5.0          | 5.0          | 4.0          | 3.6               | 3.9   |
| 1700-1800 | 9.0          | 0.0          | 4.0          | 5.0          | 6.0          | 3.0          | 8.0          | 4.8               | 5.0   |
| 1800-1900 | 5.0          | 0.0          | 3.0          | 3.0          | 2.0          | 2.0          | 6.0          | 2.6               | 3.0   |
| 1900-2000 | 0.0          | 1.0          | 1.0          | 1.0          | 2.0          | 1.0          | 2.0          | 1.0               | 1.1   |
| 2000-2100 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 1.0          | 0.0          | 0.0               | 0.1   |
| 2100-2200 | 0.0          | 0.0          | 0.0          | 0.0          | 5.0          | 0.0          | 0.0          | 1.0               | 0.7   |
| 2200-2300 | 0.0          | 1.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.2               | 0.1   |
| 2300-2400 | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0               | 0.0   |
| Totals    |              |              |              |              |              |              |              |                   |       |
| 0700-1900 | 100.0        | 65.0         | 67.0         | 77.0         | 86.0         | 97.0         | 130.0        | 79.0              | 88.9  |
| 0600-2200 | 103.0        | 67.0         | 68.0         | 78.0         | 93.0         | 99.0         | 133.0        | 81.8              | 91.6  |
| 0600-0000 | 103.0        | 68.0         | 68.0         | 78.0         | 93.0         | 99.0         | 133.0        | 82.0              | 91.7  |
| 0000-0000 | 104.0        | 69.0         | 69.0         | 79.0         | 94.0         | 104.0        | 134.0        | 83.0              | 93.3  |
| AM Peak   | 0700<br>13.0 | 1100<br>13.0 | 1000<br>12.0 | 0800<br>14.0 | 1100<br>19.0 | 1100<br>19.0 | 1100<br>19.0 |                   |       |
| PM Peak   | 1400<br>12.0 | 1200<br>11.0 | 1300<br>11.0 | 1300<br>9.0  | 1300<br>9.0  | 1500<br>11.0 | 1300<br>13.0 |                   |       |

## Class Speed Matrix

**ClassMatrix-874**

**Site:** .0.1NS

**Description:** Clarie Hall Dam Road at No 23 (80Kph)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023

**Scheme:** Vehicle classification (AustRoads94)

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

| Class   |         |          |          |          |         |           |           |           |           |          |           |           |           |
|---------|---------|----------|----------|----------|---------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|
| km/h    | SV<br>1 | SVT<br>2 | TB2<br>3 | TB3<br>4 | T4<br>5 | ART3<br>6 | ART4<br>7 | ART5<br>8 | ART6<br>9 | BD<br>10 | DRT<br>11 | TRT<br>12 | Total     |
| 10- 20  | 4       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 4 0.6%    |
| 20- 30  | 7       | .        | 2        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 9 1.3%    |
| 30- 40  | 47      | 6        | 8        | 1        | 1       | .         | .         | .         | .         | .        | .         | .         | 63 9.3%   |
| 40- 50  | 171     | 3        | 13       | 3        | 1       | .         | 1         | .         | .         | .        | .         | .         | 192 28.5% |
| 50- 60  | 243     | 5        | 19       | 1        | .       | 1         | 1         | .         | .         | .        | .         | .         | 270 40.1% |
| 60- 70  | 109     | 2        | 8        | 1        | .       | .         | .         | .         | .         | .        | .         | .         | 120 17.8% |
| 70- 80  | 13      | .        | 1        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 14 2.1%   |
| 80- 90  | 2       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 2 0.3%    |
| 90-100  | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 100-110 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 110-120 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 120-130 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 130-140 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 140-150 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 150-160 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| Total   | 596     | 16       | 51       | 6        | 2       | 1         | 2         | 0         | 0         | 0        | 0         | 0         | 674       |
|         | 88.4%   | 2.4%     | 7.6%     | 0.9%     | 0.3%    | 0.1%      | 0.3%      | 0.0%      | 0.0%      | 0.0%     | 0.0%      | 0.0%      |           |

### Speed Statistics by Hour

SpeedStatHour-875

Site: .0.1NS  
 Description: **Clarie Hall Dam Road at No 23 (80Kph)**  
 Filter time: **12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023**  
 Scheme: Vehicle classification (AustRoads94)  
 Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 674

Posted speed limit = 80 km/h, Exceeding = 2 (0.297%), Mean Exceeding = 82.70 km/h

Maximum = 83.5 km/h, Minimum = 10.7 km/h, Mean = 51.8 km/h

85% Speed = 61.74 km/h, 95% Speed = 67.14 km/h, Median = 52.38 km/h

20 km/h Pace = 42 - 62, Number in Pace = 487 (72.26%)

Variance = 97.50, Standard Deviation = 9.87 km/h

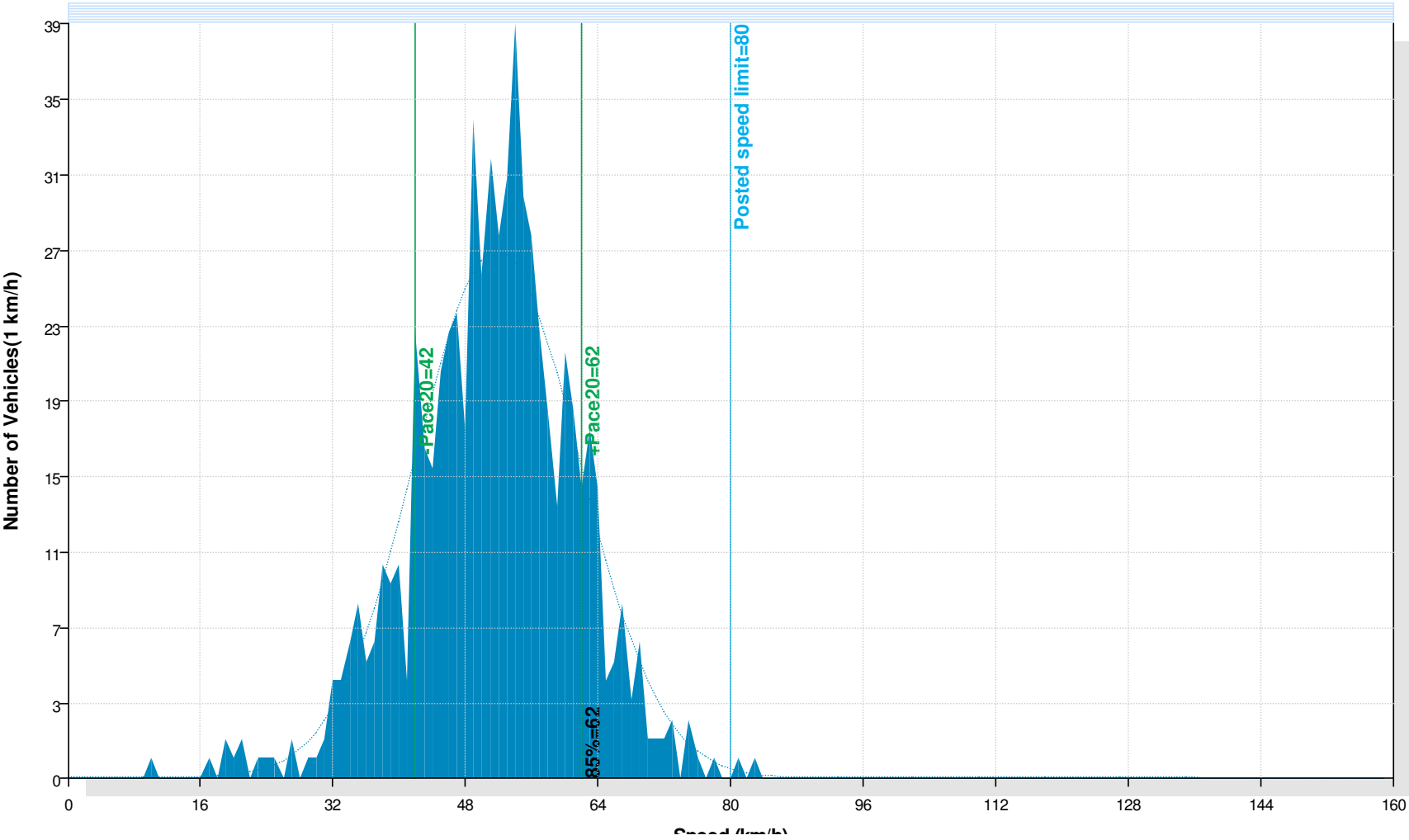
#### Hour Bins (Partial days)

| Time | Bin               | Min         | Max         | Mean        | Median      | 85%         | 95%         | >PSL<br>80 km/h |
|------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|
| 0000 | 2 0.297%          | 54.0        | 61.9        | 58.0        | 58.0        | 61.9        | 61.9        | 0 0.000%        |
| 0100 | 2 0.297%          | 51.7        | 66.6        | 59.2        | 59.1        | 66.6        | 66.6        | 0 0.000%        |
| 0200 | 1 0.148%          | 54.0        | 54.0        | 54.0        | 54.0        | 54.0        | 54.0        | 0 0.000%        |
| 0300 | 1 0.148%          | 55.7        | 55.7        | 55.7        | 55.7        | 55.7        | 55.7        | 0 0.000%        |
| 0400 | 1 0.148%          | 57.4        | 57.4        | 57.4        | 57.4        | 57.4        | 57.4        | 0 0.000%        |
| 0500 | 4 0.593%          | 32.8        | 38.9        | 36.2        | 36.6        | 38.9        | 38.9        | 0 0.000%        |
| 0600 | 5 0.742%          | 36.1        | 63.3        | 52.2        | 52.9        | 63.3        | 63.3        | 0 0.000%        |
| 0700 | 38 5.638%         | 23.1        | 64.5        | 49.6        | 50.6        | 61.4        | 64.1        | 0 0.000%        |
| 0800 | 55 8.160%         | 25.9        | 73.5        | 52.5        | 53.6        | 62.8        | 68.3        | 0 0.000%        |
| 0900 | 53 7.864%         | 33.2        | 69.3        | 52.2        | 52.0        | 60.7        | 67.1        | 0 0.000%        |
| 1000 | 54 8.012%         | 32.9        | 76.7        | 52.0        | 52.0        | 61.0        | 68.0        | 0 0.000%        |
| 1100 | 98 14.54%         | 19.2        | 75.6        | 50.0        | 49.5        | 59.2        | 65.5        | 0 0.000%        |
| 1200 | 79 11.72%         | 21.6        | 81.9        | 52.3        | 53.5        | 60.3        | 67.5        | 1 1.266%        |
| 1300 | 75 11.13%         | 10.7        | 73.4        | 50.4        | 50.8        | 59.9        | 67.8        | 0 0.000%        |
| 1400 | 53 7.864%         | 19.7        | 75.3        | 52.6        | 54.2        | 62.1        | 67.2        | 0 0.000%        |
| 1500 | 55 8.160%         | 27.5        | 68.3        | 52.3        | 51.8        | 63.2        | 65.9        | 0 0.000%        |
| 1600 | 27 4.006%         | 20.1        | 70.1        | 52.5        | 54.9        | 64.7        | 69.4        | 0 0.000%        |
| 1700 | 35 5.193%         | 17.2        | 75.4        | 54.1        | 55.3        | 68.1        | 71.1        | 0 0.000%        |
| 1800 | 21 3.116%         | 40.9        | 73.0        | 55.8        | 56.3        | 66.1        | 72.9        | 0 0.000%        |
| 1900 | 8 1.187%          | 42.1        | 64.5        | 54.7        | 54.6        | 63.5        | 64.5        | 0 0.000%        |
| 2000 | 1 0.148%          | 47.3        | 47.3        | 47.3        | 47.3        | 47.3        | 47.3        | 0 0.000%        |
| 2100 | 5 0.742%          | 21.7        | 83.5        | 57.1        | 51.3        | 83.5        | 83.5        | 1 20.00%        |
| 2200 | 1 0.148%          | 52.3        | 52.3        | 52.3        | 52.3        | 52.3        | 52.3        | 0 0.000%        |
| 2300 | 0 0.000%          | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0 -%            |
| ---- | <b>674 100.0%</b> | <b>10.7</b> | <b>83.5</b> | <b>51.8</b> | <b>52.4</b> | <b>61.7</b> | <b>67.1</b> | <b>2 0.297%</b> |



Speed Histogram

SpeedHist-876 (Metric) Site: .0.1NS  
Description: Clarie Hall Dam Road at No 23 (80Kph)  
Filter time: 12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023  
Filter: CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)  
Scheme: Vehicle classification (AustRoads94)



## Speed Bin Chart

**SpeedBin-877** (Metric) **Site:** .0.1NS

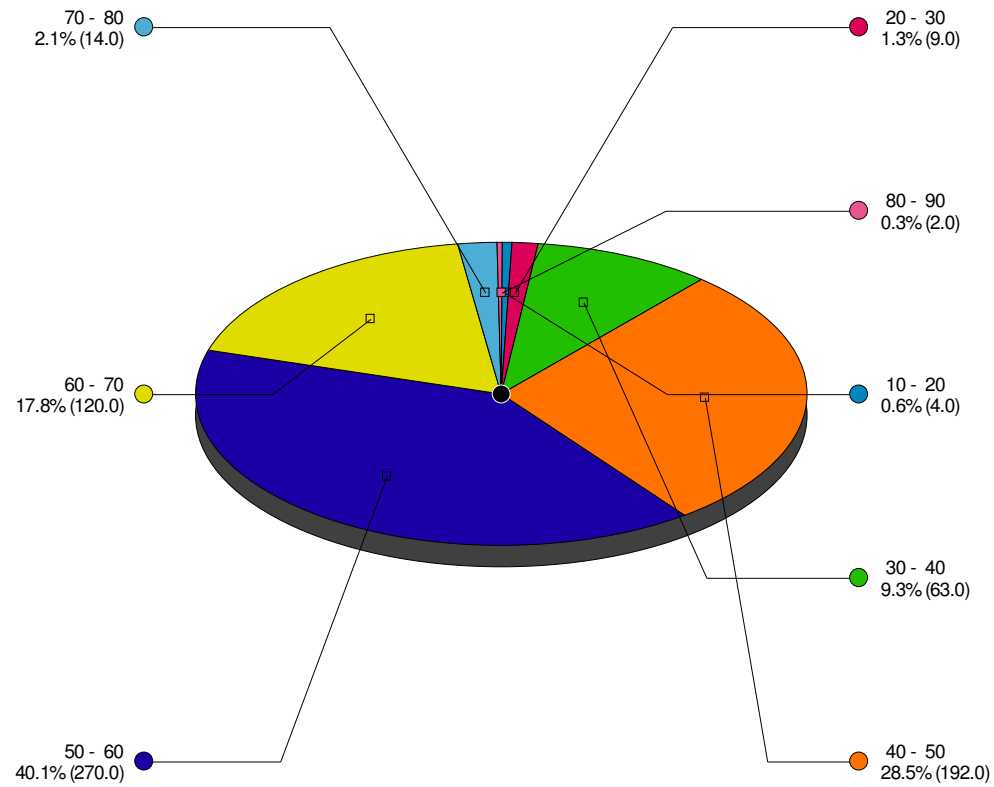
**Description:** Clarie Hall Dam Road at No 23 (80Kph)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=674



## Class Bin Chart

**ClassBin-878** (Metric) **Site:** .0.1NS

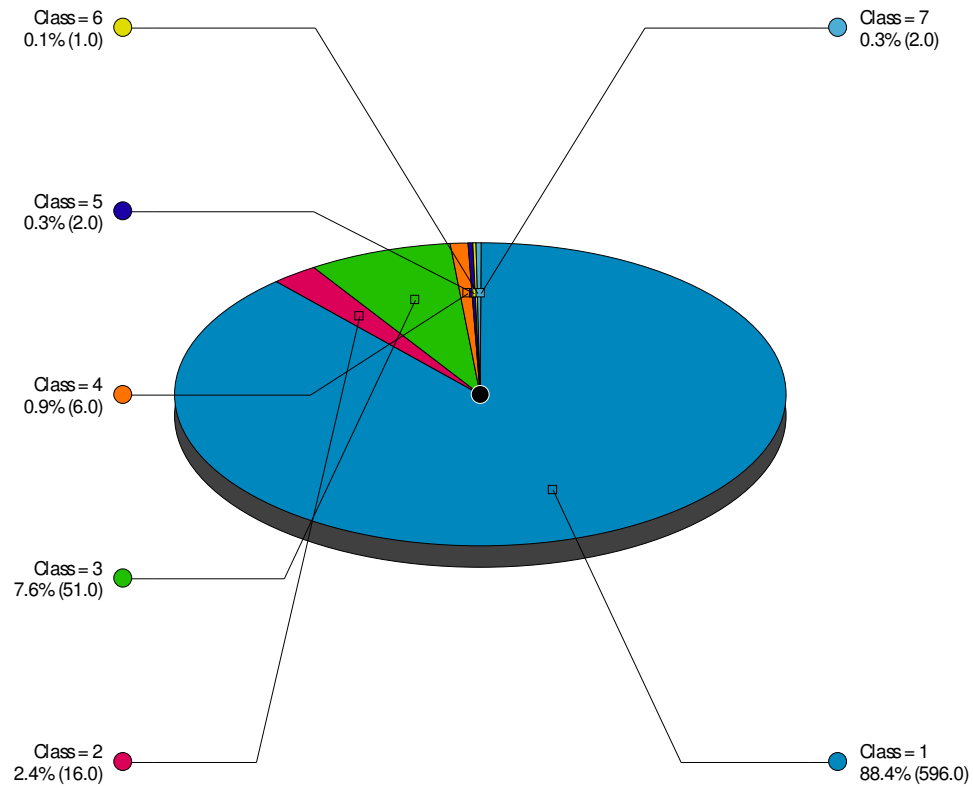
**Description:** Clarie Hall Dam Road at No 23 (80Kph)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:53 Friday, 17 February 2023

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=674



## **MetroCount Traffic Executive** **Weekly Vehicle Counts (Virtual Week)**

### **VirtWeeklyVehicle-885 -- English (ENA)**

#### **Datasets:**

**Site:** [95] Comminsioners Creek Road at No 60 (80Kph)  
**Attribute:**  
**Direction:** 7 - North bound A>B, South bound B>A. **Lane:** 0  
**Survey Duration:** 12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023,  
**Zone:**  
**File:** 95 0 2023-02-17 1455.EC0 (Plus )  
**Identifier:** KB7917KJ MC56-L5 [MC55] (c)Microcom 19Oct04  
**Algorithm:** Factory default axle (v5.07)  
**Data type:** Axle sensors - Paired (Class/Speed/Count)

#### **Profile:**

**Filter time:** 12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023 (7)  
**Included classes:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12  
**Speed range:** 10 - 160 km/h.  
**Direction:** North, East, South, West (bound), P = North, Lane = 0-16  
**Separation:** Headway > 0 sec, Span 0 - 100 metre  
**Name:** Default Profile  
**Scheme:** Vehicle classification (AustRoads94)  
**Units:** Metric (metre, kilometre, m/s, km/h, kg, tonne)  
**In profile:** Vehicles = 798 / 819 (97.44%)

# Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-885

Site:

95.0.1NS

Description:

Comminsoners Creek Road at No 60 (80Kphh)

Filter time:

12:00 Friday, 10 February 2023 => 12:00 Friday, 17 February 2023

Scheme:

Vehicle classification (AustRoads94)

Filter:

Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

|           | Mon   | Tue   | Wed   | Thu   | Fri   | Sat   | Sun   | Averages<br>1 - 5 | 1 - 7 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------------------|-------|
| Hour      |       |       |       |       |       |       |       |                   |       |
| 0000-0100 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 1.0   | 1.0   | 0.0               | 0.3   |
| 0100-0200 | 0.0   | 0.0   | 0.0   | 0.0   | 1.0   | 0.0   | 0.0   | 0.2               | 0.1   |
| 0200-0300 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0               | 0.0   |
| 0300-0400 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0               | 0.0   |
| 0400-0500 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 1.0   | 0.0   | 0.0               | 0.1   |
| 0500-0600 | 1.0   | 2.0   | 2.0   | 0.0   | 0.0   | 0.0   | 0.0   | 1.0               | 0.7   |
| 0600-0700 | 2.0   | 0.0   | 0.0   | 4.0   | 1.0   | 4.0   | 1.0   | 1.4               | 1.7   |
| 0700-0800 | 17.0  | 11.0  | 13.0  | 8.0   | 11.0  | 3.0   | 2.0   | 12.0              | 9.3   |
| 0800-0900 | 12.0  | 5.0   | 12.0  | 16.0  | 10.0  | 6.0   | 2.0   | 11.0              | 9.0   |
| 0900-1000 | 11.0  | 13.0  | 7.0   | 6.0   | 6.0   | 9.0   | 8.0   | 8.6               | 8.6   |
| 1000-1100 | 5.0   | 9.0   | 15.0  | 8.0   | 4.0   | 13.0  | 12.0  | 8.2               | 9.4   |
| 1100-1200 | 10.0  | 15.0  | 6.0   | 2.0   | 13.0  | 7.0   | 16.0  | 9.2               | 9.9   |
| 1200-1300 | 1.0   | 16.0  | 6.0   | 8.0   | 8.0   | 8.0   | 7.0   | 7.8               | 7.7   |
| 1300-1400 | 4.0   | 9.0   | 6.0   | 6.0   | 12.0  | 16.0  | 20.0  | 7.4               | 10.4  |
| 1400-1500 | 10.0  | 8.0   | 10.0  | 11.0  | 10.0  | 5.0   | 8.0   | 9.8               | 8.9   |
| 1500-1600 | 13.0  | 15.0  | 10.0  | 11.0  | 8.0   | 1.0   | 3.0   | 11.4              | 8.7   |
| 1600-1700 | 15.0  | 6.0   | 14.0  | 8.0   | 8.0   | 5.0   | 10.0  | 10.2              | 9.4   |
| 1700-1800 | 7.0   | 4.0   | 6.0   | 8.0   | 8.0   | 8.0   | 3.0   | 6.6               | 6.3   |
| 1800-1900 | 3.0   | 4.0   | 4.0   | 3.0   | 4.0   | 7.0   | 3.0   | 3.6               | 4.0   |
| 1900-2000 | 3.0   | 1.0   | 6.0   | 4.0   | 3.0   | 7.0   | 3.0   | 3.4               | 3.9   |
| 2000-2100 | 0.0   | 1.0   | 2.0   | 7.0   | 2.0   | 4.0   | 3.0   | 2.4               | 2.7   |
| 2100-2200 | 4.0   | 1.0   | 0.0   | 3.0   | 0.0   | 1.0   | 3.0   | 1.6               | 1.7   |
| 2200-2300 | 0.0   | 2.0   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   | 1.0               | 0.7   |
| 2300-2400 | 0.0   | 0.0   | 0.0   | 0.0   | 1.0   | 2.0   | 0.0   | 0.2               | 0.4   |
| Totals    |       |       |       |       |       |       |       |                   |       |
| 0700-1900 | 108.0 | 115.0 | 109.0 | 95.0  | 102.0 | 88.0  | 94.0  | 105.8             | 101.6 |
| 0600-2200 | 117.0 | 118.0 | 117.0 | 113.0 | 108.0 | 104.0 | 104.0 | 114.6             | 111.6 |
| 0600-0000 | 117.0 | 120.0 | 118.0 | 114.0 | 110.0 | 106.0 | 104.0 | 115.8             | 112.7 |
| 0000-0000 | 118.0 | 122.0 | 120.0 | 114.0 | 111.0 | 108.0 | 105.0 | 117.0             | 114.0 |
| AM Peak   | 0700  | 1100  | 1000  | 0800  | 1100  | 1000  | 1100  |                   |       |
|           | 17.0  | 15.0  | 15.0  | 16.0  | 13.0  | 13.0  | 16.0  |                   |       |
| PM Peak   | 1600  | 1200  | 1600  | 1500  | 1300  | 1300  | 1300  |                   |       |
|           | 15.0  | 16.0  | 14.0  | 11.0  | 12.0  | 16.0  | 20.0  |                   |       |



## Class Speed Matrix

**ClassMatrix-886**

**Site:** 95.0.1NS

**Description:** Comminsioners Creek Road at No 60 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023

**Scheme:** Vehicle classification (AustRoads94)

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

| Class   |         |          |          |          |         |           |           |           |           |          |           |           |           |
|---------|---------|----------|----------|----------|---------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|
| km/h    | SV<br>1 | SVT<br>2 | TB2<br>3 | TB3<br>4 | T4<br>5 | ART3<br>6 | ART4<br>7 | ART5<br>8 | ART6<br>9 | BD<br>10 | DRT<br>11 | TRT<br>12 | Total     |
| 10- 20  | 3       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 3 0.4%    |
| 20- 30  | 6       | .        | 1        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 7 0.9%    |
| 30- 40  | 5       | .        | 3        | 1        | .       | .         | .         | .         | .         | .        | .         | .         | 9 1.1%    |
| 40- 50  | 48      | .        | 4        | .        | .       | .         | 1         | .         | .         | .        | .         | .         | 53 6.5%   |
| 50- 60  | 105     | 7        | 10       | .        | .       | .         | .         | .         | .         | .        | .         | .         | 122 15.0% |
| 60- 70  | 192     | 7        | 33       | 2        | .       | 2         | .         | .         | .         | .        | .         | .         | 236 29.0% |
| 70- 80  | 236     | 3        | 15       | .        | .       | .         | .         | .         | .         | .        | .         | .         | 254 31.2% |
| 80- 90  | 95      | .        | 6        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 101 12.4% |
| 90-100  | 22      | .        | 3        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 25 3.1%   |
| 100-110 | 4       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 4 0.5%    |
| 110-120 | 1       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 1 0.1%    |
| 120-130 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 130-140 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 140-150 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| 150-160 | .       | .        | .        | .        | .       | .         | .         | .         | .         | .        | .         | .         | 0 0.0%    |
| Total   | 717     | 17       | 75       | 3        | 0       | 2         | 1         | 0         | 0         | 0        | 0         | 0         | 815       |
|         | 88.0%   | 2.1%     | 9.2%     | 0.4%     | 0.0%    | 0.2%      | 0.1%      | 0.0%      | 0.0%      | 0.0%     | 0.0%      | 0.0%      |           |

### Speed Statistics by Hour

SpeedStatHour-887

Site: 95.0.1NS  
 Description: **Comminsoners Creek Road at No 60 (80Kphh)**  
 Filter time: **12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023**  
 Scheme: Vehicle classification (AustRoads94)  
 Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Vehicles = 815

Posted speed limit = 80 km/h, Exceeding = 131 (16.07%), Mean Exceeding = 86.45 km/h

Maximum = 112.0 km/h, Minimum = 10.3 km/h, Mean = 68.1 km/h

85% Speed = 80.28 km/h, 95% Speed = 88.02 km/h, Median = 69.30 km/h

20 km/h Pace = 61 - 81, Number in Pace = 496 (60.86%)

Variance = 176.76, Standard Deviation = 13.30 km/h

#### Hour Bins (Partial days)

| Time | Bin               | Min         | Max          | Mean        | Median      | 85%         | 95%         | >PSL<br>80 km/h   |
|------|-------------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------------|
| 0000 | 2 0.245%          | 66.8        | 81.3         | 74.1        | 74.1        | 81.3        | 81.3        | 1 50.00%          |
| 0100 | 1 0.123%          | 93.0        | 93.0         | 93.0        | 93.0        | 93.0        | 93.0        | 1 100.0%          |
| 0200 | 0 0.000%          | 0.0         | 0.0          | 0.0         | 0.0         | 0.0         | 0.0         | 0 -%              |
| 0300 | 0 0.000%          | 0.0         | 0.0          | 0.0         | 0.0         | 0.0         | 0.0         | 0 -%              |
| 0400 | 1 0.123%          | 42.6        | 42.6         | 42.6        | 42.6        | 42.6        | 42.6        | 0 0.000%          |
| 0500 | 5 0.613%          | 65.2        | 81.3         | 75.2        | 76.0        | 81.3        | 81.3        | 1 20.00%          |
| 0600 | 12 1.472%         | 45.8        | 87.9         | 68.4        | 70.4        | 83.7        | 87.9        | 2 16.67%          |
| 0700 | 65 7.975%         | 42.8        | 112.0        | 69.9        | 70.4        | 83.0        | 94.9        | 12 18.46%         |
| 0800 | 63 7.730%         | 34.9        | 101.6        | 72.7        | 73.4        | 83.7        | 87.1        | 17 26.98%         |
| 0900 | 60 7.362%         | 10.3        | 94.9         | 66.6        | 71.2        | 80.2        | 83.3        | 9 15.00%          |
| 1000 | 66 8.098%         | 24.3        | 96.0         | 67.0        | 68.8        | 82.0        | 88.6        | 10 15.15%         |
| 1100 | 69 8.466%         | 28.8        | 103.6        | 70.0        | 70.6        | 80.6        | 95.7        | 13 18.84%         |
| 1200 | 65 7.975%         | 26.7        | 87.2         | 67.0        | 67.1        | 78.5        | 82.2        | 7 10.77%          |
| 1300 | 76 9.325%         | 31.8        | 97.9         | 67.4        | 67.8        | 80.3        | 90.2        | 11 14.47%         |
| 1400 | 65 7.975%         | 31.7        | 93.8         | 66.6        | 68.0        | 82.8        | 90.6        | 12 18.46%         |
| 1500 | 61 7.485%         | 45.0        | 100.5        | 66.6        | 66.2        | 80.1        | 88.7        | 9 14.75%          |
| 1600 | 66 8.098%         | 48.3        | 95.6         | 70.5        | 71.9        | 78.7        | 82.0        | 5 7.576%          |
| 1700 | 44 5.399%         | 41.3        | 94.8         | 68.6        | 68.9        | 81.4        | 91.6        | 8 18.18%          |
| 1800 | 28 3.436%         | 48.0        | 94.4         | 71.9        | 71.1        | 84.5        | 93.7        | 7 25.00%          |
| 1900 | 27 3.313%         | 10.6        | 96.2         | 61.2        | 63.7        | 79.5        | 93.1        | 3 11.11%          |
| 2000 | 19 2.331%         | 25.2        | 73.4         | 59.9        | 60.7        | 69.5        | 73.4        | 0 0.000%          |
| 2100 | 12 1.472%         | 41.3        | 86.5         | 64.0        | 66.7        | 83.0        | 86.5        | 2 16.67%          |
| 2200 | 5 0.613%          | 61.4        | 81.4         | 69.5        | 69.3        | 81.4        | 81.4        | 1 20.00%          |
| 2300 | 3 0.368%          | 57.5        | 77.9         | 67.6        | 67.3        | 77.9        | 77.9        | 0 0.000%          |
| ---- | <b>815 100.0%</b> | <b>10.3</b> | <b>112.0</b> | <b>68.1</b> | <b>69.3</b> | <b>80.3</b> | <b>88.0</b> | <b>131 16.07%</b> |

## Speed Histogram

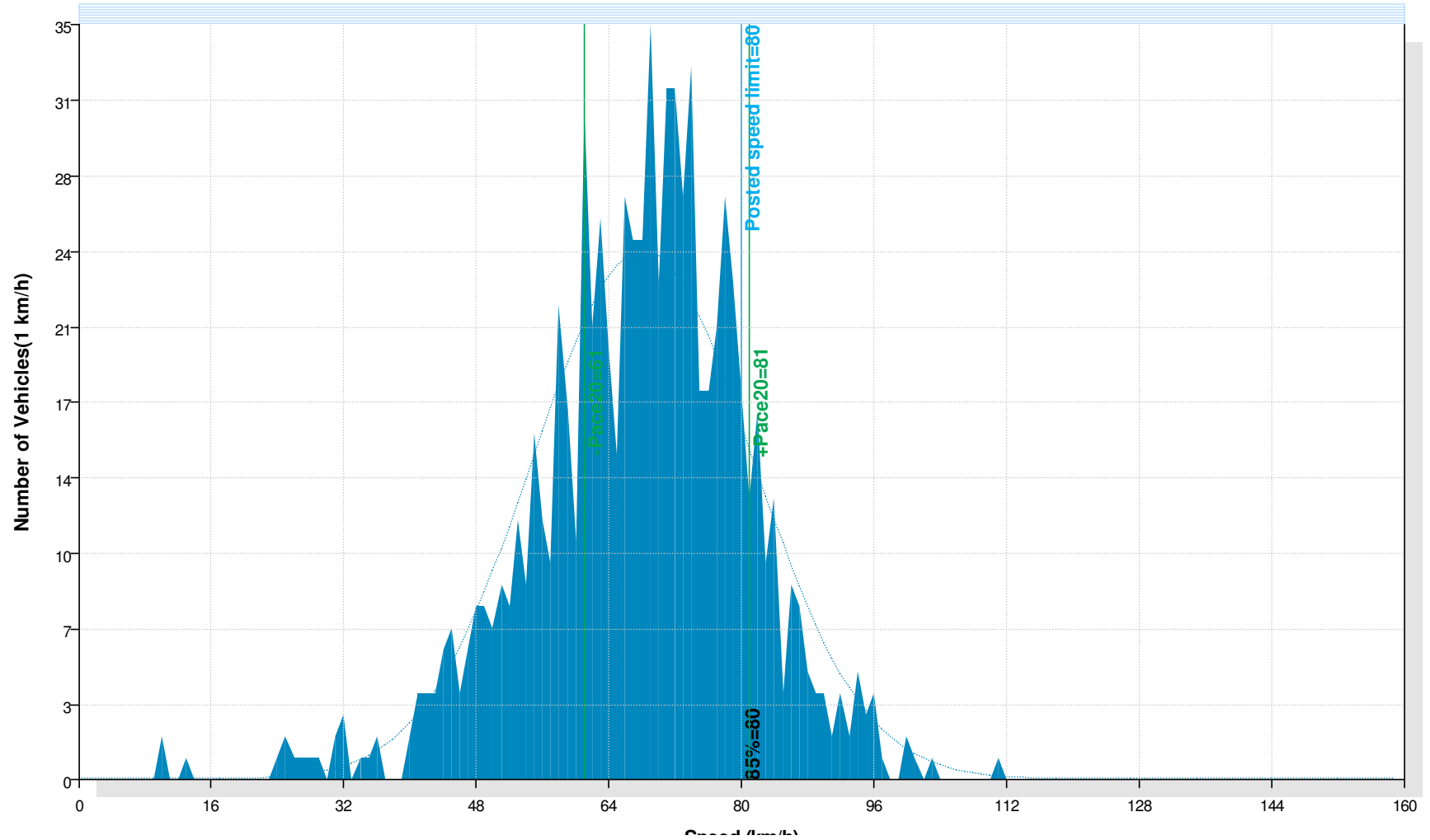
**SpeedHist-888** (Metric) **Site:** 95.0.1NS

**Description:** Commisioners Creek Road at No 60 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)



## Speed Bin Chart

**SpeedBin-889** (Metric) **Site:** 95.0.1NS

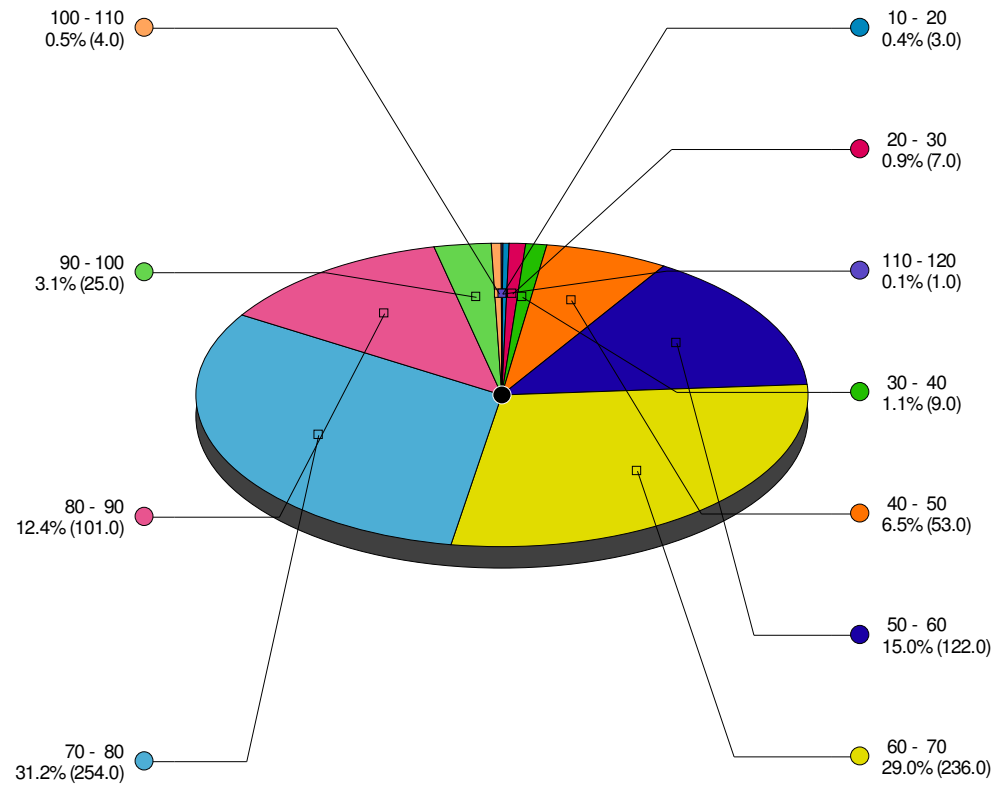
**Description:** Commisioners Creek Road at No 60 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023

**Filter:** CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=815



## Class Bin Chart

**ClassBin-890** (Metric) **Site:** 95.0.1NS

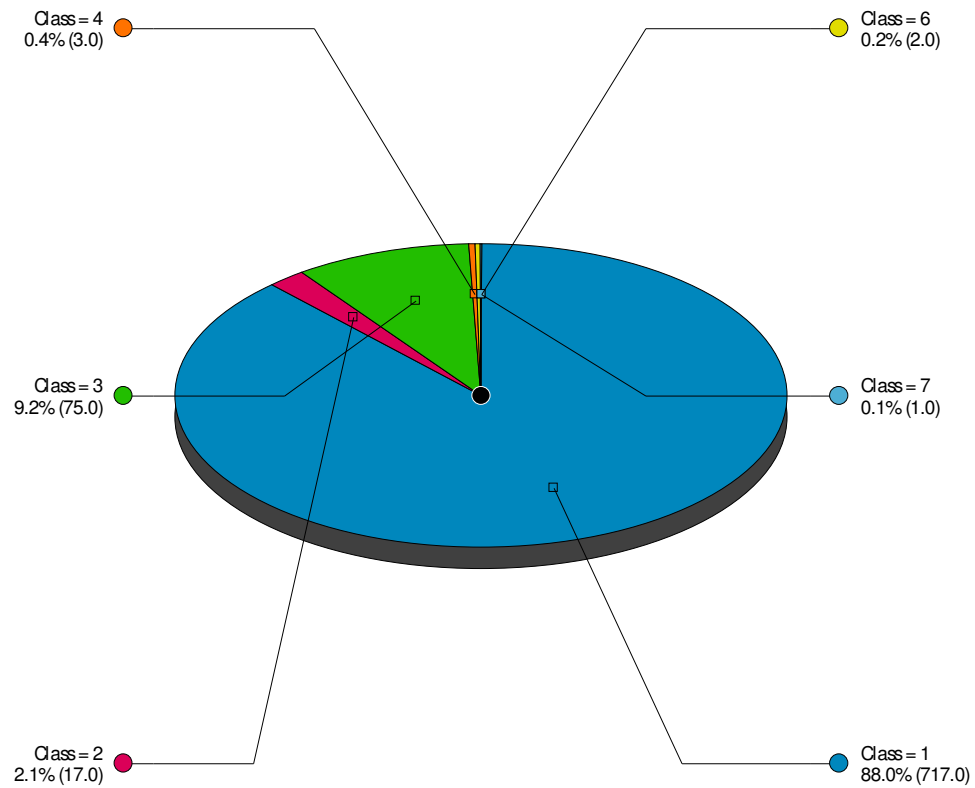
**Description:** Commisioners Creek Road at No 60 (80Kphh)

**Filter time:** 12:00 Friday, 10 February 2023 => 14:55 Friday, 17 February 2023

**Filter:** Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

**Scheme:** Vehicle classification (AustRoads94)

Total=815





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# Appendix C

## SIDRA results

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# MOVEMENT SUMMARY

▼ Site: 101 [Base 2026 Kyogle Rd/Tarcoola Ln AM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |     |                                          |     |                      |                        |                  |                                             |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|-----|------------------------------------------|-----|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |     | Arrival Flows<br>[ Total HV ]<br>veh/h % |     | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| NorthEast: Kyogle Road       |      |           |                                         |     |                                          |     |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 100                                     | 4.2 | 100                                      | 4.2 | 0.053                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.9                    |
| 6                            | R2   | All MCs   | 1                                       | 0.0 | 1                                        | 0.0 | 0.053                | 5.5                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 52.8                    |
| Approach                     |      |           | 101                                     | 4.2 | 101                                      | 4.2 | 0.053                | 0.1                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.8                    |
| NorthWest: Tarcoola Lane     |      |           |                                         |     |                                          |     |                      |                        |                  |                                             |     |           |                |                     |                         |
| 7                            | L2   | All MCs   | 1                                       | 0.0 | 1                                        | 0.0 | 0.002                | 4.9                    | LOS A            | 0.0                                         | 0.0 | 0.25      | 0.50           | 0.25                | 48.6                    |
| 9                            | R2   | All MCs   | 1                                       | 0.0 | 1                                        | 0.0 | 0.002                | 5.4                    | LOS A            | 0.0                                         | 0.0 | 0.25      | 0.50           | 0.25                | 48.3                    |
| Approach                     |      |           | 2                                       | 0.0 | 2                                        | 0.0 | 0.002                | 5.1                    | LOS A            | 0.0                                         | 0.0 | 0.25      | 0.50           | 0.25                | 48.4                    |
| SouthWest: Kyogle Road       |      |           |                                         |     |                                          |     |                      |                        |                  |                                             |     |           |                |                     |                         |
| 10                           | L2   | All MCs   | 1                                       | 0.0 | 1                                        | 0.0 | 0.073                | 5.6                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.00           | 0.00                | 57.4                    |
| 11                           | T1   | All MCs   | 139                                     | 3.0 | 139                                      | 3.0 | 0.073                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.00           | 0.00                | 59.9                    |
| Approach                     |      |           | 140                                     | 3.0 | 140                                      | 3.0 | 0.073                | 0.1                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.00           | 0.00                | 59.9                    |
| All Vehicles                 |      |           | 243                                     | 3.5 | 243                                      | 3.5 | 0.073                | 0.1                    | NA               | 0.0                                         | 0.1 | 0.00      | 0.01           | 0.00                | 59.8                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

▼ Site: 101 [Base 2026 Kyogle Rd/Tarcoola Ln PM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)

Site Category: (None)

Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                                 |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|-------------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. veh     Dist ]<br>m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| NorthEast: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                                 |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.065                | 0.0                    | LOS A            | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 59.9                    |
| 6                            | R2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.065                | 5.5                    | LOS A            | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 52.8                    |
| Approach                     |      |           | 124                                     | 2.5  | 124                                      | 2.5  | 0.065                | 0.0                    | NA               | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 59.9                    |
| NorthWest: Tarcoola Lane     |      |           |                                         |      |                                          |      |                      |                        |                  |                                                 |     |           |                |                     |                         |
| 7                            | L2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.002                | 4.8                    | LOS A            | 0.0                                             | 0.0 | 0.22      | 0.50           | 0.22                | 48.6                    |
| 9                            | R2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.002                | 5.3                    | LOS A            | 0.0                                             | 0.0 | 0.22      | 0.50           | 0.22                | 48.4                    |
| Approach                     |      |           | 2                                       | 0.0  | 2                                        | 0.0  | 0.002                | 5.1                    | LOS A            | 0.0                                             | 0.0 | 0.22      | 0.50           | 0.22                | 48.5                    |
| SouthWest: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                                 |     |           |                |                     |                         |
| 10                           | L2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.053                | 5.6                    | LOS A            | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 57.4                    |
| 11                           | T1   | All MCs   | 95                                      | 12.2 | 95                                       | 12.2 | 0.053                | 0.0                    | LOS A            | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 59.9                    |
| Approach                     |      |           | 96                                      | 12.1 | 96                                       | 12.1 | 0.053                | 0.1                    | NA               | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 59.9                    |
| All Vehicles                 |      |           | 222                                     | 6.6  | 222                                      | 6.6  | 0.065                | 0.1                    | NA               | 0.0                                             | 0.0 | 0.00      | 0.01           | 0.00                | 59.7                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9

# MOVEMENT SUMMARY

▼ Site: 102 [Base 2026 Kyogle Rd/Clarrie Hall Dam Rd AM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)

Site Category: (None)

Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |              |     |               |     |           |             |                  |                   |          |           |                |                     |             |
|----------------------------------|------|-----------|--------------|-----|---------------|-----|-----------|-------------|------------------|-------------------|----------|-----------|----------------|---------------------|-------------|
| Mov ID                           | Turn | Mov Class | Demand Flows |     | Arrival Flows |     | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue |          | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                                  |      |           | [ Total HV ] | %   | [ Total HV ]  | %   | v/c       | sec         |                  | [ Veh. veh        | Dist ] m |           |                |                     | km/h        |
| East: Kyogle Road                |      |           |              |     |               |     |           |             |                  |                   |          |           |                |                     |             |
| 4a                               | L1   | All MCs   | 3            | 0.0 | 3             | 0.0 | 0.054     | 6.5         | LOS A            | 0.0               | 0.0      | 0.00      | 0.02           | 0.00                | 73.0        |
| 11                               | T1   | All MCs   | 100          | 4.2 | 100           | 4.2 | 0.054     | 0.0         | LOS A            | 0.0               | 0.0      | 0.00      | 0.02           | 0.00                | 79.6        |
| Approach                         |      |           | 103          | 4.1 | 103           | 4.1 | 0.054     | 0.2         | NA               | 0.0               | 0.0      | 0.00      | 0.02           | 0.00                | 79.4        |
| West: Kyogle Road                |      |           |              |     |               |     |           |             |                  |                   |          |           |                |                     |             |
| 5                                | T1   | All MCs   | 139          | 3.0 | 139           | 3.0 | 0.074     | 0.0         | LOS A            | 0.0               | 0.1      | 0.01      | 0.01           | 0.01                | 79.8        |
| 12b                              | R3   | All MCs   | 100.0        |     | 100.0         |     | 0.074     | 9.3         | LOS A            | 0.0               | 0.1      | 0.01      | 0.01           | 0.01                | 40.9        |
| Approach                         |      |           | 140          | 3.8 | 140           | 3.8 | 0.074     | 0.1         | NA               | 0.0               | 0.1      | 0.01      | 0.01           | 0.01                | 79.2        |
| SouthWest: Clarrie Hall Dam Road |      |           |              |     |               |     |           |             |                  |                   |          |           |                |                     |             |
| 30b                              | L3   | All MCs   | 2            | 0.0 | 2             | 0.0 | 0.005     | 8.3         | LOS A            | 0.0               | 0.1      | 0.24      | 0.58           | 0.24                | 63.6        |
| 32a                              | R1   | All MCs   | 4            | 0.0 | 4             | 0.0 | 0.005     | 7.1         | LOS A            | 0.0               | 0.1      | 0.24      | 0.58           | 0.24                | 63.6        |
| Approach                         |      |           | 6            | 0.0 | 6             | 0.0 | 0.005     | 7.5         | LOS A            | 0.0               | 0.1      | 0.24      | 0.58           | 0.24                | 63.6        |
| All Vehicles                     |      |           | 249          | 3.8 | 249           | 3.8 | 0.074     | 0.3         | NA               | 0.0               | 0.1      | 0.01      | 0.03           | 0.01                | 78.8        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9

# MOVEMENT SUMMARY

▼ Site: 102 [Base 2026 Kyogle Rd/Clarrie Hall Dam Rd PM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|----------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                           | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| East: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 4a                               | L1   | All MCs   | 2                                       | 0.0  | 2                                        | 0.0  | 0.065                | 6.5                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 73.2                    |
| 11                               | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.065                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 79.8                    |
| Approach                         |      |           | 125                                     | 2.5  | 125                                      | 2.5  | 0.065                | 0.1                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 79.6                    |
| West: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                                | T1   | All MCs   | 95                                      | 12.2 | 95                                       | 12.2 | 0.053                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 79.8                    |
| 12b                              | R3   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.053                | 7.2                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 73.0                    |
| Approach                         |      |           | 96                                      | 12.1 | 96                                       | 12.1 | 0.053                | 0.1                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 79.7                    |
| SouthWest: Clarrie Hall Dam Road |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 30b                              | L3   | All MCs   | 2                                       | 0.0  | 2                                        | 0.0  | 0.002                | 8.3                    | LOS A            | 0.0                                         | 0.1 | 0.23      | 0.58           | 0.23                | 63.1                    |
| 32a                              | R1   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.002                | 7.0                    | LOS A            | 0.0                                         | 0.1 | 0.23      | 0.58           | 0.23                | 63.1                    |
| Approach                         |      |           | 3                                       | 0.0  | 3                                        | 0.0  | 0.002                | 7.9                    | LOS A            | 0.0                                         | 0.1 | 0.23      | 0.58           | 0.23                | 63.1                    |
| All Vehicles                     |      |           | 224                                     | 6.6  | 224                                      | 6.6  | 0.065                | 0.2                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.02           | 0.01                | 79.4                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.



# MOVEMENT SUMMARY

▼ Site: 103 [Base 2026 Kyogle Rd/Doon Doon Rd AM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
|------------------------------|------|-----------|--------------|------|---------------|------|-----------|-------------|------------------|-------------------|----------|-----------|----------------|---------------------|-------------|
| Mov ID                       | Turn | Mov Class | Demand Flows |      | Arrival Flows |      | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue |          | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                              |      |           | [ Total HV ] | %    | [ Total HV ]  | %    | v/c       | sec         |                  | [ Veh. veh        | Dist ] m |           |                |                     | km/h        |
| South: Doon Doon Road        |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 1                            | L2   | All MCs   | 6            | 0.0  | 6             | 0.0  | 0.031     | 7.2         | LOS A            | 0.1               | 0.8      | 0.22      | 0.61           | 0.22                | 63.9        |
| 3                            | R2   | All MCs   | 28           | 7.4  | 28            | 7.4  | 0.031     | 7.4         | LOS A            | 0.1               | 0.8      | 0.22      | 0.61           | 0.22                | 61.3        |
| Approach                     |      |           | 35           | 6.1  | 35            | 6.1  | 0.031     | 7.4         | LOS A            | 0.1               | 0.8      | 0.22      | 0.61           | 0.22                | 61.7        |
| East: Kyogle Road            |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 4                            | L2   | All MCs   | 9            | 22.2 | 9             | 22.2 | 0.046     | 7.4         | LOS A            | 0.0               | 0.0      | 0.00      | 0.08           | 0.00                | 64.0        |
| 11                           | T1   | All MCs   | 69           | 21.2 | 69            | 21.2 | 0.046     | 0.0         | LOS A            | 0.0               | 0.0      | 0.00      | 0.08           | 0.00                | 78.6        |
| Approach                     |      |           | 79           | 21.3 | 79            | 21.3 | 0.046     | 0.9         | NA               | 0.0               | 0.0      | 0.00      | 0.08           | 0.00                | 76.5        |
| West: Kyogle Road            |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 5                            | T1   | All MCs   | 86           | 3.7  | 86            | 3.7  | 0.052     | 0.0         | LOS A            | 0.1               | 0.5      | 0.05      | 0.07           | 0.05                | 78.6        |
| 12                           | R2   | All MCs   | 9            | 11.1 | 9             | 11.1 | 0.052     | 7.1         | LOS A            | 0.1               | 0.5      | 0.05      | 0.07           | 0.05                | 67.5        |
| Approach                     |      |           | 96           | 4.4  | 96            | 4.4  | 0.052     | 0.7         | NA               | 0.1               | 0.5      | 0.05      | 0.07           | 0.05                | 77.3        |
| All Vehicles                 |      |           | 209          | 11.1 | 209           | 11.1 | 0.052     | 1.9         | NA               | 0.1               | 0.8      | 0.06      | 0.16           | 0.06                | 73.9        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 103 [Base 2026 Kyogle Rd/Doon Doon Rd PM (Site Folder: Baseline 2026)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| South: Doon Doon Road        |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 1                            | L2   | All MCs   | 5                                       | 20.0 | 5                                        | 20.0 | 0.012                | 7.6                    | LOS A            | 0.0                                         | 0.4 | 0.20      | 0.59           | 0.20                | 57.9                    |
| 3                            | R2   | All MCs   | 8                                       | 25.0 | 8                                        | 25.0 | 0.012                | 7.8                    | LOS A            | 0.0                                         | 0.4 | 0.20      | 0.59           | 0.20                | 56.2                    |
| Approach                     |      |           | 14                                      | 23.1 | 14                                       | 23.1 | 0.012                | 7.7                    | LOS A            | 0.0                                         | 0.4 | 0.20      | 0.59           | 0.20                | 56.8                    |
| East: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 4                            | L2   | All MCs   | 22                                      | 9.5  | 22                                       | 9.5  | 0.051                | 7.1                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 67.7                    |
| 11                           | T1   | All MCs   | 75                                      | 1.4  | 75                                       | 1.4  | 0.051                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 77.5                    |
| Approach                     |      |           | 97                                      | 3.3  | 97                                       | 3.3  | 0.051                | 1.6                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 75.0                    |
| West: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 73                                      | 10.1 | 73                                       | 10.1 | 0.042                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 79.3                    |
| 12                           | R2   | All MCs   | 3                                       | 0.0  | 3                                        | 0.0  | 0.042                | 6.7                    | LOS A            | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 72.7                    |
| Approach                     |      |           | 76                                      | 9.7  | 76                                       | 9.7  | 0.042                | 0.3                    | NA               | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 79.0                    |
| All Vehicles                 |      |           | 186                                     | 7.3  | 186                                      | 7.3  | 0.051                | 1.5                    | NA               | 0.0                                         | 0.4 | 0.02      | 0.13           | 0.02                | 74.8                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [Dev 2026 Kyogle Rd/Tarcoola Ln AM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |              |              |               |              |           |             |                  |                   |          |           |                |                     |             |
|------------------------------|------|-----------|--------------|--------------|---------------|--------------|-----------|-------------|------------------|-------------------|----------|-----------|----------------|---------------------|-------------|
| Mov ID                       | Turn | Mov Class | Demand Flows |              | Arrival Flows |              | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue |          | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                              |      |           | [ Total HV ] | [ Total HV ] | [ Total HV ]  | [ Total HV ] |           |             |                  | [ Veh. veh        | Dist ] m |           |                |                     | km/h        |
|                              |      |           | veh/h        | %            | veh/h         | %            | v/c       | sec         |                  |                   |          |           |                |                     |             |
| NorthEast: Kyogle Road       |      |           |              |              |               |              |           |             |                  |                   |          |           |                |                     |             |
| 5                            | T1   | All MCs   | 234          | 13.5         | 234           | 13.5         | 0.135     | 0.0         | LOS A            | 0.0               | 0.4      | 0.02      | 0.01           | 0.02                | 59.9        |
| 6                            | R2   | All MCs   | 4            | 75.0         | 4             | 75.0         | 0.135     | 6.8         | LOS A            | 0.0               | 0.4      | 0.02      | 0.01           | 0.02                | 51.2        |
| Approach                     |      |           | 238          | 14.6         | 238           | 14.6         | 0.135     | 0.1         | NA               | 0.0               | 0.4      | 0.02      | 0.01           | 0.02                | 59.7        |
| NorthWest: Tarcoola Lane     |      |           |              |              |               |              |           |             |                  |                   |          |           |                |                     |             |
| 7                            | L2   | All MCs   | 3            | 66.7         | 3             | 66.7         | 0.083     | 6.0         | LOS A            | 0.3               | 2.0      | 0.39      | 0.64           | 0.39                | 45.9        |
| 9                            | R2   | All MCs   | 71           | 0.0          | 71            | 0.0          | 0.083     | 6.3         | LOS A            | 0.3               | 2.0      | 0.39      | 0.64           | 0.39                | 47.9        |
| Approach                     |      |           | 74           | 2.9          | 74            | 2.9          | 0.083     | 6.2         | LOS A            | 0.3               | 2.0      | 0.39      | 0.64           | 0.39                | 47.8        |
| SouthWest: Kyogle Road       |      |           |              |              |               |              |           |             |                  |                   |          |           |                |                     |             |
| 10                           | L2   | All MCs   | 1            | 0.0          | 1             | 0.0          | 0.079     | 5.6         | LOS A            | 0.0               | 0.0      | 0.00      | 0.00           | 0.00                | 57.4        |
| 11                           | T1   | All MCs   | 145          | 7.2          | 145           | 7.2          | 0.079     | 0.0         | LOS A            | 0.0               | 0.0      | 0.00      | 0.00           | 0.00                | 59.9        |
| Approach                     |      |           | 146          | 7.2          | 146           | 7.2          | 0.079     | 0.1         | NA               | 0.0               | 0.0      | 0.00      | 0.00           | 0.00                | 59.9        |
| All Vehicles                 |      |           | 458          | 10.3         | 458           | 10.3         | 0.135     | 1.1         | NA               | 0.3               | 2.0      | 0.07      | 0.11           | 0.07                | 57.5        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [Dev 2026 Kyogle Rd/Tarcoola Ln PM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| NorthEast: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.065                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.9                    |
| 6                            | R2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.065                | 5.7                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 52.8                    |
| Approach                     |      |           | 124                                     | 2.5  | 124                                      | 2.5  | 0.065                | 0.1                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.8                    |
| NorthWest: Tarcoola Lane     |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 7                            | L2   | All MCs   | 2                                       | 50.0 | 2                                        | 50.0 | 0.003                | 6.2                    | LOS A            | 0.0                                         | 0.1 | 0.35      | 0.52           | 0.35                | 46.6                    |
| 9                            | R2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.003                | 6.0                    | LOS A            | 0.0                                         | 0.1 | 0.35      | 0.52           | 0.35                | 48.1                    |
| Approach                     |      |           | 3                                       | 33.3 | 3                                        | 33.3 | 0.003                | 6.1                    | LOS A            | 0.0                                         | 0.1 | 0.35      | 0.52           | 0.35                | 47.1                    |
| SouthWest: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 10                           | L2   | All MCs   | 71                                      | 0.0  | 71                                       | 0.0  | 0.163                | 5.6                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.14           | 0.00                | 56.1                    |
| 11                           | T1   | All MCs   | 222                                     | 14.7 | 222                                      | 14.7 | 0.163                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.14           | 0.00                | 58.5                    |
| Approach                     |      |           | 293                                     | 11.2 | 293                                      | 11.2 | 0.163                | 1.4                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.14           | 0.00                | 57.9                    |
| All Vehicles                 |      |           | 420                                     | 8.8  | 420                                      | 8.8  | 0.163                | 1.0                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.11           | 0.01                | 58.3                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

▼ Site: 102 [Dev 2026 Kyogle Rd/Clarrie Hall Dam Rd AM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)

Site Category: (None)

Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |                                         |       |                                          |       |                      |                        |                  |                                                                       |     |           |                |                     |                         |
|----------------------------------|------|-----------|-----------------------------------------|-------|------------------------------------------|-------|----------------------|------------------------|------------------|-----------------------------------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                           | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |       | Arrival Flows<br>[ Total HV ]<br>veh/h % |       | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. veh      Dist ]<br>veh                  m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| East: Kyogle Road                |      |           |                                         |       |                                          |       |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 4a                               | L1   | All MCs   | 131                                     | 4.8   | 131                                      | 4.8   | 0.169                | 6.6                    | LOS A            | 0.0                                                                   | 0.0 | 0.00      | 0.28           | 0.00                | 67.3                    |
| 11                               | T1   | All MCs   | 176                                     | 14.4  | 176                                      | 14.4  | 0.169                | 0.0                    | LOS A            | 0.0                                                                   | 0.0 | 0.00      | 0.28           | 0.00                | 75.1                    |
| Approach                         |      |           | 306                                     | 10.3  | 306                                      | 10.3  | 0.169                | 2.8                    | NA               | 0.0                                                                   | 0.0 | 0.00      | 0.28           | 0.00                | 71.5                    |
| West: Kyogle Road                |      |           |                                         |       |                                          |       |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 5                                | T1   | All MCs   | 139                                     | 3.0   | 139                                      | 3.0   | 0.082                | 0.2                    | LOS A            | 0.1                                                                   | 0.7 | 0.07      | 0.07           | 0.07                | 78.8                    |
| 12b                              | R3   | All MCs   | 5                                       | 100.0 | 5                                        | 100.0 | 0.082                | 12.0                   | LOS A            | 0.1                                                                   | 0.7 | 0.07      | 0.07           | 0.07                | 40.7                    |
| Approach                         |      |           | 144                                     | 6.6   | 144                                      | 6.6   | 0.082                | 0.7                    | NA               | 0.1                                                                   | 0.7 | 0.07      | 0.07           | 0.07                | 76.2                    |
| SouthWest: Clarrie Hall Dam Road |      |           |                                         |       |                                          |       |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 30b                              | L3   | All MCs   | 6                                       | 66.7  | 6                                        | 66.7  | 0.024                | 10.3                   | LOS A            | 0.1                                                                   | 0.9 | 0.39      | 0.65           | 0.39                | 46.6                    |
| 32a                              | R1   | All MCs   | 11                                      | 60.0  | 11                                       | 60.0  | 0.024                | 10.3                   | LOS A            | 0.1                                                                   | 0.9 | 0.39      | 0.65           | 0.39                | 47.7                    |
| Approach                         |      |           | 17                                      | 62.5  | 17                                       | 62.5  | 0.024                | 10.3                   | LOS A            | 0.1                                                                   | 0.9 | 0.39      | 0.65           | 0.39                | 47.3                    |
| All Vehicles                     |      |           | 467                                     | 11.0  | 467                                      | 11.0  | 0.169                | 2.4                    | NA               | 0.1                                                                   | 0.9 | 0.03      | 0.22           | 0.03                | 71.6                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9



# MOVEMENT SUMMARY

Site: 102 [Dev 2026 Kyogle Rd/Clarrie Hall Dam Rd PM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|----------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                           | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| East: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 4a                               | L1   | All MCs   | 2                                       | 0.0  | 2                                        | 0.0  | 0.065                | 6.5                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 73.2                    |
| 11                               | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.065                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 79.8                    |
| Approach                         |      |           | 125                                     | 2.5  | 125                                      | 2.5  | 0.065                | 0.1                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.01           | 0.00                | 79.6                    |
| West: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                                | T1   | All MCs   | 171                                     | 19.1 | 171                                      | 19.1 | 0.099                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.00      | 0.00           | 0.00                | 79.9                    |
| 12b                              | R3   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.099                | 7.2                    | LOS A            | 0.0                                         | 0.1 | 0.00      | 0.00           | 0.00                | 73.1                    |
| Approach                         |      |           | 172                                     | 19.0 | 172                                      | 19.0 | 0.099                | 0.0                    | NA               | 0.0                                         | 0.1 | 0.00      | 0.00           | 0.00                | 79.8                    |
| SouthWest: Clarrie Hall Dam Road |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 30b                              | L3   | All MCs   | 2                                       | 0.0  | 2                                        | 0.0  | 0.126                | 8.4                    | LOS A            | 0.4                                         | 3.0 | 0.35      | 0.67           | 0.35                | 63.8                    |
| 32a                              | R1   | All MCs   | 121                                     | 0.0  | 121                                      | 0.0  | 0.126                | 7.5                    | LOS A            | 0.4                                         | 3.0 | 0.35      | 0.67           | 0.35                | 63.7                    |
| Approach                         |      |           | 123                                     | 0.0  | 123                                      | 0.0  | 0.126                | 7.6                    | LOS A            | 0.4                                         | 3.0 | 0.35      | 0.67           | 0.35                | 63.7                    |
| All Vehicles                     |      |           | 420                                     | 8.5  | 420                                      | 8.5  | 0.126                | 2.3                    | NA               | 0.4                                         | 3.0 | 0.10      | 0.20           | 0.10                | 74.3                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9

# MOVEMENT SUMMARY

Site: 103 [Dev 2026 Kyogle Rd/Doon Doon Rd AM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
|------------------------------|------|-----------|--------------|------|---------------|------|-----------|-------------|------------------|-------------------|----------|-----------|----------------|---------------------|-------------|
| Mov ID                       | Turn | Mov Class | Demand Flows |      | Arrival Flows |      | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue |          | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                              |      |           | [ Total HV ] | %    | [ Total HV ]  | %    | v/c       | sec         |                  | [ Veh. veh        | Dist ] m |           |                |                     | km/h        |
| South: Doon Doon Road        |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 1                            | L2   | All MCs   | 6            | 0.0  | 6             | 0.0  | 0.039     | 7.2         | LOS A            | 0.1               | 1.0      | 0.26      | 0.62           | 0.26                | 63.7        |
| 3                            | R2   | All MCs   | 33           | 19.4 | 33            | 19.4 | 0.039     | 8.0         | LOS A            | 0.1               | 1.0      | 0.26      | 0.62           | 0.26                | 57.6        |
| Approach                     |      |           | 39           | 16.2 | 39            | 16.2 | 0.039     | 7.9         | LOS A            | 0.1               | 1.0      | 0.26      | 0.62           | 0.26                | 58.5        |
| East: Kyogle Road            |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 4                            | L2   | All MCs   | 89           | 30.6 | 89            | 30.6 | 0.099     | 7.5         | LOS A            | 0.0               | 0.0      | 0.00      | 0.36           | 0.00                | 58.5        |
| 11                           | T1   | All MCs   | 69           | 21.2 | 69            | 21.2 | 0.099     | 0.0         | LOS A            | 0.0               | 0.0      | 0.00      | 0.36           | 0.00                | 74.0        |
| Approach                     |      |           | 159          | 26.5 | 159           | 26.5 | 0.099     | 4.2         | NA               | 0.0               | 0.0      | 0.00      | 0.36           | 0.00                | 64.4        |
| West: Kyogle Road            |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 5                            | T1   | All MCs   | 86           | 3.7  | 86            | 3.7  | 0.052     | 0.1         | LOS A            | 0.1               | 0.5      | 0.07      | 0.09           | 0.07                | 78.4        |
| 12                           | R2   | All MCs   | 9            | 11.1 | 9             | 11.1 | 0.052     | 7.5         | LOS A            | 0.1               | 0.5      | 0.07      | 0.09           | 0.07                | 67.4        |
| Approach                     |      |           | 96           | 4.4  | 96            | 4.4  | 0.052     | 0.8         | NA               | 0.1               | 0.5      | 0.07      | 0.09           | 0.07                | 77.1        |
| All Vehicles                 |      |           | 294          | 17.9 | 294           | 17.9 | 0.099     | 3.6         | NA               | 0.1               | 1.0      | 0.06      | 0.31           | 0.06                | 67.1        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 103 [Dev 2026 Kyogle Rd/Doon Doon Rd PM (Site Folder: Option 1 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| South: Doon Doon Road        |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 1                            | L2   | All MCs   | 5                                       | 20.0 | 5                                        | 20.0 | 0.092                | 7.6                    | LOS A            | 0.3                                         | 2.7 | 0.25      | 0.63           | 0.25                | 57.8                    |
| 3                            | R2   | All MCs   | 84                                      | 27.5 | 84                                       | 27.5 | 0.092                | 8.0                    | LOS A            | 0.3                                         | 2.7 | 0.25      | 0.63           | 0.25                | 55.4                    |
| Approach                     |      |           | 89                                      | 27.1 | 89                                       | 27.1 | 0.092                | 8.0                    | LOS A            | 0.3                                         | 2.7 | 0.25      | 0.63           | 0.25                | 55.6                    |
| East: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 4                            | L2   | All MCs   | 22                                      | 9.5  | 22                                       | 9.5  | 0.051                | 7.1                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 67.7                    |
| 11                           | T1   | All MCs   | 75                                      | 1.4  | 75                                       | 1.4  | 0.051                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 77.5                    |
| Approach                     |      |           | 97                                      | 3.3  | 97                                       | 3.3  | 0.051                | 1.6                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.15           | 0.00                | 75.0                    |
| West: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 73                                      | 10.1 | 73                                       | 10.1 | 0.042                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 79.3                    |
| 12                           | R2   | All MCs   | 3                                       | 0.0  | 3                                        | 0.0  | 0.042                | 6.7                    | LOS A            | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 72.7                    |
| Approach                     |      |           | 76                                      | 9.7  | 76                                       | 9.7  | 0.042                | 0.3                    | NA               | 0.0                                         | 0.1 | 0.02      | 0.03           | 0.02                | 79.0                    |
| All Vehicles                 |      |           | 262                                     | 13.3 | 262                                      | 13.3 | 0.092                | 3.4                    | NA               | 0.3                                         | 2.7 | 0.09      | 0.28           | 0.09                | 67.9                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 101 [Dev 2026 Kyogle Rd/Tarcoola Ln AM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
|------------------------------|------|-----------|--------------|------|---------------|------|-----------|-------------|------------------|-------------------|----------|-----------|----------------|---------------------|-------------|
| Mov ID                       | Turn | Mov Class | Demand Flows |      | Arrival Flows |      | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue |          | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                              |      |           | [ Total HV ] | %    | [ Total HV ]  | %    | v/c       | sec         |                  | [ Veh. veh        | Dist ] m |           |                |                     | km/h        |
| NorthEast: Kyogle Road       |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 5                            | T1   | All MCs   | 225          | 12.6 | 225           | 12.6 | 0.138     | 0.1         | LOS A            | 0.1               | 1.0      | 0.05      | 0.06           | 0.05                | 59.6        |
| 6                            | R2   | All MCs   | 13           | 50.0 | 13            | 50.0 | 0.138     | 7.0         | LOS A            | 0.1               | 1.0      | 0.05      | 0.06           | 0.05                | 51.5        |
| Approach                     |      |           | 238          | 14.6 | 238           | 14.6 | 0.138     | 0.5         | NA               | 0.1               | 1.0      | 0.05      | 0.06           | 0.05                | 59.1        |
| NorthWest: Tarcoola Lane     |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 7                            | L2   | All MCs   | 7            | 85.7 | 7             | 85.7 | 0.044     | 6.2         | LOS A            | 0.1               | 1.8      | 0.42      | 0.62           | 0.42                | 44.5        |
| 9                            | R2   | All MCs   | 18           | 94.1 | 18            | 94.1 | 0.044     | 9.4         | LOS A            | 0.1               | 1.8      | 0.42      | 0.62           | 0.42                | 43.9        |
| Approach                     |      |           | 25           | 91.7 | 25            | 91.7 | 0.044     | 8.5         | LOS A            | 0.1               | 1.8      | 0.42      | 0.62           | 0.42                | 44.1        |
| SouthWest: Kyogle Road       |      |           |              |      |               |      |           |             |                  |                   |          |           |                |                     |             |
| 10                           | L2   | All MCs   | 18           | 94.1 | 18            | 94.1 | 0.091     | 6.6         | LOS A            | 0.0               | 0.0      | 0.00      | 0.06           | 0.00                | 53.1        |
| 11                           | T1   | All MCs   | 141          | 4.5  | 141           | 4.5  | 0.091     | 0.0         | LOS A            | 0.0               | 0.0      | 0.00      | 0.06           | 0.00                | 59.9        |
| Approach                     |      |           | 159          | 14.6 | 159           | 14.6 | 0.091     | 0.8         | NA               | 0.0               | 0.0      | 0.00      | 0.06           | 0.00                | 59.1        |
| All Vehicles                 |      |           | 422          | 19.2 | 422           | 19.2 | 0.138     | 1.1         | NA               | 0.1               | 1.8      | 0.05      | 0.09           | 0.05                | 57.9        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

▼ Site: 101 [Dev 2026 Kyogle Rd/Tarcoola Ln PM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| NorthEast: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.065                | 0.0                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.9                    |
| 6                            | R2   | All MCs   | 1                                       | 0.0  | 1                                        | 0.0  | 0.065                | 5.6                    | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 52.8                    |
| Approach                     |      |           | 124                                     | 2.5  | 124                                      | 2.5  | 0.065                | 0.0                    | NA               | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 59.9                    |
| NorthWest: Tarcoola Lane     |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 7                            | L2   | All MCs   | 6                                       | 0.0  | 6                                        | 0.0  | 0.031                | 5.3                    | LOS A            | 0.1                                         | 1.1 | 0.41      | 0.61           | 0.41                | 47.6                    |
| 9                            | R2   | All MCs   | 14                                      | 92.3 | 14                                       | 92.3 | 0.031                | 8.8                    | LOS A            | 0.1                                         | 1.1 | 0.41      | 0.61           | 0.41                | 44.2                    |
| Approach                     |      |           | 20                                      | 63.2 | 20                                       | 63.2 | 0.031                | 7.7                    | LOS A            | 0.1                                         | 1.1 | 0.41      | 0.61           | 0.41                | 45.2                    |
| SouthWest: Kyogle Road       |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 10                           | L2   | All MCs   | 14                                      | 92.3 | 14                                       | 92.3 | 0.135                | 6.6                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.03           | 0.00                | 53.2                    |
| 11                           | T1   | All MCs   | 218                                     | 15.5 | 218                                      | 15.5 | 0.135                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.03           | 0.00                | 59.9                    |
| Approach                     |      |           | 232                                     | 20.0 | 232                                      | 20.0 | 0.135                | 0.4                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.03           | 0.00                | 59.5                    |
| All Vehicles                 |      |           | 376                                     | 16.5 | 376                                      | 16.5 | 0.135                | 0.7                    | NA               | 0.1                                         | 1.1 | 0.02      | 0.06           | 0.02                | 58.6                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

▼ Site: 102 [Dev 2026 Kyogle Rd/Clarrie Hall Dam Rd AM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |                                         |       |                                          |       |                  |                    |                  |                                             |     |           |                |                     |                     |
|----------------------------------|------|-----------|-----------------------------------------|-------|------------------------------------------|-------|------------------|--------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|---------------------|
| Mov ID                           | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |       | Arrival Flows<br>[ Total HV ]<br>veh/h % |       | Deg. Satn<br>v/c | Aver. Delay<br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br>km/h |
| East: Kyogle Road                |      |           |                                         |       |                                          |       |                  |                    |                  |                                             |     |           |                |                     |                     |
| 4a                               | L1   | All MCs   | 76                                      | 20.8  | 76                                       | 20.8  | 0.142            | 6.9                | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.20           | 0.00                | 62.8                |
| 11                               | T1   | All MCs   | 169                                     | 17.4  | 169                                      | 17.4  | 0.142            | 0.0                | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.20           | 0.00                | 76.6                |
| Approach                         |      |           | 245                                     | 18.5  | 245                                      | 18.5  | 0.142            | 2.2                | NA               | 0.0                                         | 0.0 | 0.00      | 0.20           | 0.00                | 71.7                |
| West: Kyogle Road                |      |           |                                         |       |                                          |       |                  |                    |                  |                                             |     |           |                |                     |                     |
| 5                                | T1   | All MCs   | 143                                     | 5.9   | 143                                      | 5.9   | 0.078            | 0.0                | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 79.8                |
| 12b                              | R3   | All MCs   | 1                                       | 100.0 | 1                                        | 100.0 | 0.078            | 10.0               | LOS A            | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 40.9                |
| Approach                         |      |           | 144                                     | 6.6   | 144                                      | 6.6   | 0.078            | 0.1                | NA               | 0.0                                         | 0.1 | 0.01      | 0.01           | 0.01                | 79.2                |
| SouthWest: Clarrie Hall Dam Road |      |           |                                         |       |                                          |       |                  |                    |                  |                                             |     |           |                |                     |                     |
| 30b                              | L3   | All MCs   | 13                                      | 0.0   | 13                                       | 0.0   | 0.042            | 8.5                | LOS A            | 0.1                                         | 1.4 | 0.38      | 0.66           | 0.38                | 61.7                |
| 32a                              | R1   | All MCs   | 19                                      | 77.8  | 19                                       | 77.8  | 0.042            | 10.8               | LOS A            | 0.1                                         | 1.4 | 0.38      | 0.66           | 0.38                | 44.4                |
| Approach                         |      |           | 32                                      | 46.7  | 32                                       | 46.7  | 0.042            | 9.9                | LOS A            | 0.1                                         | 1.4 | 0.38      | 0.66           | 0.38                | 50.0                |
| All Vehicles                     |      |           | 421                                     | 16.5  | 421                                      | 16.5  | 0.142            | 2.0                | NA               | 0.1                                         | 1.4 | 0.03      | 0.17           | 0.03                | 71.7                |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9



# MOVEMENT SUMMARY

Site: 102 [Dev 2026 Kyogle Rd/Clarrie Hall Dam Rd PM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance     |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
|----------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|---------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                           | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ]<br>veh m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| East: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 4a                               | L1   | All MCs   | 15                                      | 85.7 | 15                                       | 85.7 | 0.077                | 8.2                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.07           | 0.00                | 47.9                    |
| 11                               | T1   | All MCs   | 123                                     | 2.6  | 123                                      | 2.6  | 0.077                | 0.0                    | LOS A            | 0.0                                         | 0.0 | 0.00      | 0.07           | 0.00                | 79.8                    |
| Approach                         |      |           | 138                                     | 11.5 | 138                                      | 11.5 | 0.077                | 0.9                    | NA               | 0.0                                         | 0.0 | 0.00      | 0.07           | 0.00                | 74.5                    |
| West: Kyogle Road                |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 5                                | T1   | All MCs   | 160                                     | 20.4 | 160                                      | 20.4 | 0.100                | 0.0                    | LOS A            | 0.1                                         | 0.6 | 0.04      | 0.06           | 0.04                | 78.8                    |
| 12b                              | R3   | All MCs   | 11                                      | 0.0  | 11                                       | 0.0  | 0.100                | 7.5                    | LOS A            | 0.1                                         | 0.6 | 0.04      | 0.06           | 0.04                | 72.1                    |
| Approach                         |      |           | 171                                     | 19.1 | 171                                      | 19.1 | 0.100                | 0.5                    | NA               | 0.1                                         | 0.6 | 0.04      | 0.06           | 0.04                | 78.3                    |
| SouthWest: Clarrie Hall Dam Road |      |           |                                         |      |                                          |      |                      |                        |                  |                                             |     |           |                |                     |                         |
| 30b                              | L3   | All MCs   | 2                                       | 0.0  | 2                                        | 0.0  | 0.085                | 8.4                    | LOS A            | 0.3                                         | 2.3 | 0.36      | 0.67           | 0.36                | 63.4                    |
| 32a                              | R1   | All MCs   | 71                                      | 19.4 | 71                                       | 19.4 | 0.085                | 8.2                    | LOS A            | 0.3                                         | 2.3 | 0.36      | 0.67           | 0.36                | 57.6                    |
| Approach                         |      |           | 73                                      | 18.8 | 73                                       | 18.8 | 0.085                | 8.2                    | LOS A            | 0.3                                         | 2.3 | 0.36      | 0.67           | 0.36                | 57.8                    |
| All Vehicles                     |      |           | 381                                     | 16.3 | 381                                      | 16.3 | 0.100                | 2.1                    | NA               | 0.3                                         | 2.3 | 0.09      | 0.18           | 0.09                | 72.1                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

# MOVEMENT SUMMARY

Site: 103 [Dev 2026 Kyogle Rd/Doon Doon Rd AM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)

Site Category: (None)

Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                                         |      |                                          |      |                      |                        |                  |                                                                       |     |           |                |                     |                         |
|------------------------------|------|-----------|-----------------------------------------|------|------------------------------------------|------|----------------------|------------------------|------------------|-----------------------------------------------------------------------|-----|-----------|----------------|---------------------|-------------------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ]<br>veh/h % |      | Arrival Flows<br>[ Total HV ]<br>veh/h % |      | Deg. Satn<br><br>v/c | Aver. Delay<br><br>sec | Level of Service | 95% Back Of Queue<br>[ Veh. veh      Dist ]<br>veh                  m |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed<br><br>km/h |
| South: Doon Doon Road        |      |           |                                         |      |                                          |      |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 1                            | L2   | All MCs   | 6                                       | 0.0  | 6                                        | 0.0  | 0.039                | 7.2                    | LOS A            | 0.1                                                                   | 1.0 | 0.26      | 0.62           | 0.26                | 63.7                    |
| 3                            | R2   | All MCs   | 33                                      | 19.4 | 33                                       | 19.4 | 0.039                | 8.0                    | LOS A            | 0.1                                                                   | 1.0 | 0.26      | 0.62           | 0.26                | 57.6                    |
| Approach                     |      |           | 39                                      | 16.2 | 39                                       | 16.2 | 0.039                | 7.9                    | LOS A            | 0.1                                                                   | 1.0 | 0.26      | 0.62           | 0.26                | 58.5                    |
| East: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 4                            | L2   | All MCs   | 89                                      | 30.6 | 89                                       | 30.6 | 0.099                | 7.5                    | LOS A            | 0.0                                                                   | 0.0 | 0.00      | 0.36           | 0.00                | 58.5                    |
| 11                           | T1   | All MCs   | 69                                      | 21.2 | 69                                       | 21.2 | 0.099                | 0.0                    | LOS A            | 0.0                                                                   | 0.0 | 0.00      | 0.36           | 0.00                | 74.0                    |
| Approach                     |      |           | 159                                     | 26.5 | 159                                      | 26.5 | 0.099                | 4.2                    | NA               | 0.0                                                                   | 0.0 | 0.00      | 0.36           | 0.00                | 64.4                    |
| West: Kyogle Road            |      |           |                                         |      |                                          |      |                      |                        |                  |                                                                       |     |           |                |                     |                         |
| 5                            | T1   | All MCs   | 86                                      | 3.7  | 86                                       | 3.7  | 0.052                | 0.1                    | LOS A            | 0.1                                                                   | 0.5 | 0.07      | 0.09           | 0.07                | 78.4                    |
| 12                           | R2   | All MCs   | 9                                       | 11.1 | 9                                        | 11.1 | 0.052                | 7.5                    | LOS A            | 0.1                                                                   | 0.5 | 0.07      | 0.09           | 0.07                | 67.4                    |
| Approach                     |      |           | 96                                      | 4.4  | 96                                       | 4.4  | 0.052                | 0.8                    | NA               | 0.1                                                                   | 0.5 | 0.07      | 0.09           | 0.07                | 77.1                    |
| All Vehicles                 |      |           | 294                                     | 17.9 | 294                                      | 17.9 | 0.099                | 3.6                    | NA               | 0.1                                                                   | 1.0 | 0.06      | 0.31           | 0.06                | 67.1                    |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: X:\2023\E230044 - Clarrie Hall Dam EIS - Transport and traffic assessment\SIDRA Modelling\E230044 Clarrie Hall Dam SIDRA v3.sip9

# MOVEMENT SUMMARY

Site: 103 [Dev 2026 Kyogle Rd/Doon Doon Rd PM (Site Folder: Option 2 - Baseline 2026 + Construction)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Priority-controlled intersection (give way)  
Site Category: (None)  
Give-Way (Two-Way)

| Vehicle Movement Performance |      |           |                              |      |                               |      |           |             |                  |                                    |     |           |                |                     |             |
|------------------------------|------|-----------|------------------------------|------|-------------------------------|------|-----------|-------------|------------------|------------------------------------|-----|-----------|----------------|---------------------|-------------|
| Mov ID                       | Turn | Mov Class | Demand Flows<br>[ Total HV ] |      | Arrival Flows<br>[ Total HV ] |      | Deg. Satn | Aver. Delay | Level of Service | 95% Back Of Queue<br>[ Veh. Dist ] |     | Prop. Que | Eff. Stop Rate | Aver. No. of Cycles | Aver. Speed |
|                              |      |           | veh/h                        | %    | veh/h                         | %    | v/c       | sec         |                  |                                    | m   |           |                |                     | km/h        |
| South: Doon Doon Road        |      |           |                              |      |                               |      |           |             |                  |                                    |     |           |                |                     |             |
| 1                            | L2   | All MCs   | 5                            | 20.0 | 5                             | 20.0 | 0.092     | 7.6         | LOS A            | 0.3                                | 2.7 | 0.25      | 0.63           | 0.25                | 57.8        |
| 3                            | R2   | All MCs   | 84                           | 27.5 | 84                            | 27.5 | 0.092     | 8.0         | LOS A            | 0.3                                | 2.7 | 0.25      | 0.63           | 0.25                | 55.4        |
| Approach                     |      |           | 89                           | 27.1 | 89                            | 27.1 | 0.092     | 8.0         | LOS A            | 0.3                                | 2.7 | 0.25      | 0.63           | 0.25                | 55.6        |
| East: Kyogle Road            |      |           |                              |      |                               |      |           |             |                  |                                    |     |           |                |                     |             |
| 4                            | L2   | All MCs   | 22                           | 9.5  | 22                            | 9.5  | 0.051     | 7.1         | LOS A            | 0.0                                | 0.0 | 0.00      | 0.15           | 0.00                | 67.7        |
| 11                           | T1   | All MCs   | 75                           | 1.4  | 75                            | 1.4  | 0.051     | 0.0         | LOS A            | 0.0                                | 0.0 | 0.00      | 0.15           | 0.00                | 77.5        |
| Approach                     |      |           | 97                           | 3.3  | 97                            | 3.3  | 0.051     | 1.6         | NA               | 0.0                                | 0.0 | 0.00      | 0.15           | 0.00                | 75.0        |
| West: Kyogle Road            |      |           |                              |      |                               |      |           |             |                  |                                    |     |           |                |                     |             |
| 5                            | T1   | All MCs   | 73                           | 10.1 | 73                            | 10.1 | 0.042     | 0.0         | LOS A            | 0.0                                | 0.1 | 0.02      | 0.03           | 0.02                | 79.3        |
| 12                           | R2   | All MCs   | 3                            | 0.0  | 3                             | 0.0  | 0.042     | 6.7         | LOS A            | 0.0                                | 0.1 | 0.02      | 0.03           | 0.02                | 72.7        |
| Approach                     |      |           | 76                           | 9.7  | 76                            | 9.7  | 0.042     | 0.3         | NA               | 0.0                                | 0.1 | 0.02      | 0.03           | 0.02                | 79.0        |
| All Vehicles                 |      |           | 262                          | 13.3 | 262                           | 13.3 | 0.092     | 3.4         | NA               | 0.3                                | 2.7 | 0.09      | 0.28           | 0.09                | 67.9        |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

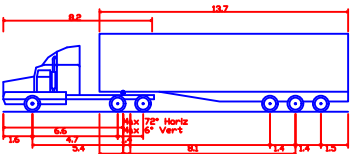
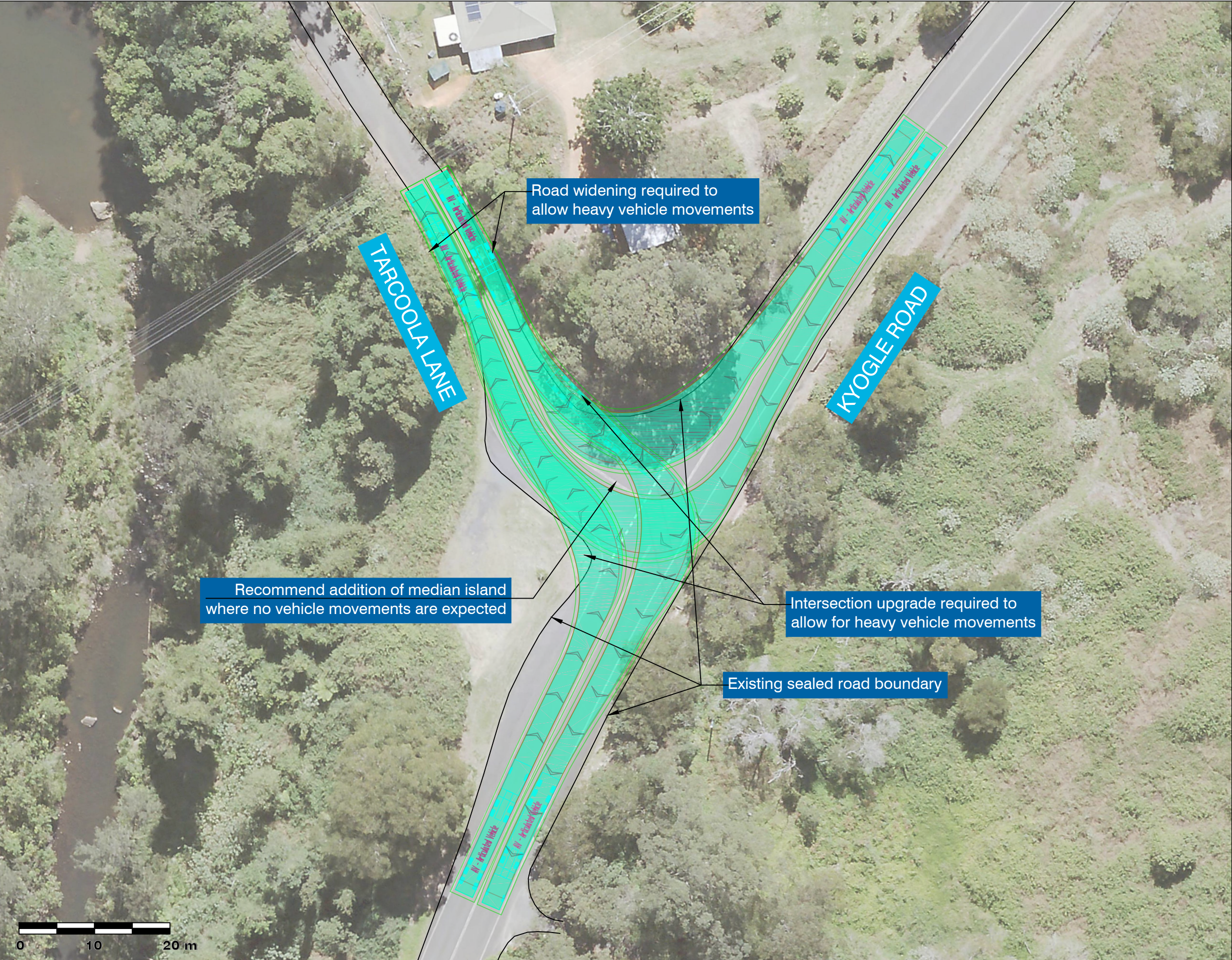
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# Appendix D

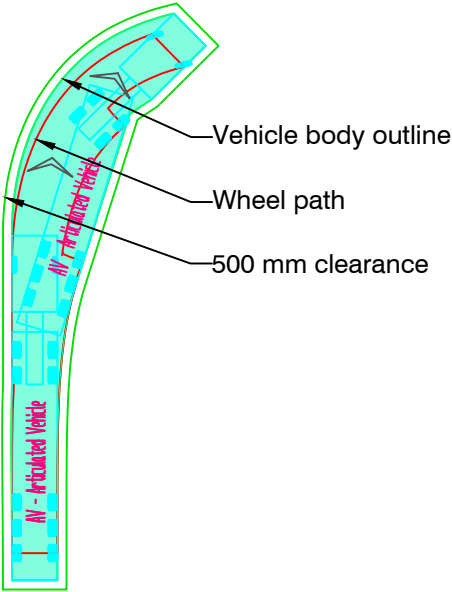
## Swept path assessments

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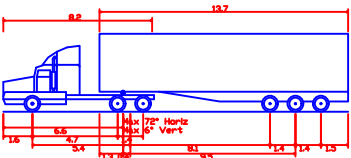
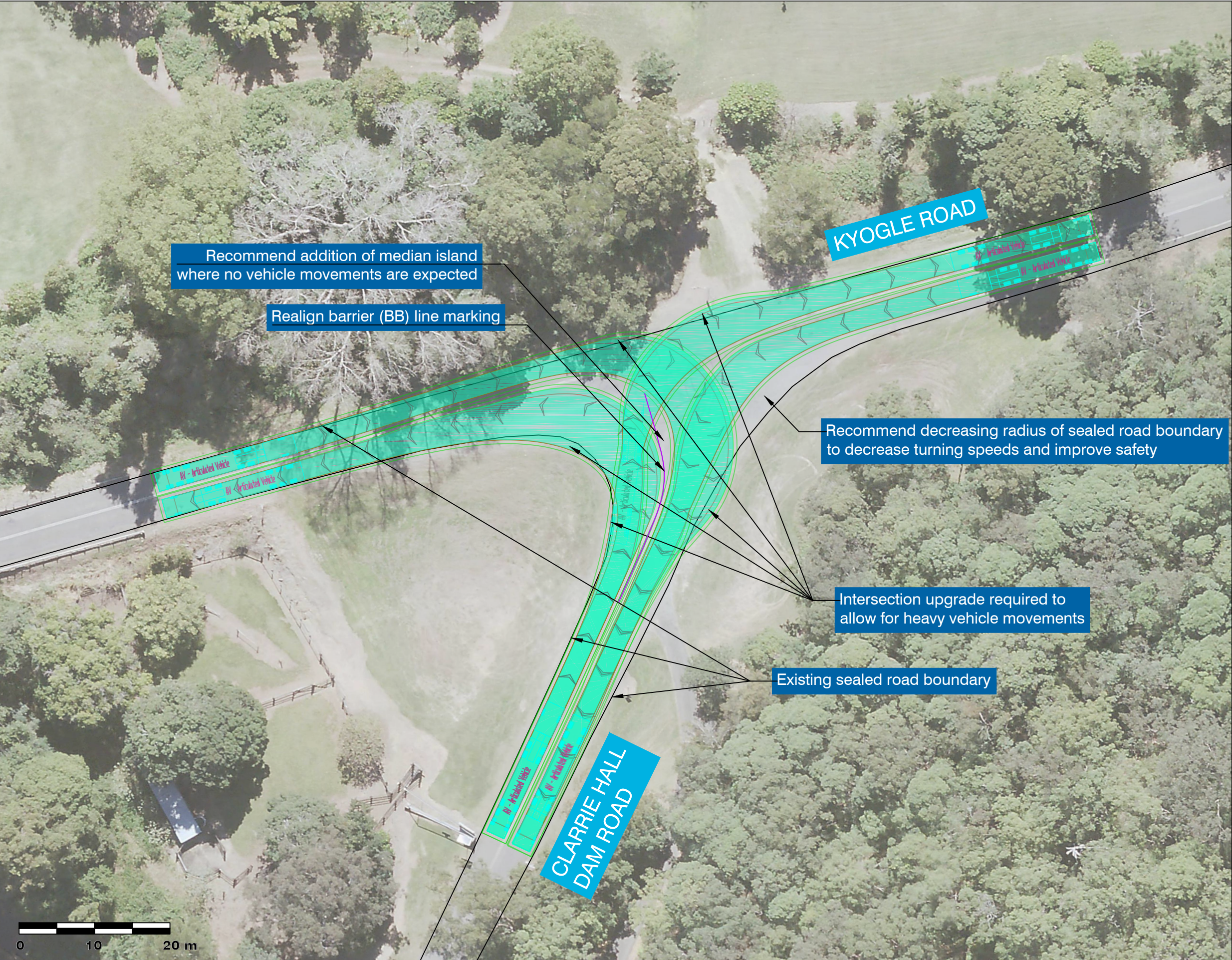




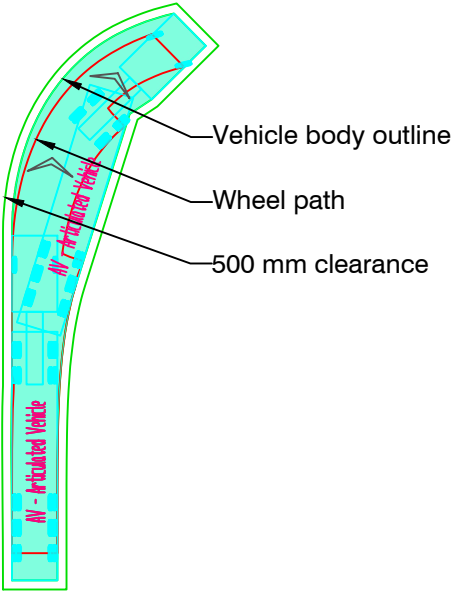
|                             |         |
|-----------------------------|---------|
| AV - Articulated Vehicle    | 19.000m |
| Overall Length              | 19.000m |
| Overall Width               | 2.500m  |
| Wheel Track                 | 1.500m  |
| Wheel Offset                | 0.500m  |
| Lock-to-lock time           | 6.00s   |
| Curb to curb turning Radius | 12.500m |



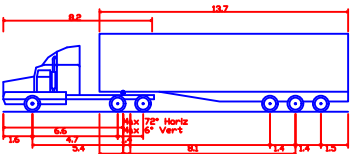




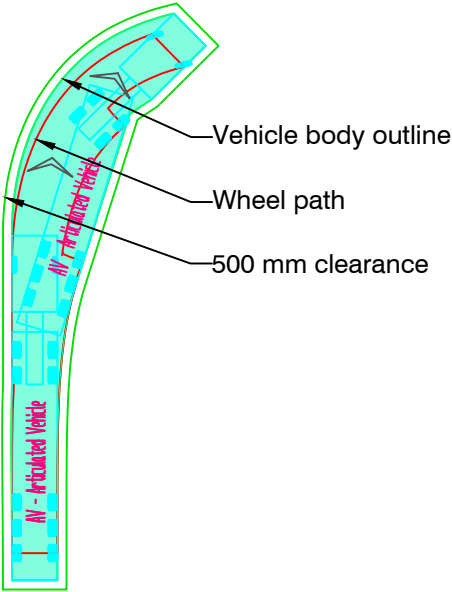
AV - Articulated Vehicle  
Overall Length 19.000m  
Overall Width 2.500m  
Overall Height 4.300m  
Min Body Ground Clearance 0.450m  
Track Width 2.500m  
Lock-to-lock time 6.00s  
Curb to Curb Turning Radius 12.500m







AV - Articulated Vehicle  
Overall Length 19.000m  
Overall Width 3.500m  
Overall Body Height 4.300m  
Min Body Ground Clearance 0.410m  
Track Width 2.500m  
Lock-to-lock time 6.00s  
Curb to curb turning Radius 12.500m





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