TECHNICAL PAPER 01

Transport and traffic

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

ARTC INLAND RAIL

ALBURY TO ILLABO (A2I) PROJECT

TECHNICAL PAPER 1 – TRANSPORT AND TRAFFIC

JULY 2022

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GLOSSARY

AADT	Average Annual Daily Traffic
AUL	Auxiliary Left-turn treatment
AUR	Auxiliary Right-turn treatment
BAL	Basic Left-turn treatment
BAR	Basic Right- turn treatment
CEMP	Construction Environment Management Plan
CHL	Channelised Left-turn treatment
CHR	Channelised Right-turn treatment
CSSI	Critical State Significant Infrastructure
CTTAMP	Construction Traffic, Transport and Access Management Plan
DDA	Disability Discrimination Act
DOS	Degree of Saturation
EIS	Environmental Impact Statement
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment protection licence
HV	Heavy Vehicle
km/h	Kilometres-per-hour
LOS	Level of Service
PC	Passenger Car
PCU	Passenger Car Unit
RMAR	Rail Maintenance Access Road
RMS	NSW Roads and Maritime Service (now part of TfNSW)
RTA	Roads and Traffic Authority (Now TfNSW)
SEAR	Secretary's Environmental Assessment Requirements
SFAIRP	So Far As Is Reasonably Possible
SSI	State Significant Infrastructure
TfNSW	Transport for New South Wales
TMP	Traffic Management Plan
TTIA	Transport and Traffic Impact Assessment

DEFINITIONS

Active level crossing	At grade road crossing of the rail corridor which uses flashing lights and boom barriers for motorists, and automated gates for pedestrians. These devices are activated prior to and during the passage of a train through a level crossing.
Construction environmental management plan	A site-specific plan developed for the construction phase of a project, to ensure that all contractors and sub-contractors comply with the environmental conditions of approval for the project and manage environmental risks properly.
Construction compound	An area used as the base for construction activities, usually for the storage of plant, equipment and materials and/or construction site offices and worker facilities.
Culvert	A structure that allows water to flow under a road, railway, track, or similar obstruction.
Cumulative impacts	Impacts that, when considered together, have different and/or more substantial impacts
Down line	Track within a dual-track section of corridor on which trains travel away from Sydney Central station
Enhancement site	Discrete sites within the proposal site that are proposed for infrastructure enhancement.
Gantry	An overhead metal structure with a frame supporting equipment such as a signals, lighting or cameras.
Inland Rail program	The Inland Rail program comprises the design and construction of a new Inland Rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 km in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track.
Loop line	Track which briefly leaves the main line and re-join to allow for train passing or access to minor locations.
Main line	Primary track on which trains travel within a single-track section of corridor
Main South Line	A major rail line between Sydney and Albury, passing through the Southern Highlands, Southern Tablelands, South West Slopes and Riverina regions of NSW.
Passive level crossing	At grade road crossing of the rail corridor which uses stop or give way signs for motorists, and 'look for trains' signs for pedestrians.
Pedestrian bridge	A bridge designed solely for pedestrians to cross a watercourse, rail corridor or road.
Precinct	Groupings of enhancement sites in line with the LGAs including Albury, Greater Hume – Lockhart, Wagga Wagga and Junee.
The proposal	Proposed enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway between Albury and Illabo for the purpose of meeting Inland Rail specifications.
The proposal site	The areas that enhancement works are required to operate the Albury to Illabo section of Inland Rail. It includes the location of construction worksites, operational rail infrastructure, new bridge structures, level crossings and other ancillary infrastructure.

Overbridge	A bridge over a railway or road. For the proposal, overbridges refer to those structures which allow a road to pass over the railway.
Rail corridor	The corridor within which the rail tracks and associated infrastructure are located
Study area	The wider area, including and surrounding the proposal site, with the potential to be directly or indirectly affected by the proposal. The extent of the study area varies according to the requirements of each assessment and the potential for impacts.
Track	The structure consisting of the rails, fasteners, sleepers and ballast, which conveys trains.

EXECUTIVE SUMMARY

THE PROPOSAL

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national project that would enhance Australia's existing national rail network and serve the interstate freight market. Inland Rail has been divided into 13 projects, seven of which are located in NSW. Each of these projects can be delivered and operated independently with tie-in points on the existing railway. Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Albury to Illabo section of Inland Rail ('the proposal').

The proposal involves enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway to provide the increased vertical and horizontal clearances required for double-stacked freight trains. The proposal is generally within the existing active rail corridor between the towns of Albury and Illabo. Works are proposed at 24 locations along the Main South Line corridor, described as "enhancement sites", within four precincts aligned with the local government areas of Albury, Greater Hume and Lockhart, Wagga Wagga and Junee.

The proposal is State significant infrastructure and is subject to approval by the NSW Minister for Planning under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). On 29 June 2020, the Australian Government Department of Agriculture, Water and Environment (DAWE) notified that the proposal is a not controlled action, and hence approval under the EPBC Act is not required.

THIS REPORT

This report has been prepared by WSP Australia on behalf of ARTC as part of the Environmental Impact Statement (EIS) for the proposal to address the transport and traffic related Secretary's Environmental Assessment Requirements (SEARs) issued by the Secretary of the then NSW Department of Planning Industry and Environment (now the Department of Planning and Environment) for the proposal on 14 October 2020.

This report provides a description of the existing conditions on the transport network and details the expected construction activities and timeframes of the proposal. It provides an impact assessment of peak construction traffic and proposed road closures on the surrounding transport networks, including implications for access, cyclists, pedestrians, and public transport. The report also provides a review of operational impacts, including impacts at level crossings and the number of peak hour vehicles expected to be impacted by a level crossing closure.

Recommended mitigation and management measures are identified in response to the impact assessment findings and are detailed by planning stages of the proposal.

EXISTING ENVIRONMENT

The proposal site is an approximately 185km section of existing rail corridor that runs generally north – south between Albury and Illabo, crossing five Local Government Areas (LGAs) Albury City Council, Greater Hume Shire Council, Lockhart Regional Council, Wagga Wagga City Council and Junee Shire Council). The land use throughout the LGAs is predominantly rural land used for agriculture and grazing, with Albury and Wagga Wagga featuring higher density urban environments.

The road network expected to support the proposal is typically local rural roads, State highways (the Hume Highway and the Olympic Highway), and local urban roads within the cities of Albury and Wagga Wagga and the town of Junee. Other key transport facilities within the proposal study area are:

- public transport
  - public and school bus services including limited regional services linking rural towns and urban routes within the cities of Albury and Wagga Wagga
  - passenger rail services along The Main South Line
- heavy vehicle and Traveling Stock Routes
- provision for active transport in the vicinity of most enhancement sites is minimal, however pedestrian and cyclist networks exist within the urban areas.

CONSTRUCTION IMPACTS

Construction of the proposal includes 24 individual enhancement sites across four precincts (Albury, Greater Hume and Lockhart, Wagga Wagga and Junee). Typical construction activities at enhancement sites would include:

- site establishment and enabling works
- main construction works as relevant to the enhancement site and
- finishing works with associated activities.

Construction of the proposal would result in a temporary increase in light and heavy vehicle movements on the road network. Light vehicles trips are associated with construction workers moving to and from the enhancement sites. Heavy vehicles would generally be associated with trucks delivering plant or materials to and from the enhancement sites.

Although unlikely to occur, a conservative approach was taken in the assessment of construction vehicle impact on the road network by assuming that peak hour construction vehicle trips would occur during the existing network peak hour. As peak hour construction vehicle trips are low, this showed negligible impact to the performance of surrounding links and intersections, all of which continued to operate with stable flow conditions and an acceptable Level of Service, respectively, and typically with no change to the existing Level of Service.

The road closures and associated diversions required to facilitate construction in Henty, Wagga Wagga, and Junee result in temporary impacts to localised intersection performance, travel times, and public and active transport, particularly in the denser urban area of Wagga Wagga. The Edmondson Street bridge closure in Wagga Wagga, would impact public and school bus routes, stops, and would require bus service rerouting, amended stopping patterns and alternative stop locations. Pedestrian and cycling connectivity would also be affected by the bridge closure.

The low traffic volumes generated from construction activities are not expected to impact the operation of Heavy Vehicle and Travelling stock routes although there may be minor delays from traffic control. Rail freight and passenger services would not be impacted as rail possessions would occur during regularly scheduled maintenance periods. Active transport facilities for pedestrians and cyclists are not expected to be impacted by construction vehicle movements, however the closure of active transport facilities to allow for pedestrian and road bridge replacements within Wagga Wagga and Junee would result in temporary loss of connectivity and travel time impacts.

OPERATIONAL IMPACTS

The proposal would allow for increases in rail services, with an increase between 2025 and 2040 of up to two daily services.

As the proposal solely provides enhancements to the existing rail line, operational impacts would be associated with:

- increased daily train services resulting in an increased frequency of closures per day at level crossings
- increased delay where level crossings have been upgraded from passive to active.

The proposal would not generate additional traffic during operation; as such, no impacts to the road network performance during operation of the proposal from vehicle movements would occur.

An increase in the number of daily train numbers and therefore the number of times level crossings on public roads are activated is expected during the operation of the proposal. It is anticipated that the maximum closure time encountered at a level crossing (with or without the proposal) would be 121 seconds. An assessment of active level crossing LOS was undertaken and found that all level crossings on public roads will operate at a delay-based LOS of A.

Amendments to the road network as part of the permanent works will not remove any existing turn movements and are not expected to impact on the current capacity, level of service or safety of any intersections. Short stacking deficiencies at the existing level crossings were assessed and some potential storage deficiencies identified.

It is noted that all operation impacts would be expected to occur with and without the proposal, however the potential occurrence of these impacts is expected to increase due to the increase in average rail services per day.

RECOMMENDED MITIGATIONS

During the design, construction and operational phases of the proposal, mitigation measures have been identified to reduce the impact on the local transport network. During construction of the proposal a Traffic Management Plan (TMP) sub-plan will be prepared as part of the Construction Environmental Management Plan (CEMP) detailing construction sites activities, impacted transport facilities and specifying the mitigation measure. Key mitigation measures that will be undertaken, as far as practicable, include:

- road safety audits where changes to the road network are required or increased traffic movements during the construction phase may present an increased crash risk
- consultation with relevant stakeholders (state, local government, emergency services, transport service providers and impacted property owners)
- heavy vehicle diversionary signage would be implemented to divert Heavy vehicle traffic outside of Junee on the existing heavy vehicle routes via Goldfields Way and Old Junee Road
- community notification of any proposed road or pedestrian network closures and diversions and provision of appropriate wayfinding signage for road and pedestrian diversions, clearly articulating alternative routes
- rectification of pavement where necessary to support diversion of vehicles from the Olympic Highway to local roads in Junee
- restricted access to level crossings for oversize vehicles that may present a short-stacking risk.

With these mitigation measures in place the proposal construction activities are expected to have minimal impact on the transport network. Residual traffic impacts are likely to be experienced during construction of the proposal, particularly associated with road closures and diversions in Wagga Wagga and Junee. The post-construction operation of the proposal has been shown to have no significant impact to the transport network in this assessment.

1 INTRODUCTION

1.1 OVERVIEW

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national program that would enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, would involve:

- using the existing interstate rail line through Victoria and southern NSW
- upgrading about 400 kilometres of existing track, mainly in western NSW
- providing about 600 kilometres of new track in northern NSW and south-east Queensland.

Inland Rail has been divided into 13 projects, seven of which are located in NSW. Each of these projects can be delivered and operated independently with tie-in points on the existing railway.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Albury to Illabo section of Inland Rail ('the proposal').

The proposal is Critical State Significant Infrastructure (CSSI) and is subject to approval by the NSW Minister for Planning under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared as part of the Environmental Impact Statement (EIS) for the proposal. The EIS has been prepared to support the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the then NSW Department of Planning, Industry and Environment (the SEARs), dated 14 October 2020.

1.2 THE PROPOSAL

The proposal involves enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway between Albury and Illabo. Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains.

1.2.1 LOCATION

The proposal is generally within the existing active rail corridor between the town of Albury on the Victorian-NSW border and around three kilometres to the north-east of Illabo. The alignment passes through two major regional towns, Albury and Wagga Wagga, NSW, and several smaller regional towns. Works are proposed at 24 locations along the 'Main South Line' corridor, described as 'enhancement sites'.

The enhancement sites have been broken down into four precincts which align with the local government areas (LGA) of Albury, Greater Hume – Lockhart, Wagga Wagga and Junee, as identified in Table 1.1 and shown in Figure 1.1.

Table 1.1 Enhancement sites

PRECINCT	ENHANCEMENT SITES
Albury	Murray River bridge
	Albury Station pedestrian bridge
	Albury Yard clearances
	Riverina Highway bridge
	Billy Hughes bridge
	Table Top Yard clearances
Greater Hume – Lockhart	Culcairn pedestrian bridge
	Culcairn Yard clearances
	Henty Yard clearances
	Yerong Creek Yard clearances
	The Rock Yard clearances
Wagga Wagga	Uranquinty Yard clearances
	Pearson Street bridge
	Cassidy Parade pedestrian bridge
	Edmondson Street bridge
	Wagga Wagga Station pedestrian bridge
	Wagga Wagga Yard clearances
	Bomen Yard clearances
Junee	Harefield Yard clearances
	Kemp Street bridge
	Junee Station pedestrian bridge
	Junee Yard clearances
	Olympic Highway underbridge
	Junee to Illabo clearances

1.2.2 KEY FEATURES

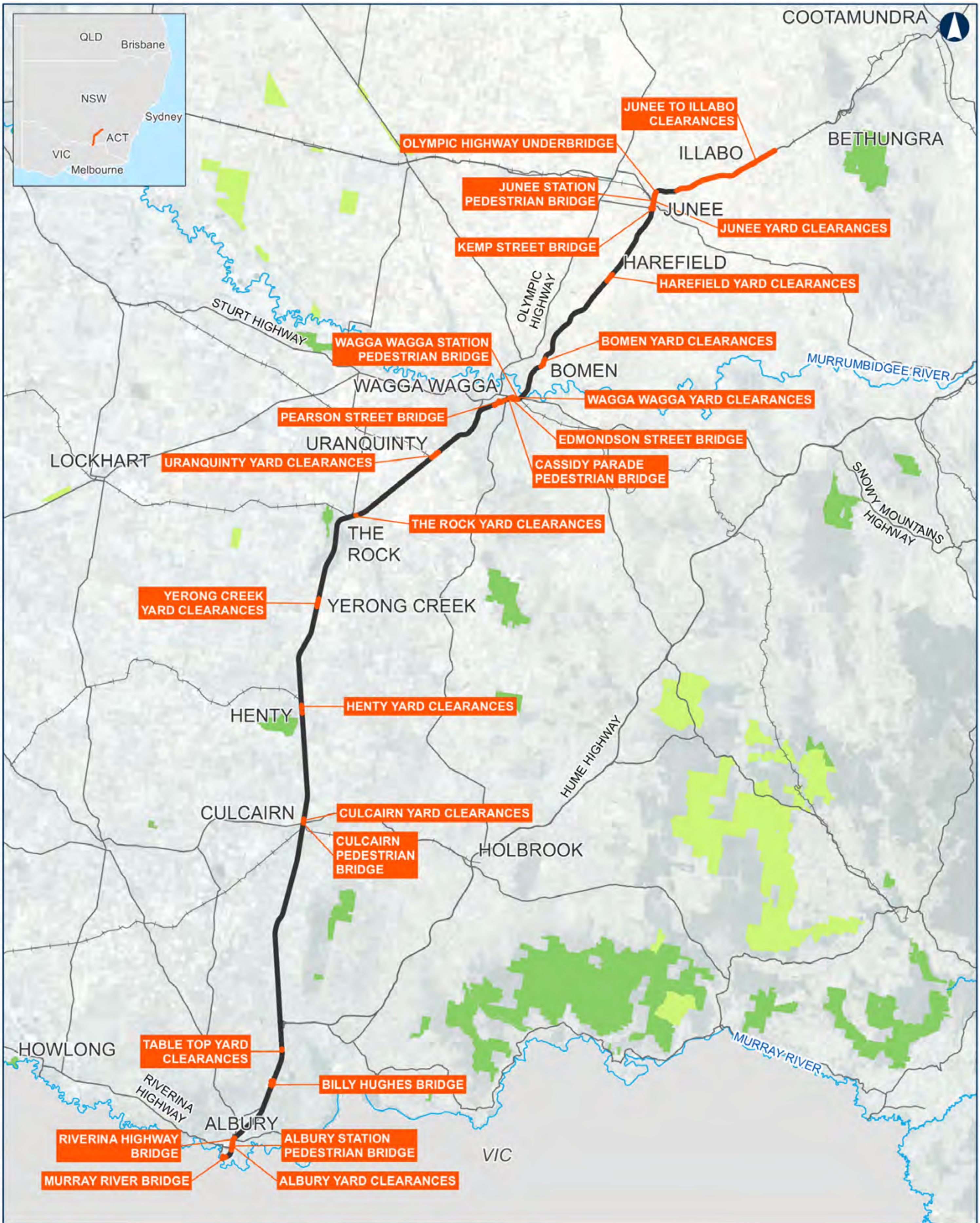
The key features of the proposal include:

- adjustments to approximately 44 kilometres of track across 14 enhancement sites to accommodate the vertical and horizontal clearances according to Inland Rail clearance specifications, comprising:
  - realignment of track within the rail corridor
  - lowering of track up to 1.6 metres at three enhancement sites
- changes to bridges and culverts at enhancement sites to accommodate vertical clearances and track realignment as follows:
  - replacement of two road bridges and adjustments to adjoining intersections
  - replacement of three pedestrian bridges
  - removal of two redundant pedestrian bridges
  - modifications to four rail bridges
- ancillary works, including adjustments to nine level crossings, modifications to drainage and road infrastructure, signalling infrastructure, fencing, signage, and services and utilities.

No additional works would be required outside the enhancement sites identified in Figure 1.1 as they meet the clearance requirement for the Inland Rail program.

Albury to Illabo

Figure 1.1 Enhancement sites of the proposal



0 10 20 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 4/11/2021 Paper: A3
Author: WSP Scale: 1:500,000
Data Sources: ARTC, NSWSS

- Proposal site
- Track alignment
- Existing railway
- Main road
- River
- National Park
- State Forest

INLAND RAIL ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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1.2.3 TIMING

Subject to approval, further design and procurement, construction of the proposal is planned to start in early 2024 and is expected to take about 16 months. The proposal would be fully operational in 2025 with enhancement sites progressively commissioned on completion of construction. Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2027.

1.2.4 CONSTRUCTION

An indicative construction methodology has been developed based on the current design to be used as a basis for the environmental assessment process. Overall, the construction strategy is based on an approach of dividing the proposal into four construction packages which align with the precincts: Albury, Greater Hume – Lockhart, Wagga Wagga and Junee.

Construction of the proposal would require:

- construction compounds, laydown areas and other areas needed to facilitate construction works
- temporary changes to the road network, including road closures to undertake works on road bridges and level crossings
- other ancillary works.

Construction within each precinct would generally involve the site establishment and enabling works, main construction works as relevant to the enhancement site and finishing works as outlined in Table 1.2.

Further information on the construction of the proposal is provided in Chapter 8: Construction of the proposal of the EIS.

Table 1.2 Indicative construction activities

CONSTRUCTION STAGES	INDICATIVE ACTIVITIES
Site establishment and enabling works	— Establishment of key construction infrastructure, work areas, access points and other construction facilities — Installation of environmental controls, fencing and site services — Preliminary activities including clearing/trimming of vegetation
Main construction works	— Track works — Rail bridge works — Road bridge replacement — Pedestrian bridge works — Associated infrastructure works on level crossings, culverts and signalling
Finishing works	— Testing and commissioning of the new and modified infrastructure — Demobilisation and removal of construction compounds and other construction infrastructure — Restoration of disturbed areas, as required, including revegetation and landscaping, where required

1.2.5 OPERATION

The proposal would form part of the rail network managed and maintained by ARTC. Train services would be provided by a variety of operators.

The proposal would enable the use of double stacked trains along its entire length. Inland Rail would operate 24 hours per day and would initially accommodate double-stacked freight trains up to 6.5 metres high and up to 1,800 metres in length. The possible future use of the railway between Albury and Illabo by freight trains up to 3,600 metres long would be subject to separate assessment. Freight train speeds would range from 60 to 115 kilometres per hour, which is consistent with current train speeds.

The average number of freight trains movements between Albury and Illabo would increase from a current average of up to 12 per day in 2021 to 18 per day in 2025, further increasing to about 20 per day in 2040.

ARTC would continue to maintain the Main South Line. This would typically involve minor maintenance works, such as bridge and culvert inspections, rail grinding and track tamping, through to major maintenance, such as reconditioning of track and topping up of ballast as required. Maintenance works and schedule are not proposed to change as a result of the proposal and would continue in accordance with the existing Environmental Protection Licence which applies to the rail corridor (EPL 3142).

Further information on the operation of the proposal is in Chapter 7: Proposal features and operation of the EIS.

1.3 PURPOSE AND SCOPE OF THIS REPORT

This report has been prepared by WSP Australia as part of the Environmental Impact Statement (EIS) for the proposal to assess Transport and Traffic impacts related to the construction and operation of the Inland Rail corridor between Albury and Illabo.

This traffic and transport assessment addresses the relevant Secretary's Environmental Assessment Requirements (SEARs) issued by the Secretary of the then NSW Department of Planning Industry and Environment (now the Department of Planning and Environment)for the proposal on 14 October 2020. The SEARs relevant to the assessment of Transport and Traffic are presented in Table 1.3.

Table 1.3 Secretary's Environmental Assessment Requirements – Transport and traffic

KEY ISSUE	ASSESSMENT REQUIREMENT	REPORT REFERENCE
1. Transport and Traffic	1) The Proponent must assess construction transport and traffic (vehicle, pedestrian and cyclists, bus services, and train operations) impacts, including, but not necessarily limited to:	
	a) the likely construction access routes (including haul routes) and scheduling of construction vehicle movements	Access routes are discussed in sections 5.1.1, 5.2.1, 5.3.1, and 5.4.1
	b) the indicative number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements and track machines)	Construction vehicle traffic generation is discussed in sections 5.1.1.3, 5.2.1.3, 5.3.1.3 and 5.4.1.3
	c) construction worker parking	Construction worker parking is discussed in section 5.1.1, 5.2.2, 5.3.2, and 5.4.2

KEY ISSUE	ASSESSMENT REQUIREMENT	REPORT REFERENCE
	d) the nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times, movement of livestock, agricultural machinery, farm vehicles and other farm infrastructure, construction deliveries and parking arrangements and sensitive road users) and assessment of traffic impacts on these routes including identifying traffic management measures to mitigate any impacts	Existing transport environment discussed in Chapter 4
	e) provisions proposed to ensure safe access and egress to/from the classified road network	Enhancement site access assessments are discussed in sections 5.1.3, 5.2.3, 5.3.3, 5.4.3
	f) the nature of any train paths (types and number of movements) and potential impact to these train paths due to additional track possession requirements	Rail construction impacts are discussed in sections 5.1.10, 5.2.10, 5.3.10, and 5.4.10
	g) the need to close, divert or otherwise reconfigure elements of the road and cycle network associated with construction of the project and the duration of these changes; and	Closures, diversions, and associated impacts are discussed in sections 5.1.1, 5.2.1, 5.3.1, and 5.4.1 and mitigations are discussed in section 8.2
	h) impacts to on-street parking, including to residents and businesses.	Construction impacts to parking are discussed in Chapter 5
	2) Operational transport impacts of the project (vehicle, pedestrian and cyclists, bus services, and train operations), including:	Operational impacts are discussed in Chapter 6
	a) forecast travel demand and traffic volumes for the project (road and rail)	Forecast traffic volumes relevant to the operation of the proposal are discussed in section 6.2.
	b) travel time analysis	Travel time impacts relevant to the operation of the proposal are discussed in section 6.3.1.
	c) the performance of key intersections and level crossings by undertaking a level of service analysis at key locations along the project alignment	Performance of key intersections and level crossings relevant to the operation of the proposal are discussed in section 6.3.8.3.
	d) wider transport interactions (local and regional roads, cycling, public and freight transport and the broader NSW rail network)	Impacts to active, public, and freight transport relevant to the operation of the proposal are discussed in Chapter 6
	e) consideration of how increased train movements would impact level crossings and emergency access across the rail line	Consideration of train movements relevant to the operation of the proposal are discussed in section 6.3

KEY ISSUE	ASSESSMENT REQUIREMENT	REPORT REFERENCE
	f) identification of traffic and transport measures to mitigate any impacts.	Mitigation measures are discussed in section 8.2
	The assessment must include modelling of the operational impact of the project.	Modelling of operational impacts are included throughout Chapter 6
	3) Assess the feasibility of level and grade-separated crossings along the project alignment (existing and proposed) and justify the safety and operational impacts and/or benefits of the proposed crossing type, taking into account the NSW Government's Construction of New Level Crossings Policy.	The assessment of level crossings feasibility has been undertaken separately to this transport impact assessment; it is discussed in section 6.3 and the process undertaken by ARTC is provided in section 3.3 and Appendix A. Operational impacts of level crossings are assessed in section 6.3.8
	4) In the assessment of level crossings, the EIS must:	
	a) provide a safety assessment for each level crossing. The safety assessment is to be consistent with ALCAM and any Interface Agreements and Safety Management Plans	The assessment of safety of level crossings has been undertaken separately to this transport impact assessment; it is discussed in section 6.3 and the process undertaken by ARTC is provided in Appendix A.
	b) demonstrate how the risks would be reduced So Far As Is Reasonably Practical (SFAIRP) in consultation with the relevant road authority	The assessment of safety of level crossings has been undertaken separately to this transport impact assessment; it is discussed in section 6.3 and the process undertaken by ARTC is provided in Appendix A.
	c) assess potential short-stacking impacts	Short-stacking assessment relevant to operation of the proposal is performed in section 6.3.5.
	d) confirm road approaches to level crossings are fit for purpose, safe and designed and constructed in accordance with Austroads Guide to Road Design	Design elements are discussed and detailed within the relevant design reports.
	e) account any rationalisation of private and public level crossings in line with the NSW Government's Level Crossing Closure Policy.	N/A – No rationalisation of private and public level crossings is included in the proposal.

1.4 STRUCTURE OF THIS REPORT

The structure of the report is as follows:

- **Chapter 1 – Introduction** – provides an introduction to the report.
- **Chapter 2 – Legislation and policy context** – describes the legislative and policy context for the assessment and relevant guidelines.
- **Chapter 3 – Methodology** – describes the methods and assessment criteria adopted in this report to characterise and assess potential impacts on the transport network.
- **Chapter 4 – Existing environment** – describes the existing transport network environment including road, rail and public transport services.
- **Chapter 5 – Construction impact assessment** – identifies and assesses potential transport network impacts from construction of the proposal.
- **Chapter 6 – Operational impact assessment** – identifies and assesses potential transport network impacts from operation of the proposal.
- **Chapter 7 – Cumulative impacts –** details cumulative impact on adjacent Inland Rail projects/other proposed major developments during Construction and Operation.
- **Chapter 8 – Mitigation and management measures** – details recommended mitigation and management measures to reduce transport network impacts.
- **Chapter 9 – Conclusion** – overview of the key findings of the report.

2 LEGISLATION AND POLICY CONTEXT

2.1 COMMONWEALTH LEGISLATION

2.1.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Under the EPBC Act, proposed 'actions' that have the potential to significantly impact on matters of national environmental significance, the environment of Commonwealth land, or that are being carried out by an Australian Government agency, must be referred to the Australian Minister for the Environment for assessment.

Preliminary environmental investigations identified threatened species under the EPBC Act which have the potential to be impacted by the proposal. As a result of the potential for impacts on protected matters, the proposal was referred to the (then) Australian Minister for the Environment on 2 June 2020 (EPBC Referral No 2020/8670). On 29 June 2020, the Australian Government Department of Agriculture, Water and the Environment (DAWE) notified that the proposal is a not controlled action, and hence approval under the EPBC Act is not required.

2.2 NSW STATE LEGISLATION

2.2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The EP&A Act and Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) establish a framework for the assessment and approval of developments in NSW.

The proposal has been declared as Critical State Significant Infrastructure (CSSI) and is subject to approval by the Minister for Planning under Division 5.2, Part 5 of the EP&A Act. An EIS has been prepared for the proposal to assess the impacts of the proposal in accordance with the SEARs. This technical paper supports the EIS.

2.2.2 ROADS ACT 1993

The *Roads Act 1993* (Roads Act) aims to establish the rights of members of the public to pass along public roads, rights of persons who own land adjoining a public road to have access to the public road, and to establish the procedures for the opening and closing of a public road. The Roads Act also aims to provide a structure for the classification of roads, empower the public agencies such as Transport for NSW as the road authorities and regulate the carrying out of various activities on public roads, including the transportation of construction materials with heavy vehicles.

This proposal is consistent with this legislation by ensuring that the appropriate processes and measures are in place to manage the impacts to users of the public roads, property owners and the opening/closing of public roads.

Consent from the appropriate road authority is required under section 138 of the Roads Act for certain activities, such as disturbing the surface of a public road, or carrying out work in, on or above a public road. Section 138 of the Roads Act, does not apply for works that relate to the exercise of a public authority's functions in, on or over an unclassified road (other than a Crown road) (Schedule 2 of the Roads Act). However, ARTC is not a public authority for the Roads Act. Section 5.24 of the EP&A Act provides that a section 138 Roads Act consent cannot be refused for a State significant infrastructure project for which planning approval has been given, and any section 138 consent must not be inconsistent with the terms of that planning approval.

2.3 POLICIES, GUIDELINES AND STANDARDS

2.3.1 STRATEGIC POLICIES

2.3.1.1 FUTURE TRANSPORT STRATEGY 2056

Future Transport Strategy 2056 (TfNSW 2018a) provides a 40-year strategy outlining a vision and strategic directions for the transport system in NSW. In particular, Inland Rail is discussed as a major focus of Australian governments, providing an enhanced link between Melbourne and Brisbane and supporting intermodal hubs in regional NSW.

2.3.1.2 NSW FREIGHT AND PORTS PLAN 2018-2023

Key objectives of the NSW Freight and Ports Plan 2018–2023 (TfNSW 2018b) are to increase economic growth, increase efficiency, connectivity and access, greater freight capacity, improved safety and enhanced sustainability. The accompanying Implementation Plan includes supporting the delivery of Inland Rail. The NSW Freight and Ports Plan 2018–2023 recognises investment the east-west rail freight network to NSW ports is critical to optimising the benefits of the Inland Rail project for NSW and the Plan details several measures recommended to maximise the benefits of Inland Rail.

2.3.1.3 REROC REGIONAL FREIGHT TRANSPORT PLAN

The REROC Regional Freight Transport Plan (Riverina Joint Organisation (RivJO) 2019) and the Riverina Eastern Regional Organisation of Councils (REROC) to provide guidance on transport and freight management planning for the eastern Riverina region of NSW. The Plan covers the following Local Government Areas: Bland, Coolamon, Cootamundra-Gundagai, Greater Hume, Junee, Lockhart, Temora and Wagga Wagga.

2.3.2 GUIDELINES

2.3.2.1 GUIDE TO TRAFFIC GENERATING DEVELOPMENT, VERSION 2.2

The Guide to Traffic Generating Development, Version 2.2 (RTA 2002) outlines the appropriate methodology for conducting traffic impact studies and compiling traffic impact statements. It also includes a checklist style table of information required to conduct such studies (Table 2.1 in the guide) which this TTIA has adhered to, where relevant to the project. The guide has been adopted as the overarching methodology in producing the TTIA and method for calculation of link LOS.

2.3.2.2 GUIDE TO TRAFFIC MANAGEMENT, PARTS 1-13

The Austroads Guide to Traffic Management – Parts 1-13 (Austroads 2020) provide comprehensive traffic management guidance for practitioners involved in traffic engineering, road design and road safety. Guidance adopted in this TTIA to address the SEARs requirements includes methodologies for Integrated Transport Assessments for Developments, methods and criteria for calculation of LOS, link capacity and performance and determining the need for auxiliary lanes at intersections based on through and turning vehicle volumes.

2.3.2.3 CYCLING ASPECTS OF AUSTROADS GUIDES

Cycling Aspects of Austroads Guides (Austroads 2017) provides information that relates to the planning, design and traffic management of cycling facilities sourced from Austroads Guides, primarily the Guide to Road Design, the Guide to Traffic Management and the Guide to Road Safety. Its use is intended as a guide for planning, design, construction and management of cycling facilities. As this Transport Impact Assessment is not an input into the design of the proposal this guide has not been used in the assessment.

2.3.2.4 NSW BICYCLE GUIDELINES V 1.2

The NSW Bicycle Guidelines V 1.2 (RTA 2005) is provided as a guide to practitioners on how bicycle network facilities should be developed as part of the wider NSW transportation network. It lists the government's four strategies as:

- improving the bike network by making provisions for cyclists on new major road infrastructure projects
- making it safer to cycle
- improving personal and environmental health by promoting benefits of cycling; and
- raising the community awareness of the importance of cycling and raising community involvement.

As this Transport Impact Assessment is not an input into the design of the proposal this guide has not been used in the assessment.

2.3.2.5 NSW SUSTAINABLE DESIGN GUIDELINES VERSION 4.0

The NSW Sustainable Design Guidelines (TfNSW 2017) seek to incorporate sustainable development practices into the design and construction of transport infrastructure projects. Key aims of the guidelines are to:

- minimise impacts of transport on the environment, through transport operations, infrastructure delivery and maintenance
- ensure development, expansion and management of the transport network is sustainable and resilient to climate change; and
- procure, deliver and promote sustainable transport options that achieve value for money and reduced life cycle costs.

The aims of this guideline have been considered within the other elements of assessment undertaken as part of the EIS which included climate change and sustainability assessment.

2.3.2.6 PLANNING GUIDELINES FOR WALKING AND CYCLING

The Planning Guidelines For Walking And Cycling (DIPNR 2004) aims to improve consideration of walking and cycling in the planning of new infrastructure. The guideline has been designed to provide a walking and cycling focus to the NSW Government's Integrating Land Use and Transport Planning Policy Package. It is primarily targeted at land-use planners and development on private land. As this Transport Impact Assessment is not an input into the design of the proposal this guide has not been used in the assessment.

2.3.2.7 AUSTRALIAN LEVEL CROSSING ASSESSMENT MODEL: LEVEL CROSSING ASSESSMENT HANDBOOK

The Australian Level Crossing Assessment Model (ALCAM) (National ALCAM Committee 2017) is a tool used to identify potential key risks at level crossings and assess the overall effects of proposed treatments. It does not specify what treatment is warranted at level rail-road crossing sites nor attempt to define a 'safe' or acceptable level of risk. It is a risk model used to support a decision-making process, with the decision to be made for each jurisdiction based on the standard of existing crossings, upgrade budgets and the level of risk prepared to be tolerated. ALCAM assessments have been undertaken for all public road level crossings proposed as part of the proposal as part of the design process.

2.3.2.8 CONSTRUCTION OF NEW LEVEL CROSSING POLICY

The purpose of Construction of New Level Crossing Policy (TFNSW 2014) is to provide guidance and direction to transport planners and infrastructure managers in the ongoing development and management of the NSW rail network. The approach taken by TfNSW and rail and road agencies is to avoid building new level crossings wherever possible given the inherent risk attached to any level crossing, even those with modern active controls. Although upgrades of passive to active level crossings are included, no new level crossings are proposed as part of the scope of works.

2.3.2.9 RAILWAY CROSSING SAFETY SERIES 2011, PLAN: ESTABLISHING A RAILWAY CROSSING SAFETY MANAGEMENT PLAN

The Railway Crossing Safety Series 2011, Plan: Establishing A Railway Crossing Safety Management Plan (RTA 2011) outlines the process, procedures and tools required to meet the legislative, occupational health and safety and project management requirements for safety at railway crossings. The planning and management of safety risks, safety management measures and railway crossing safety management plans requires a systematic planning approach, involving collaboration with both internal and external stakeholders. This plan has been considered throughout the proposal to maximise safety outcomes at railway crossings.

3 METHODOLOGY

3.1 ASSESSMENT PROCESS

To assess the impact of the construction and operation of the proposal on the existing transport network (road, rail, public and active transport) the following methodology, based on the Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments (RTA 2002), is adopted. This process consists of:

- identification of study area
- documentation of the existing transport environment
- documentation of expected construction movements
- estimation of future (construction and operational horizons) baseline traffic volumes
- assessment of construction impacts to existing transport environment
- assessment of operational impacts to existing transport environment
- assessment of cumulative impacts to existing transport environment
- development of mitigation measures.

3.1.1 STUDY AREA

The study area for this Transport and Traffic Impact Assessment has been identified as the transport networks that may be impacted by construction movements to the enhancement sites, required diversions or by the operation of the proposal (staff and maintenance movements and level crossing closures). As construction workforce and material origins are expected to be widely distributed across the broader region, the study area is identified as those roads and associated transport facilities (e.g. parking, active transport, heavy vehicle, public transport networks) which provide access to the enhancement sites, back to the nearest highway. Beyond this point, the construction traffic is expected to diminish as it is distributed across the broader network to multiple origins and represents no measurable impact.

3.1.2 EXISTING TRAFFIC AND TRANSPORT ENVIRONMENT

The existing traffic and transport environment has been documented for each enhancement site within the identified study area, including:

- link characteristics including controlling agency, geometric configurations, and key connections
- key intersections
- crash history near the proposal or on roads expected to support construction or operational activities using online TfNSW data
- on-street and parking facilities expected to support construction or operational activities based on aerial imagery and Google Street View
- the rail network and services based on TfNSW online information
- daily flow profiles for rural areas
- seasonal variation in traffic demands
- observed or estimated traffic volumes sourced from:
  - TfNSW online traffic volumes viewer (adopted traffic volumes range from 2006 to 2018)
  - Annual Average Daily Traffic (AADT) volumes provided by local councils (provided traffic volumes range from 2010 to 2020)

- 24-hour (to identify daily flow profiles and peak period volumes) and 10-hour peak period (to provide peak period traffic flows) traffic surveys were undertaken from the 22nd to the 24th of June 2021). Surveys were not taken in the Greater Hume-Lockhart precinct as existing data (listed above) was sufficient to complete traffic analysis. Surveys were undertaken at the following locations:
  - Albury precinct
    - East Street and Atkins Street (10 hour)
    - Young Street and Smollet Street (10 hour)
    - Guinea Street and Hume Highway NB on off ramps (10 hour)
  - Wagga Wagga precinct
    - Sturt Highway and Olympic Highway and Pearson Street (10 hour)
    - Glenfield Road and Fernleigh Road (10 hour)
    - Edward Street and Docker Street (10 hour)
    - Docker Street and Bourke Street and Coleman Street (10 hour)
    - Edward Street and Best Street (10 hour)
    - Coleman Street and Edmondson Street and Mitchelmore Street (24-hour)
    - Urana Street and Bourke Street (10 hour)
  - Junee precinct
    - Olympic Highway and Seignior Street and Kemp Street (24-hour)
    - Olympic Highway and Seignior Street and Broadway Street (10 hour).

Where traffic volume data was not available, traffic volumes used for the assessment have been estimated based on recorded traffic volumes on adjacent road segments, roads within the study area that have a similar configuration and serve a similar function, or as proportions of higher order roads in proximity (considering road type, connectivity and surrounding land uses).

It is noted that traffic volumes have been affected in many areas by changes in travel behaviour due to COVID-19. These changes are considered unlikely to affect the traffic surveys procured for this project as no travel restrictions were in place during the survey periods.

At a precinct level, the following transport facilities have been detailed:

- Travelling Stock Reserves near the proposal or on roads expected to support construction or operational activities using NSW Local Land Services, Travelling Stock Reserves (TSR) online mapping software
- heavy vehicle routes near the proposal or on roads expected to support construction or operational activities using NSW (RMS) online heavy vehicle restricted access vehicles map
- public transport infrastructure and services near the proposal or on roads expected to support construction or operational activities (rail and bus)
- active transport infrastructure near the proposal or on roads expected to support construction or operational activities
- existing rail freight and passenger rail service movements.

3.1.3 IDENTIFICATION OF EXPECTED CONSTRUCTION VEHICLE MOVEMENTS

Construction activity and associated generated traffic movements has been identified:

- review of forecast workforce and construction vehicle types, quantities and staging:
  - locations for construction sites and lay down areas
  - construction staging and the peak period of construction
  - construction worker parking locations
  - construction worker accommodation is expected to be dispersed in the local community
  - identification of peak construction workforce light vehicle (assuming an average vehicle occupancy of 1.5) and heavy vehicle volumes – typically during a track possession.

3.1.4 ESTIMATION OF FUTURE BASELINE TRAFFIC VOLUMES

Estimation of future baseline traffic has been undertaken through application of a compounding annual growth rate to observed and estimated existing traffic volumes for:

- 2024 – peak year of construction
- 2025 and 2040 – year of opening and 15 year operational horizons.

The growth rates applied have been developed through analysis of historic growth rates and consultation with state and local government representatives. Further detail of growth rates and application to observed volumes is provided in section 4.2.3.

3.1.5 ASSESSMENT OF CONSTRUCTION IMPACTS

Construction activities would generate vehicle movements, including light and heavy vehicles. Light vehicles trips would be generated by construction workers moving to and from the enhancement sites. Heavy vehicle movements would generally be associated with trucks delivering plant or materials to the enhancement sites. Impacts expected to occur as a result of the construction of the proposal have been assessed as follows:

- Link (mid-block) LOS assessment of construction routes with and without the proposal, during the peak period of construction for each enhancement site, using the method outlined in the Guide to Traffic Generating Developments Version 2.2 (RTA 2002) where:
  - the total volumes of the highest hour of construction generated traffic are assessed against the background traffic peak hour for each part of the proposed access route
  - total peak hour construction traffic flows have been assumed as the highest flows expected during the construction duration, typically during rail possession periods
  - light vehicles would have an average occupancy of 1.5 worker per vehicle and would all arrive or depart within the background peak hour. This adoption of the background peak hour for assessment of the arrival/departure of the workforce is assumed to be a worst-case scenario for workforce arrivals as expected construction start and finish times end outside of typical peak periods
  - to maintain the worst-case scenario assessment each potential access route has been assessed with the total expected light and heavy vehicles expected to arrive/depart within this peak hour with no proportioning of expected traffic volumes across multiple access routes
  - where available, the highest peak hour period background traffic volumes from 2021 counts have been utilised, where this information is not available, a 10% proportion of AADT flows (two way, 5% one way) has been adopted. This is considered a conservative approach as assessed (see section 4.2.1) network peak hour flows are less than this proportion.
- Access intersections turn warrant assessments adopting peak construction demands as per the link assessment for each enhancement site using the method outlined in the Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020) to provide guidance on the appropriate access intersection form as:
  - Basic Left-turn treatment (BAL)
  - Basic Right- turn treatment (BAR)
  - Auxiliary Left-turn treatment (AUL)
  - Auxiliary Right-turn treatment (AUR)
  - Channelised Left-turn treatment (CHL)
  - Channelised Right-turn treatment (CHR).

- Intersections along the construction route, during the peak period of construction (typically the possession period), using SIDRA modelling software. Only the heaviest trafficked intersections (on a per lane basis) or those deemed most likely to be affected by construction traffic were assessed in each precinct to reduce needless assessment. The process for selecting the intersections for each enhancement site is described in the relevant sections in Chapter 5. The intersection assessment has assessed peak hour construction traffic in conjunction with peak hour background traffic as per the link assessment to create a worst-case scenario, as expected construction start and finish times are outside of typical peak periods.
- Construction related temporary diversions in relation to:
  - peak hour road performance
  - peak hour intersection performance using SIDRA modelling software
  - travel time impacts.
- Qualitative assessment of the impacts to road safety.
- Qualitative assessment of the impacts to parking facilities.
- Qualitative assessment of impacts to other transport facilities:
  - rail movements
  - heavy vehicle routes
  - Travelling Stock Reserves
  - public transport networks, including impacted bus stops, school bus stops and drop off areas
  - active transport networks.

Details of performance criteria and standards adopted for the construction impact assessment are outlined in section 3.2.

3.1.6 ASSESSMENT OF OPERATIONAL IMPACTS

Assessment of construction and operation impacts to transport networks expected to occur as a result of the operation of the proposal have been undertaken for:

- Road link and intersection operations – qualitative assessment of expected impacts from additional daily rail services and the associated maintenance and operational staff movements resulting from the proposal.
- Level crossings in the vicinity of enhancement sites:
  - feasibility of level crossings (existing and proposed)
  - calculation of expected closure time and number of peak period impacted vehicles at each public road level crossing for the operational horizon years of 2025 and 2040
  - SIDRA analysis of level crossings assessing LOS and average delay and queue lengths
  - safety assessment for each level crossing in accordance with ALCAM and any Interface Agreements and Safety Management Plans
  - sight lines at all modified level crossings checked in accordance with the methodology documented in Appendix D of Australian Standard AS1742.7 - Manual of uniform traffic control devices Railway crossings
  - demonstrate how the risks would be reduced So Far As Is Reasonably Practical (SFAIRP) in consultation with the relevant road authority plans
  - potential for short stacking deficiencies.
- Other transport facilities – qualitative assessment of expected impacts from additional daily rail services and the associated maintenance and operational staff movements resulting from the proposal.

3.1.7 ASSESSMENT OF CUMULATIVE IMPACTS

In addition to assessment of the proposal impacts in isolation, the cumulative impacts of the proposal in conjunction with other projects within proximity to the proposal site has been undertaken. This qualitative cumulative impact assessment includes:

- review of the relevant traffic and transport aspects of concurrent projects in the region
- qualitative assessment of the cumulative impacts from the construction/operation of the proposal and these projects.

3.1.8 DEVELOPMENT OF MITIGATION MEASURES

Proposal specific mitigations have been developed to reduce the likelihood or severity of impacts to the surrounding transport networks and their users during the construction and operation of the proposal. The developed mitigations have been designed to be implemented at various stages of the proposal from pre-construction to operation.

3.2 IMPACT ASSESSMENT CRITERIA AND PERFORMANCE STANDARDS

It is understood that the proposed redevelopment is not a typical traffic generating development, however, the overarching methodology and performance standards from the Guide to Traffic Generating Developments (RMS 2002) and the Austroads Guide to Traffic Management (Austroads 2020) are used to inform the assessment of the transport networks. Key analysis methods and metrics are described in the following sections.

3.2.1 LINK ASSESSMENTS

The assessment of the road (mid-block) network performance has been performed in relation to Level of Service (LOS) for the road links and intersections with and with the project traffic generated during the construction and operational period. LOS metrics are detailed in Table 3.1.

Table 3.1 Level of Service description (Guide to Traffic Generating Developments (RMS 2002))

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

The Guide to Traffic Generating Developments (RTA 2002) notes that during peak periods on weekdays on major and minor rural roads LOS C is the performance standard. LOS D is noted as the performance standard on weekends.

Local urban road link LOS will be assessed using Table 4.4 from the Guide to Traffic Generating Developments (RTA 2002) (shown in Table 3.2) to calculate a peak hour.

Table 3.2 Link LOS adapted from The Guide to Traffic Generating Developments (2002) Table 4.4

LOS	ONE LANE PER DIRECTION (VEH/HR)	TWO LANE PER DIRECTION (VEH/HR)
A	200	900
B	380	1,400
C	600	1,800
D	900	2,200
E	>900	2,800

Local rural road link LOS will be assessed using Table 4.5 from the Guide to Traffic Generating Developments (RTA 2002) (shown in Table 3.3) to calculate a peak hour, peak direction LOS peak direction LOS assuming 10 per cent Heavy Vehicle proportions and level terrain.

Table 3.3 Link LOS adapted from The Guide to Traffic Generating Developments (2002) Table 4.5

LOS	ONE LANE (VEH/HR)
B	590
C	920
D	1,480
E	>1,480

Highway road link LOS has been calculated based on Table 5.5 of the Guide to Traffic Management Part 3, (Austroads 2020) as shown in Table 3.4 for an road of 80 kilometres-per-hour (km/h). It is noted that the criteria for Highways is based on Passenger Car Units (PCU), which has been accounted for by factoring expected background and proposal vehicle demands to PCUs based on heavy vehicles percentages and a PCU factor of 2.

Table 3.4 Highway Capacity Manual Highway peak hour flows per lane direction LOS criteria

LEVEL OF SERVICE	MAXIMUM SERVICE FLOW (PCU/LN/HR)				
	A	B	C	D	E
80km/h	550	900	1,300	1,710	2,000

3.2.2 INTERSECTION ASSESSMENTS

Intersection LOS assessment for the heaviest trafficked intersection within each work precinct has been undertaken using SIDRA intersection software based on Delay based LOS, with reporting on the average delay, Degree of Saturation (DOS) and LOS by approach, as output by the SIDRA analysis for each intersection under assessment for base and during project construction scenarios.

LOS is defined in SIDRA as:

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

Delay is defined in SIDRA as:

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

Degree of Saturation (DOS) is defined in SIDRA as:

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

95th Percentile Queue Length is defined in SIDRA as:

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

Table 4.2 of the Guide to Traffic Generating Developments (RTA 2002), shown as Table 3.5 below, sets out average delays for different levels of service.

Table 3.5 Level of service criteria for intersections (Table 4.2 of RTA 2002)

LEVEL OF SERVICE	AVERAGE DELAY PER VEHICLE (SECS/VEH)	TRAFFIC SIGNALS, ROUNDABOUT	GIVE WAY & STOP SIGNS
A	<14	Good Operation	Good Operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

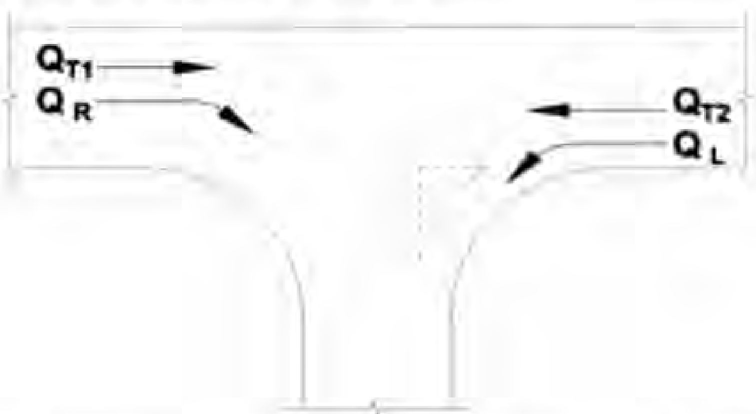
RTA 2002 notes *'any particular assessment should take into account site-specific factors including maximum queue lengths (and their effect on lane blocking), the influence of nearby intersections and the sensitivity of the location to delays'*.

All intersections which operate between LOS A and LOS C (to cover the range between LOS A: good operation, LOS B: acceptable and LOS C: satisfactory) or where no change has been noted as a result of the proposal are referred to as operating with an *'acceptable'* Level of Service in this assessment.

3.2.3 SITE ACCESS ASSESSMENTS

The appropriateness of the proposed work site accesses has been undertaken based on The Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020) which provides guidance for determining the need for auxiliary lanes at intersections based on through and turning vehicle volumes. The 'major road traffic volume' (QM) is required to determine the need for auxiliary lanes at intersections. Figure 2.27 in this guide (shown in Figure 3.1) provides the calculation for QM on two-lane, two-way roads. This turn warrant assessments have been undertaken at the access intersection with the highest combined construction and background peak hour volumes within each work precinct. The AM peak period has been adopted for the assessment, and construction vehicles turning into the enhancement sites would impact traffic on the adjacent road network, while the impact of exiting construction vehicles in the PM peak would be confined to queuing within the enhancement site.

Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$

Figure 3.1 Calculation of the major road traffic volume QM

3.2.4 ROAD SAFETY ASSESSMENT

This study has primarily considered the operation and capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles. A separate risk assessment and Road Safety Audit (RSA) will be required to be undertaken by the contractor for each enhancement site prior to commencement of construction activities on site to ensure the safety of all road users is considered. A review of historical crash data for a five-year period (2015–2019) has been taken from Transport for New South Wales (TfNSW) crash and causality statistics site for the roads in the vicinity of the enhancement sites. The data was used to identify locations on the road network expected to be used to support the construction or operational activities related to the proposal that may require addressing, in relation to road safety, during construction activities.

3.2.5 OTHER TRANSPORT FACILITIES

Set assessment or performance criteria were not adopted for impacts to other transport facilities in the vicinity of the proposal. However potential impacts to these facilities have been qualitatively assessed and detailed for construction and operation periods and considered:

- parking facilities
- heavy vehicle routes
- Travelling Stock Reserves
- public transport routes (Rail and bus)
- active transport routes and infrastructure
- property access.

3.2.6 LEVEL CROSSINGS

Impacts resulting from level crossings on public roads have been assessed for a 2025 and 2040 operational horizon based on expected maximum closure time during a train passing and the expected number of vehicles that would be stopped at the level crossing while a train is passing. Assessment elements adopted for determining impacts from level crossings on public roads were:

- maximum expected closure time based on level crossing activation times
- average numbers of vehicles impacted during a peak hour level crossing closure
- SIDRA assessment of LOS, average delay and average queue length
- potential short stacking.

3.3 LEVEL CROSSING ASSESSMENT

3.3.1 ASSESSMENT OF LEVEL CROSSINGS

Public road rail interfaces are points where the rail alignment crosses a public road. The proposal would require the crossing of state-controlled roads, local government roads as well as road controlled by Crown Lands and the Forestry Corporation of NSW.

The Construction of New Level Crossings Policy (TfNSW 2014) notes that building new level crossings is to be avoided wherever possible, and all other options, including grade separation and use of existing level crossings, should be explored before a new crossing is proposed.

Therefore, a methodical process of review was undertaken by ARTC to determine the appropriate treatment at public road-rail interfaces in the vicinity of enhancement sites within the study area, in consultation with potentially impacted landowners.

Considerations in the review process included:

- determining the interface location and type: i.e. public roads, private access roads, farm tracks, pedestrian interfaces and travelling stock routes
- assessing the need for the interface: Legal and physical access to both properties and severed properties is retained, potential traffic levels, land use, nearby interfaces, adjoined properties, vertical geometry of the rail alignment (in the context of the property and access for other local connectivity)
- determining feasible options for public road interfaces.

The process for identifying and assessing feasible options for public road interfaces broadly involved the following main steps:

- identifying opportunities for grade separation
- determining locations where provision of a level crossing would not be practicable and where road closures or realignments are likely to be required
- determining the preferred type of level crossings treatments (i.e. active or passive).

Further information on these steps is provided below.

3.3.2 OPPORTUNITIES FOR GRADE SEPARATIONS

ARTC's policy is that rail-road interfaces would be automatically grade separated in the following three instances:

- rail–road crossings with four rail tracks
- rail–road crossings of freeways and highways of four or more lanes (current and committed future plans)
- where grade separation is the logical option for topographical or engineering reasons.

Provision of grade separations were considered where the height between the existing road and the proposed rail line was sufficient to provide for the required legal clearance for road traffic.

3.3.3 LOCATIONS WHERE PROVISION OF A LEVEL CROSSING WOULD NOT BE REASONABLY PRACTICABLE

This step involved identifying where:

- provision of a new level crossing was not possible due to height differences between the road and rail
- provision of a new level crossing was not possible due to the location of crossing loops
- road crossings were closely spaced along the rail line and could be consolidated into a single crossing.

Generally, public roads would be retained wherever possible. However, where public roads cross the proposal rail corridor, the road would need to be closed in the following instances:

- the road exists only as a road reserve and is not being used as a road (i.e. no formed road exists) or required for legal access
- grade separation and raising/lowering the road is not reasonably practicable
- providing a level crossing on the existing road alignment would not be possible
- there is a nearby grade separation or level crossing enabling diversion of the road.

Formed public roads would only be proposed for closure where the impact of diversions or consolidations is considered acceptable, or the existing location is not considered safe and cannot be reasonably made safe.

3.3.4 DETERMINING THE PREFERRED LEVEL CROSSING TREATMENTS

Where it has been determined that a level crossing is the preferred solution, a consistent methodology which aligns with the Office of the National Rail Safety Regulator guidelines (2016) has been used to develop proposed level crossing treatments.

This approach involves applying the Australian Level Crossing Assessment Model (ALCAM) to determine the 'risk score' for each level crossing, and then undertaking cost-benefit analysis to assess whether higher levels of protection are justified (e.g. upgrade passive protection to active, active to grade separation).

ALCAM is the nationally accepted risk tool for level crossings which looks at a range of factors including road and rail volumes and speeds, heavy vehicle use, sighting distances and road/rail geometry. The road inputs are validated by the relevant road manager through the stakeholder consultation process.

The ALCAM assessment has been carried out separate to this TTIA. The requirement to minimise safety risks is an ongoing process that must be adhered to in future design changes.

Level crossings would be provided with warning signage, line marking, and other relevant controls; in accordance with the relevant ARTC and Australian standards. Through the application of this process, the safety risks would be eliminated or minimised SFAIRP.

In accordance with Rail Safety National Law (NSW) No 82a requirements, public road crossings would be subject to an Interface Agreement with the relevant road manager in order to ensure that safety risks are also identified and minimised so far as is reasonably practicable during the operations phase.

The interface agreements would be prepared to cover each public road crossing location to ensure a formal written agreement between the responsible road and/or rail managers is in place consistent with the requirements of section 105 of the Rail Safety National Law (NSW) No 82a, including responsibilities of parties for implementing safety measures and a process for monitoring these.

Further information regarding the methodology undertaken to determine the preferred level crossing treatments is provided in Appendix A.

4 EXISTING ENVIRONMENT

4.1 REGIONAL CONTEXT

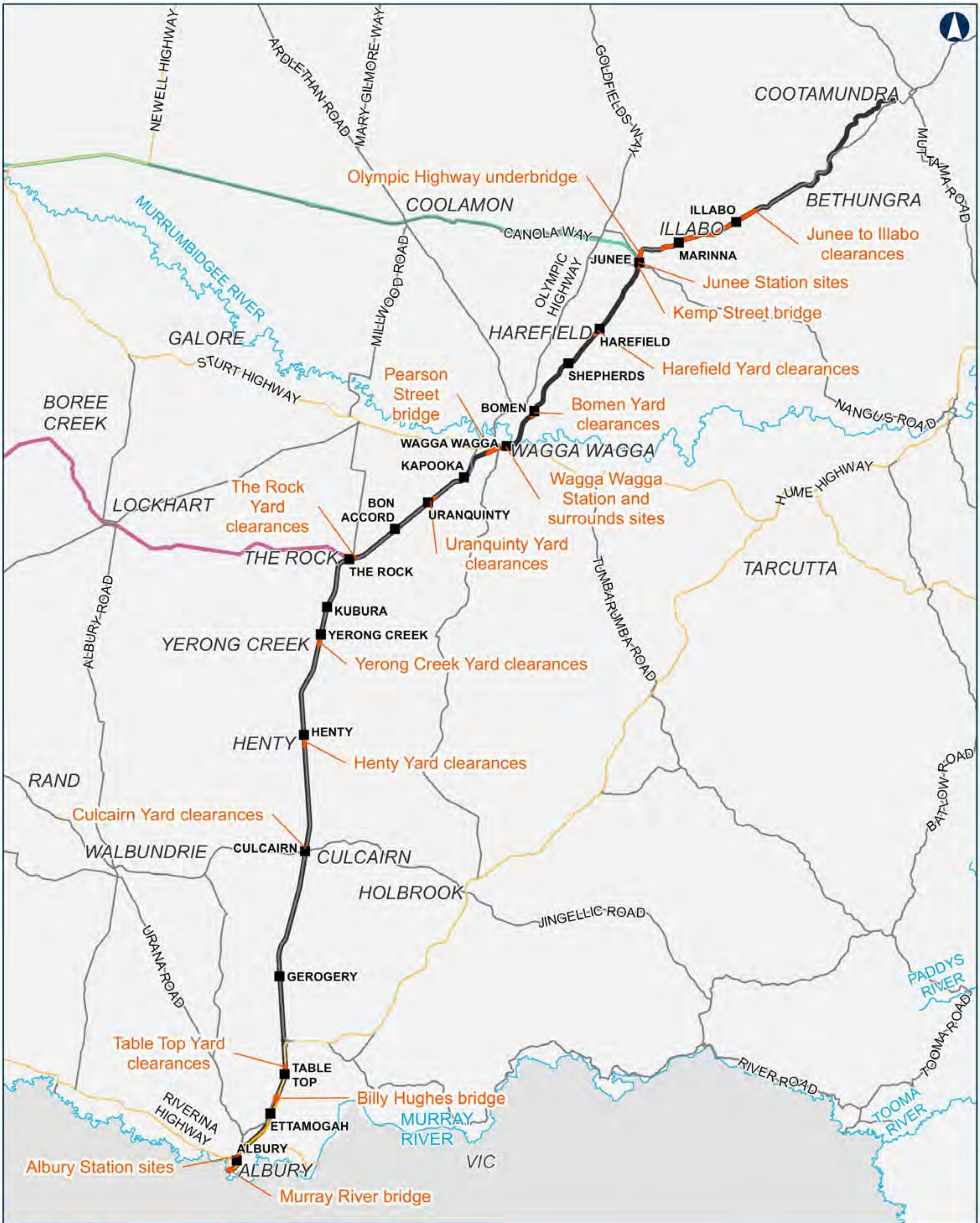
The proposal site includes discreet enhancement sites located on the existing The Main South Line. These sites are located over a total distance of about 185km, between the towns of Albury and Illabo. The proposal site is located within five Local Government Areas (LGAs):

- Albury City Council
- Greater Hume Shire Council
- Lockhart Regional Council
- Wagga Wagga City Council
- Junee Shire Council.

Albury is located at the southern extent of the proposal in the Albury City Council LGA, north of the Murray River on the border of NSW and Victoria, both of which separate the city from the neighbouring Victorian city of Wodonga. Illabo is a small town located at the northern end of the proposal, located within Junee Shire council. The proposal also includes the major town of Wagga Wagga and smaller towns of Culcairn, Henty, Yerong Creek, The Rock, Uranquinty, Bomen, Harefield and Junee. The land use throughout the LGAs is predominantly rural land used for agriculture and grazing, with Albury and Wagga Wagga featuring higher density urban environments. An overview of the regional road and rail network is presented in Figure 4.1 and shows the north south connectivity between the urban areas along the proposal is provided by:

- Hume Highway – connecting to Melbourne and Sydney and running through Albury, connecting to the Olympic Highway l8km north of Albury. The Hume Highway is generally four lanes and in 2018 carried approximately 11,400 vehicles per day on average in the Albury precinct
- Olympic Highway, which runs generally north south from the Hume Highway connecting to Culcairn, Henty, Yerong Creek, The Rock, Uranquinty, Bomen, Wagga Wagga, Harefield and Junee. The Olympic Highway is generally two lanes and in 2011 carried approximately 2,800 vehicles per day on average in the Greater Hume – Lockhart precinct.
- The Main South Line runs from Albury to Sydney, passing through each of the work precincts. Operational stations within the study area are located at Albury, Culcairn, Henty, The Rock, Wagga Wagga, and Junee.

The east-west connections are provided by a network of roads including the Sturt Highway and Riverina Highway, as well as regional arterial roads. Movements within urban areas are facilitated by a supporting network of local roads.



Albury to Illabo Figure 4.1 Regional road and rail network

0 10 20 km

Coordinate System: GDA 1994 MGA Zone 55

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Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:525,000

Proposal site
Railway station

Railway branches
Main South line
Junee to Griffith freight line
The Rock to Boree Creek line

Highway
Primary road
Arterial road
River

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4.2 TRAFFIC CHARACTERISTICS

Regional historic traffic data was analysed to establish an understanding of the directionality and proportion of AADT flows that is experienced in the peak period in the region. This analysis informed estimates of peak hour traffic volumes along key roads around the enhancement sites where traffic surveys have not been undertaken, as described in section 3.1.2. Availability of recent and complete historical data for regional and rural daily and seasonal traffic analysis is limited in the area of the proposal, with the most recent and complete data available identified at the Hume Highway (Site ID: ALBSTC) count site, sourced from the TfNSW traffic volume viewer. This count site is taken as representative of the background regional traffic environment and the existing traffic characteristics.

4.2.1 DAILY TRAFFIC VOLUME FLOW PROFILE

A daily traffic volume flow profile has been developed using the most recent, complete data recorded (January to September, 2018) using data from the Hume Highway (Site ID: ALBSTC) as shown in Figure 4.2. This daily flow profile shows that northbound and southbound traffic follows broadly similar profiles, with no significant peaks in traffic activity, although volumes are generally highest in the mid-afternoon. The highest proportion for two-ways flows is under 8 per cent of the AADT and the highest directional flow is 4 per cent of AADT. Based on this, a 5 per cent proportion of AADT has been adopted to calculate a one-way peak hour flow for highways and rural roads. It is noted that this data was not available for other roads near the proposal, however, this site is expected to provide a reasonable representation of traffic flows across a day on highways and in rural areas.

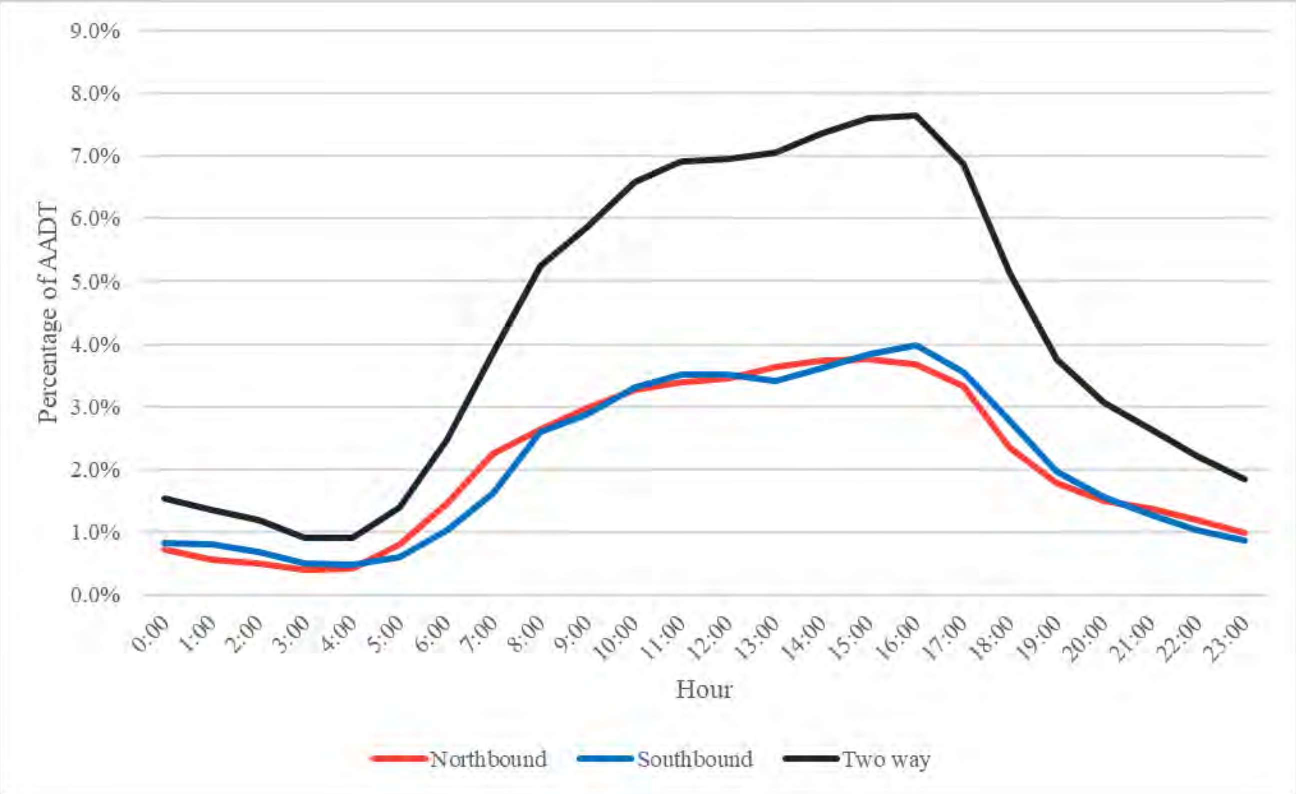

Figure 4.2 Percentage of AADT by hour – Hume Highway at Table Top (2018 – excluding October – December)

It is noted this count site represents a daily flow profile outside of urban areas. Additional data has been collected from traffic survey within the Albury, Wagga Wagga and Junee which has been used to determine peak hour flows within these urban areas.

4.2.2 SEASONAL TRAFFIC

Seasonal variations to daily traffic flows are expected to occur associated with such factors as agricultural production, freight movement and tourism. Limited information is available to understand seasonal variations in traffic flows within the study area, however the most recent complete calendar year (2017) of traffic volumes from the Hume Highway at Table Top (Site ALBSTC) are presented in Figure 4.3 showing average daily traffic flow per month. The analysis of monthly variation in traffic flows shows that although variation is evident, there is relatively low change in total or heavy vehicle monthly flows across the year and it is not expected that seasonal variations shown would have a significant effect on the impact assessment undertaken.

Similar representative data was not available for other roads in or near the study area, however, the Hume Highway in this location provides a good indication of activity along the north south corridor and it is expected that the wider highway and regional road network supporting the region would have similar seasonal variations to that shown for Hume Highway. It is noted that the performance of rural roads within the study area is less likely to be affected by seasonality, mostly due to the lower baseline traffic volumes expected on these roads.

As discussed in Chapter 12: Land use and property of the EIS, land use surrounding the proposal includes a high proportion of agriculture, including grazing, and cropping land. Traffic generated by these land uses can be highly seasonal and timed around harvesting periods or transportation of livestock to market. Traffic generated during these periods can include heavy vehicles associated with transportation of agricultural product, machinery, farm vehicles, and other farm infrastructure as well as increased light vehicle movements from the seasonal workforce. Review of seasonal change in vehicle movements for the Hume Highway did not identify a significant seasonal trend, however this may be more pronounced in discreet local areas. Transportation of agricultural product also occurs within some enhancement sites, where vehicles transport grain and other produce to the rail line for transportation by train. Further discussion of agricultural infrastructure, grain silos or agricultural produce storage and transportation facilities relevant to each precinct is provided in Chapter 5.

Temporary events may result in periodical influxes of vehicles to an area. Technical paper 4: Social identified a number of events scheduled to occur which may result in vehicles travelling roads relevant to the proposal. Predominantly, these events occur in the urban areas of Albury, Wagga and Junee.

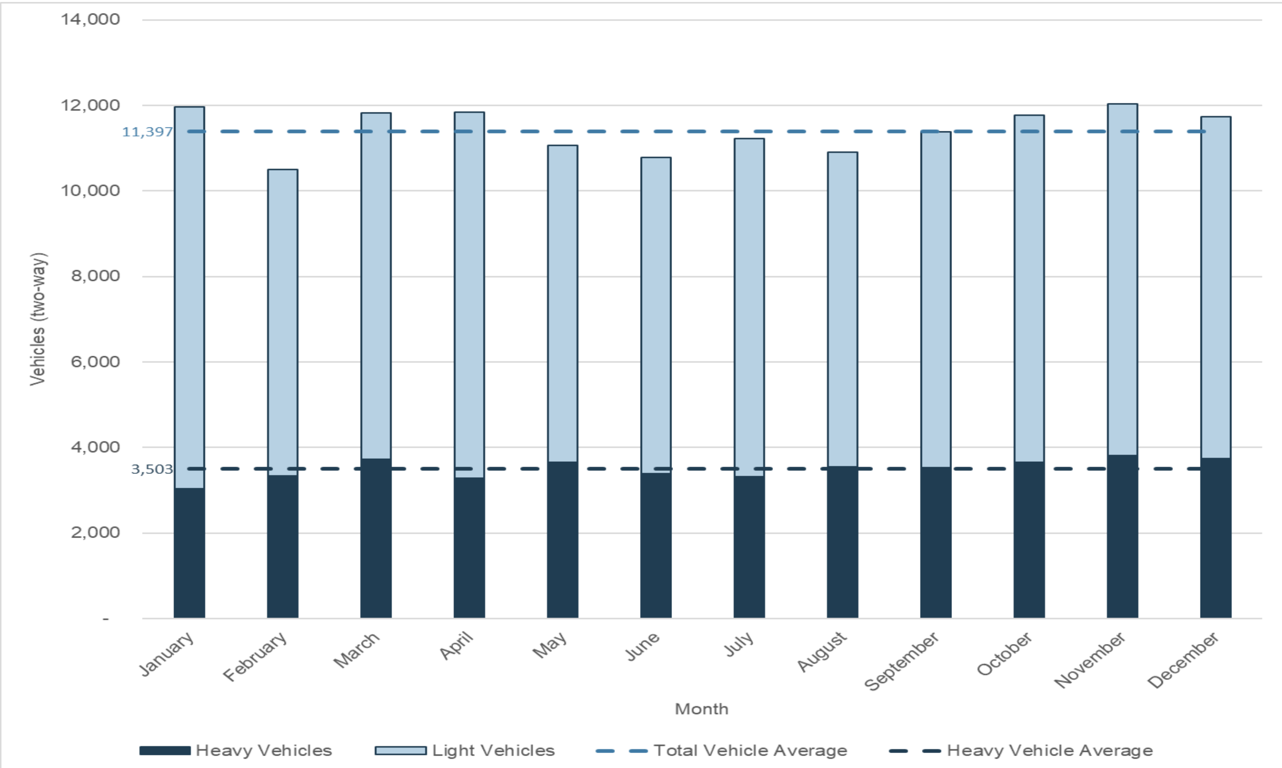

Figure 4.3 Yearly traffic volume variation – Hume Highway at Table Top 2017

4.2.3 TRAFFIC GROWTH RATES

Historic growth rates within the study area have been collected from several sources including:

- Advice from TfNSW
- Advice from Junee Shire and Albury City Council
- TfNSW Traffic viewer counts.

The advice received during discussions with TfNSW representatives suggested that a 2 per cent per annum compounding growth rate would be acceptable on State controlled roads in some areas, however a 3 per cent per annum compounding growth rate would be more appropriate in Wagga Wagga and Albury.

Junee Shire Council provided advice in relation to expected growth rates with the local area ranging from 1 per cent to 2 per cent per annum compounding. Advice from Albury City Council suggested a 1.7 per cent growth rate on Local roads in the area surrounding Table Top.

In addition to the advice from transport agencies detailed above, historic data from the most recent and complete count site for the region for the Hume Highway at Table Top (Site ID: ALBSTC) from 2010 to 2018 was assessed to determine historic annual compounding growth rates as shown in Table 4.1. This site is considered to provide a good representation of growth along the north south corridor and it is expected that the wider road network supporting the study area would have similar growth characteristics.

Table 4.1 Hume Highway at Table Top (Site ID: ALBSTC) average historic growth rates to 2018

PERIOD	AVERAGE GROWTH RATE (%)
1-year	1.2
2-year	2.2
3-year	3.0
8-year	3.0

Based on the provided advice and analysis of historic growth rates, the growth rates shown in Table 4.2 have been adopted for extrapolation of observed traffic volumes to the construction and operational horizon years for roads within the study area each work precinct.

Table 4.2 Adopted growth rates

WORK PRECINCT	ADOPTED GROWTH RATES	DISCUSSION
Albury	3% – Highways 2% – Other roads	As per TfNSW advice and highest observed Hume Highway historical growth rate for state-controlled roads. As per Albury City advice for local roads.
Greater Hume – Lockhart	3% – Highways 3% – Other roads	As per TfNSW advice and highest observed Hume Highway historical growth rate.
Wagga Wagga	3% – Highways 3% – Other roads	As per TfNSW advice and highest observed Hume Highway historical growth rate.
Junee	1.5% – Highways 2% – Byrnes Road 1% – Other roads	As per Junee Shire Council advice.

4.3 ALBURY PRECINCT

Albury precinct includes the following enhancement sites:

- Murray River bridge
- Albury Station pedestrian bridge
- Albury Yard clearances
- Riverina Highway bridge
- Billy Hughes bridge
- Table Top Yard clearances.

Due to their proximity, Albury Station pedestrian bridge, Albury Yard clearances, and Riverina Highway bridge were considered collectively (referred to as Albury Station and surrounds).

The existing traffic and transport network relevant to Albury precinct is discussed in the following sections.

4.3.1 ROAD NETWORK

Enhancement sites within Albury precinct are connected by the Hume Highway. The enhancement sites and key road links are shown below in Figure 4.4.

Albury to Illabo

Figure 4.4 Road network - Albury Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021
Paper: A3
Author: WSP
Scale: 1:60,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies

Road type

Highway
Primary road
Arterial road
Sub-arterial road
Local road

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4.3.1.1 MURRAY RIVER BRIDGE ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Murray River bridge enhancement site are depicted below in Figure 4.5. Key road characteristics are described in Table 4.3 and key intersection configurations are shown in Appendix C.

Table 4.3 Key road links – Murray River bridge enhancement site

ROAD NAME	ROAD DESCRIPTION
Atkins Street	Two-way, two lane urban locally controlled street with sections running both north-south and east-west. The north-south section runs from Hume Street, crosses East Street and connects to the east-west section that runs through south Albury to Townsend Street, crossing Kiewa, Olive, and Macauley Streets, and providing access to industrial areas in South Albury. In the vicinity of the enhancement site the north-south section of the road generally features 3.6m wide lanes, sealed shoulders, and has a posted speed limit of 60km/h. The east-west section generally features a 12m sealed width, sealed shoulders with parking, and has a posted speed limit of 50km/h.
East Street	Two-way, two lane urban locally controlled street that generally runs east-west, crossing the rail line and Hume Highway via underpasses and connects South Albury with residential areas in East Albury and Eastern Hill Reserve. In the vicinity of the enhancement site the road generally features 3.6m wide lanes, sealed shoulders with parking, and has a posted speed limit of 60km/h through Albury and 80km/h outside of the Albury urban area.
Hume Highway	Two-way, four lane state-controlled highway that runs from Melbourne in the southwest and Sydney in the northeast. In Albury the Hume Highway includes interchanges at East Street, Riverina Highway, Racecourse Road, and Thurgoona Road. In the vicinity of the enhancement site the single lane northbound off ramp generally features a 3.5m wide lane, sealed shoulders, and has a posted speed limit of 110km/h.
Macauley Street	Two-way, two lane urban locally controlled street that runs north-south from North Street in Albury and provides access to residential and industrial areas in South Albury. In the vicinity of the enhancement site the road generally features a 11.8m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Panmure Street	Two-way, two lane urban locally controlled street that runs east-west from Macauley Street, crossing Kiewa Street and Olive Street and provides access to residential and industrial areas in South Albury. In the vicinity of the enhancement site the road generally features a 6.6m sealed width, limited line marking, shoulders with parking, and has a posted speed limit of 50km/h.
Abercorn Street	Two-way, two lane urban locally controlled street that runs generally east-west from Olive Street, crossing Kiewa Street and Townsend Street and provides access to residential and industrial areas in South Albury. In the vicinity of the enhancement site the road generally features a 10.3m sealed width, limited line marking, shoulders with parking, and has a posted speed limit of 50km/h. The road also crosses Oddies Creek via a 4.2m (approx.) road bridge.

ROAD NAME	ROAD DESCRIPTION
Kiewa Street	Two-way, two lane urban locally controlled that runs north-south, crossing Atkins Street, Panmure Street, and Abercorn Street, and provides access to residential and industrial areas in South Albury. In the vicinity of the enhancement site the road generally features a 12.6m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Townsend Street	Two-way, one lane rural locally controlled street that runs generally north-south, from Abercorn Street and provides access to the enhancement site. In the vicinity of the enhancement site the road generally features an 8.1m sealed width, limited road marking, and has a posted speed limit of 40km/h.
Olive Street	Two-way, two lane urban locally controlled street that runs north-south from Crisp Street, crossing Atkins Street, Panmure Street, and Abercorn Street, and provides access to residential and industrial areas in Albury and South Albury. In the vicinity of the enhancement site the road generally features a 10.4m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.

Albury to Illabo

Figure 4.5 Key road links and intersections – Murray River bridge

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:7,500
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Key intersection
Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected to support the construction or operational movements related to the Murray River bridge enhancement site are shown below in Table 4.4.

Table 4.4 Murray River bridge enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
East Street[1]	2021	10,991	5%
Atkins Street[1]	2021	3,297	14%
Hume Highway[2]	2007	21,501	Not available
Macauley Street[3]	2021	330	14%
Panmure Street[3]	2021	330	14%
Abercorn Street[3]	2021	330	14%
Kiewa Street[4]	2021	989	14%
Townsend Street[3]	2021	330	14%
Olive Street[4]	2021	989	14%

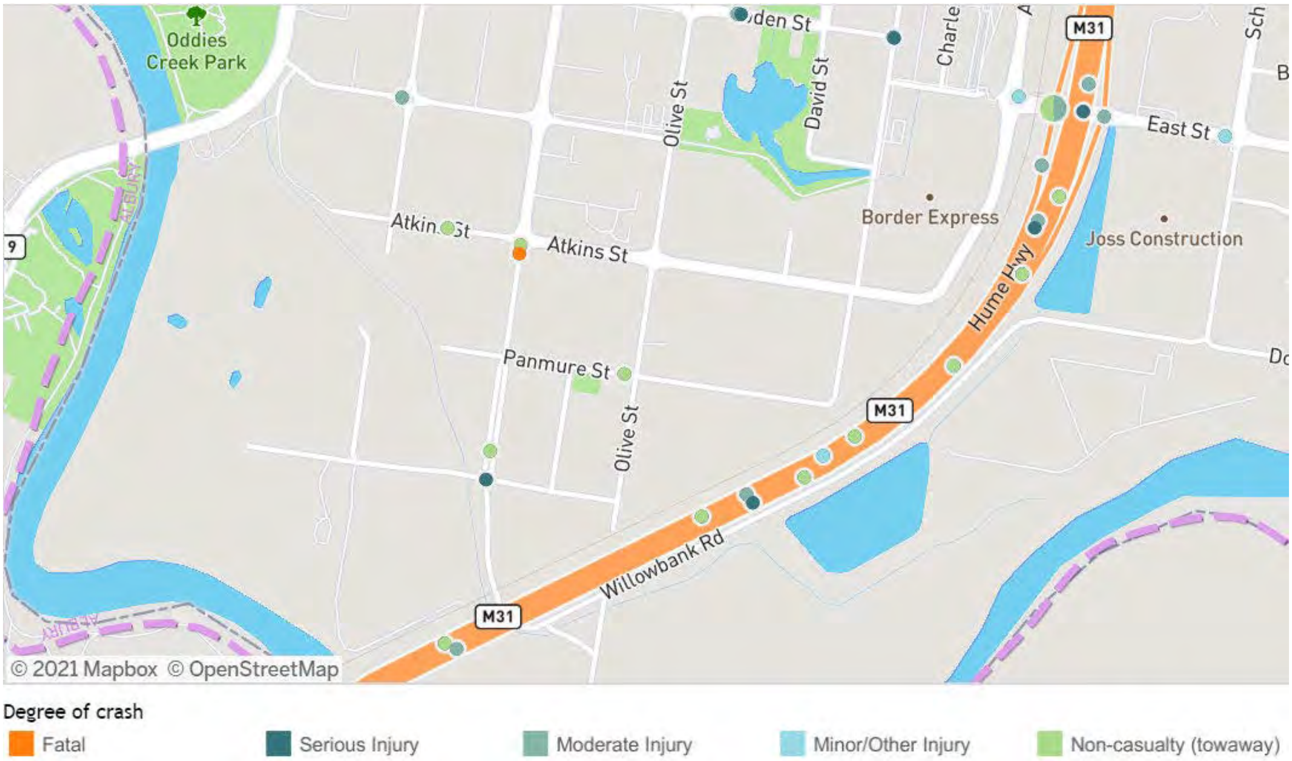
(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) Hume Highway – 120m East of Olive Street, South Albury 2640. This is the most recent data publicly available for an urban location on the Hume Highway in Albury
(3) No data available, volumes estimated as 10% of Atkins Street 10-hour with equivalent HV proportion
(4) No data available, volumes estimated as 30% of Atkins Street 10-hour with equivalent HV proportion.

ROAD SAFETY

Figure 4.6 shows the crashes that occurred in the data collection period in the vicinity of the Murray River bridge enhancement site, with the following observations:

- Hume Highway around the East Street interchange (key road link and intersection) – 13 crashes
- Kiewa Street (key road link) – four crashes
- Kiewa Street (key road link) – one fatal crash occurring in 2018.

It is noted that the Hume Highway also carries a high volume of vehicles (relative to the rest of the network), increasing the overall likelihood of crash occurrence.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.6 Crash data (2015–2019) Murray River bridge enhancement site

PARKING

On-street kerbside parking is generally allowed on the local road network in the vicinity of the Murray River bridge enhancement site and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site.

4.3.1.2 ALBURY STATION AND SURROUNDS

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Albury Station and surrounds are depicted below in Figure 4.7. Key road characteristics are described in Table 4.5 and key intersection configurations are shown in Appendix C.

Table 4.5 Key road links – Albury Station and surrounds

ROAD NAME	ROAD DESCRIPTION
Young Street	Two-way, four lane state-controlled street that forms part of the Riverina Highway and runs north-south between North Street and Atkins Street, crossing Dean Street, Wilson Street and Borella Road and provides access to commercial areas and Albury Railway Station. In the vicinity of the enhancement site the road generally features 3.4m wide lanes, sealed shoulders with parking, and has a posted speed limit of 60km/h.
Borella Road (Riverina Highway)	Two-way, four lane state-controlled road that forms part of the Riverina Highway and that runs east-west from Young Street, crossing the rail line and Hume Highway via a road overpass and provides access to Albury Airport, residential and commercial areas in East Albury. In the vicinity of the enhancement site the road generally features 3.2m wide lanes, sealed shoulders with parking, and has a posted speed limit of 60km/h between Young Street and Drome Street, and 80km/h west of Drome Street.
Hume Highway	Two-way, four lane state-controlled urban highway that runs from Melbourne in the southwest and Sydney in the northeast. In Albury the Hume Highway includes interchanges at East Street, Riverina Highway, Racecourse Road, and Thurgoona Road. In the vicinity of the enhancement site the single lane northbound off ramp to Borella Road generally features a 3.6m wide lane, sealed shoulders, and has a posted speed limit of 110km/h.
Smollet Street (Railway Place)	Two-way, two lane urban locally controlled street that runs east-west from Young Street and provides access to the Albury Railway Station. In the vicinity of the enhancement site the road generally features 3.5m wide lanes, sealed shoulders with parking, and a posted speed limit of 50km/h.
Schubach Street	Two-way, two lane urban locally controlled street running north-south between Borella Road and East Street and provides access to residential areas in Albury east of the rail line and Hume Highway. In the vicinity of the enhancement site the road generally features a 11.8m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Kenilworth Street	Two-way, two lane urban locally controlled street that runs east-west, from Schubach Street and provides and eastern access to the Albury Station pedestrian bridge. In the vicinity of the enhancement site the road generally features a 11.8m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.

Albury to Illabo

Figure 4.7 Key road links and intersections – Albury Station pedestrian bridge and Riverina Highway bridge

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Paper: A3
Author: WSP
Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Albury Station and surrounds are shown below in Table 4.6.

Table 4.6 Albury Station and surrounds observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Young Street [1]	2021	7,496	3%
Smollet Street (Railway Place) [1]	2021	472	3%
Borella Road [1]	2021	13,894	3%
Hume Highway Northbound Off Ramps [1]	2021	3,668	5%
Schubach Street [2]	2021	3,297	14%
Kenilworth Street [3]	N/A	50	Not available

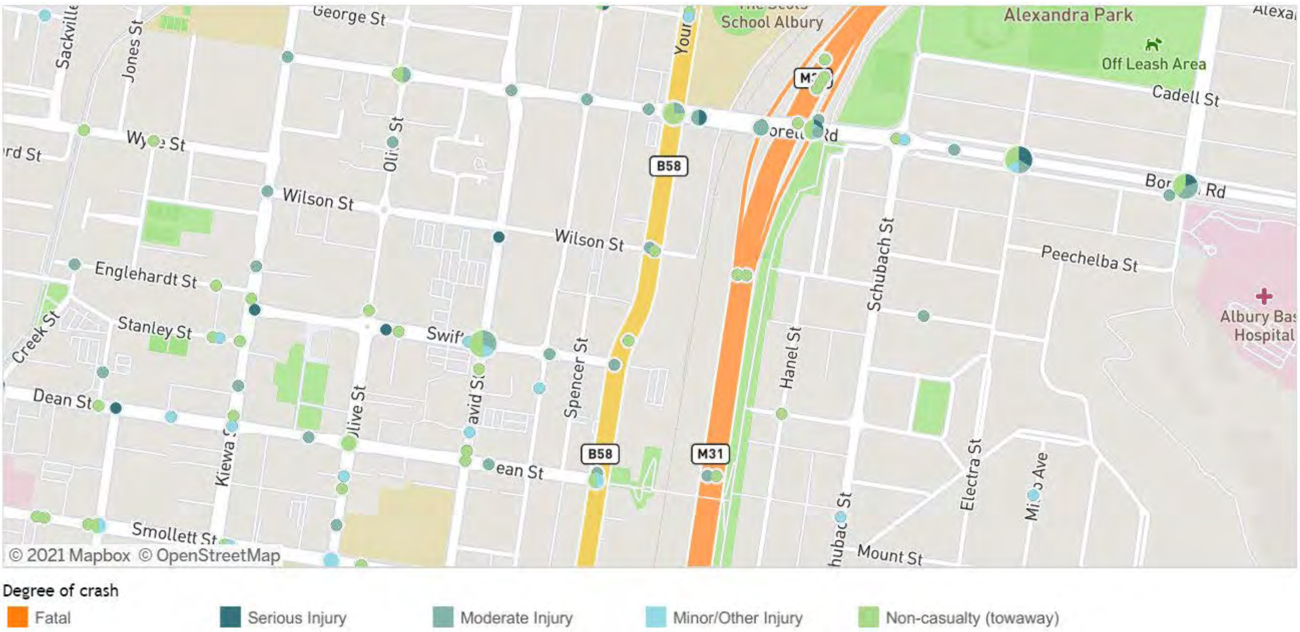
(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) No data available, volumes estimated as Atkins Street 10-hour with equivalent HV proportion
(3) Estimated traffic volume based on road type and surrounding land uses

ROAD SAFETY

Figure 4.8 shows the crashes that occurred in the data collection period in the vicinity of the Albury Station and surrounds, with the following observations:

- Hume Highway around the Borella Road (Riverina Highway) interchange (key road links and intersection) – 15 crashes around the interchange
- Young Street/Borella Road intersection (key road links and intersection) – seven crashes around the interchange
- no fatal crashes are noted in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.8 Crash data (2015–2019) Albury Station and surrounds

PARKING

On-street kerbside parking is generally allowed on the road network in the Albury Station and surrounds unless signed otherwise and there may be some competition for this parking in higher demand areas such as near the railway station, although off street parking is present within commercial, industrial and retail uses within the surrounding area. Further detail of parking on key roads expected to support construction or operational activities related to the proposal is provided in Table 4.7.

Table 4.7 Parking provision – Albury Station and surrounds

LOCATION	PARKING	RESTRICTIONS
Young Street	Kerbside parking	2P [1] 8:30am – 6pm Monday – Friday; 8:30am – 12:30pm Saturday
Borella Road	Kerbside parking east of East Street	No Restrictions
Hume Highway and ramps	No parking	N/A
Albury Station parking on Railway Place and Smollett Street	**Informal station parking to the north of the Albury Station pedestrian bridge:** approximately 13 spaces **Short-term kerbside station parking:** 21 spaces **Short-term parking in front of station:** 24 spaces (including two disabled spaces) **Taxi parking in front of station:** three spaces **Albury Station Visitor Centre parking:** 28 spaces (including one disabled space) **Designated parking to south of station building:** 61 spaces (including two disabled spaces) **Caravan parking:** approximately two spaces **Long-distance coach parking:** four bays **Recreational vehicle servicing:** five bays	**Informal:** Unsigned **Short-term kerbside parking:** 2P 8:30am – 6pm Monday – Friday; 8:30am – 12:30pm Saturday **Short-term parking in front of station:** 16 quarter-hour parking, others unknown **Albury Station Visitor Centre parking:** Unsigned **Designated parking to south of station building:** Unsigned **Caravan parking:** Unsigned **Long-distance coach parking:** Unsigned **Recreational vehicle servicing**: Unsigned
Schubach Street	Kerbside Parking	No Restrictions
Kenilworth Street	Kerbside Parking	No Restrictions

(1) Two-hour parking

4.3.1.3 BILLY HUGHES BRIDGE ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Billy Hughes bridge enhancement site are depicted below in Figure 4.9. Key road characteristics are described in Table 4.8 and key intersection configurations are shown in Appendix C.

Table 4.8 Key road links – Billy Hughes bridge enhancement site

ROAD NAME	ROAD DESCRIPTION
Wagga Road	Two-way, two lane road state-controlled rural road generally running north-south between Mate Street in Lamington and the Hume Highway northbound on ramps at Ettamogah and crossing the Hume. In the vicinity of the Billy Hughes bridge enhancement site the road generally features 3.9m wide lanes, sealed shoulders, and has a posted speed limit of 100km/h.
Hume Highway	Two-way, four lane state-controlled highway with existing north-facing ramps at Wagga Road and south-facing ramps currently under construction and due to be completed in late 2021. In the vicinity of the Billy Hughes bridge enhancement site the single lane northbound on ramp from Wagga Road generally features a 3.5m wide lane, sealed shoulders, and has a posted speed limit of 100km/h, increasing to 110km/h near the Hume Highway main alignment.
R W Henry Drive	Two-way, two lane road council controlled rural road generally running north-south adjacent Wagga Road to the south and Hume Highway to the north. In the vicinity of the Billy Hughes bridge enhancement site the road generally features 3.9m wide lanes, sealed shoulders, and has posted advisory warning speed limit of 65km/h for a 100km/h speed limit rural road.

TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Billy Hughes bridge enhancement site are shown below in Table 4.9. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in section 3.1.4, are presented.

Table 4.9 Billy Hughes bridge enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO -WAY)	HV PROPORTION
Wagga Road[1]	2006	5,392	Not Available
Hume Highway[2]	2018	11,529	32%
R W Henry Drive[3]	2006	539	Not Available

(1) No data available, volumes estimated as Wagga Road – 110m South of Waldner Court, Lavington
(2) No data available, volumes estimated as Hume Highway – 200m North of Ford Lane, Table Top
(3) No data available, volumes estimated as 10% of Wagga Road – 110m South of Waldner Court, Lavington

Albury to Illabo

Figure 4.9 Key road links and intersections – Billy Hughes bridge

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021
Paper: A3
Author: WSP
Scale: 1:5,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Key intersection
Key road links

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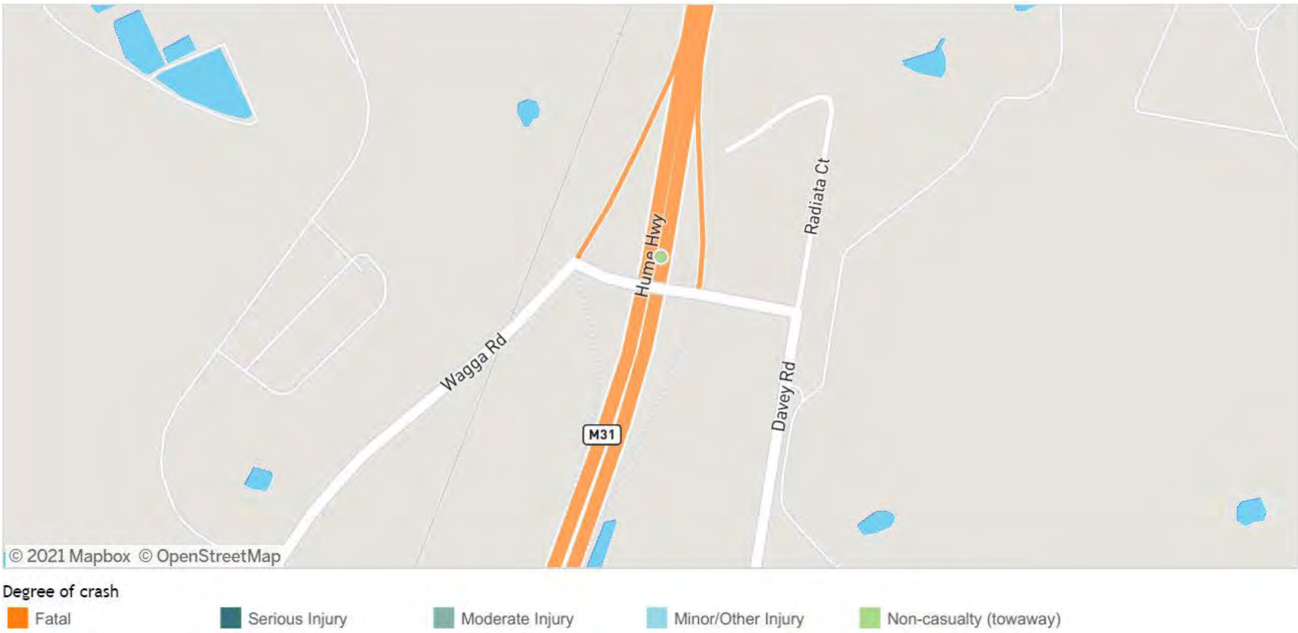
ROAD SAFETY

Figure 4.10 shows the crashes that occurred in the data collection period in the vicinity of the Billy Hughes bridge enhancement site. It is noted that an insufficient number of crashes were recorded to identify any significant observations in the in the vicinity of this enhancement site.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.10 Crash data (2015–2019) Billy Hughes bridge enhancement site

PARKING

Within the rural areas in the vicinity of the Billy Hughes bridge enhancement site there is limited provision of on street parking and demand for this parking would be low due to provision of off-street parking within commercial and industrial areas. There is no designated parking within the enhancement site. Further detail around parking on key links is provided below in Table 4.10.

Table 4.10 Parking provision – Billy Hughes bridge enhancement site

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Wagga Road	No formal provision however no limitation on verge parking where space allows	No Restrictions
Hume Highway and ramps	Emergency stopping only	N/A
R W Henry Drive	No formal provision however no limitation on verge parking where space allows	No Restrictions

4.3.1.4 TABLE TOP YARD CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Table Top Yard clearances enhancement site are depicted below in Figure 4.11. Key road characteristics are described in Table 4.11 and key intersection configurations are shown in Appendix C.

Table 4.11 Key road links – Table Top Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Perryman Lane	Two-way, two lane locally controlled rural road that runs generally north south from Tynan Road and provides access to rural properties in Table Top. In the vicinity of Table Top Yard clearances enhancement site the road generally features 3.3m wide lanes, sealed shoulders, and has a posted speed limit of 100km/h.
Tynan Road	Two-way, two lane locally controlled rural road that runs generally east west between Gregory Road and the Hume Highway and provides access to rural properties and cross connectivity within Table Top via a rail level crossing west of the Hume Highway. In the vicinity of Table Top Yard clearances enhancement site the road generally features a 6.4m sealed width, unsealed shoulders, and has a posted speed limit of 80km/h.
Hume Highway and ramps	Two-way, four lane state-controlled highway that connects to Tynan Road via an at-grade intersection. In the vicinity of Table Top Yard clearances enhancement site the Highway and features 3.7m wide lanes, sealed shoulders, and has a posted speed limit of 110km/h.

Albury to Illabo

Figure 4.11 Key road links and intersections – Table Top Yard clearances

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Table Top Yard clearances enhancement site are shown below in Table 4.12.

Table 4.12 Table Top Yard clearances enhancement site observed traffic volumes

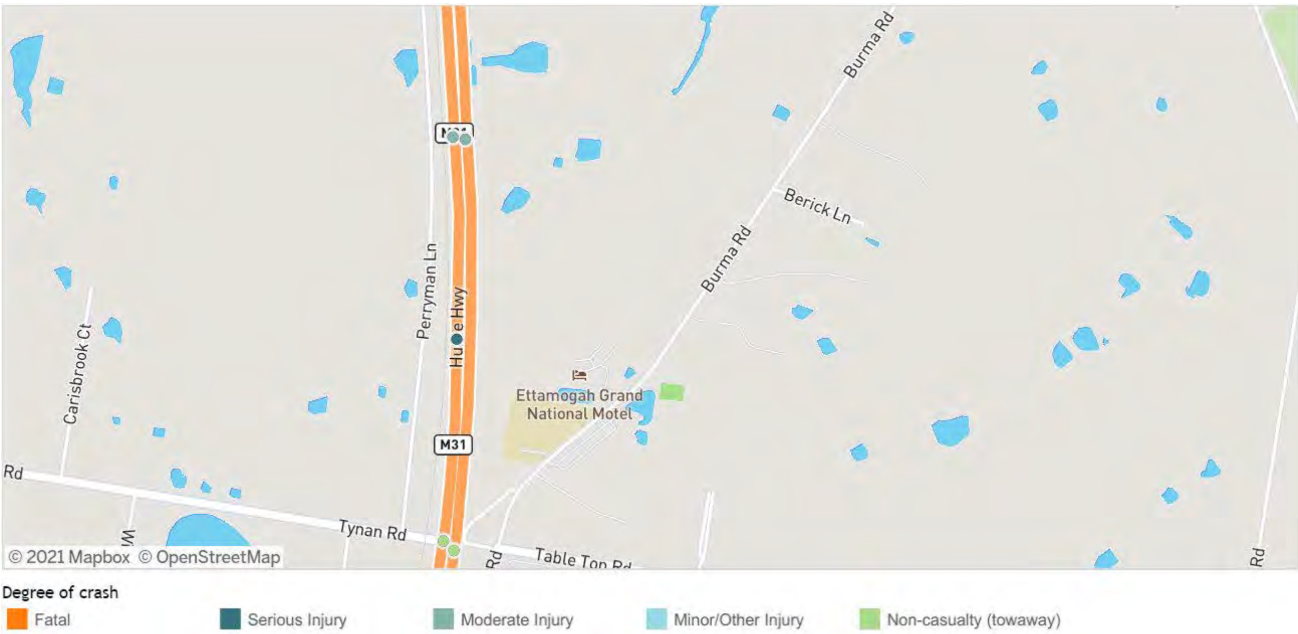
ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Perryman Lane [1]	2018	576	32%
Tynan Road [2]	2013	655	Not available
Hume Highway [3]	2018	11,529	32%

(1) No data available, volumes estimated as 5% of Hume Highway with equivalent HV proportion
(2) Tynan Road – between Gerogery Road and Perryman Lane, Table Top
(3) Hume Highway – 200m North of Ford Lane, Table Top

ROAD SAFETY

Figure 4.12 shows the crashes that occurred in the data collection period in the vicinity of the Table Top Yard clearances enhancement site, with the following observations noted:

- Tynan Road/Hume Highway intersection (key road links and intersection) – two non casualty crashes
- no fatal crashes are noted in in the vicinity of this enhancement site.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.12 Crash data (2015–2019) Table Top Yard clearances enhancement site

PARKING

Within the rural areas in the vicinity of the Table Top Yard clearances enhancement site there is limited provision of formal on-street parking. Parking is allowed on road verges however considering the road environment and the provision of off-street parking within commercial, industrial, and residential uses in the surrounding area it is expected demand for this road side parking would be low. There is no designated public parking within the enhancement site.

4.3.2 RAIL NETWORK

The Main South Line intersects all enhancement sites within the Albury precinct. Existing road rail interfaces include eight rail crossings (four grade separated road crossings, three grade separated pedestrian crossings, and one level crossing) in the vicinity of the enhancement sites.

The heritage-listed Albury Railway Station located on Railway Place is the only operating railway station in the Albury precinct and is located adjacent to the Albury Station and surrounds. The station features commuter parking, passenger drop-off, public bus stops, regional coach parking, and taxi staging areas. Pedestrian access to the station is provided via footpaths on Railway Place and also connect to pedestrian overpasses spanning the rail line and the Hume Highway to connect to Kenilworth Street to the east.

The Main South Line that runs through the Albury precinct carries the passenger rail services connecting Melbourne, Sydney, Canberra, and Griffith. Melbourne services terminate at Albury station. Additionally, the rail line is an important freight corridor. Table 4.13 shows the average daily passenger and freight rail services that currently operate through the area.

Table 4.13 Existing passenger and rail freight services – Albury Railway Station

SERVICE	PASSENGER	FREIGHT	TOTAL
Average daily two-way services	10	12	16

Source: *https://transportnsw.info/trip#/departures?depart=26501&type=platform&accessible=false*

The rail line, station, and road/rail interfaces are illustrated in Figure 4.13 below.

The existing road/rail interfaces in the Albury work precinct including a rail level crossing, road bridges and underpasses, and pedestrian bridges are described below in Table 4.14.

Table 4.14 Existing rail crossings – Albury work precinct

WORK SITE	ROAD NAME	ROAD TYPE	CROSSING TYPE
Albury South	Kiewa Street	One lane – two way	Grade-separated – rail over road
	East Street	Two-way, four lanes	Grade-separated – rail over road
Albury Central	Pedestrian Bridge	Pedestrian bridge	Grade-separated pedestrian bridge
	Pedestrian Bridge	Pedestrian bridge	Grade-separated pedestrian bridge
	Harold Mair Bridge	Pedestrian bridge	Grade-separated pedestrian bridge
	Borella Road (Riverina Highway)	Two-way, five lanes	Grade-separated – road over rail
Ettamogah	Wagga Road	Two-way, four lanes	Grade-separated – road over rail
Table Top	Tynan Road	Two lane – two way	Level Crossing – active

Figure 4.13 Existing rail crossings - Albury Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021
Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:60,000

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Railway stations

Existing rail crossings

Level crossing
Bridge

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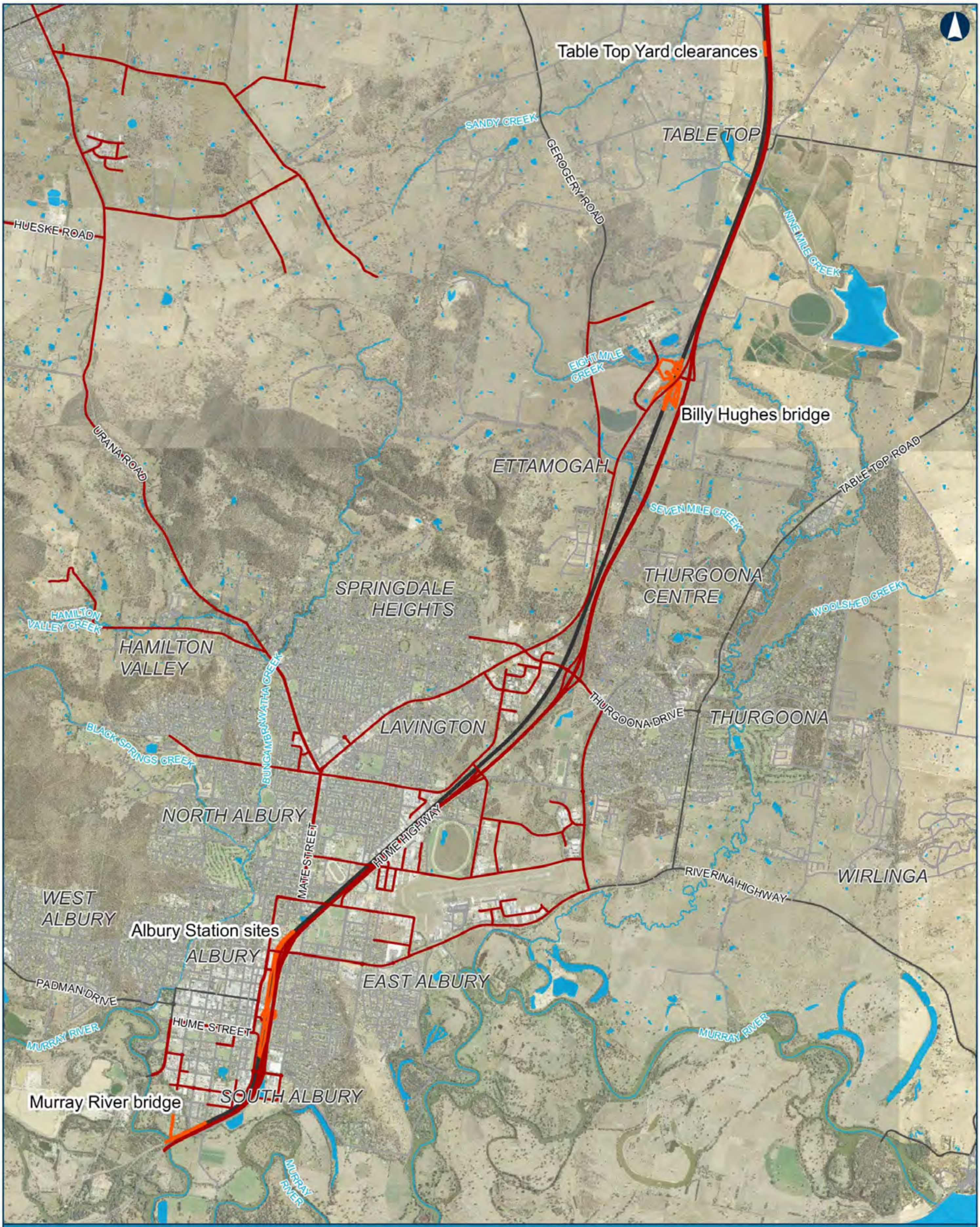
4.3.3 HEAVY VEHICLES ROUTES

Figure 4.14 shows the designated heavy vehicle routes that exist within the Albury work precinct. Heavy vehicle routes are located along the enhancement site access routes within the Albury precinct on the following roads:

- Hume Highway
- Borella Road
- Atkins Street
- MacLeay Street
- Panmure Street
- East Street.
- Young Street
- Wilson Street
- Railway Place
- Wagga Road.

In addition to these routes the Regional Freight Transport Plan 2019 (RFTP) by Riverina Eastern Regional Organisation of Councils (REROC) identifies Hume Highway (from Albury to Olympic Highway interchange) as a REROC Strategic Highway.



Albury to Illabo Figure 4.14 Heavy vehicle routes - Albury Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:50,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies
Designated 19m B-double routes (>50 T)
Main road
Local road

JUNEE ILLABO LOCKHART WAGGA WAGGA HENTY HOLBROOK HOWLONG ALBURY

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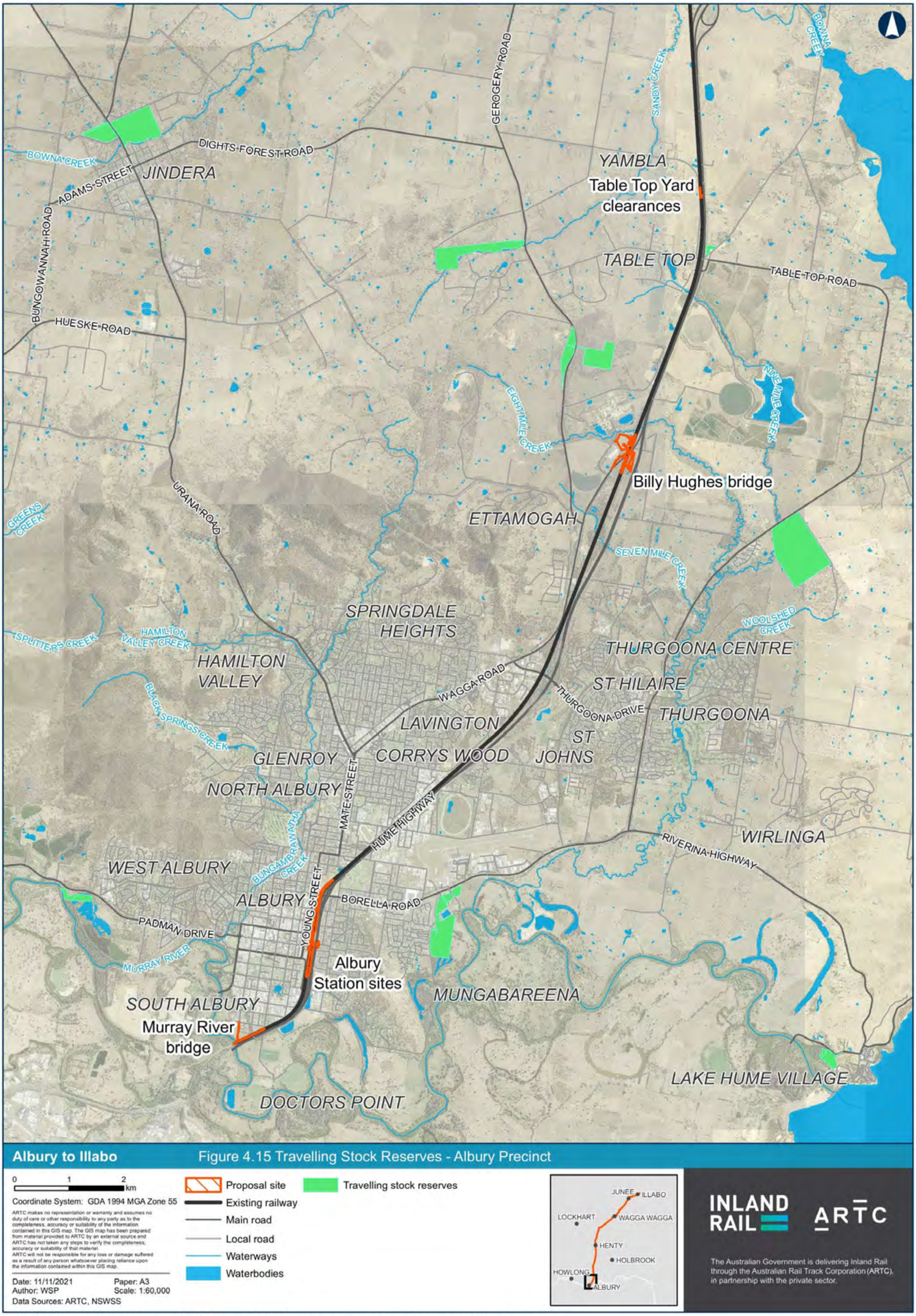
4.3.4 TRAVELLING STOCK RESERVES

Travelling Stock Reserves (TSR) are reserves of connected crown land which are designated for the movement of stock between watering and grazing land, but are also used for emergency stock refuge and transport of stock to market, providing biodiversity corridors, providing access and connection to country for Aboriginal peoples maintaining heritage. Often the TSR will be along roads and consequently interface with road vehicles. A TSR, when on public roads, is referred to as a livestock highway.

Figure 4.15 shows that there are no Livestock Highways or stock routes in the vicinity of enhancement sites within the Albury precinct. Moving stock on public roads outside of Travelling Stock Reserves is possible with the necessary permits and so stock may at times require limited use of rail crossings within the proposal.



Albury to Illabo

Figure 4.15 Travelling Stock Reserves - Albury Precinct

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4.3.5 PUBLIC TRANSPORT NETWORKS

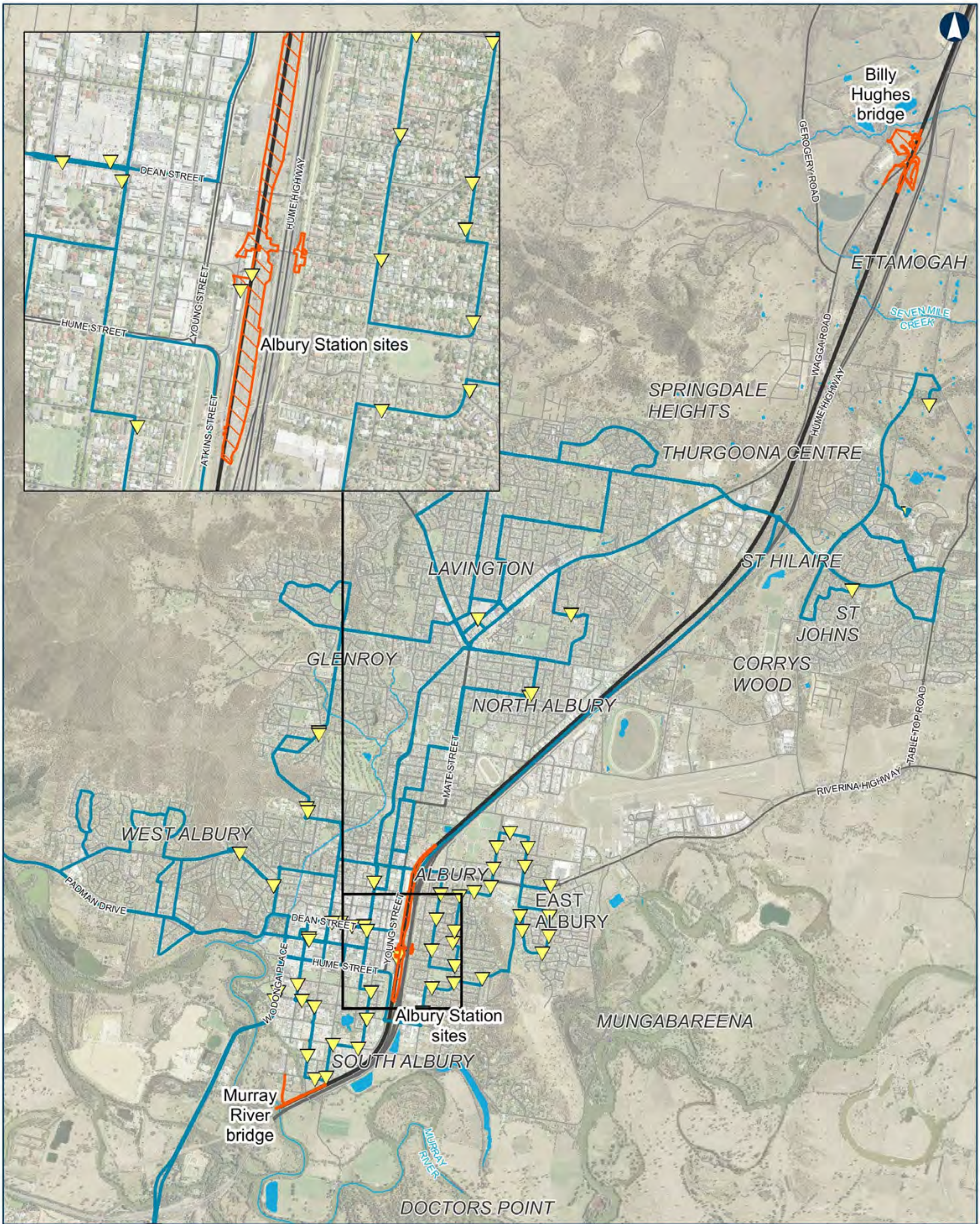
4.3.5.1 PUBLIC BUSES

Figure 4.16 shows the public bus routes that operate within the Albury precinct in the vicinity of the Murray River, and Albury Station and surrounds. No public bus routes were identified relevant to the Billy Hughes bridge or Table Top Yard clearances enhancement sites.

Table 4.15 details the Albury precinct bus services for the routes shown in Figure 4.16.

Table 4.15 Existing public bus services – Albury

SERVICE	DESTINATION	SERVICES PER DAY MON–FRI	SERVICES PER DAY SATURDAY	SERVICES PER DAY SUNDAY AND PUBLIC HOLIDAYS
901	West Albury	10	8	–
902	East Albury	11	7	–
903	South Albury	9	6	–
904	Wodonga	24	–	–
906	Lavington	20	9	–
907	Glenroy and Quicks Hill	13	9	–
908	Thurgoona	12	9	–
915	Corowa	3	–	–
150	Wodonga	–	8	–
160	Wodonga	–	7	–
741 (TrainLink)	Echuca (Tuesdays, Thursdays, and Saturdays only)	1	1	–



Albury to Illabo

Figure 4.16 Public bus routes - Albury Precinct

0 0.5 1 Kilometers

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:40,000
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Bus stops
Bus routes

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The public buses services operating on key road links within the Albury precinct are detailed in Table 4.16.

Table 4.16 Existing public bus routes on key road links – Albury

SERVICE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY BUS STOP NAME / NUMBER
902 – Albury to East Albury	Murray River bridge	Uses East Street and Borella Road	— No stops on key links
903 – Albury to South Albury	Murray River bridge	Uses and stops on Atkins Street, Abercorn Street, Kiewa Street, and Olive Street	— Atkins Street after Macauley Street / 264077 — Olive Street/Atkins Street / 264078 — Olive Street before Abercorn Street / 264079 — Kiewa Street at Panmure Street / 264081 — Plummer Street/Abercorn Street / 264080
908 – Thurgoona to Albury	Albury Station and surrounds	Uses Young Street and Borella Road	— No stops on key links
741 / 742 – Albury to Echuca	Albury Station and surrounds	Uses Young Street, Smollett Street, and Railway Place	— Albury Station / 26402

4.3.5.2 SCHOOL BUSES

The school bus routes in the Albury precinct are detailed in Table 4.17.

Table 4.17 Existing school bus services on key road links – Albury

SERVICE	SERVICE RUNNING AREA
School Service 1	Uses and stops on Young Street
Lara Lakes	Uses and stops on Tynan Road and Perryman Lane

Source: https://martinsalbury.com.au/direct-school-services/albury-high-school/

4.3.6 ACTIVE TRANSPORT NETWORKS

4.3.6.1 CYCLING NETWORK

Figure 4.17 shows the designated cycle infrastructure that TfNSW has classified within the Albury precinct. No dedicated cycle infrastructure is provided in the vicinity of the Billy Hughes bridge or Table Top Yard clearances enhancement sites. In all areas the existing road lanes or shoulders may be used informally by cyclists.

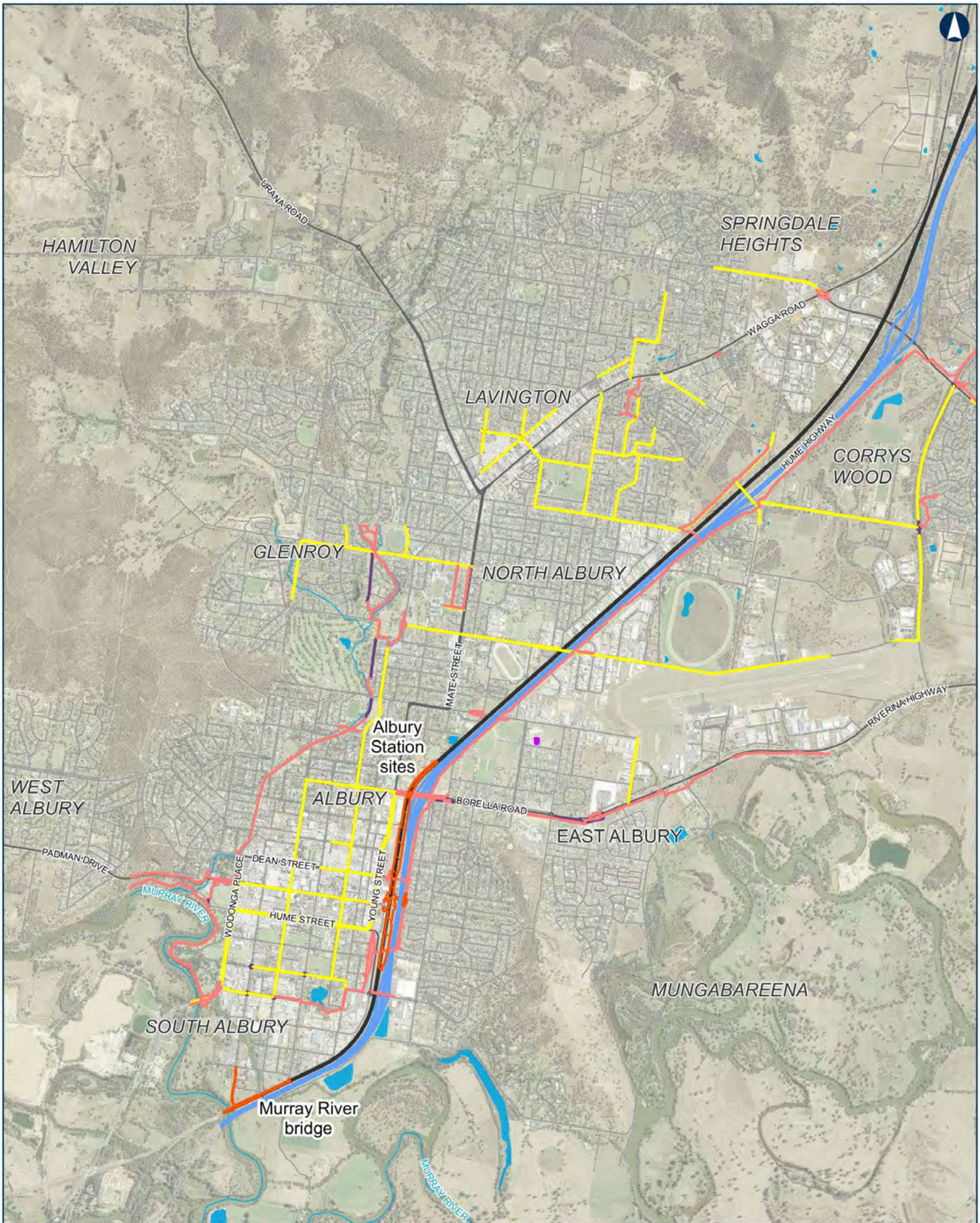
4.3.6.2 PEDESTRIAN NETWORK

Footpaths are present on most roads within the urban area of the Albury precinct and pedestrian crossings are provided at most signalised intersections, and many unsignalised intersections. Typically, there is not provision of connected pedestrian infrastructure in the vicinity of enhancement sites in rural areas. There are also several opportunities to cross the rail line at grade-separated road bridges and three pedestrian overpasses as described in Table 4.18.

Table 4.18 Pedestrian rail crossing opportunities – Albury precinct

WORK SITE	LOCATION	CROSSING TYPE
Murray River bridge	East Street	Grade-separated – rail over road
Albury Station and surrounds	Harold Mair Bridge	Pedestrian overpass
	Amatex Street pedestrian bridge	Pedestrian overpass
	Albury Station pedestrian bridge	Pedestrian overpass Bridge does not feature ramps
	Borella Road	Grade-separated – road over rail

Figure 4.18 shows existing opportunities to cross the rail line in the Albury precinct.



Albury to Illabo Figure 4.17 Cycling infrastructure - Albury Precinct

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:30,000
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies

Cycle path type
Bicycle Only
Emergency Stopping Lane
Mixed Traffic
Parking Lane
Shared Use

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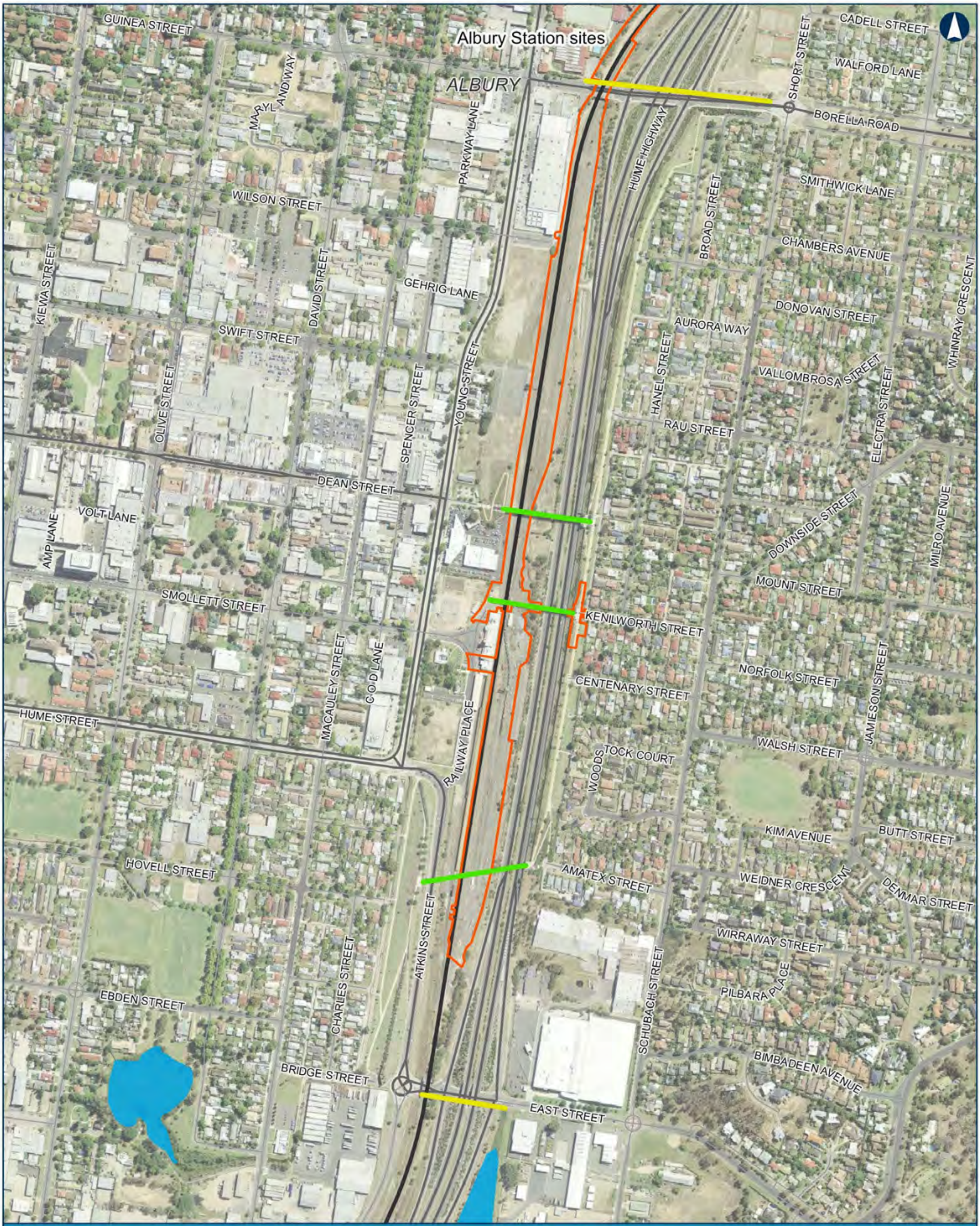

Albury to Illabo

Figure 4.18 Existing pedestrian rail crossings - Albury Precinct

0 100 200 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 4/11/2021
Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:6,000

Proposal site
Existing railway
Main road
Local road
Waterbodies

Pedestrian rail crossing
Pedestrian overpass
Road with footpath

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4.3.7 WATER BASED TRANSPORT

In the vicinity of the study area the Murray River is used primarily for tourism, recreational activities, and events including but not limited to:

- water ski school and users
- annual sporting events such as:
  - Murray River kayak race
  - Murray River long distance river swim
  - Frank Harrison Interstate Marathon Cup
- commercial canoe kayak hire operators
- commercial river cruises
- private watercraft.

Any water-based emergency services would also access the waterway beneath the Murray River bridge.

At the time of preparation of this report, river tour operators were closed due to COVID-19 restrictions and could not be contacted for comment on duration or location of activities on the Murray River.

The river features several public and private jetties that allow users to access the river, including at the new Albury Riverside precinct that is due to be completed in December 2022 and Oddies Creek Park, both to the north of the Murray River bridge enhancement site. The river does not support public transport, trade, or shipping freight routes. In the vicinity of the study area the river is crossed by the Murray River rail bridge and the Hume Highway.

4.4 GREATER HUME – LOCKHART

Greater Hume – Lockhart precinct includes the following enhancement sites:

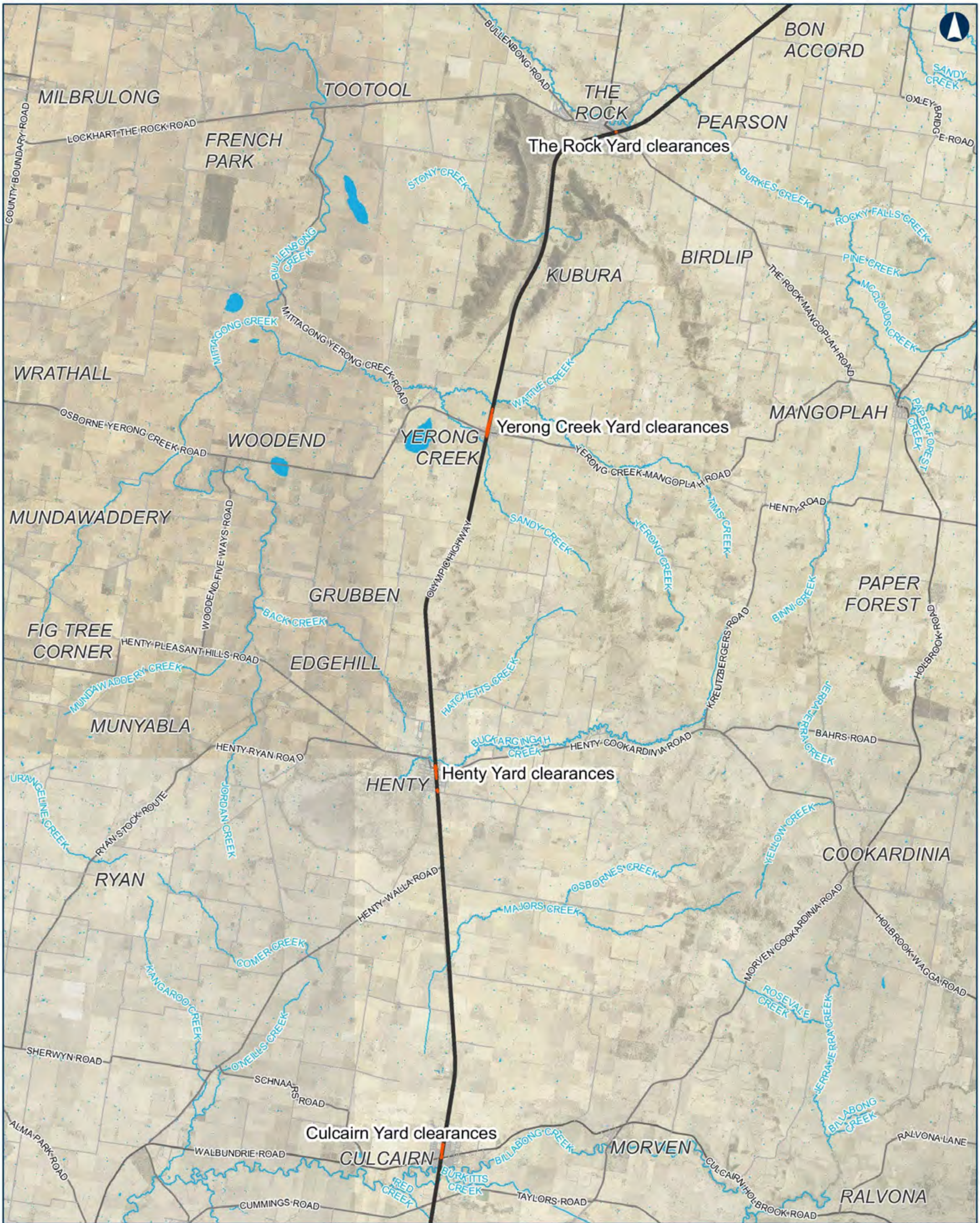
- Culcairn Yard clearances
- Culcairn pedestrian bridge
- Henty Yard clearances
- Yerong Creek clearances
- The Rock Yard clearances.

Due to their proximity, Culcairn Yard clearances and Culcairn pedestrian bridge were considered collectively (referred to as Culcairn enhancement sites).

The existing traffic and transport network relevant to Greater Hume – Lockhart precinct is discussed in the following sections.

4.4.1 ROAD NETWORK

The sites within the precinct are connected by the Olympic Highway. The enhancement sites and main road links within the precinct are shown below in Figure 4.19.



Albury to Illabo Figure 4.19 Road network - Greater Hume – Lockhart Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:150,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies

Road type
Arterial road
Sub-arterial road
Local road

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4.4.1.1 CULCAIRN ENHANCEMENT SITES

The enhancement sites in Culcairn share the same road network and have been considered collectively.

The key road links and intersections expected to support the construction or operational movements related to the proposal for Culcairn are depicted below in Figure 4.20. Key road characteristics are described in Table 4.19 and key intersection configurations are shown in Appendix C.

Table 4.19 Key road links – Culcairn enhancement sites

ROAD NAME	ROAD DESCRIPTION
Olympic Highway/ Melville Street	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. In the vicinity of the enhancement site the highway is generally rural and features 3.6m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Railway Parade	Two-way, two lane locally controlled urban road that generally runs north-south from Balfour Street and provides access to rural properties and commercial areas in central Culcairn on the western side of the rail line. In the vicinity of the enhancement site the road generally features 3.5m wide lanes, areas of sealed and unsealed shoulders with parking, and has a posted speed limit of 50km/h.
Balfour Street	Two-way, two lane state-controlled road, that is classified as a regional road and forms part of the state-controlled Olympic Highway between Railway Street and Melville Street. The road runs east-west and provides cross connectivity within Culcairn via a rail level crossing. In the vicinity of the enhancement site the road generally features 3.7m wide lanes, sealed shoulders, and has a posted speed limit of 50km/h.

TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Albury Station and surrounds are shown in Table 4.20. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

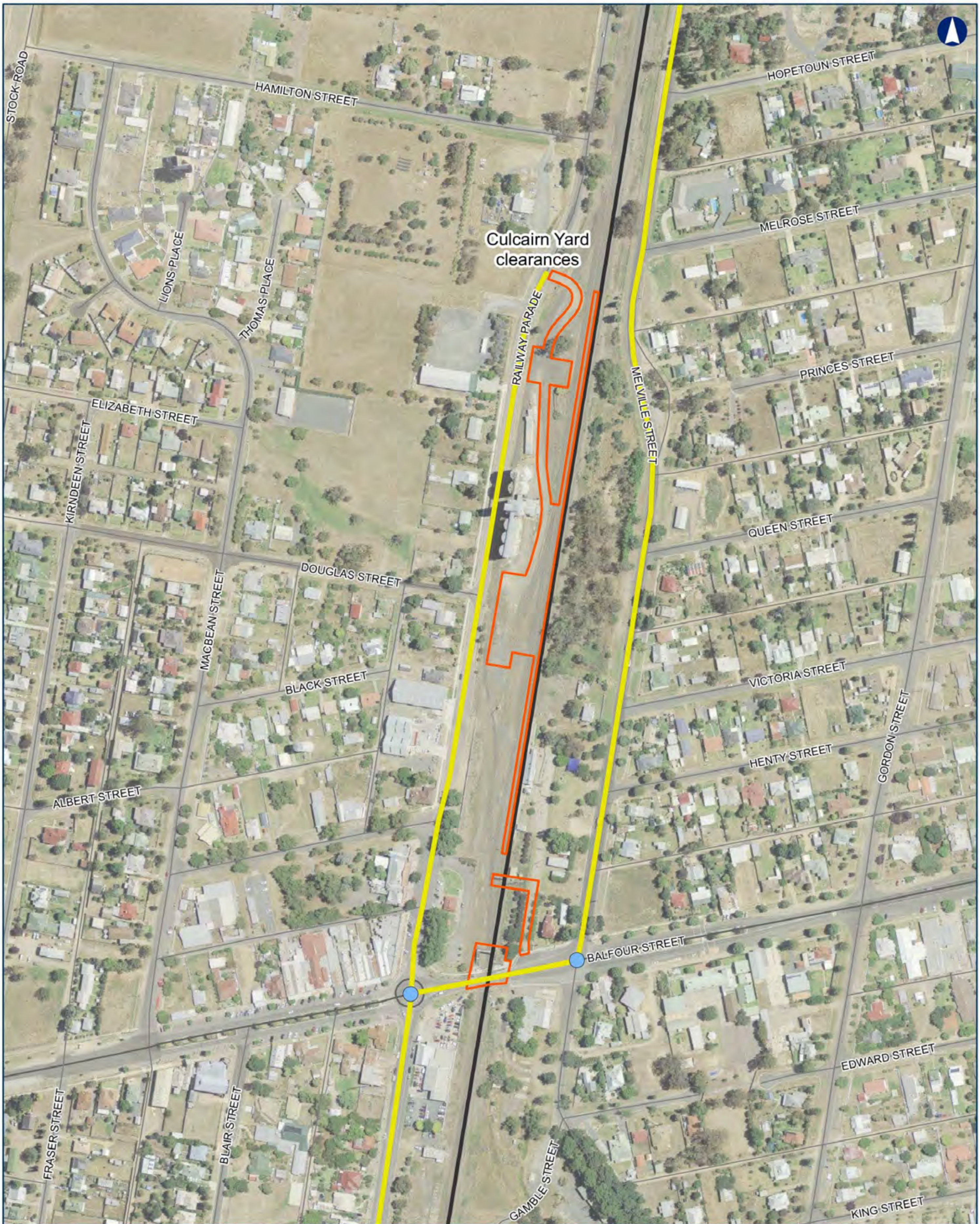
Table 4.20 Culcairn enhancement sites observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Olympic Highway/Melville Street[1]	2011	2,454	28%
Balfour Street	2010	5,527	Not available
Railway Parade South[2]	2006	3,625	Not available
Railway Parade North[3]	2010	906	Not available

(1) No data available, volumes estimated as Olympic Highway – 290m North of Calool Lane, Culcairn
(2) No data available, volumes estimated as Railway Parade – 80m South of Balfour Street, Culcairn 2660
(3) No data available, volumes estimated as 25% of Railway Parade – 80m South of Balfour Street, Culcairn 2660

Albury to Illabo

Figure 4.20 Key road links and intersections – Culcairn Yard clearances



0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021
Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:3,000

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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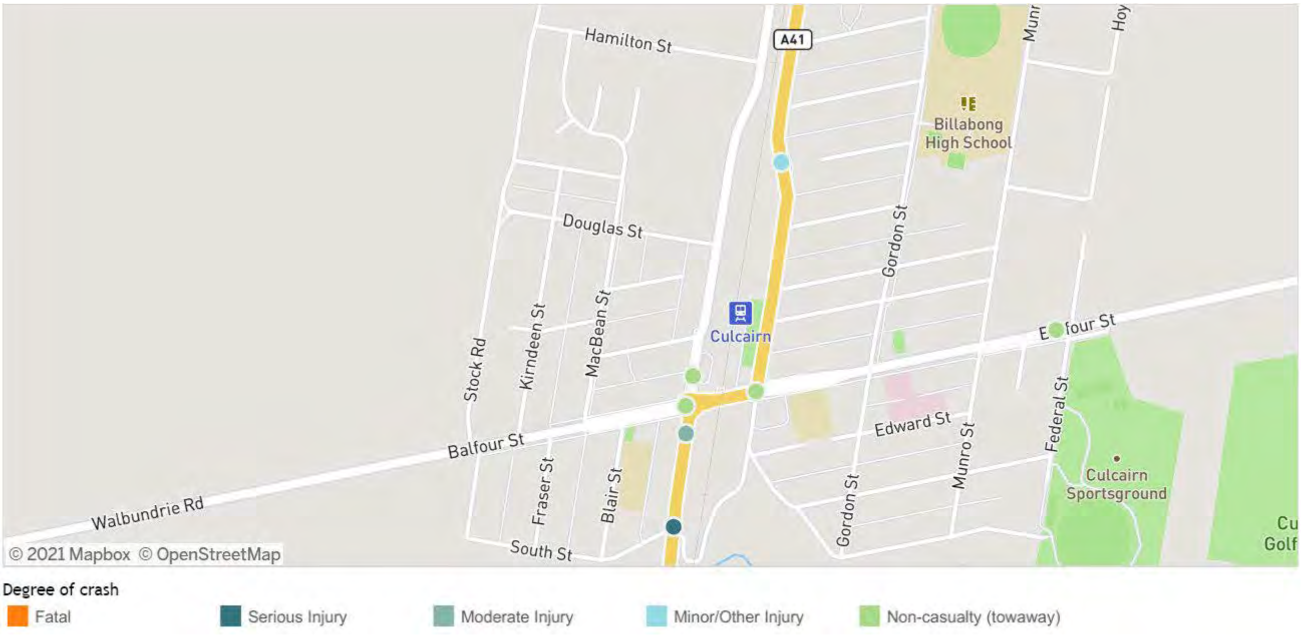
ROAD SAFETY

Figure 4.21 shows the crashes that occurred in the data collection period in the vicinity of the Culcairn enhancement sites, with the following observations:

- Railway Parade/Balfour Street (key road links and intersection) – four crashes
- Balfour Steer/Melville Street (key road links and intersection) – one crash
- No fatal crashes are noted in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.21 Crash data (2015–2019) Culcairn enhancement sites

PARKING

Within the urban and rural areas in the vicinity of the Culcairn enhancement sites, on-street kerbside parking is generally allowed unless signed otherwise and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area, and the Culcairn Railway Station. There is no designated parking within the enhancement site. Further detail around parking on key links is provided below in Table 4.21.

Table 4.21 Parking provision – Culcairn

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Olympic Highway / Melville Street	Kerbside parking	No Restrictions
Railway Parade	Kerbside parking	Heavy vehicle parking restriction 9pm – 7am
Balfour Street	Kerbside and angle parking	No Restrictions

4.4.1.2 HENTY YARD CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Henty Yard clearances enhancement site are depicted below in Figure 4.22. Key road characteristics are described in Table 4.22 and key intersection configurations are shown in Appendix C.

Table 4.22 Key road links – Henty Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway/ Railway Parade	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. The highway runs through Henty is also known as Railway Parade, running east of the rail line and providing access to central Henty and the Henty Railway station, Henty highway rest area and Bi-Centennial Park. In the vicinity of the Henty Yard clearances enhancement site the highway is generally rural and features 3.5m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Sladen Street	Two-way, two lane locally controlled urban road that generally runs east-west through Henty and provides cross connectivity across the Olympic Highway and rail line via a level crossing. The road provides access to Henty Public School, St Paul's Lutheran Primary School, and residential areas in Henty. In the vicinity of the Henty Yard clearances enhancement site the road features a 6.8m wide eastbound lane and 3.8m westbound lane (approx.) through the level crossing, unsealed shoulders, and has a posted speed limit of 50km/h.
Rosler Parade/ Yankee Crossing Road	Two-way, two lane locally controlled urban road that generally runs east-west through Henty and provides cross connectivity across the Olympic Highway and rail line via a level crossing. The road provides access to residential areas inside and outside of Henty. In the vicinity of the enhancement site the road features a 6.8m wide eastbound lane and 3.8m westbound lane (approx.) through the level crossing, unsealed shoulders, and has a posted speed limit of 50km/h.
Allan Street	Two-way, two lane locally controlled urban road that generally runs north-south through Henty and provides access to Henty Memorial Park, and residential areas inside and outside of Henty. In the vicinity of the Henty Yard clearances enhancement site the road features a 6.8m wide sealed width, unsealed shoulders, and has a posted speed limit of 50km/h.
Ivor Street	Two-way, two lane locally controlled urban road that generally runs north-south between Sladen Street and Rosler Parade, and residential areas inside and outside of Henty. In the vicinity of the Henty Yard clearances enhancement site the road features a 6.8m wide sealed width, unsealed shoulders, and has a posted speed limit of 50km/h.

Albury to Illabo

Figure 4.22 Key road links and intersections – Henty Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021
Paper: A3
Author: WSP
Scale: 1:4,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Key intersection
Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Henty Yard clearances enhancement site are shown below in Table 4.23. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.23 Henty Yard clearances enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	AADT (TWO -WAY)	HV PROPORTION
Railway Parade (Olympic Highway)[1]	2011	2,454	28%
Sladen Street	2014	764	12%
Rosler Parade/Yankee Crossing Road[2]	2014	153	12%
Allan Street[3]	2011	491	28%
Ivor Street[3]	2011	491	28%

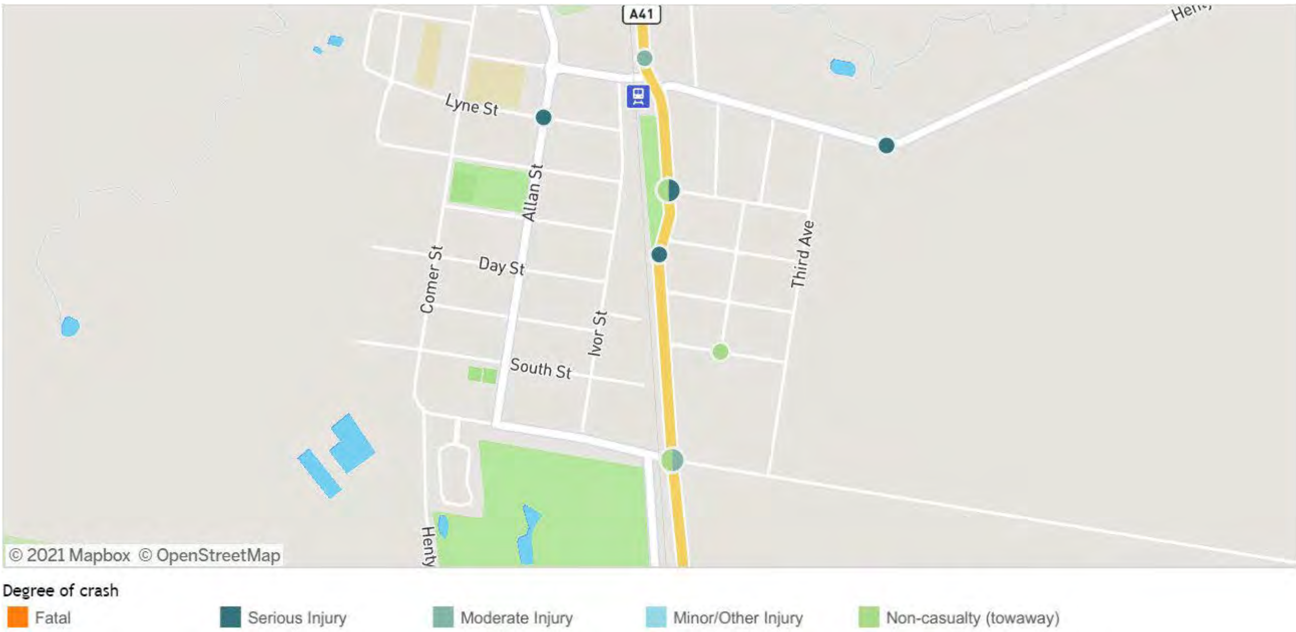
(1) No data available, volumes estimated as Olympic Highway – 290m North of Calool Lane, Culcairn
(2) No data available, volumes estimated as 50% of Sladen Street with equivalent HV proportion
(3) No data available, volumes estimated as 20% of Railway Parade with equivalent HV proportion

ROAD SAFETY

Figure 4.23 shows the crashes that occurred in the data collection period in the vicinity of the Henty Yard clearances enhancement site, with the following observations noted:

- Olympic Highway (key road link) – six crashes, five of which occurred in dark lighting conditions
- no fatal crashes are noted in in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.23 Crash data (2015–2019) Henty Yard clearances enhancement site

PARKING

Within the urban areas of Henty, on-street kerbside parking is generally allowed unless signed otherwise and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area, and the Henty Railway Station. There is no designated parking within the enhancement site.

4.4.1.3 YERONG CREEK YARD CLEARANCE ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Yerong Creek Yard clearances enhancement site are depicted below in Figure 4.24. Key road characteristics are described in Table 4.24 and key intersection configurations are shown in Appendix C.

Table 4.24 Key road links – Yerong Creek Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway/ Cox Street	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. The highway through Yerong Creek is also known as Cox Street, running east of the rail line and providing access to central Yerong Creek and residential areas. In the vicinity of the Yerong Creek Yard clearances enhancement site the highway is generally rural and features 3.6m wide lanes, unsealed shoulders with parking, and has a posted speed limit of 50km/h.
Plunkett Street	Two-way, two lane locally controlled urban street that generally runs east-west from the Olympic Highway and provides cross connectivity within Yerong Creek via a rail level crossing west of Olympic Highway. In the vicinity of the Yerong Creek Yard clearances enhancement site the road generally features 4.6m wide lanes, areas of sealed and unsealed shoulders with parking, and has a posted speed limit of 50km/h.
Finlayson Street	Two-way, two lane locally controlled urban street that generally runs north-south to the west of the Olympic Highway, crossing Plunkett Street and provides access to residential properties and the Yerong Creek Rural Fire Brigade within Yerong Creek. In the vicinity of the Yerong Creek Yard clearances enhancement site the road generally features a 5m sealed width, no shoulders, and has a posted speed limit of 50km/h.

Albury to Illabo Figure 4.24 Key road links and intersections – Yerong Creek Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Yerong Creek Yard clearances enhancement site are shown below in Table 4.25. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

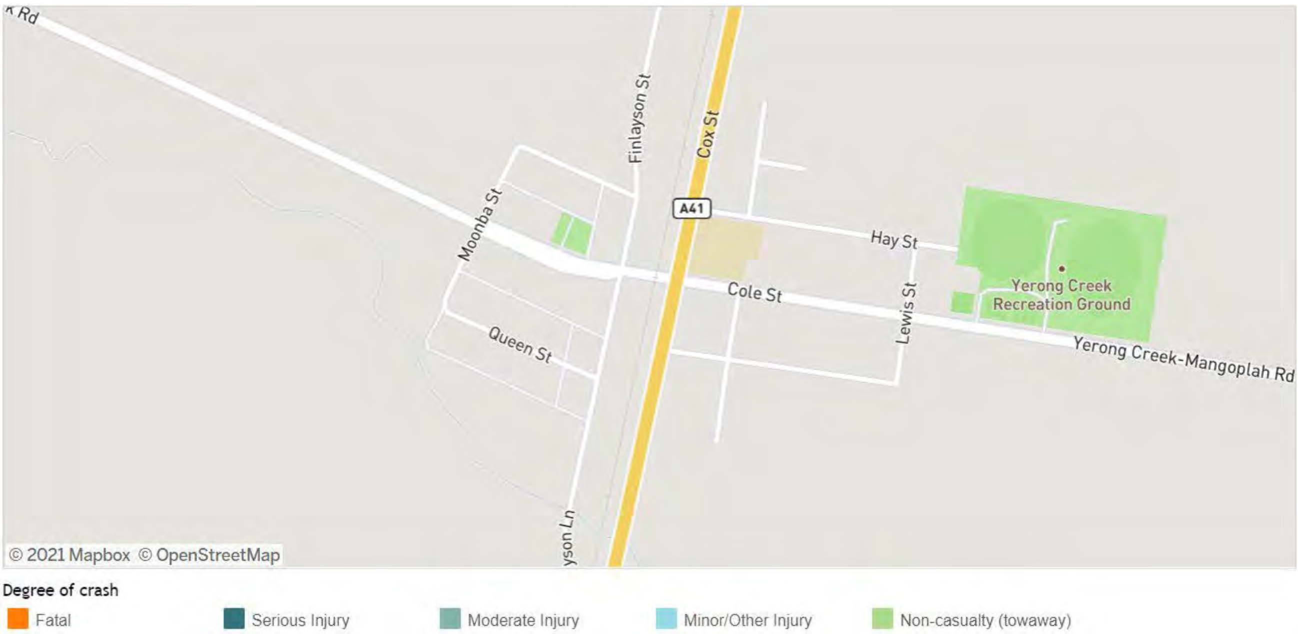
Table 4.25 Yerong Creek Yard clearances enhancement site observed traffic volumes

ROAD		**OBSERVED VOLUMES**		
Road name	**Road type**	**Count year**	**AADT (two-way)**	**HV Proportion**
Olympic Highway / Cox Street[1]	Highway	2010	3,077	18%
Plunkett Street[2]	Urban	2014	764	12%
Finlayson Lane[3]	Urban	2014	191	12%

(1) No data available, volumes estimated as Olympic Highway – 50m East of Mangoplah Road, The Rock 2655 with equivalent HV proportion
(2) No data available, volumes estimated as Sladen Street, Henty (East-West road through town) with equivalent HV proportion
(3) No data available, volumes estimated as 25% of Plunkett St with equivalent HV proportion

ROAD SAFETY

Figure 4.25 shows that no crashes were recorded in the vicinity of the Yerong Creek Yard clearances enhancement site during the data collection period.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.25 Crash data (2015–2019) Yerong Creek Yard clearances enhancement site

PARKING

On-street kerbside parking is generally allowed on the urban road network in the vicinity of the Yerong Creek Yard clearances enhancement site unless signed otherwise and demand for this parking would be low due to provision of off-street parking within retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site.

4.4.1.4 THE ROCK YARD CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for The Rock Yard clearances enhancement site are depicted below in Figure 4.26. Key road characteristics are described in Table 4.26 and key intersection configurations are presented in Appendix C.

Table 4.26 Key road links – The Rock Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway/ Railway Street	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. Through The Rock the highway generally runs east-west and provides access to residential areas in south The Rock and The Rock Railway Station. Within the vicinity of The Rock Yard clearances enhancement site the highway is generally rural and features 3.6m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Urana Street	Two-way, two lane two lane urban locally controlled street generally runs north-south and provides cross connectivity within The Rock via a rail level crossing north of Olympic Highway. The road provides access central urban areas of The Rock and residential properties. Within the vicinity of The Rock Yard clearances enhancement site the road generally features 3.6m wide lanes, unshoulders, and has a posted speed limit of 50km/h.

Albury to Illabo

Figure 4.26 Key road links and intersections – The Rock Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:2,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for The Rock Yard clearances enhancement site are shown below in Table 4.27. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.27 The Rock Yard clearances enhancement site observed traffic volumes

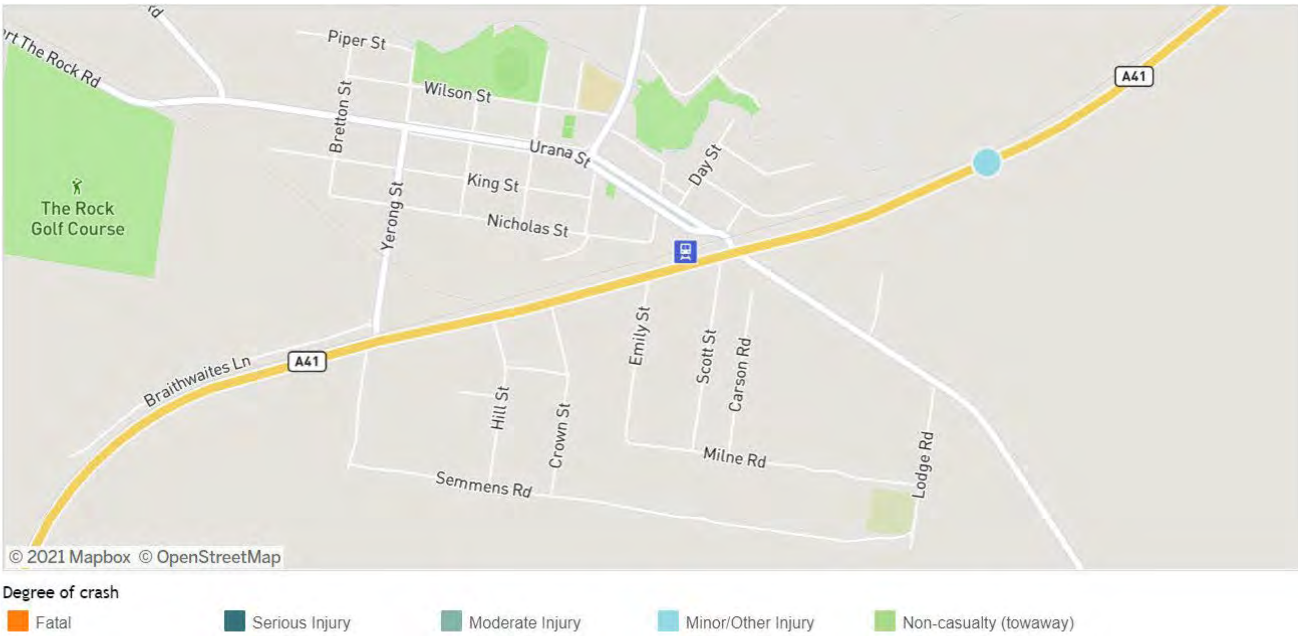
ROAD NAME	COUNT YEAR	AADT (TWO -WAY)	HV PROPORTION
Olympic Highway/Melville Street[1]	2010	3,077	18%
Urana Street [2]	2014	764	12%

(1) No data available, volumes estimated as Olympic Highway – 50m East of Mangoplah Road, The Rock 2655

(2) No data available, volumes estimated as Sladen Street, Henty with equivalent HV proportion.

ROAD SAFETY

Figure 4.27 shows the crashes that occurred in the data collection period in the vicinity of The Rock Yard clearances enhancement site. It is noted that an insufficient number of crashes were recorded for any significant observations in the vicinity of this enhancement site.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.27 Crash data (2015–2019) The Rock Yard clearances enhancement site

PARKING

Within the urban areas of The Rock, on-street kerbside parking is generally allowed unless signed otherwise and demand for this parking would be low due to provision of off-street parking within industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site.

4.4.2 RAIL NETWORK

The Main South Line runs through the Greater Hume – Lockhart precinct from Culcairn to The Rock and features seven rail crossings (one grade separated and six active level crossings) in the vicinity of the enhancement sites

The Greater Hume – Lockhart precinct includes the heritage-listed Culcairn, Henty, and The Rock railway stations. The stations each generally feature commuter parking and passenger drop-off areas. Pedestrian access to the stations is provided via the unsealed roads to the stations, with continuous pedestrian footpaths generally not provided to the station buildings.

The Main South Line that runs through the Greater Hume – Lockhart precinct carries the passenger rail services connecting Melbourne, Sydney, Canberra, and Griffith. Additionally, the rail line is an important freight corridor. Table 4.28 shows the average daily passenger and freight rail services that operate through the area.

Table 4.28 Existing passenger and rail freight services – Greater Hume – Lockhart precinct

	PASSENGER	FREIGHT	TOTAL
Average daily two-way services	4	12	16

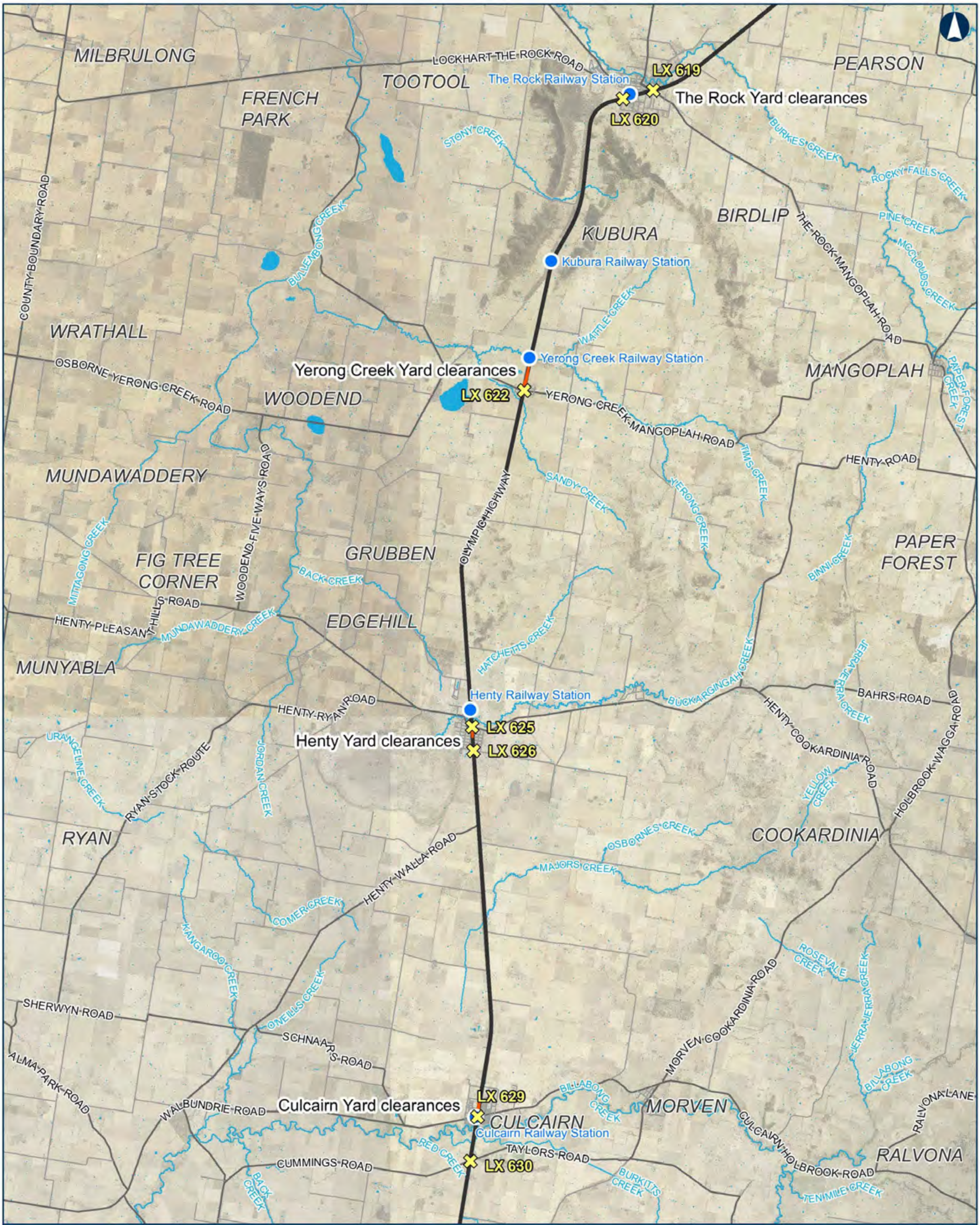
Source: *https://transportnsw.info/trip#/departures?depart=26501&type=platform&accessible=false*

The rail line, stations, and crossings are illustrated in Figure 4.28 below.

The existing road/rail interfaces in the Greater Hume – Lockhart precinct including rail level crossings, road bridges and underpasses are described below in Table 4.29.

Table 4.29 Existing rail crossings – Greater Hume – Lockhart precinct

ENHANCEMENT SITE	ROAD NAME	ROAD TYPE	CROSSING TYPE
Culcairn	Gamble Street	Two-way, one lane	Grade-separated – rail over road
	Balfour Street	Two-way, two lanes	Level Crossing – Active
Henty	Rosler Parade	Two-way, two lanes	Level Crossing – Active
	Sladen Street	Two-way, two lanes	Level Crossing – Active
Yerong Creek	Plunkett Street	Two-way, two lanes	Level Crossing – Active
The Rock	Urana Street	Two-way, two lanes	Level Crossing – Active
	Yerong Street	Two lane – two way	Level Crossing – Active



Albury to Illabo

Figure 4.28 Existing rail crossings - Greater Hume – Lockhart Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:150,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Railway stations

Existing rail crossings

Level crossing

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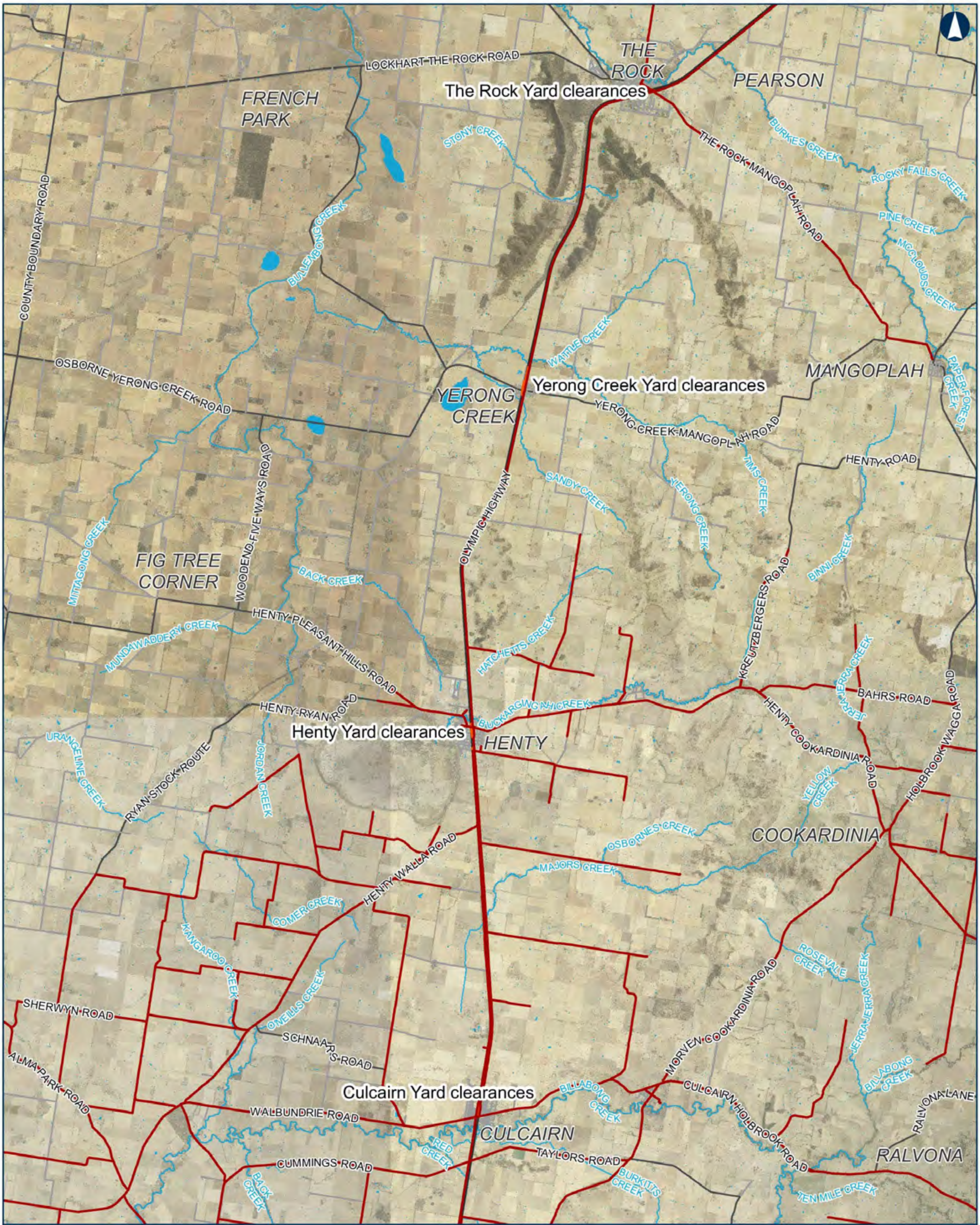
4.4.3 HEAVY VEHICLES ROUTES

Figure 4.29 shows the heavy vehicle routes that operate through the Greater Hume – Lockhart precinct. Heavy vehicle routes are located along the proposed haulage routes within the Greater Hume – Lockhart precinct on the following key road links:

- Olympic Highway / Melville Street
- Balfour Street
- Railway Parade.
- Sladen Street
- Yankee Crossing Road.
- Urana Street
- Mangoplah Road.

In addition to these routes the Regional Freight Transport Plan 2019 (RFTP) by Riverina Eastern Regional Organisation of Councils (REROC) identifies the Hume Highway (from Albury to Olympic Highway interchange) and the Olympic Highway from Hume Highway to Illabo as a REROC Strategic Highways.



Albury to Illabo

Figure 4.29 Heavy vehicle routes - Greater Hume – Lockhart Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021
Paper: A3
Author: WSP
Scale: 1:150,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies
Designated 19m B-double routes (>50 T)
Main road
Local road

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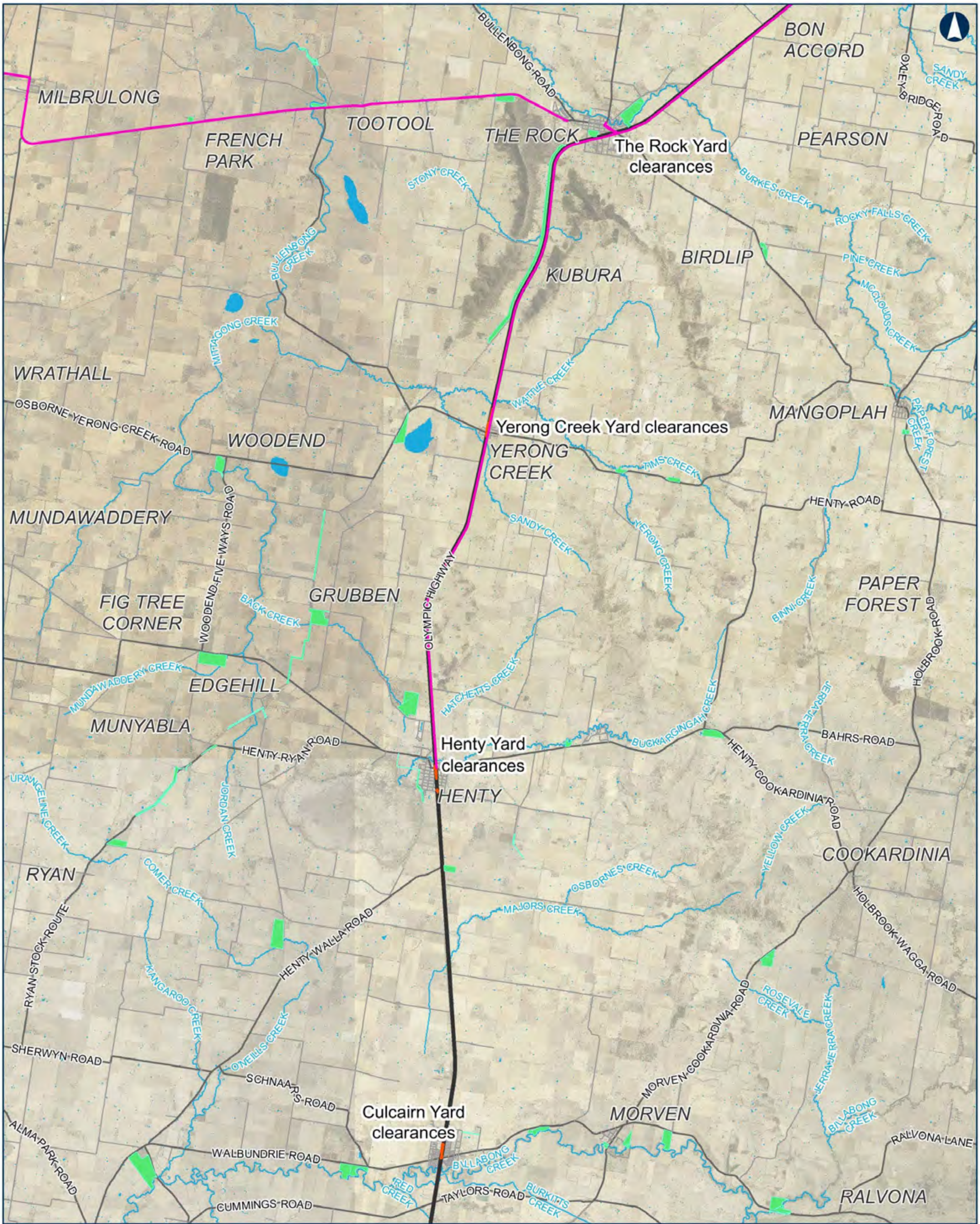
4.4.4 TRAVELLING STOCK RESERVES

Figure 4.30 shows that there are Livestock Highways within the Greater Hume – Lockhart precinct the along the Olympic Highway from Henty through Yerong Creek and The Rock, and along Lockhart – The Rock Road to The Rock. Moving stock on public roads outside of Travelling Stock Reserves is possible with the necessary permits and so stock may at times require limited use of rail crossings within the proposal.



Albury to Illabo Figure 4.30 Travelling Stock Reserves - Greater Hume & Lockhart Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 11/11/2021 Paper: A3
Author: WSP Scale: 1:150,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Travelling stock reserves
- Livestock highways

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4.4.5 PUBLIC TRANSPORT NETWORKS

4.4.5.1 PUBLIC BUSES

Public bus services are provided by Regional Buses and are operated in collaboration with TfNSW under their Rural and Regional On Demand Public Transport pilot program. Services are booked by the passenger and offer door-to-door transfers and as such service routes vary. Table 4.30 below shows the services and frequency offered.

Table 4.30 Public transport on-demand bus services – Greater Hume – Lockhart

SERVICE	DAYS OFFERED
Holbrook, Morven, Culcairn, Gerogery, Gerogery West and Albury	Mondays and Wednesdays
Holbrook, Morven, Culcairn, Henty, Yerong Creek, The Rock, Uranquinty and Wagga	Tuesdays
Henty, Culcairn, Gerogery and Albury	Thursdays
Holbrook, Woomargama, Mullengandra and Albury	Fridays

4.4.5.2 SCHOOL BUSES

The school bus routes in the Greater Hume – Lockhart precinct are run by several private bus companies. The routes identified in the vicinity of the enhancement sites are detailed in Table 4.31.

Table 4.31 Existing school bus services – Greater Hume – Lockhart

SERVICE	SERVICE RUNNING AREA
N0766 – Henty to Merri Meric, N1141 – Henty to Edgehill, N1198 – Henty to Mundawadra Primary Service, N585 – Henty to Bucki	Uses Olympic Highway in Henty, stops on Sladen Street.
N2839 – Yerong Creek to Mangoplah Road	Uses Olympic Highway through Henty and Yerong Creek.
N1200 – Henty to Culcairn	Uses Olympic Highway through Culcairn and Henty.
Bus 7 – Jindera and Walla, Bus 8 – Walbundrie, Bus 9 – Eden Valley, Bus 10 – Gerogery East and West, Bus 11 – Gerogery and Walla	Uses Olympic Highway through Culcairn and stops on Balfour Street.
N1102 Culcairn to The Pines, N317 – Culcairn to Holbrook Rt 1	Uses Olympic Highway through Culcairn and Henty and Railway Parade in Culcairn. Stops on Balfour Street in Culcairn.
N1196 – Mundawadra, Henty and Culcairn	Uses Olympic Highway through Culcairn and Henty and Railway Parade in Culcairn. Stops on Balfour Street in Culcairn and Sladen Street in Henty.
N1197 – Yerong Creek, Henty, and Culcairn	Uses Olympic Highway through Culcairn, Henty, Yerong Creek, and The Rock. Stops on Plunkett Street and Finlayson Street in Yerong Creek.
N1243 – The Rock to French Park	Uses Olympic Highway through Yerong Creek and The Rock. Stops on Plunkett Street, Yerong Creek.
N1172 – The Rock to Bourkes Creek	Uses the Olympic Highway through The Rock.

4.4.6 ACTIVE TRANSPORT NETWORKS

4.4.6.1 CYCLING NETWORK

Figure 4.31 and Figure 4.32 show the designated cycle infrastructure that TfNSW has classified in the Greater Hume – Lockhart precinct for the Yerong Creek Yard clearances and The Rock Yard clearances enhancement sites. Some cycle infrastructure is located on streets adjacent to the access routes for the Henty enhancement site. In all areas the existing road lanes or shoulders may be used by cyclists.

4.4.6.2 PEDESTRIAN NETWORK

Footpaths and formal road crossings are generally only present in the vicinity of enhancement sites in urban areas. Where present they are generally on one side of the street and consist of concrete paths with kerb ramps. Streets through central commercial areas such as Balfour Street in Culcairn, Sladen Street in Henty, Plunkett Street in Yerong Creek, and Urana Street in The Rock feature concrete paths on both sides of the street.

There are several designated opportunities to cross the rail line at level crossings and one closed pedestrian overpass in Culcairn as described in Table 4.32.

Table 4.32 Pedestrian rail crossing opportunities – Greater Hume – Lockhart

WORK SITE	ROAD NAME	CROSSING TYPE
Culcairn	Balfour Street	Pedestrian overpass (closed)
	Balfour Street	Level Crossing – Active
Henty	Sladen Street	Level Crossing – Active
Yerong Creek	Plunkett Street	Level Crossing – Active
The Rock	Urana Street	Level Crossing – Active

Figure 4.33 shows existing opportunities to cross the rail line in the in Greater Hume – Lockhart precinct.

Albury to Illabo — Figure 4.31 Cycling infrastructure - Yerong Creek Yard clearances enhancement site

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:15,000
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies

Cycle path type
Shared Use

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Albury to Illabo Figure 4.32 Cycling infrastructure - The Rock Yard clearances enhancement site

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:8,500
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies

Cycle path type
Shared Use

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Albury to Illabo

Figure 4.33 Existing pedestrian rail crossings - Greater Hume – Lockhart Precinct

0 2 4 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 4/11/2021 Paper: A3
Author: WSP Scale: 1:150,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies

Pedestrian rail crossing
Road with footpath

INLAND RAIL
ARTC

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4.5 WAGGA WAGGA PRECINCT

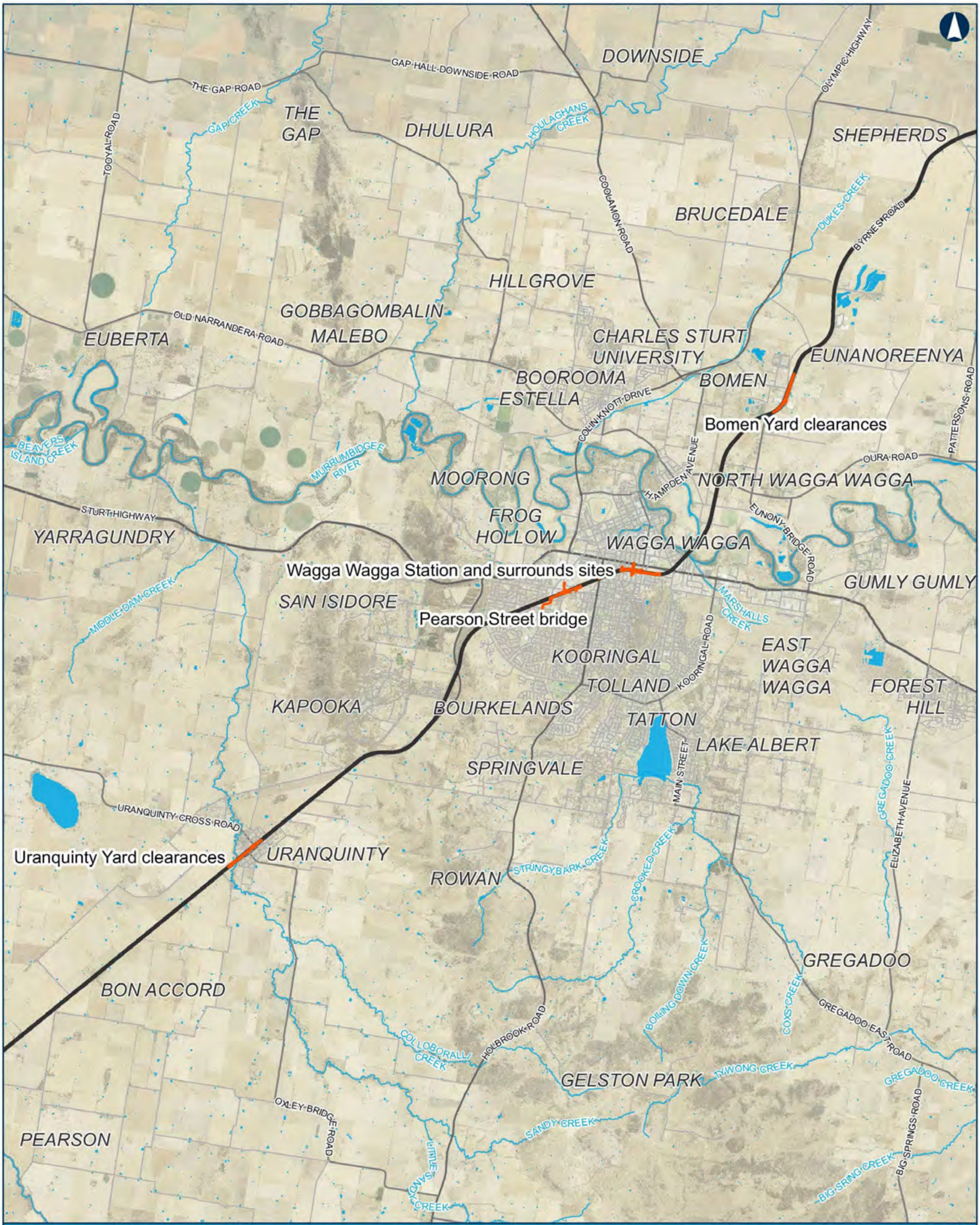
Wagga Wagga precinct includes the following enhancement sites:

- Uranquinty Yard clearances
- Pearson Street bridge
- Cassidy Parade pedestrian bridge
- Edmondson Street bridge
- Wagga Wagga Station pedestrian bridge
- Wagga Wagga Yard Clearances
- Bomen Yard clearances.
- Due to their proximity Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge, and Wagga Wagga Yard clearances were considered collectively (referred to as Wagga Wagga Station and surrounds).

The existing traffic and transport network relevant to Albury precinct is discussed in the following sections.

4.5.1 ROAD NETWORK

The Uranquinty Yard clearances enhancement site is connected to Wagga Wagga by the Olympic Highway running north-south between them. The Bomen Yard clearance enhancement site is located on Byrnes Road, which runs north-south adjacent to the railway line between Wagga Wagga and Junee. The enhancement sites and main road links within the precinct are shown below in Figure 4.34.



Albury to Illabo Figure 4.34 Road network - Wagga Wagga Precinct

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:100,000
Data Sources: ARTC, NSWSS

INLAND RAIL ARTC

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4.5.1.1 URANQUINTY ENHANCEMENT SITE

The key road links and intersections that support the construction or operational movements related to the proposal for the Uranquinty enhancement site are depicted below in Figure 4.35. Key road characteristics are described in Table 4.33 and key intersection configurations are shown in Appendix C.

Table 4.33 Key road links – Uranquinty enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. In the vicinity of the Uranquinty enhancement site the highway is generally rural and features 3.7m wide lanes, areas of sealed and unsealed shoulders, and has a posted speed limit of 50, residential accesses and a school zone and subsequently has a lower speed limit than outside of the Uranquinty area.
Yarragundry Street/ Uranquinty Cross Road	Two-way, two lane locally controlled urban road that generally runs north-south and provides access to Uranquinty town centre, the Uranquinty power station, and provides cross connectivity within Uranquinty via a rail level crossing north of Olympic Highway. In the vicinity of the Uranquinty enhancement site the road generally features 3.4m wide lanes, areas of sealed and unsealed shoulders, and has a posted speed limit of 50km/h through the Uranquinty urban area and 100km/h in the rural area.
Hanging Rock Road	Two-way, one lane locally controlled rural road that generally runs northwest from Uranquinty Cross Road and provides rural residential access. In the vicinity of the Uranquinty enhancement site the road generally features a 4.4m sealed width (approx.) and unsealed shoulders, and has a posted speed limit of 100km/h.

TRAFFIC VOLUMES

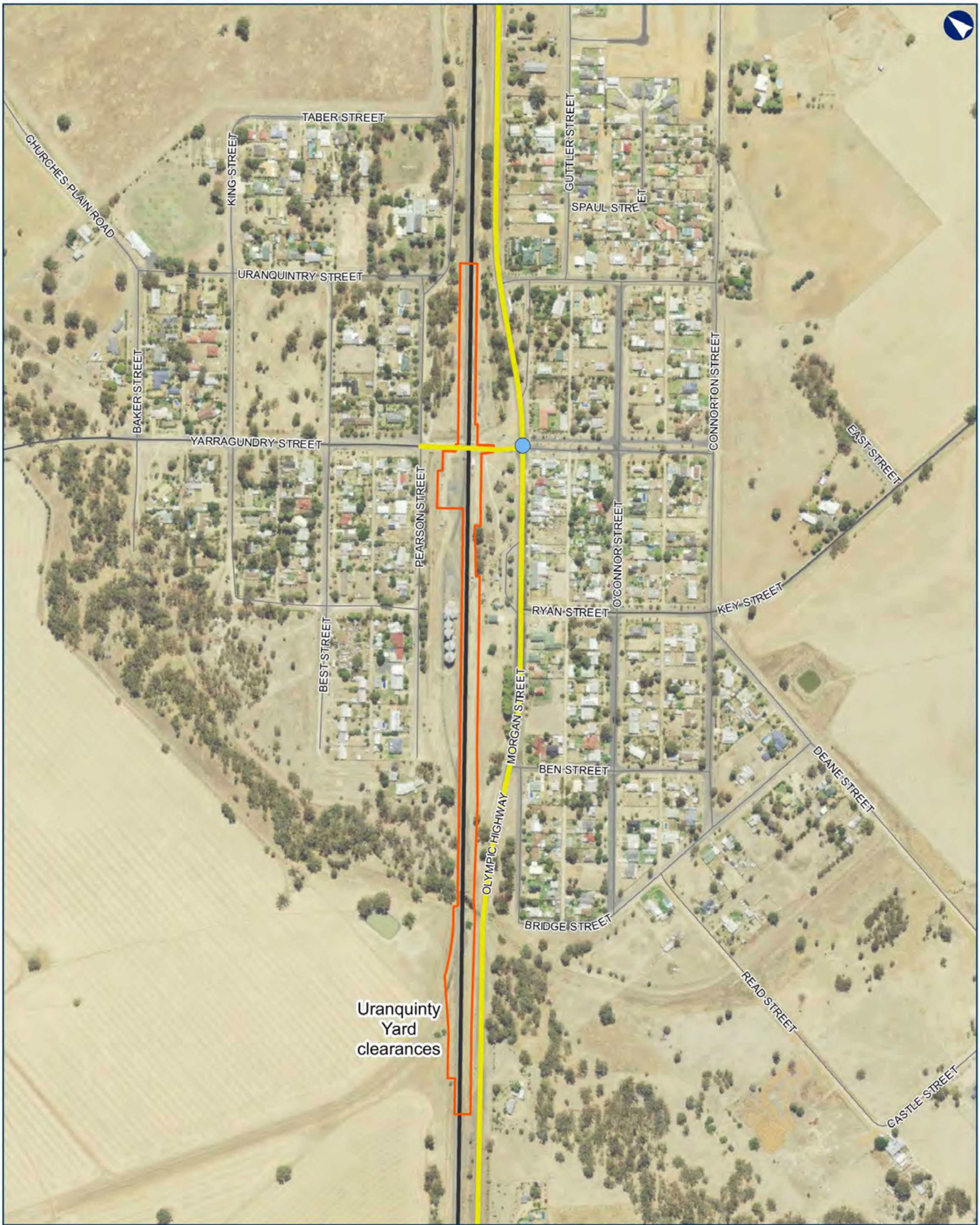
Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Uranquinty enhancement site are shown in Table 4.34. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.34 Uranquinty enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Olympic Highway[1]	2010	3,646	17%
Uranquinty Street	2017	434	9%
Yarragundry Street	2017	507	8%
Hanging Rock Road[2]	N/A	50–100	Not available

(1) No data available, volumes estimated as average of Olympic Highway – Ashmont, 95065 and Olympic Highway – The Rock, 9551 with equivalent HV proportion

(2) Estimated traffic volume based on road type and surrounding land uses



Albury to Illabo

Figure 4.35 Key road links and intersections – Uranquinty Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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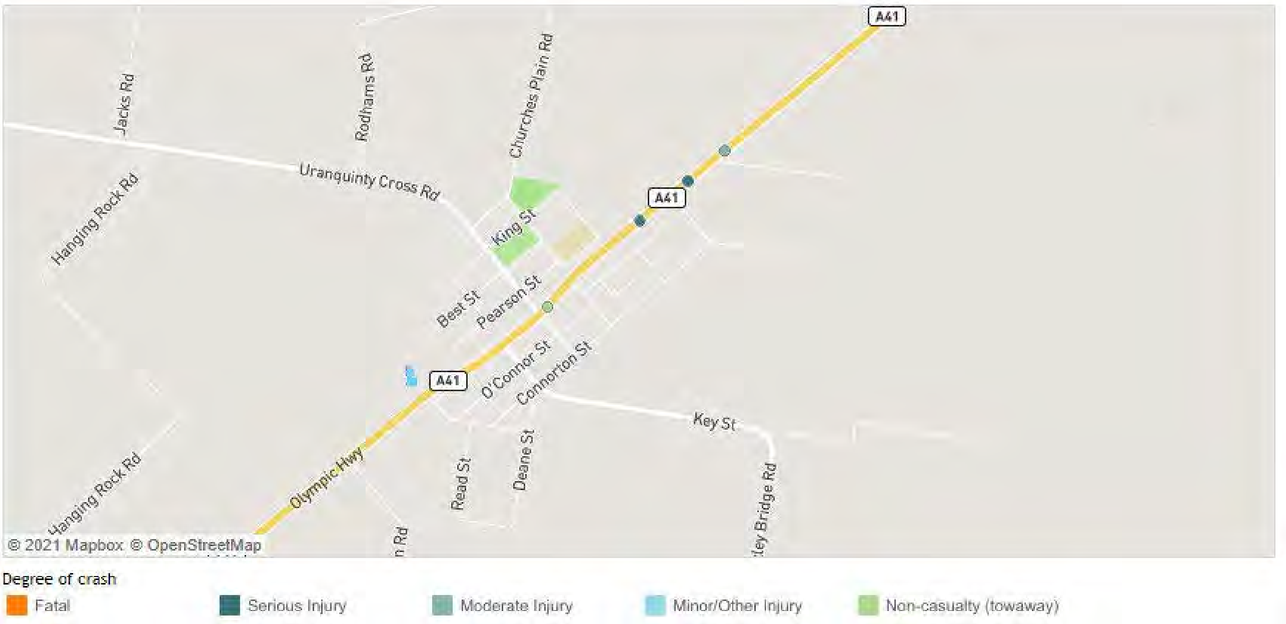
ROAD SAFETY

Figure 4.36 shows the crashes that occurred in the data collection period in the vicinity of the Uranquinty enhancement site, with the following observations:

- Olympic Highway – four crashes (an average of less than one crash per year)
- no fatal crashes are noted in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.36 Crash data (2015–2019) Uranquinty enhancement site

PARKING

On-street kerbside parking is generally allowed on the urban road network in the vicinity of the Uranquinty enhancement site unless signed otherwise and demand for this parking would be low due to provision of off-street parking within industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site. Further detail around parking on key links is provided below in Table 4.35.

Table 4.35 Parking provisions – Uranquinty enhancement site

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Olympic Highway	Kerbside parking within urban area Uranquinty Rest Area	Kerbside: Restrictions at pedestrian crossing south of Yarragundry Street Rest Area: Heavy vehicles restricted
Yarragundry Street/Uranquinty Cross Road	Kerbside and angle parking	No Restrictions
Hanging Rock Road	Kerbside parking	No Restrictions

4.5.1.2 PEARSON STREET BRIDGE ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Pearson Street bridge enhancement site are depicted below in Figure 4.37. Key road characteristics are described in Table 4.36 and key intersection configurations are shown in Appendix C.

Table 4.36 Key road links – Pearson Street bridge enhancement site

ROAD NAME	ROAD DESCRIPTION
Moorong Street (Olympic Highway)	Two-way, four lane divided state controlled road running north-south from Edward Street and forms part of the Olympic Highway. In the vicinity of the Pearson Street bridge enhancement site the road generally features 3.4m wide lanes, sealed shoulders, and has a posted speed limit of 60km/h approaching the intersection with Pearson Street and 80km/h exiting the work site.
Edward Street (Sturt Highway)	Two-way, two-lane state-controlled highway that generally runs east-west and connects the Northern Expressway in South Australia and the Hume Highway in NSW. In the vicinity of the Pearson Street bridge enhancement site the road generally features 3.4m wide lanes, sealed shoulders with parking, and has a posted speed limit of 80km/h outside and 60km/h through Wagga Wagga.
Pearson Street	Two-way, four lane urban locally controlled road that provides north-south cross-connectivity through western Wagga Wagga, running from the Sturt Highway and provides access to commercial districts in south Wagga Wagga. The road crosses the rail line via a grade-separated road bridge north of Urana Street. In the vicinity of the Pearson Street bridge enhancement site the road generally features 3.3m wide lanes, sealed shoulders with parking, and has a posted speed limit of 60km/h.
Cheshire Street	Two-way, two lane urban locally controlled street that runs east-west from Pearson street and provides access to commercial and industrial areas adjacent to the northern side of the rail line. In the vicinity of the Pearson Street bridge enhancement site the road generally features a 12.2m sealed width, limited line marking, shoulders with parking, and has a posted speed limit of 50km/h.
Urana Street	Two-way, two lane urban locally controlled street that runs generally east-west from Pearson Street, crossing Bourke Street and provides access to the Showgrounds, residential areas, and access to the rail line from the south. In the vicinity of the Pearson Street bridge enhancement site the road generally features an 8.8m sealed width, unsealed shoulders, and has a posted speed limit of 50km/h.
Fernleigh Road	Two-way, two lane urban locally controlled road that runs east-west, crossing Glenfield Road, Bourke Street, and Mitchelmore Street, and provides access to The Rules Club sports field, and residential areas. The road crosses the rail line via an at-grade rail level crossing west of the work site. In the vicinity of the Pearson Street bridge enhancement site the road generally features 3.3m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h. West of Glenfield Road, Fernleigh Road also features a median turning lane for property access.
Alan Turner Depot Access Road	Two-way, two lane urban locally controlled street that runs generally north-south, from Fernleigh Road, and provides access to The Alan Turner Depot. In the vicinity of the Pearson Street bridge enhancement site the road generally features an 8.1m sealed width, limited road marking, and has a posted speed limit of 40km/h.

Albury to Illabo Figure 4.37 Key road links and intersections – Pearson Street bridge enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:7,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Pearson Street bridge enhancement site are shown below in Table 4.37.

Table 4.37 Pearson Street bridge enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Edward Street (Sturt Highway) [1]	2021	6,907	12%
Moorong Street (Olympic Highway) [1]	2021	12,663	5%
Pearson Street [1]	2021	9,814	5%
Urana Street [1]	2021	4,758	2%
Cheshire Street[2]	2021	491	5%
Alan Turner Depot Access Road[3]	N/A	50–100	Not available

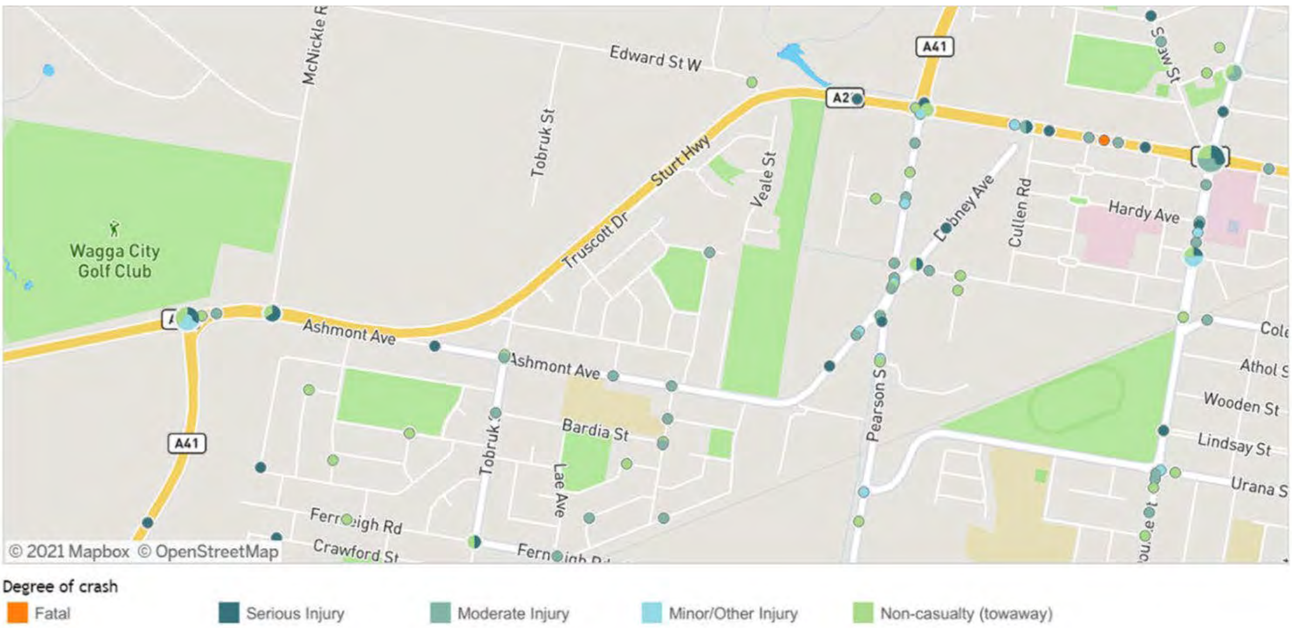
(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) No data available, volumes estimated as 5% of Pearson Street 10-hour with equivalent HV proportion
(3) Estimate traffic volume based on road type and surrounding land uses

ROAD SAFETY

Figure 4.38 shows the crashes that occurred in the data collection period in the vicinity of the Pearson Street bridge enhancement site, with the following observations:

- Edward Street/Pearson Street (key road links and intersection) – Crash cluster at the intersection
- Pearson Street/Dobney Avenue (key road links and intersection) – Crash cluster at the intersection.
- Edward Street (key road link) – One fatal crash occurring in 2018.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.38 Crash data (2015–2019) Pearson Street bridge enhancement site

PARKING

On-street kerbside parking is generally allowed on the urban road network in the vicinity of the Pearson Street bridge enhancement site unless signed otherwise and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site. Further detail of on street parking on key roads expected to support construction or operational activities related to the proposal is provided in Table 4.38.

Table 4.38 Parking provisions – Pearson

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Moorong Street (Olympic Highway)	Kerbside parking	No restrictions
Sturt Highway/Edward Street	Kerbside parking	No restrictions
Pearson Street	Kerbside parking	Areas of 1P [1] parking restrictions north of Dobney Avenue
Cheshire Street	Kerbside parking	No restrictions
Urana Street	Kerbside parking east of Peacock Drive	No restrictions
Fernleigh Road	Kerbside parking	No restrictions
Alan Turner Depot Access Road	No parking	N/A

(1) One-hour parking

4.5.1.3 WAGGA WAGGA STATION AND SURROUNDS

The enhancement sites in the vicinity of the Wagga Wagga Station share the same road network and have been combined in the following section, for:

- Cassidy Parade pedestrian bridge enhancement site
- Edmondson Street bridge enhancement site
- Wagga Wagga Station pedestrian bridge enhancement site
- Wagga Wagga Yard clearances enhancement site.

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Wagga Wagga Wagga Station and surrounds are depicted below in Figure 4.39 and Figure 4.40. Key road characteristics are described in Table 4.39 and key intersection configurations are shown in Appendix C.

Table 4.39 Key road links – Wagga Station and surrounds

ROAD NAME	ROAD DESCRIPTION
Edward Street (Sturt Highway)	Two-way, four lane state-controlled road that runs east-west through Wagga Wagga. It is alternately named Edward Street and Hammond Avenue and forms part of the Sturt Highway. The road crosses the rail line via a grade-separated rail bridge west of Lake Albert Road. In the vicinity of the Wagga Wagga Station and surrounds the highway is generally urban and features 3.4m wide lanes, sealed shoulders with parking, and has a posted speed limit of 60km/h.

ROAD NAME	ROAD DESCRIPTION
Docker Street and Bourke Street	Two-way, four lane urban locally controlled street that crosses Edward Street and provides north-south cross-connectivity through western Wagga Wagga. It provides access to the Wagga Wagga Base Hospital, showgrounds, and Henschke Primary school. The road crosses the rail line via an at-grade rail level crossing in the work site. In the vicinity of the Wagga Wagga Station and surrounds the road generally features 3.3m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Brookong Avenue	Two-way, two lane urban locally controlled road that runs between Docker Street and Edward Street and provides access to residential areas and the Wagga Wagga Base Hospital. In the vicinity of the Wagga Wagga Station and surrounds the road generally features 3.9m wide lanes, and sealed shoulders with parking and a cycle lane, and has a posted speed limit of 50km/h.
Fox Street	Two-way, two lane urban locally controlled street that runs north-south from Edward Street, connecting to Best Street via Donnelly Street and Little Best Street and provides access to residential areas and the Wagga Wagga McDonalds. In the vicinity of the Wagga Wagga Station and surrounds the road generally features a 17.9m sealed width, no line marking, shoulders with parking, and has a posted speed limit of 50km/h.
Edmondson Street and Mitchelmore Street	Two-way, four lane urban locally controlled road that provides north-south cross-connectivity through central Wagga Wagga crossing Edward Street, Coleman Street, and Urana Street. It provides access to the Wagga Wagga High School, Kildare Catholic College, The Bidgee School, and passes adjacent to the South Wagga Wagga Public School. The road crosses the rail line via a grade-separated road bridge north of Erin Street. In the vicinity of the Wagga Wagga Station and surrounds the road generally features 3.1m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/hr and a 40km/h school zone.
Norman Street	Two-way, two lane urban locally controlled street that runs north-south from Coleman Street, connecting to Cassidy Parade provides access to a residential area. In the vicinity of the Wagga Wagga Station and surrounds the road generally features a 16.6m sealed width, limited line marking, shoulders with parking, and has a posted speed limit of 50km/h.
Coleman Street	Two-way, two lane urban locally controlled street that runs generally east-west from Docker Street, crossing Edmondson Street and provides access to Wagga Wagga TAFE and residential areas. In the vicinity of the Wagga Wagga Station and surrounds the road generally features 3.6m wide lanes, sealed shoulders with parking and a cycle lane, and has a posted speed limit of 50km/h.
Cassidy Parade	Two-way, two lane urban locally controlled street that runs generally east west between Bimbeen Street and Kildare Street, running adjacent to the south side of the rail line. It provides access to the rail line, Kildare Catholic College via Kildare Street, and residential areas. In the vicinity of the Wagga Wagga Station and surrounds the road generally features a 4.5m sealed width, limited line marking, unsealed shoulders, and has a posted speed limit of 50km/h.
Erin Street	Two-way, two lane urban locally controlled street that runs east-west from Edmondson Street and provides access to Macleay Street. The road features a 12m sealed width, limited line marking, sealed shoulders with parking, and has a posted speed limit of 50km/h.

ROAD NAME	ROAD DESCRIPTION
Macleay Street	Two-way, two lane urban locally controlled street that runs north-south from Railway Street, crosses Coleman Avenue, and provides access to Wagga Wagga TAFE and residential areas. In the vicinity of the Wagga Wagga Station and surrounds the road generally features a 21m sealed width, limited line marking, shoulders with parking, and has a posted speed limit of 50km/h.
Railway Street	Two-way, two lane urban locally controlled street that runs east-west from Macleay Street to Lake Albert Road and provides access to the rail line, industrial and residential areas. The Wagga Rail Heritage Museum Rest House is located adjacent to Railway Street. In the vicinity of the Wagga Wagga Station and surrounds the road generally features a 12m sealed width, sealed shoulders with parking, and a posted speed limit of 50km/h.
Station Place	Two-way, two lane urban locally controlled street that runs north-south from Edward Street and provides access to the heritage-listed Wagga Wagga Railway Station, the Multicultural Council of Wagga Wagga, and other private business. In the vicinity of the Wagga Wagga Station and surrounds the road generally features 3.4m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Lake Albert Road	Two-way, four lane urban locally controlled road that runs north-south through eastern Wagga Wagga from Edward Street, intersecting with Railway Street and providing external connection to the suburb of Kooringal. The road generally features 3.3m wide lanes, sealed shoulders with parking and a cycle lane, and has a posted speed limit of 60km/h.
Urana Street	Two-way, two lane urban locally controlled street that provides east-west cross-connectivity through Wagga Wagga south of the rail line running from Pearson Street, crossing Bourke, Mitchelmore, and Macleay Streets and provides access to the Showgrounds, residential areas, and continues on to Kooringal in the east. In the vicinity of the Wagga Wagga Station and surrounds the road generally features an 8.3m sealed width, sealed shoulders with parking, and has a posted speed limit of 50km/h.

Albury to Illabo

Figure 4.39 Key road links and intersections – Wagga Wagga Station and surrounds

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021
Author: WSP
Data Sources: ARTC, NSWSS

Paper: A3
Scale: 1:7,000

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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Albury to Illabo

Figure 4.40 Key road links and intersections – Wagga Wagga Station and surrounds

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021
Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:6,000

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected to support the construction or operational movements related to the proposal for the Wagga Wagga Station and surrounds are shown below in Table 4.40.

Table 4.40 Wagga Wagga Station and surrounds observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Edward Street (Sturt Highway) [1]	2021	12,151	8%
Docker Street/Bourke Street [1]	2021	8,957	2%
Fox Street [2]	2021	332	3%
Mitchelmore Street [1]	2021	8,044	1%
Edmondson Street [1]	2021	10,448	2%
Norman Street [3]	2021	332	3%
Coleman Street [1]	2021	3,318	3%
Cassidy Parade [4]	2021	664	3%
Erin Street [5]	2021	476	2%
Macleay Street [6]	2020	3,230	9%
Railway Street [7]	2020	3,230	9%
Station Place [8]	2021	472	3%
Lake Albert Road [9]	2020	14,477	5%
Urana Street [1]	2021	4,758	1%
Brookong Avenue [10]	2021	1,215	8%

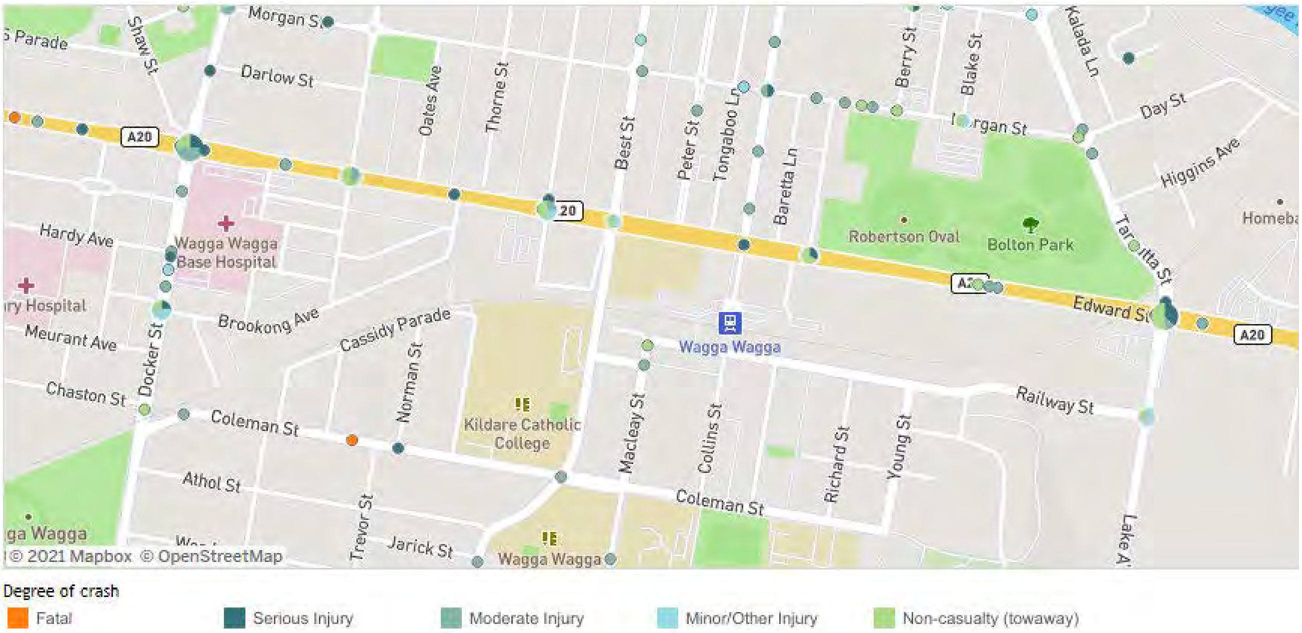
(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) No data available, volumes estimated as Norman Street 10-hour with equivalent HV proportion
(3) No data available, volumes estimated as 50% of Cassidy Street 10-hour with equivalent HV proportion
(4) No data available, volumes estimated as 20% of Coleman Street 10-hour with equivalent HV proportion
(5) No data available, volumes estimated as 10% of Urana Street 10-hour with equivalent HV proportion
(6) No data available, volumes estimated as Railway Street with equivalent HV proportion
(7) Railway Street between Lake Albert Road and Beauty Point Road
(8) No data available, volumes estimated as Smollett Street, Albury 10-hour with equivalent HV proportion
(9) Lake Albert Road between Hammond Avenue and Railway Street
(10) No data available, volumes estimated as 10% of Edward Street 10-hour with equivalent HV proportion

ROAD SAFETY

Figure 4.41 shows the crashes that occurred in the data collection period in the vicinity of the Wagga Station and surrounds, with the following observations:

— Sturt Highway/Edward Street (key road link) – a higher concentration than surrounding areas
— Docker Street (key road link) – a higher concentration than surrounding areas
— Sturt Highway/Edward Street/Docker Street intersection (key intersection) – a higher concentration than surrounding areas
— Coleman Street (key road link) – one fatal crash occurring in 2017.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.41 Crash data (2015–2019) Wagga Station and surrounds

PARKING

On-street kerbside parking is generally allowed on the urban road network in the vicinity of the Wagga Wagga Station and surrounds unless signed otherwise. Off street parking is present within commercial, industrial and retail uses within the surrounding area. Engagement with the school has revealed that the limited on-site parking and drop-off facilities combined with restricted adjacent roadside parking results in Railway Street being an important location for the drop off of students who use the Wagga Wagga Station pedestrian bridge and Edmondson Street to access the school. Off street designated parking is present within commercial, industrial and retail areas. Further detail around parking on key links is provided below in Table 4.41.

Table 4.41 Parking provisions – Wagga Station and surrounds

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Edward Street (Sturt Highway)	Kerbside parking west of Edmondson Street	No restrictions
Docker Street/Bourke Street	Kerbside parking	2P adjacent Wagga Wagga Base Hospital 8:30am – 6pm Monday – Friday; 8:30am – 12:30pm
Brookong Avenue	Kerbside parking	No restrictions
Fox Street	Kerbside parking	No restrictions
Little Best Street	Kerbside parking and informal verge parking	No restrictions
Edmondson Street/ Mitchelmore Street	Kerbside parking south of Erin Street	School bus zones 8am – 9:30am; 3pm – 4pm
Norman Street	Kerbside parking	No restrictions
Coleman Street	Kerbside parking	No parking adjacent Kildare Catholic College 8:00am – 9:30pm, 3:00pm – 4:00pm school days 2P Monday – Friday between Invenary and Kildare Street
Cassidy Parade	Kerbside parking	No restrictions
Erin Street	Kerbside parking	No restrictions
Macleay Street	Kerbside parking	No restrictions
Railway Street	Kerbside parking	Areas of restricted parking 8:00am – 9:30pm, 2:30pm – 4:00pm school days
Station Place (Wagga Wagga Railway Station)	Short-term kerbside parking: 10 spaces Public station off-street carpark: 47 spaces (including two disabled spaces) Access to private off-street local business parking: Quantity unknown Long-distance coach parking: three bays Taxi zone: One bay	Short-term kerbside parking: 1P on Station Place Public station off-street carpark: Unsigned Off-street local business parking: Unknown Long-distance coach parking: Unsigned Taxi zone: Unsigned
Lake Albert Road	No Parking	N/A
Urana Street	Kerbside parking east of Peacock Drive	No restrictions
Mt Erin Heritage Centre	Private off-street parking (no formal road markings)	Restricted to customers of the Mt Erin Heritage Centre

4.5.1.4 BOMEN YARD CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Bomen Yard clearances enhancement site are depicted below in Figure 4.42. Key road characteristics are described in Table 4.42 and key intersection configurations are shown in Appendix C.

Table 4.42 Key road links – Bomen Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway	Two-way, two-lane state-controlled highway that runs from the Hume Highway 18km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. In the vicinity of the Bomen Yard clearances enhancement site the highway is generally rural and features 3.4m wide lanes, areas of sealed and unsealed shoulders and a posted speed limit of 100km/h.
Byrnes Road	Two-way, two lane rural locally controlled road running generally north-south between Oura Road and the Olympic Highway at Junee, connecting Bomen, Junee, and Harefield and providing access to the Harefield Intermodal Terminal. In the vicinity of the Bomen Yard clearances enhancement site the road generally features 3.5m wide lanes, sealed shoulders, and has a posted speed limit of 80km/h.
Merino Street	Two-way, four lane rural locally controlled street that runs north-south through Wagga Wagga from Edward Street, intersecting with Railway street and providing access to the suburb of Kuringal. The road crosses the rail line via a grade-separated rail bridge north of Byrnes Road. In the vicinity of the Bomen Yard clearances enhancement site the road generally features 3.5m wide lanes, sealed shoulders, and has a posted speed limit of 60km/h between Byrnes Road and Dorset Drive, and 80km/h between Dorset Drive and the Olympic Highway.

Albury to Illabo

Figure 4.42 Key road links and intersections – Bomen Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021
Paper: A3
Author: WSP
Scale: 1:7,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Key intersection
Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Bomen Yard clearances enhancement site are shown below in Table 4.43. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.43 Bomen Yard clearances enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Olympic Highway [1]	2010	3,646	17%
Byrnes Road	2021	2,503	31%
Merino Drive – between Olympic and Dorsett	2019	926	33%
Merino Drive – between Byrnes and Dorsett	2019	2,115	37%
East Bomen Road [2]	2019	529	Not Available

(1) No data available, volumes estimated as average of Olympic Highway – Ashmont, 95065 and Olympic Highway – The Rock, 9551 with equivalent HV proportion

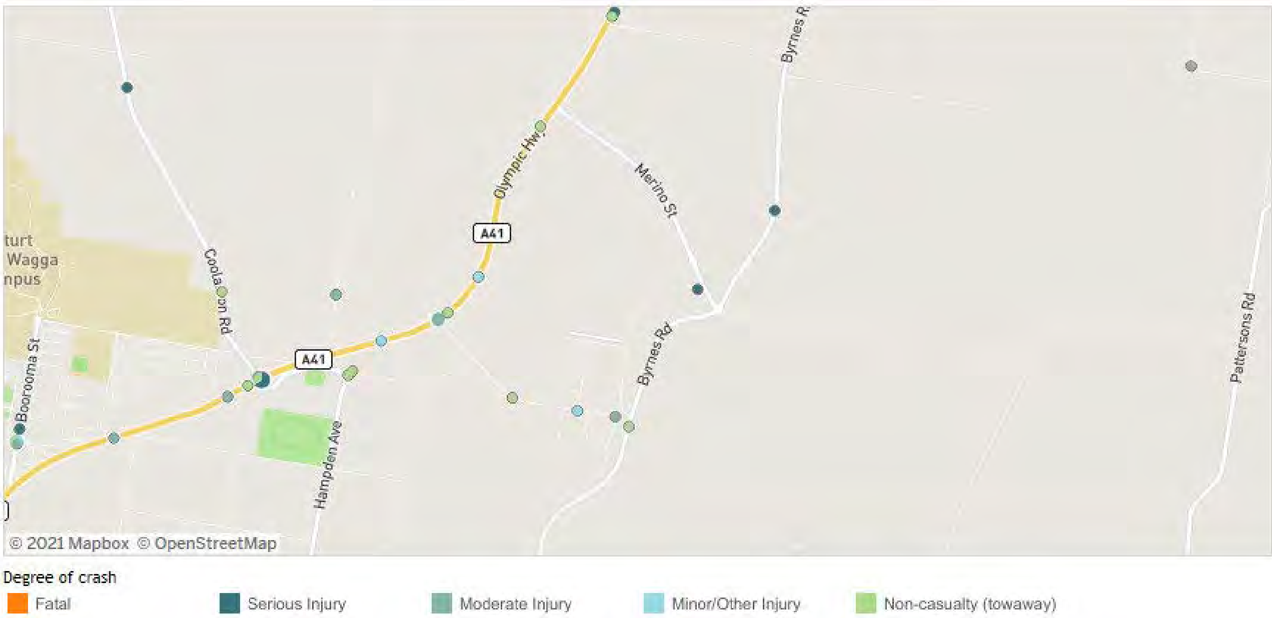
(2) No data available, volumes estimated as 25% of Merino Street - Between Byrnes Road and Dorset Drive with equivalent HV proportion

ROAD SAFETY

Figure 4.43 shows the crashes that occurred in the data collection period in the vicinity of the Bomen Yard clearances enhancement site, with the following observations noted:

— Olympic Highway (key road link) – 13 crashes in the vicinity of this enhancement site
— no fatal crashes are noted in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.43 Crash data (2015–2019) Bomen Yard clearances enhancement site

PARKING

Within the rural areas in the vicinity of the Bomen Yard clearances enhancement site there is limited provision of on street parking and demand for this parking would be low due to provision of off-street parking within commercial and industrial uses in the surrounding area. There is no designated parking within the enhancement site.

4.5.2 RAIL NETWORK

The Main South Line runs through the Wagga Wagga Work precinct from Uranquinty to Bomen and features eight road crossings (four grade-separated crossings, three active level crossings, and one closed level crossing) in the vicinity of the enhancement sites.

The heritage-listed Wagga Wagga Railway Station located on Station Place is the one operating Railway Station in the Wagga Wagga precinct and is adjacent to the South Wagga Wagga Public School. The station features commuter parking, a regional coach stop, passenger drop-off and taxi staging areas. The station also houses the Wagga Rail Heritage Museum and the Multicultural Council of Wagga Wagga and ARTC Interstate Network Division – South Corridor office are adjacent to the station.

Pedestrian access to the station from Edward Street is provided via footpaths on Station Place. Footpaths also connect to Wagga Wagga Station pedestrian bridge over the rail line to Railway Street.

Through Albury the Main South Line carries the passenger rail services connecting Melbourne, Sydney, Canberra, and Griffith. Additionally, the rail line is an important freight corridor. Table 4.44 shows the average daily passenger and freight rail services that currently operate through the area.

Table 4.44 Existing passenger services – Wagga Wagga Railway Station

	PASSENGER	FREIGHT	TOTAL
Average daily two-way services	4	12	16

Source: *https://transportnsw.info/trip#/departures?depart=26501&type=platform&accessible=false*

The rail line, station, and road/rail interfaces are illustrated in Figure 4.44 below.

The existing road/rail interfaces in the Wagga Wagga work precinct including rail level crossings, road bridges and underpasses are described below in Table 4.45.

Table 4.45 Existing rail crossings – Wagga Wagga work precinct

WORK SITE	ROAD NAME	ROAD TYPE	CROSSING TYPE
Uranquinty Yard clearances	Yarragundry Street	Two-way, two lanes	Level Crossing – Active
Pearson Street bridge	Fernleigh Road	Two-way, two lanes	Level Crossing – Active
	Pearson Street	Two-way, two lanes	Grade-separated – road over rail
Wagga Station and surrounds	Bourke Street	Two-way, four lanes	Level Crossing – Active
	Edmondson Street	Two-way, four lanes	Grade-separated – road over rail
	Edward Street	Two-way, four lanes	Grade-separated – rail over road
Bomen Yard clearances	Dampier Street	Two lane – two way	Closed Level Crossing
	Merino Street	Two lane – two way	Grade-separated – rail over road

Albury to Illabo Figure 4.44 Existing rail crossings - Wagga Wagga Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:70,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Railway stations

Existing rail crossings

Level crossing
Bridge

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4.5.3 HEAVY VEHICLES ROUTES

Figure 4.45 shows the heavy vehicle routes that operate through the Wagga Wagga precinct. Heavy vehicle routes are located along the proposed construction access routes for the Uranquinty Yard clearances, Pearson Street bridge, Wagga Wagga Yard clearances and Bomen Yard enhancement sites on the following key road links:

- Olympic Highway
- Pearson Street
- Cheshire Street
- Fernleigh Road
- Edward Street
- Fox Street
- Byrnes Road
- Merino Road.

In addition to these routes, the Regional Freight Transport Plan 2019 (RFTP) by Riverina Eastern Regional Organisation of Councils (REROC) identifies the Olympic Highway from Hume Highway to Illabo as a REROC Strategic Highway and the Federal Department of Infrastructure, Transport, Regional Development and Communications identifies the Sturt Highway as a key national freight route.

Albury to Illabo Figure 4.45 Heavy vehicle routes - Wagga Wagga Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:70,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies
Designated 19m B-double routes (>50 T)
Main road
Local road

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4.5.4 TRAVELLING STOCK RESERVES

Figure 4.46 shows Travelling stock routes within the Wagga Wagga precinct. It is noted that there are livestock highways along the Olympic Highway through Uranquinty, along the Sturt Highway through Wagga Wagga and Bourke Street/ Docker Street through central Wagga Wagga to the intersection of Sturt Highway/Docker Street.

Albury to Illabo Figure 4.46 Travelling Stock Reserves - Wagga Wagga Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 11/11/2021 Paper: A3
Author: WSP Scale: 1:100,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Travelling stock reserves
- Livestock highways

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4.5.5 PUBLIC TRANSPORT NETWORKS

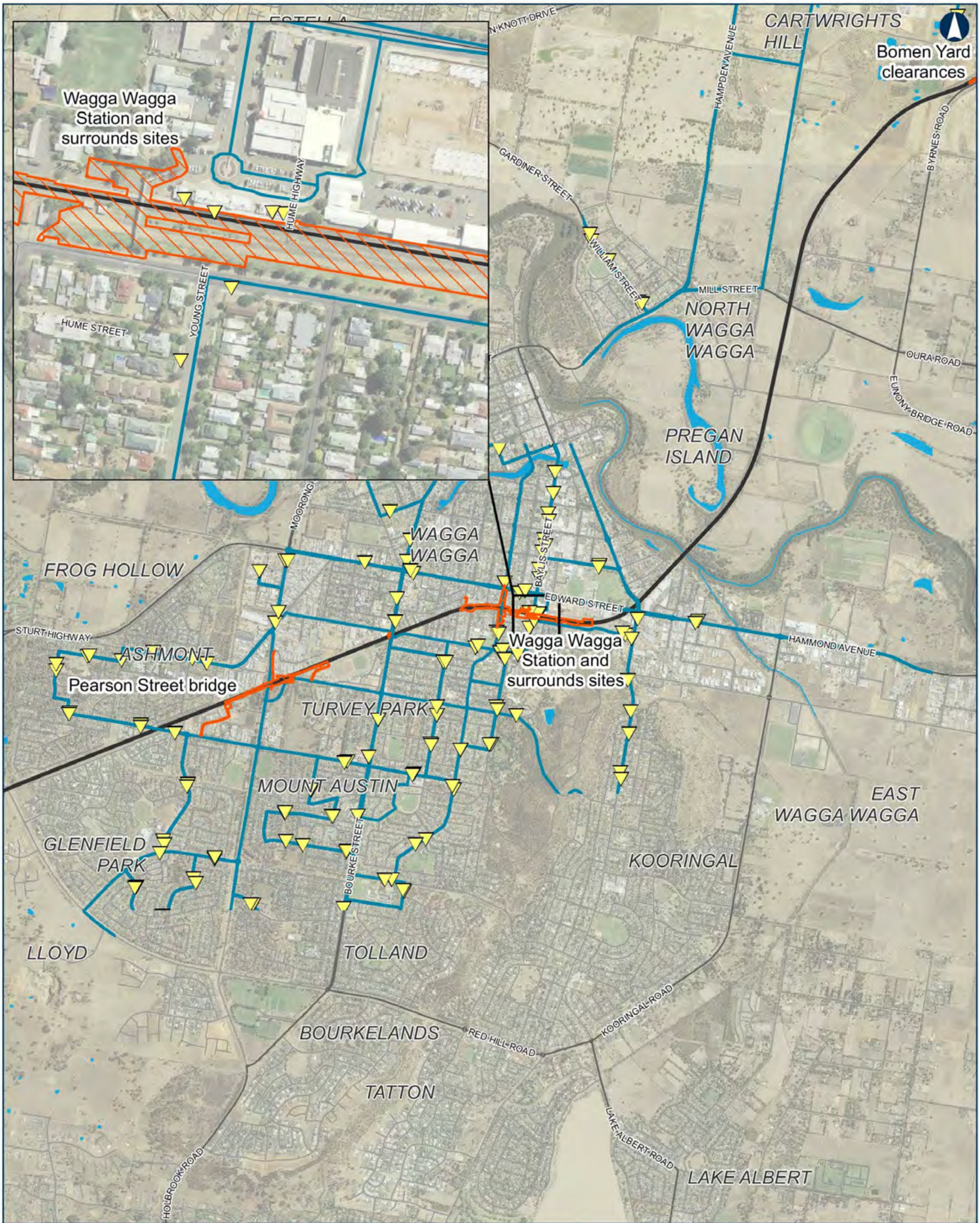
4.5.5.1 PUBLIC BUSES

Figure 4.47 shows the public bus routes that operate within the vicinity of the Wagga Wagga precinct enhancement sites.

Table 4.46 shows all bus services accessible within Wagga Wagga as shown in Figure 4.47.

Table 4.46 Existing public bus services – Wagga Wagga work precinct

SERVICE	DESTINATION	SERVICES PER DAY MON- FRI	SERVICES PER DAY SATURDAY	SERVICES PER DAY SUNDAY AND PUBLIC HOLIDAYS
921	Junee	2	–	–
922	Junee	2	–	–
930	Ganmian	2	–	–
931	Coolamon	2	–	–
960	Lake Albert to Charles Sturt University	17	15	10
961	Bourkelands	16	14	8
962	Glenfield Park	17	13	5
963	Glenfield Park	14	14	5
965	Forest Hill	10	6	4
966	Estella	9	7	5
969	Tatton	15	13	5
702 (TrainLink)	Queanbeyan (Mondays and Fridays only)	1	–	–
704 (TrainLink)	Queanbeyan (Tuesdays and Thursdays only)	1	1	–
727	Tumbarumba (Mondays, Wednesdays, and Fridays only)	1	–	–
731	Griffith	1	–	–
733	Echuca (Mondays, Wednesday, Fridays, and Sundays only)	1	–	1
735	Griffith (Mondays and Saturdays only)	1	1	



Albury to Illabo

Figure 4.47 Public bus routes - Wagga Wagga Precinct

0 0.5 1 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:30,000
Data Sources: ARTC, NSWSS, TfNSW

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Bus stops

INLAND RAIL

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The public buses services operating on roads expected to support proposal construction or operational movements within the Wagga Wagga precinct are described below in Table 4.47.

Table 4.47 Existing public bus routes on key road links– Wagga Wagga

SERVICE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY BUS STOP (NAME / NUMBER)
Route 1W – Coolamon via Downside, Route 931 – Coolamon to Wagga Wagga, Route 930 – Ganmain, 921 – Junee to Wagga Wagga	Edmondson Street bridge Pearson Street bridge Harefield Yard clearances	Uses Edmondson Street, Coleman Street, Edward Street, and has stops on Edmondson Street Uses Harefield Road	Kildare Catholic College / 2650107 and 265098 Pearson Street before Edward Street / 265078
Route 969 – Tatton to Wagga Wagga, 965 – Forest Hill	Edmondson Street bridge	Uses Edmondson Street and has stops on Edmondson Street and Railway Street	Railway Street at Collins Street / 2650305 Kildare Catholic College / 2650107 and 265098
961 – Wagga Wagga – Bourkelands	Edmondson Street bridge	Uses and stops on Docker/ Bourke Street	Docker Street opposite Meurant Ave / 2650250 Henschke Primary School / 2650100
970 – Bomen via Wagga CBD	Pearson Street bridge	Uses Fernleigh Road	No stops on key links
923 – Junee to Wagga Wagga via Junee Station	Bomen	Uses Byrnes Road	No stops on key links
998 – Wagga Wagga Marketplace	Edmondson Street bridge	Uses Station Place	Wagga Wagga Station / 26502

4.5.5.2 SCHOOL BUSES

There are wide variety of school bus routes in Wagga Wagga which service numerous schools within the area and the surrounding region. The majority of the school bus routes use or cross Edward Street as part of their routes, as a number of schools are located near The Wagga Wagga Station and on Edmondson Street and Mitchelmore Street. The school bus routes identified in the area are shown below in Table 4.48.

Table 4.48 Existing school bus routes on key road links – Wagga Wagga

BUS ROUTE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY SCHOOL BUS STOPS (NAME / NUMBER)
S100 – Mount Austin Public School, S120 – Wagga Wagga HS, S122 – Gobbagombalin, S123 – Sturt PS, S150 – The Riverina College, S159 – Ashmont, S171 – South Wagga PS, S179 – South Wagga PS, S199 – North Wagga Wagga, S210 – Marrar, S215 – Lockhart, S216 – Currawarna, S243 – Wagga to Gundagai, S188 – North Wagga PS,	Edmondson Street bridge	Uses and stops on Edmondson Street	— Kildare Catholic College / 2650107 and 265098 — South Wagga Public School / 265052 and 26509

BUS ROUTE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY SCHOOL BUS STOPS (NAME / NUMBER)
S203 – TRAC to Lloyd, S197 – Estella to Wagga Wagga High School, S191 – The Riverina Anglican College to Kooringal via Uranquinty, S185 – South Wagga Wagga Primary to Estella, S173 – North Wagga Wagga Primary to Henschke Primary, S172 – Wagga Wagga Primary to Tarcutta, S167 – Estella to Lake Albert Primary, S162 – Glenfield Park to Kildare, S149 – The Riverina Anglican College to Mangoplah, S144 – Estella to Turvey Park Primary, S134 – North Wagga Wagga to Wagga Wagga Primary, S124 – Wagga Wagga Primary to Ashmont via The Rock			
S103 – South Wagga PS	Edmondson Street bridge	Uses and stops on Edmondson Street and Railway Street	— Kildare Catholic College / 2650107 and 265098 — Railway Street at Collins Street / 2650305 &265073
S109 – Wagga Wagga Primary, S121 – South Wagga Primary, S138 – Forest Hill, S163 – Wagga Wagga Primary, S190 – Uranquinty to Wagga Wagga Primary	Edmondson Street bridge Uranquinty	Uses and stops on Railway Street	— Railway Street at Collins Street / 2650305 &265073
S126 – Lake Albert, S187 – Gumly Gumly, S196 – Ladysmith	Edmondson Street bridge	Uses Erin and Edmondson Street. Stops on Edmondson Street	— Railway Street at Collins Street / 2650305 &265073
S129 – Glenfield Park, S250 – San Isidore, S130 – Mater Dei College, S143 – South Wagga Wagga Primary	Edmondson Street bridge	Uses Erin and Edmondson Street. Stops on Edmondson Street and Railway Street	— Kildare Catholic College / 2650107 and 265098 — Railway Street at Collins Street / 2650305 &265073
S148 – Holy Trinity Primary, S155 – South Wagga Wagga, S151 – Forest Hill, S174 – Forest Hill to Wagga Wagga High	Edmondson Street bridge	Uses Erin, Railway, Coleman, and Edmondson Street. Stops on Edmondson Street	— Kildare Catholic College / 2650107 and 265098 — MacLeay Street at Erin Street / 2650220 and 2650358 — Kildare Catholic College, Coleman Street / 2650340

4.5.6 *ACTIVE TRANSPORT NETWORKS*

4.5.6.1 CYCLING NETWORK

Figure 4.48 shows the designated cycle infrastructure that TfNSW has classified in Wagga Wagga. No dedicated cycle infrastructure is provided in Uranquinty or Bomen. In all areas the existing road lanes or shoulders may be used by cyclists.

Additionally, Wagga Wagga City Council are planning and constructing a 56km network of shared and cycle paths across Wagga Wagga, referred to as the Wagga Wagga Active Travel Plan, which aims to provide active transport alternatives to car travel. One of the links in this plan crosses the rail corridor at the Cassidy Parade pedestrian bridge connecting to Brookong Avenue and Murray Street to the north and Cassidy Parade and Norman Street to the south of the rail corridor (Wagga Wagga City Council, 2021).

4.5.6.2 PEDESTRIAN NETWORK

Footpaths are present on most roads within the urban area of the Wagga Wagga precinct and pedestrian crossings are provided at most signalised intersections, and many unsignalised intersections. Typically, there is not provision of connected pedestrian infrastructure in the vicinity of enhancement sites in rural areas such as in Bomen.

There are also several opportunities to cross the rail line at grade separated and level crossings and pedestrian overpasses as detailed in Table 4.49 and Figure 4.49.

Table 4.49 Pedestrian rail crossing opportunities – Wagga Wagga work precinct

ENHANCEMENT SITE	LOCATION	CROSSING TYPE
Uranquinty Yard clearances	Yarragundry Street	Railway Level Crossing
Pearson Street bridge	Fernleigh Road	Railway Level Crossing
	Pearson Street	Grade-separated – road over rail
Wagga Wagga Station and surrounds	Bourke/Docker Street	Railway Level Crossing
	Cassidy Parade	Pedestrian overpass
	Edmondson Street	Grade-separated – road over rail
	Wagga Wagga Station pedestrian bridge	Pedestrian overpass
	Edward Street	Rail bridge over road/footpath

Engagement with the South Wagga Public School has revealed Wagga Wagga Station pedestrian bridge connecting to Railway Street and Edmondson Street pedestrian path is particularly important to the community as the limited on-site parking and drop-off facilities combined with restricted adjacent roadside parking results in many people using Railway Street to drop off students who subsequently use the Edmondson Street pedestrian path and Wagga Wagga Station pedestrian bridge (250m east of Edmondson Street) to access the school. Figure 4.49 shows existing opportunities to cross the rail line in the Wagga Wagga precinct.

Albury to Illabo Figure 4.48 Cycling infrastructure - Wagga Wagga Precinct

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:15,000
Data Sources: ARTC, NSWSS, TfNSW

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies

Cycle path type
- Bicycle Lane
- Bicycle Only
- High-speed Shoulder
- Mixed Traffic
- Parking Lane
- Shared Use

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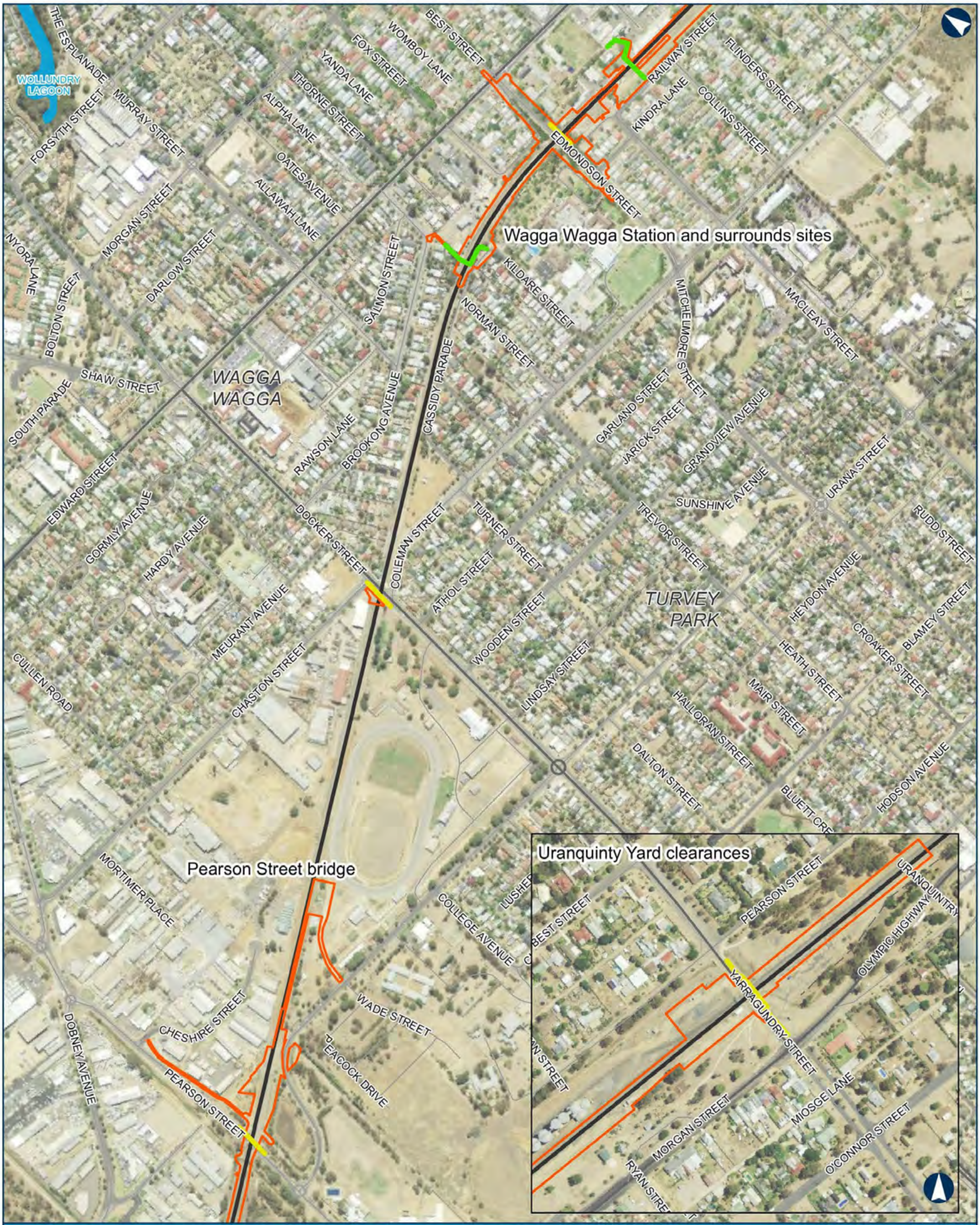

Albury to Illabo

Figure 4.49 Existing pedestrian rail crossings- Wagga Wagga Precinct

0 100 200 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 4/11/2021 Paper: A3
Author: WSP Scale: 1:7,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterbodies

Pedestrian rail crossing

- Pedestrian overpass
- Road with footpath

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4.6 JUNEE PRECINCT

Junee precinct includes the following enhancement sites:

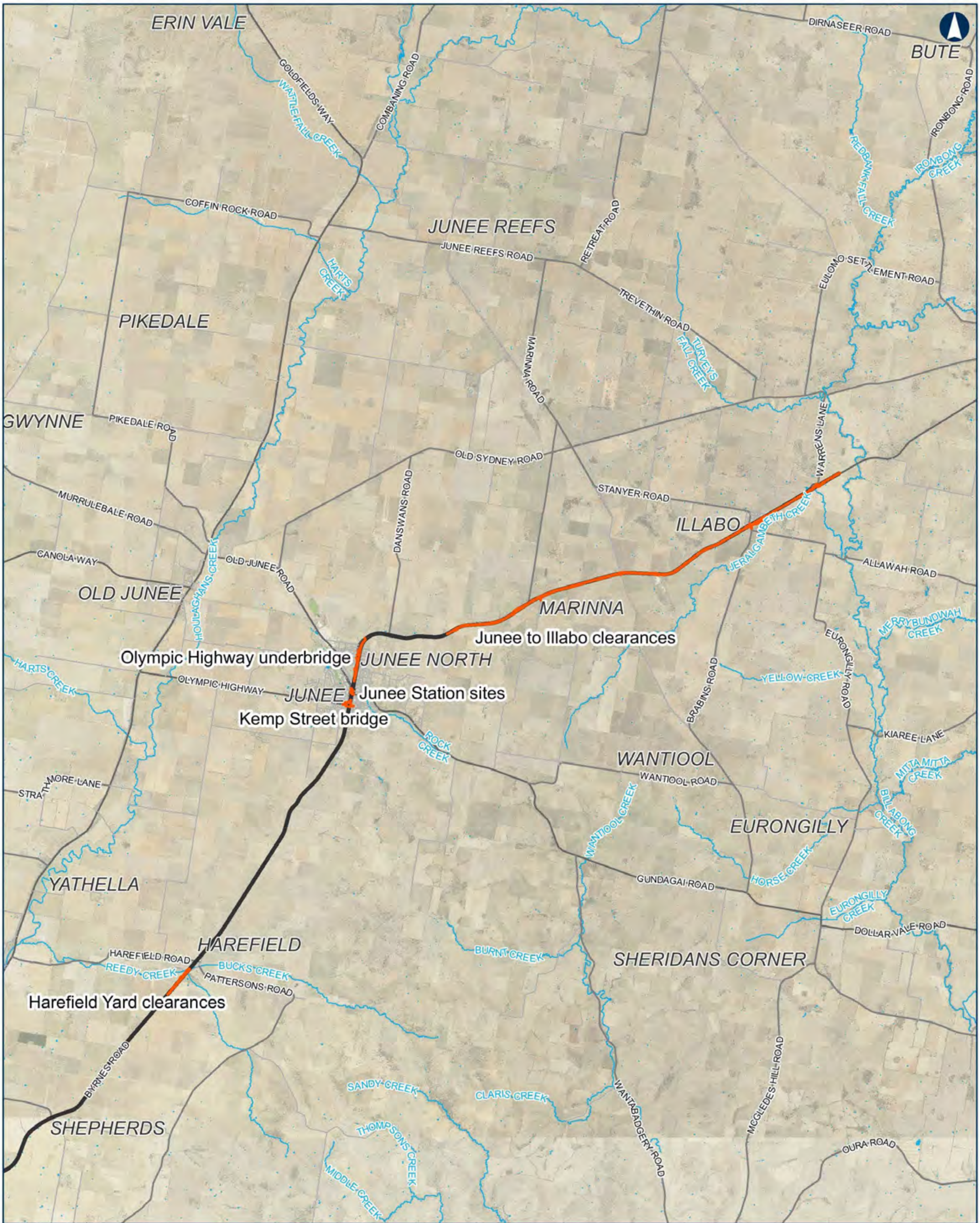
- Harefield Yard clearances
- Kemp Street bridge
- Junee Station pedestrian bridge
- Junee Yard clearances
- Olympic Highway underbridge
- Junee to Illabo clearances.

Due to their proximity Kemp Street bridge, Junee Station pedestrian bridge and Junee Yard clearances were considered collectively (referred to as Junee Station and surrounds).

The existing traffic and transport network relevant to the Junee precinct is discussed in the following sections.

4.6.1 ROAD NETWORK

The Harefield and Junee sites are connected by Byrnes Road running north-south between them and adjacent to the railway line. The sites from Junee to Illabo are connected by the Olympic Highway running north-south between them. The precinct includes a number of key railway crossings. The enhancement sites and main road links within the precinct are shown below in Figure 4.50.



Albury to Illabo Figure 4.50 Road network - Junee Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:125,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies

Road type
Arterial road
Sub-arterial road
Local road

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4.6.1.1 HAREFIELD YARD CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Harefield Yard clearances enhancement site are depicted below in Figure 4.51. Key road characteristics are described in Table 4.50 and key intersection configurations are shown in Appendix C.

Table 4.50 Key road links – Harefield Yard clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Harefield Road	Two-way, one lane rural locally controlled arterial that runs from the Olympic Highway to Byrnes Road at Harefield and provides access to surrounding rural properties and the Harefield Railway Station. In the vicinity of the Harefield Yard clearances enhancement site the highway generally features a 6.2m sealed width, unsealed shoulders, and has a posted speed limit of 100km/h.
Byrnes Road	Two-way, two lane rural locally controlled road running generally north-south between Oura Road and the Olympic Highway at Junee, connecting Bomen, Junee, and Harefield and providing access to the Harefield Intermodal Terminal. In the vicinity of the Harefield Yard clearances enhancement site the main north-south movement has been rerouted to separate Pattersons Road from the Harefield Road/Byrnes Road intersection, with the original road alignment also retained to provide access to the Rural Fire Service. On the main alignment the road generally features 3.5m wide lanes, sealed shoulders, and has a posted speed limit of 100km/h. The access road features a 4.4m sealed width (approx.) and unsealed shoulders. No speed limit signs were noted.
Harefield Railway Access Road	Two-way, one lane rural locally controlled road that generally runs southwest from Harefield Road and provides access to the Harefield railway yard. In the vicinity of the Harefield Yard clearances enhancement site the road generally features a 4.4m sealed width (approx.) and unsealed shoulders. No speed limit signs were noted.

Albury to Illabo

Figure 4.51 Key road links and intersections – Harefield Yard clearances enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 11/11/2021 Paper: A3
Author: WSP Scale: 1:6,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Key intersection
Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Harefield Yard clearances enhancement site are shown in Table 4.51. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.51 Harefield Yard clearances enhancement sites observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Harefield Road	2016	173	38%
Byrnes Road [1]	2018	2,590	33%
Harefield Railway Access Road [2]	N/A	50–100	Not available

(1) Byrnes Road, north of Harefield Road
(2) No data available, traffic volume estimated based on road type and surrounding land uses

ROAD SAFETY

Figure 4.52 shows that an insufficient number of crashes were recorded for any significant observations in in the vicinity of the Harefield Yard clearances enhancement site.

Source: *https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats*

Figure 4.52 Crash data (2015–2019) Harefield Yard clearances enhancement site

PARKING

Within the rural areas in the vicinity of the Harefield Yard clearances enhancement site there is limited provision of on street parking and demand for this parking would be low due to provision of off-street parking within industrial land uses in the surrounding area. There is no designated parking within the enhancement site.

4.6.1.2 JUNEE STATION AND SURROUNDS

The Junee Station and surrounds share the same road network and have been combined in the following section, consisting of:

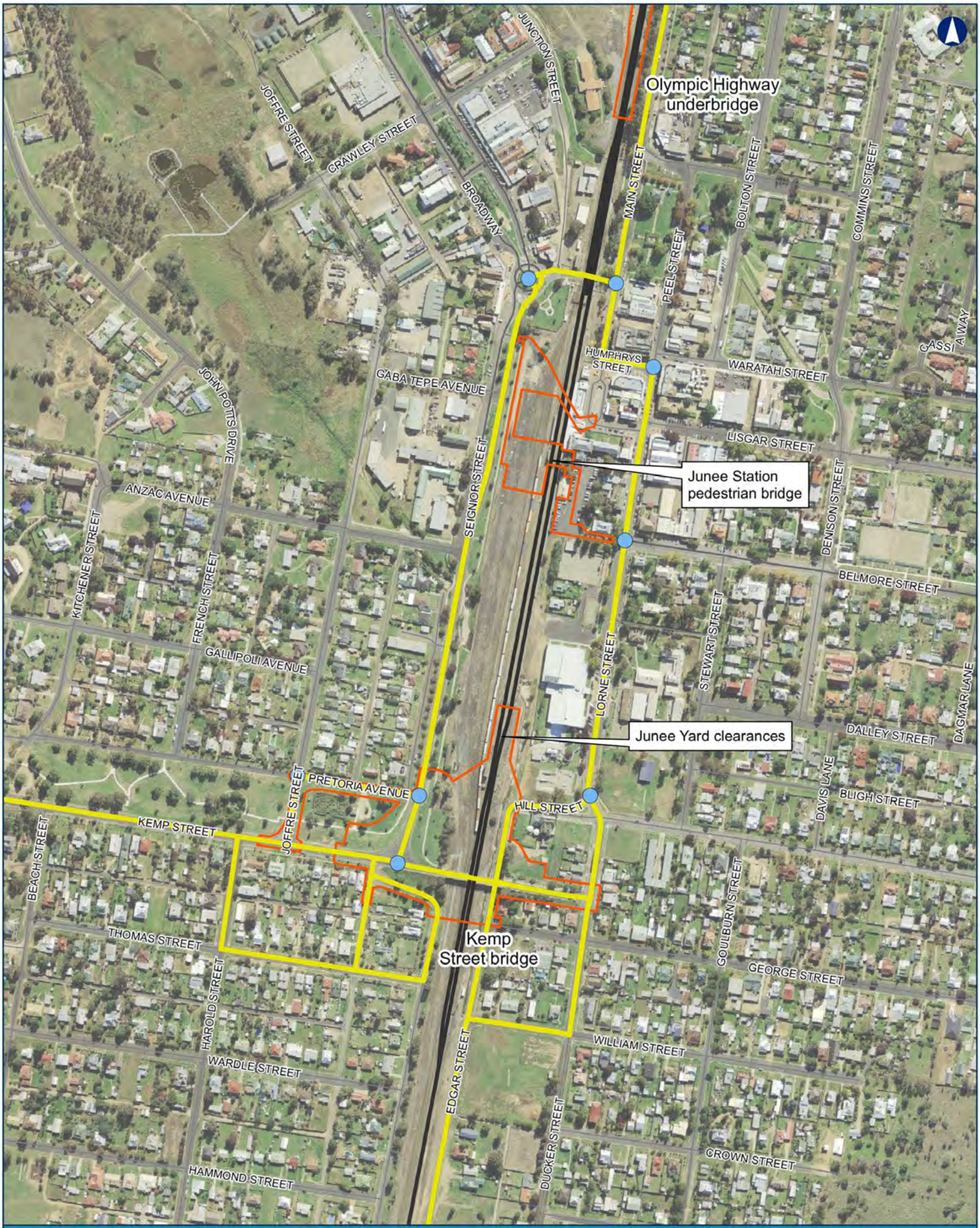
- Kemp Street bridge enhancement site
- Junee Station pedestrian bridge enhancement site
- Junee Yard clearances enhancement site.

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Junee Station and surrounds are depicted below in Figure 4.53. Key road characteristics are described in Table 4.52 and key intersection configurations are shown in Appendix C.

Table 4.52 Key road links – Junee Station and surrounds

ROAD NAME	ROAD DESCRIPTION
Kemp Street/ Olympic Highway	Two-way, two lane state-controlled highway that generally runs east-west and connects the Northern Expressway in South Australia and the Hume Highway in NSW. Kemp Street runs east-west and serves as a key cross-rail connectivity corridor via a rail overpass from Ducker Street and connects to the Olympic Highway at the Seignior Street intersection. In the vicinity of the Junee Station and surrounds the highway is generally urban and features 3.3m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Seignior Street	Two-way, two lane urban state-controlled road running generally north-south between the Olympic Highway/Kemp Street intersection and Broadway Street, forming part of the Olympic Highway and providing access through central Junee west of the rail line. In the vicinity of the Junee Station and surrounds the road generally features 3.5m wide lanes, sealed shoulders with areas of angle parking, and has a posted speed limit of 50km/h.
Humphreys Street	Two-way, two lane urban locally controlled street running east-west between Peel Street and Main Street and providing access to Junee Railway Station and central Junee east of the rail line. In the vicinity of the Junee Station and surrounds the road generally features 5.5m wide lanes, sealed shoulders with angle parking, and has a posted speed limit of 50km/h.
Main Street (Olympic Highway)	Two-way, two lane urban street that forms part of the state-controlled highway Olympic highway running generally north-south from Railway Square and providing access to residential areas of Junee and the Junee Memorial Park. The Olympic Highway crosses the rail line via an at-grade rail level crossing between Seignior Street and Main Street and via a rail overpass north of Cedric Street. In the vicinity of the Junee Station and surrounds the road generally features 3.5m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Lorne Street/Peel Street/Ducker Street	Two-way, two lane urban locally controlled road running north-south through Junee from Cox Street and providing access to the Junee Public School, Junee Junction Recreation & Aquatic Centre, Junee Skate Park, and commercial areas in central Junee east of the rail line. In the vicinity of the Junee Station and surrounds the road generally features 3.5m wide lanes, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Hill Street	Two-way, two lane urban locally controlled street that crosses Lorne Street and runs east-west from the railway line and provides access to residential areas in east Junee. In the vicinity of the Junee Station and surrounds the road generally features 6m wide lanes, sealed shoulders, and has a posted speed limit of 50km/h.

ROAD NAME	ROAD DESCRIPTION
Joffre Street	Two-way, two lane urban locally controlled street that runs north-south from the Olympic Highway to Crawley Street and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 7.1m sealed width, unsealed shoulders, and has a posted speed limit of 50km/h.
Harold Street	Two-way, two lane urban locally controlled street that crosses Thomas Street and runs north-south from the Olympic Highway and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 10.2m sealed width, sealed shoulders with parking, and has a posted speed limit of 50km/h.
Thomas Street	Two-way, two lane urban locally controlled street that crosses Railway Lane and runs east-west from the railway line and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 6m sealed width, sealed shoulders, and has a posted speed limit of 50km/h.
Railway Lane	Two-way, two lane urban locally controlled street that crosses Thomas Street and runs north-south from the Olympic Highway and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 3.8m sealed width, unsealed shoulders with parking, and has a posted speed limit of 50km/h.
Railway Parade	Two-way, two lane urban locally controlled street that crosses Thomas Street and runs north-south from the Olympic Highway and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 7.6m sealed width, sealed shoulders with parking, and has a posted speed limit of 50km/h.
William Street	Two-way, two lane urban locally controlled street that crosses Lorne Street and runs east-west from the railway line and provides access to residential areas in east Junee. In the vicinity of the Junee Station and surrounds the road generally features a 12m sealed width, sealed shoulders, and has a posted speed limit of 50km/h.
Edgar Street / Byrnes Road	Two-way, two lane rural locally controlled street running generally north-south between Oura Road and the Olympic Highway at Junee, connecting Bomen, Junee, and Harefield and providing access to the Harefield Intermodal Terminal. In the vicinity of the Junee Station and surrounds the road generally features 3.5m wide lanes, sealed shoulders, and has a posted speed limit of 50km/h.
Pretoria Avenue	Two-way, two lane urban locally controlled street that crosses Joffre Street and runs east-west from the seignior Street and provides access to residential areas in west Junee. In the vicinity of the Junee Station and surrounds the road generally features a 7.2m sealed width, sealed shoulders with parking, and has a posted speed limit of 50km/h.



Albury to Illabo

Figure 4.53 Key road links and intersections – Junee Station and surrounds

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Junee Station and surrounds are shown below in Table 4.53.

Table 4.53 Junee Station and surrounds enhancement sites observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Olympic Highway (west of Seignior Street) [1]	2021	3,271	3%
Kemp Street [1]	2021	2,905	2%
Seignior Street [1]	2021	2,856	4%
Broadway Street [1]	2021	3,363	2%
Olympic Highway Level Crossing [1]	2021	2,292	4%
Humphrys Street [2]	2021	1,146	4%
Main Street (Olympic Highway) [2]	2021	1,146	3%
Lorne Street	2016	2,315	8%
Hill Street [3]	2016	926	8%
Joffre Street [4]	2016[5]	451	8%
Harold Street [6]	2016	1,158	8%
Thomas Street [7]	2016[5]	338	8%
Railway Lane [1]	2021	341	3%
Railway Parade [8]	2021	341	3%
William Street [9]	2016	518	8%
Edgar Street	2018	1,436	8%
Byrnes Road	2014	2,299	8%
Pretoria Avenue [7]	2016[5]	338	8%

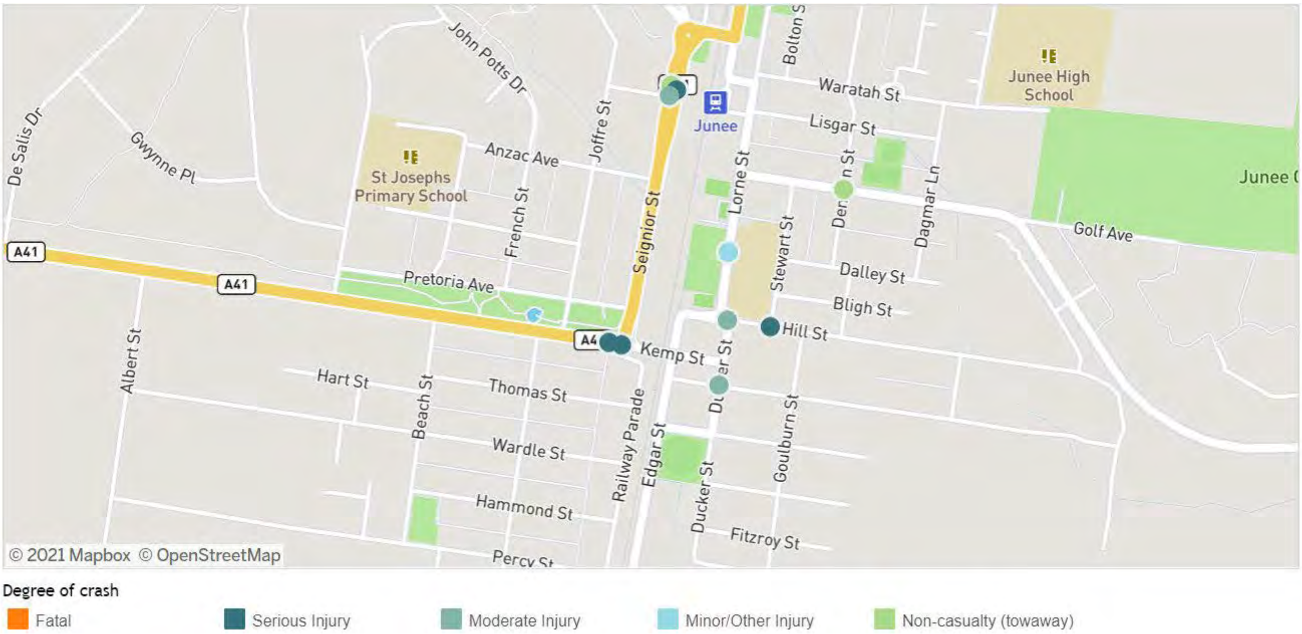
(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) No data available, volumes estimated as 50% of Olympic Highway Level Crossing 10-hour with equivalent HV proportion
(3) No data available, volumes estimated as 40% of Lorne Street with equivalent HV proportion
(4) No data available, volumes estimated as Crawley Street with equivalent HV proportion
(5) No data available, assume count occurred in 2016 with equivalent HV proportion
(6) No data available, volumes estimated as 50% of Lorne Street with equivalent HV proportion
(7) No data available, volumes estimated as 75% of Joffre Street with equivalent HV proportion
(8) No data available, volumes estimated as Railway Lane with equivalent HV proportion
(9) No data available, volumes estimated as 60% of the difference between Byrnes Road and Edgar Street with equivalent HV proportion.

ROAD SAFETY

Figure 4.54 shows the crashes that occurred in the data collection period in the vicinity of the Junee Station and surrounds, with the following observations noted:

- Olympic Highway/Seignior Street/Kemp Street (key road links and intersection) – two crashes
- Seignior Street (key road link) – three crashes
- no fatal crashes are noted in the vicinity of these enhancement sites.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.54 Crash data (2015–2019) Junee Station and surrounds

PARKING

Within the urban areas of Junee, on-street kerbside parking is generally allowed unless signed otherwise and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site. Further detail around parking on key links is provided below in Table 4.54.

Table 4.54 Parking provisions –Junee Station and surrounds

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Kemp Street	Kerbside parking	No restrictions
Seignior Street	Kerbside parking Angle parking north of Anzac Avenue	1P [1] for angle parking in central Junee
Humphreys Street	Kerbside parking	No restrictions
Railway Square (Junee Railway Station)	Junee Station Parking: 13 spaces. One PWD space	No restrictions
Main Street (Olympic Highway)	Kerbside parking	No restrictions

LOCATION	PARKING	TIME OF DAY RESTRICTIONS
Lorne Street/Peel Street/ Ducker Street	Kerbside parking Designated commercial parking behind train station: 60 car spaces (approximately)	No restrictions
Hill Street	Kerbside parking	No restrictions
Thomas Street	Kerbside parking	No restrictions
Railway Lane	Kerbside parking	No restrictions
Railway Parade	Kerbside parking	No restrictions
William Street	Kerbside parking	No restrictions
Edgar Street/Byrnes Road	Kerbside parking permitted where space allows	No restrictions
Joffre Street	Kerbside parking	No restrictions
Pretoria Avenue	Kerbside parking	No restrictions

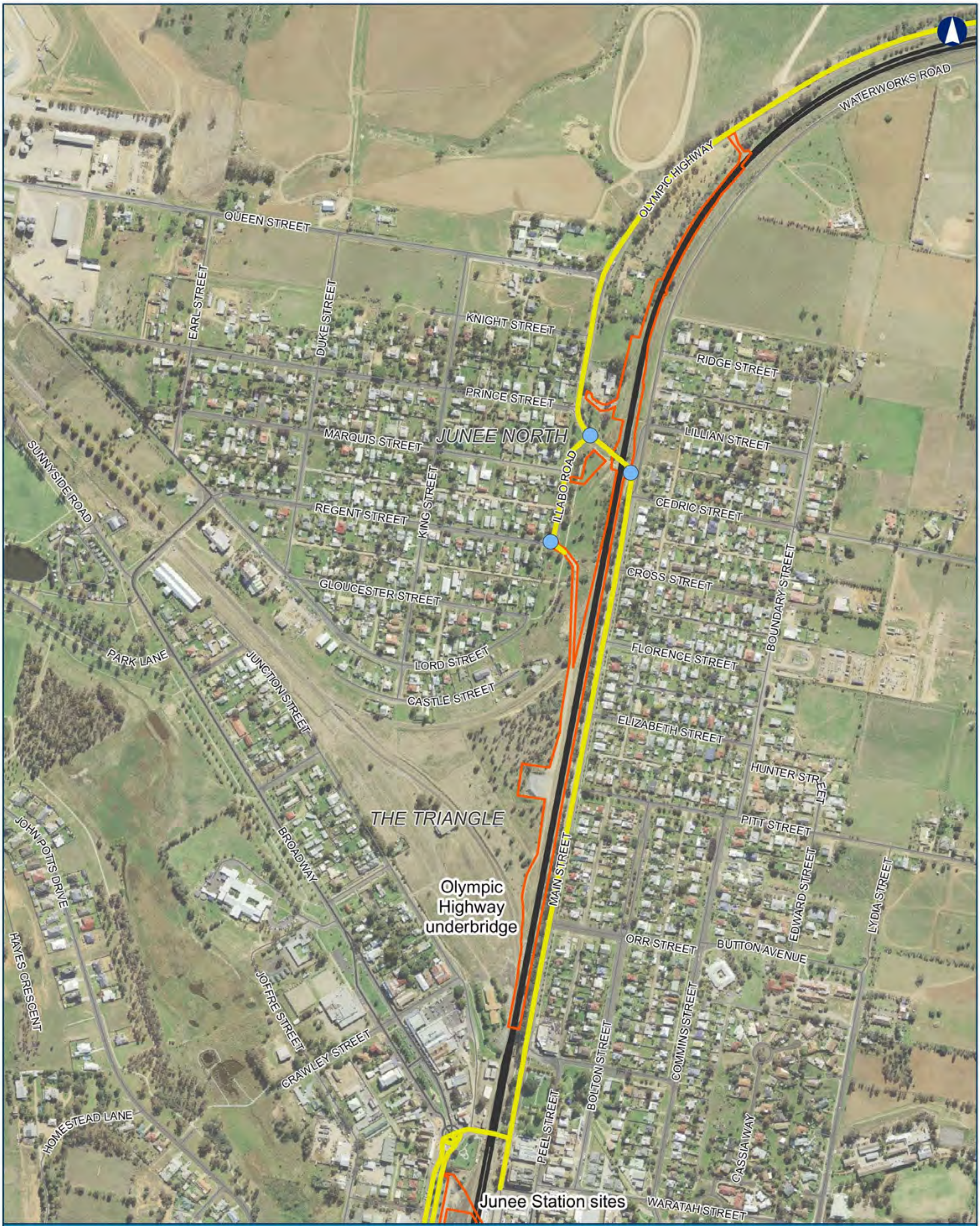
(1) One-hour parking

4.6.1.3 OLYMPIC HIGHWAY UNDERBRIDGE ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Olympic Highway under bridge enhancement site are depicted below in Figure 4.55. Key road characteristics are described in Table 4.55 and key intersection configurations are shown in Appendix C.

Table 4.55 Key road links – Olympic Highway under bridge enhancement site

ROAD NAME	ROAD DESCRIPTION
Main Street (Olympic Highway)	Two-way, two lane state-controlled highway running generally north-south from Railway Square, forming part of the Olympic Highway and providing access to northern residential areas of Junee and the Junee Memorial Park, extending north and connecting to Illabo. The Olympic Highway crosses the rail line via an at-grade rail level crossing between Seignior Street and Main Street and via a rail overpass north of Cedric Street.
Illabo Road (Olympic Highway)	Two-way, two lane local road that runs north-south between Regent Street and Olympic Highway, providing access to residential areas and the Highway. In the vicinity of the enhancement site the road generally features a 13.2m sealed width, minimal road marking, shoulders with parking, and has a posted speed limit of 50km/h.



Albury to Illabo

Figure 4.55 Key road links and intersections – Olympic Highway underbridge enhancement site

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:6,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Olympic Highway under bridge enhancement site are shown below in Table 4.56. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

Table 4.56 Olympic Highway under bridge enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Main Street (Olympic Highway) [1]	2011	1,718	16% [3]
Illabo Road [2]	2015	592	6%

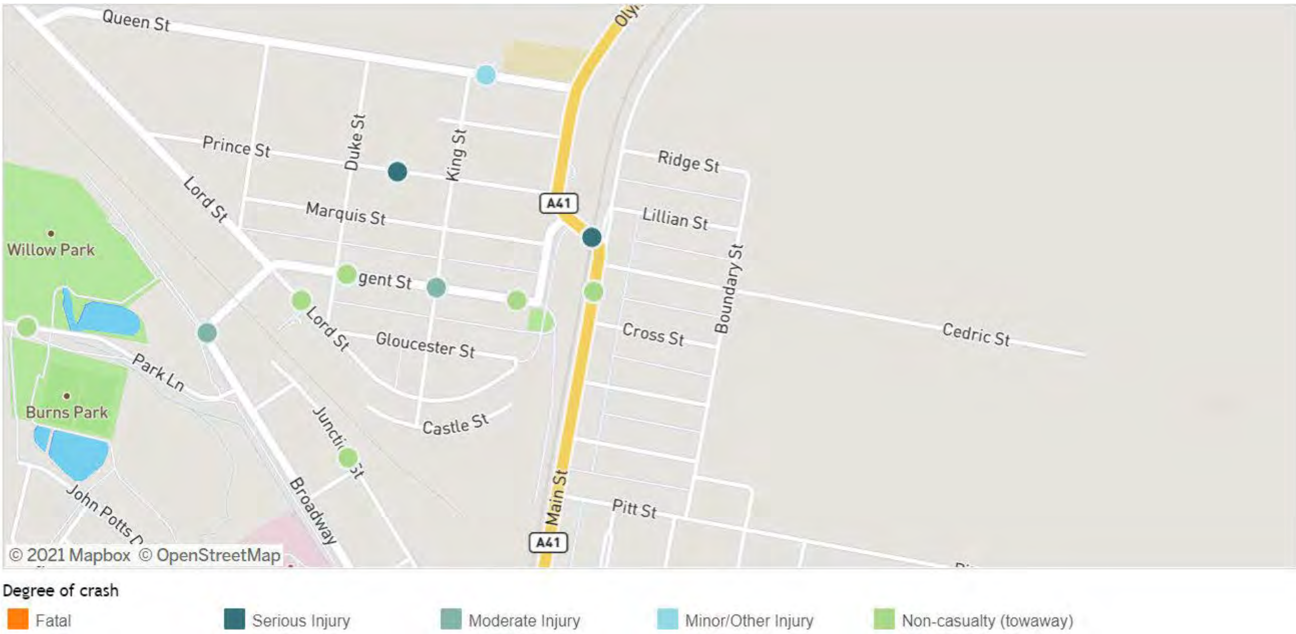
(1) Olympic Highway – 90m North of Illabo Road, Junee
(2) No data available, volumes estimated as John Potts Drive, Junee with equivalent HV proportion
(3) No data available, heavy vehicles estimated as Cox Street, Junee with equivalent HV proportion.

ROAD SAFETY

Figure 4.56 shows the crashes that occurred in the data collection period in the vicinity of the Olympic Highway underbridge enhancement site, with the following observations:

- Main Street (key road link) – two crashes
- Regent Street (key road link) – three crashes
- no fatal crashes are noted in the vicinity of this enhancement site.

It is noted that the areas with a greater occurrence of crashes are also roads carrying a high volume of vehicles (relative to the rest of the network), increasing the overall crash exposure risk.



Source: *https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats*

Figure 4.56 Crash data (2015–2019) Olympic Highway under bridge enhancement site

PARKING

On-street kerbside parking is generally allowed on the urban road network in the vicinity of the Olympic Highway underbridge enhancement site unless signed otherwise and demand for this parking would be low due to provision of off-street parking within commercial, industrial, retail, and residential uses in the surrounding area. There is no designated parking within the enhancement site.

4.6.1.4 JUNEE TO ILLABO CLEARANCES ENHANCEMENT SITE

The key road links and intersections expected to support the construction or operational movements related to the proposal for the Junee to Illabo clearances enhancement site are depicted below in Figure 4.57 and Figure 4.58. Key road characteristics are described in Table 4.57 and key intersection configurations are shown in Appendix C.

Table 4.57 Key road links – Junee to Illabo clearances enhancement site

ROAD NAME	ROAD DESCRIPTION
Olympic Highway	Two-way, two lane state-controlled highway that runs from the Hume Highway l8km north of Albury (23km north of the Murray River) to the Mid-Western Highway at Cowra. In the vicinity of the Junee to Illabo clearances enhancement site the highway generally features 3.5m wide lanes, partially sealed shoulders, and has a posted speed limit of 100km/h.
Brabins Road	Two-way, one lane locally controlled road that generally runs north-south from the Olympic Highway and provides access to surrounding rural properties. The road crosses the rail line via an at-grade rail level crossing. In the vicinity of the Junee to Illabo clearances enhancement site the road generally features a 6.2m sealed width, unsealed shoulders, and a 100km/h speed limit.
Waterworks Road	Two-way, one lane locally controlled road running generally north-south between Ballengorrah Lane and Main Street in Junee, rural properties in Wantiool with the Olympic Highway and Junee. In the vicinity of the Junee to Illabo clearances enhancement site the road is generally unsealed and features unsealed shoulders and a 100km/h speed limit.
Marinna Station Access Road	Two-way, one lane locally controlled road that provides access to Marinna Station and silo. In the vicinity of the Junee to Illabo clearances enhancement site the road is generally unsealed and features unsealed shoulders and a 100km/h speed limit.
Marinna Station Cross Road	Two-way, one lane locally controlled road that connects Waterworks Road and the Olympic Highway. In the vicinity of the Junee to Illabo clearances enhancement site the road is generally unsealed and features unsealed shoulders and a 100km/h speed limit.
Lawford Street/ Junee Street	Two-way, one lane locally controlled road that connects Brabins Road and Morris Street and provides access to the silo on Junee Street. In the vicinity of the Junee to Illabo clearances enhancement site the road is generally unsealed and features unsealed shoulders and a 100km/h speed limit.

Albury to Illabo

Figure 4.57 Key road links and intersections – Junee to Illabo clearances enhancement site (Marinna area)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:11,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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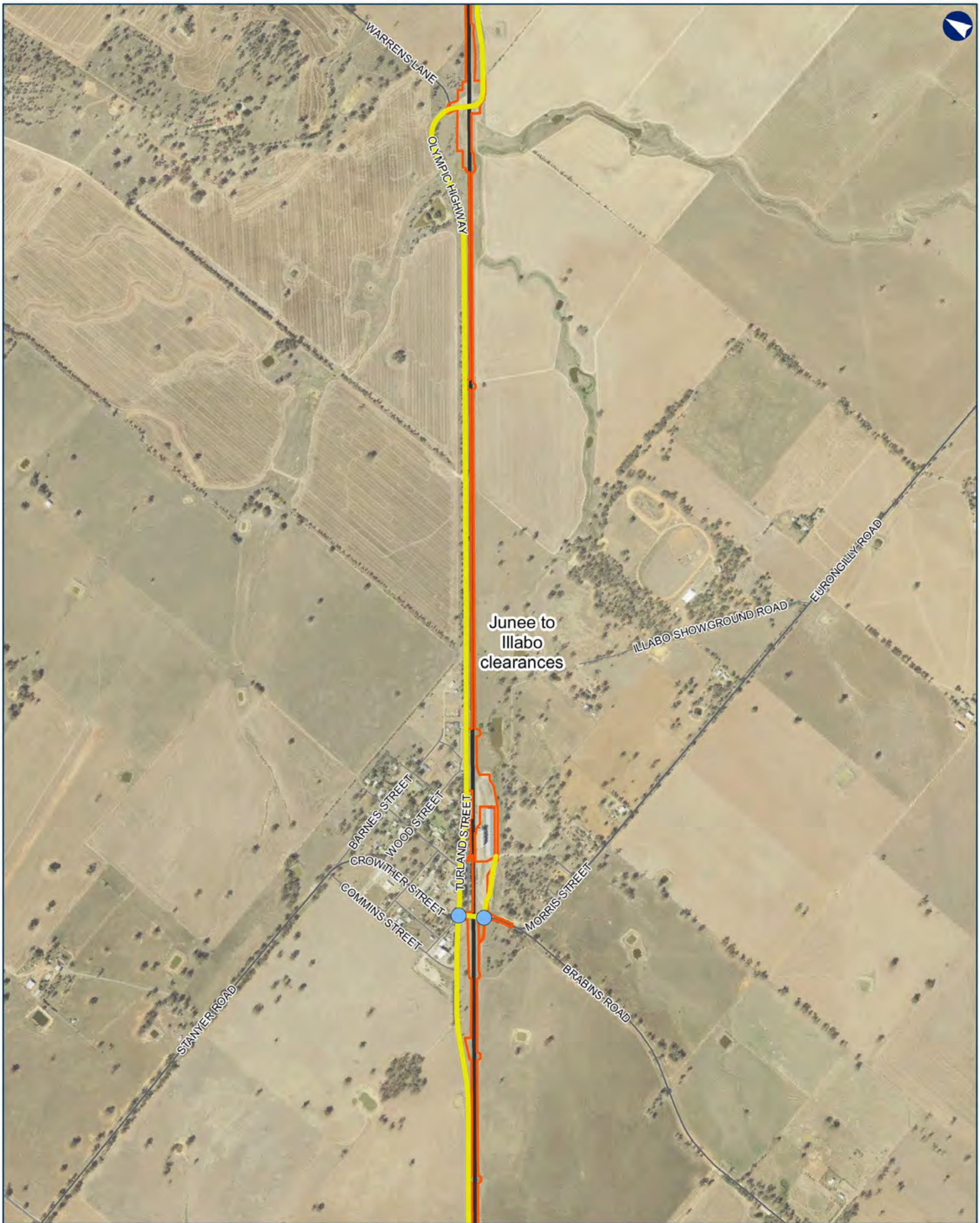

Albury to Illabo

Figure 4.58 Key road links and intersections – Junee to Illabo clearances enhancement site (Illabo area)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021
Paper: A3
Author: WSP
Scale: 1:12,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Key intersection
- Key road links

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TRAFFIC VOLUMES

Observed traffic volumes for the roads expected support the construction or operational movements related to the proposal for the Junee to Illabo Yard clearances enhancement site are shown below in Table 4.58. Where published AADT data was not available or considered inappropriate, estimations based on comparable locations, as detailed in the methodology, are presented.

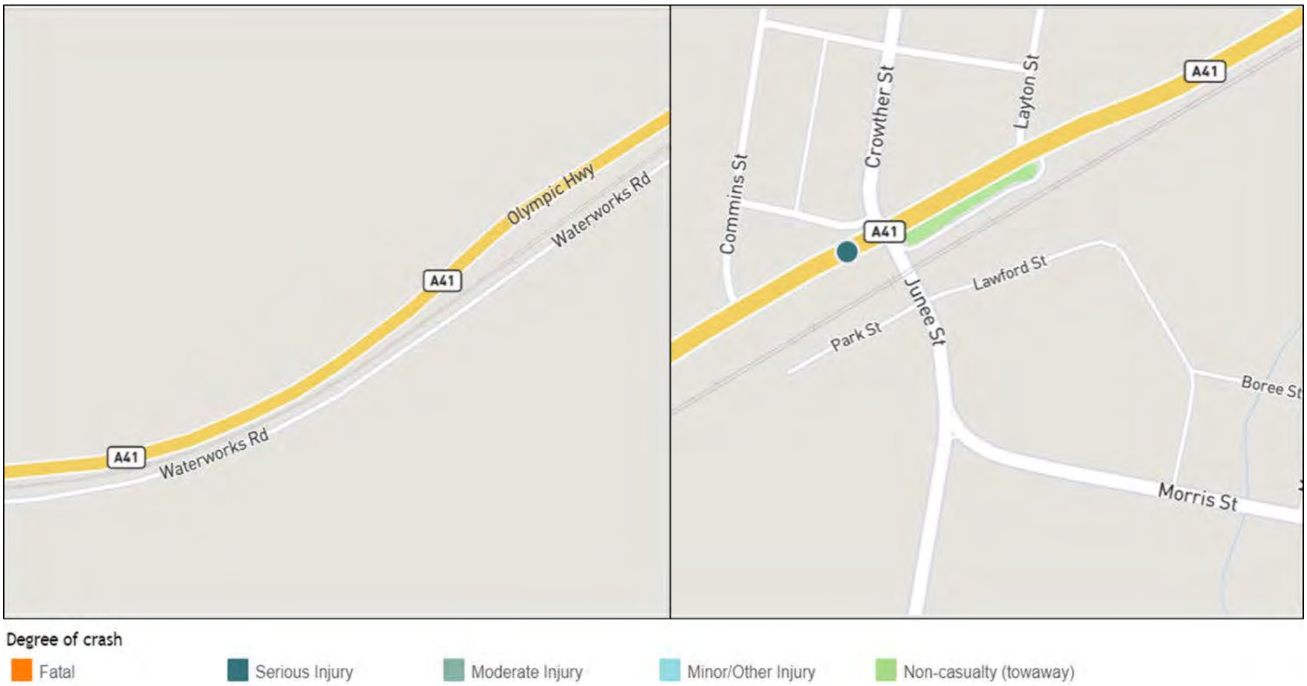
Table 4.58 Junee to Illabo Yard clearances enhancement site observed traffic volumes

ROAD NAME	COUNT YEAR	DAILY (TWO-WAY) VOLUME	HV PROPORTION
Olympic Highway [1]	2011	1,718	16 %
Brabins Road	2014	44	Not available
Waterworks Road	2014	241	Not available
Marinna Station Access Road	N/A	10	Not available
Marinna Station Cross Road [2]	2014	44	Not available
Lawford Street/ Junee Street	N/A	10	Not available

(1) Olympic Highway – 90m North of Illabo Road, Junee
(2) No data available, volumes estimated as Brabins Road, Illabo with equivalent HV proportion
(3) Estimated traffic volume based on road type and surrounding land uses.

ROAD SAFETY

Figure 4.59 shows that an insufficient number of crashes were recorded to identify any significant observations in the vicinity of the Junee to Illabo clearances enhancement site.



Source: https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats

Figure 4.59 Crash data (2015–2019) Junee to Illabo clearances enhancement site

PARKING

Within the rural areas in the vicinity of the Junee to Illabo clearances enhancement site, site there is limited provision or demand of on street parking and demand for this parking would be low due to provision of off-street parking within industrial land uses in the surrounding area. There is no designated parking within the enhancement site. There is no designated parking within the enhancement site.

4.6.2 RAIL NETWORK

The Main South Line runs through the Junee precinct from Harefield to Illabo and features eight road crossings (2 grade-separated, 6 active) in the vicinity of the enhancement sites.

The heritage-listed Junee Railway Station located on Railway Square is the one operating railway station in the Junee precinct and is adjacent to the Junee station enhancement site. The station features commuter parking, passenger drop-off, and public bus stops and services The Main South Line.

Pedestrian access to the station is provided via footpaths on Station Square, Lorne Street, and Main Street. Footpaths also connect to the rail level crossing on the Olympic Highway.

Through Junee the Main South Line carries the passenger rail services connecting Melbourne, Sydney, Canberra, and Griffith. Additionally, the rail line is an important freight corridor. Table 4.59 shows the average daily passenger and freight rail services that currently operate through the area.

Table 4.59 Existing passenger services – Wagga Wagga Railway Station

	PASSENGER	FREIGHT	TOTAL
Average daily two-way services	4	12	16

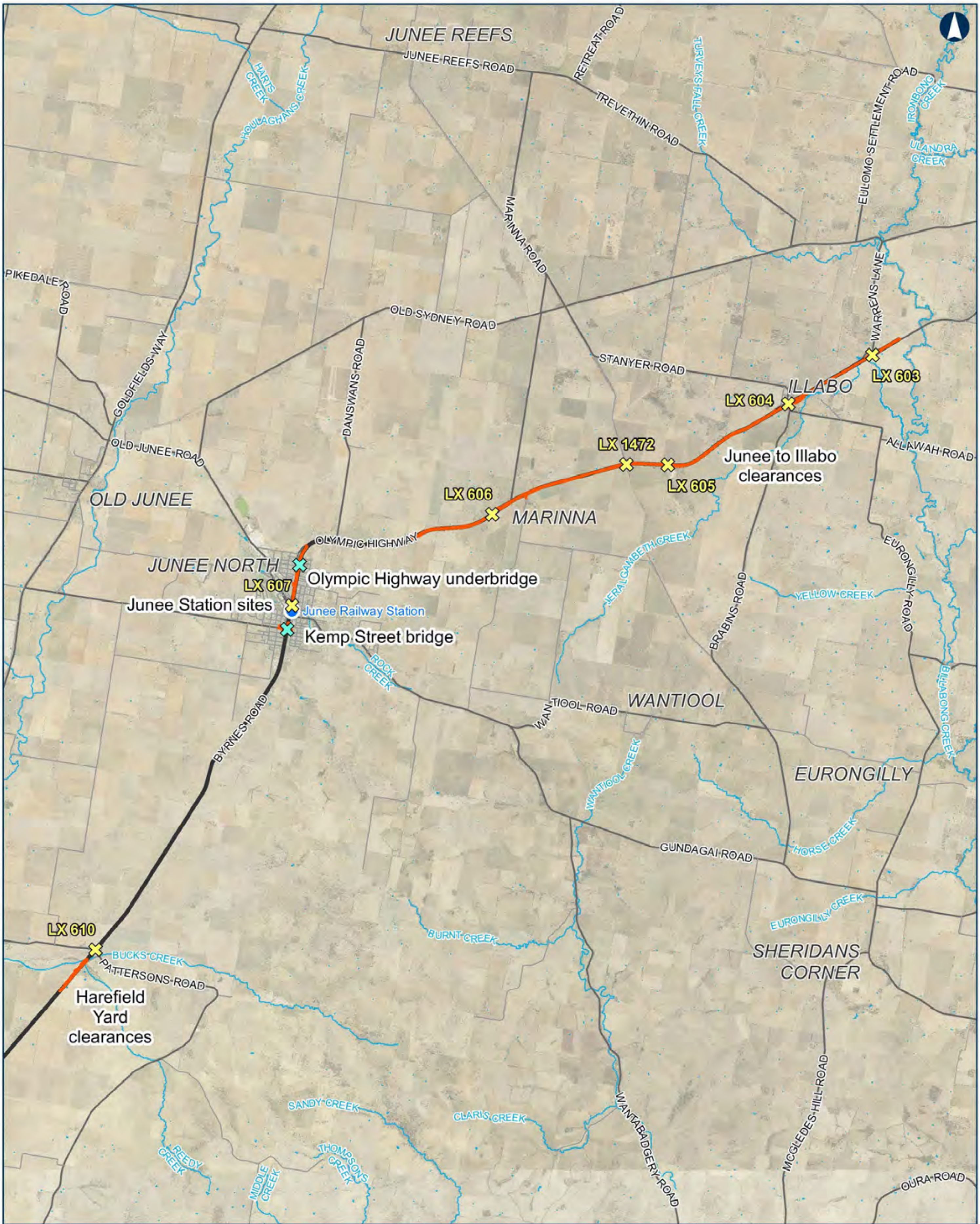
Source: *https://transportnsw.info/trip#/departures?depart=26501&type=platform&accessible=false*

The rail line, station, and road/rail interfaces are illustrated in Figure 4.60 below.

The existing road/rail interfaces in the Junee precinct including rail level crossings, road bridges and underpasses are described below in Table 4.60.

Table 4.60 Existing rail crossings – Junee precinct

ENHANCEMENT SITE	ROAD NAME	ROAD TYPE	CROSSING TYPE
Harefield	Harefield Road	Two-way, two lanes	Level Crossing – Active
Kemp Street bridge and Junee Station	Kemp Street	Two-way, two lanes	Grade-separated – road over rail
	Junee Station pedestrian overpass	Pedestrian bridge	Pedestrian bridge
	Olympic Highway (between Seignior Street and Main Street	Two-way, two lanes	Level Crossing – Active
Olympic Highway underbridge	Main Street	Two-way, two lanes	Grade-separated – rail over road
Illabo	Unnamed Road (near Waterworks Road at Marinna)	Two lane, two way	Level Crossing – Active
	Brabins Road	Two lane, two way	Level Crossing – Active
	Olympic Highway	Two lane, two way	Level Crossing – Active



Albury to Illabo Figure 4.60 Existing rail crossings - Junee Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:100,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Railway stations

Existing rail crossings

Level crossing

Bridge

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4.6.3 HEAVY VEHICLES ROUTES

Figure 4.61 shows the heavy vehicle routes that operate through the Junee precinct. Heavy vehicle routes are located along the proposed haulage routes within the Junee precinct on the following key road links:

- Byrnes Road
- Harefield Road.
- Olympic Highway
- Seignior Street
- Edgar Street
- Harold Street
- Brabins Road.

In addition to these routes The Regional Freight Transport Plan 2019 (RFTP) by Riverina Eastern Regional Organisation of Councils (REROC) identifies the Olympic Highway from Hume Highway to Illabo as a REROC Strategic Highway.

Albury to Illabo Figure 4.61 Heavy vehicle routes - Junee Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:65,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Waterways
Waterbodies
Designated 19m B-double routes (>50 T)
Main road
Local road

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4.6.4 TRAVELLING STOCK RESERVES

Figure 4.62 shows that there are no Livestock Highways in the vicinity of enhancement sites within the Junee precinct. Moving stock on public roads outside of Travelling Stock Reserves is possible with the necessary permits and so stock may at times require limited use of rail crossings within the proposal.

Albury to Illabo Figure 4.62 Travelling Stock Reserves - Junee Precinct

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 11/11/2021 Paper: A3
Author: WSP Scale: 1:125,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Travelling stock reserves
Livestock highways

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4.6.5 PUBLIC TRANSPORT NETWORKS

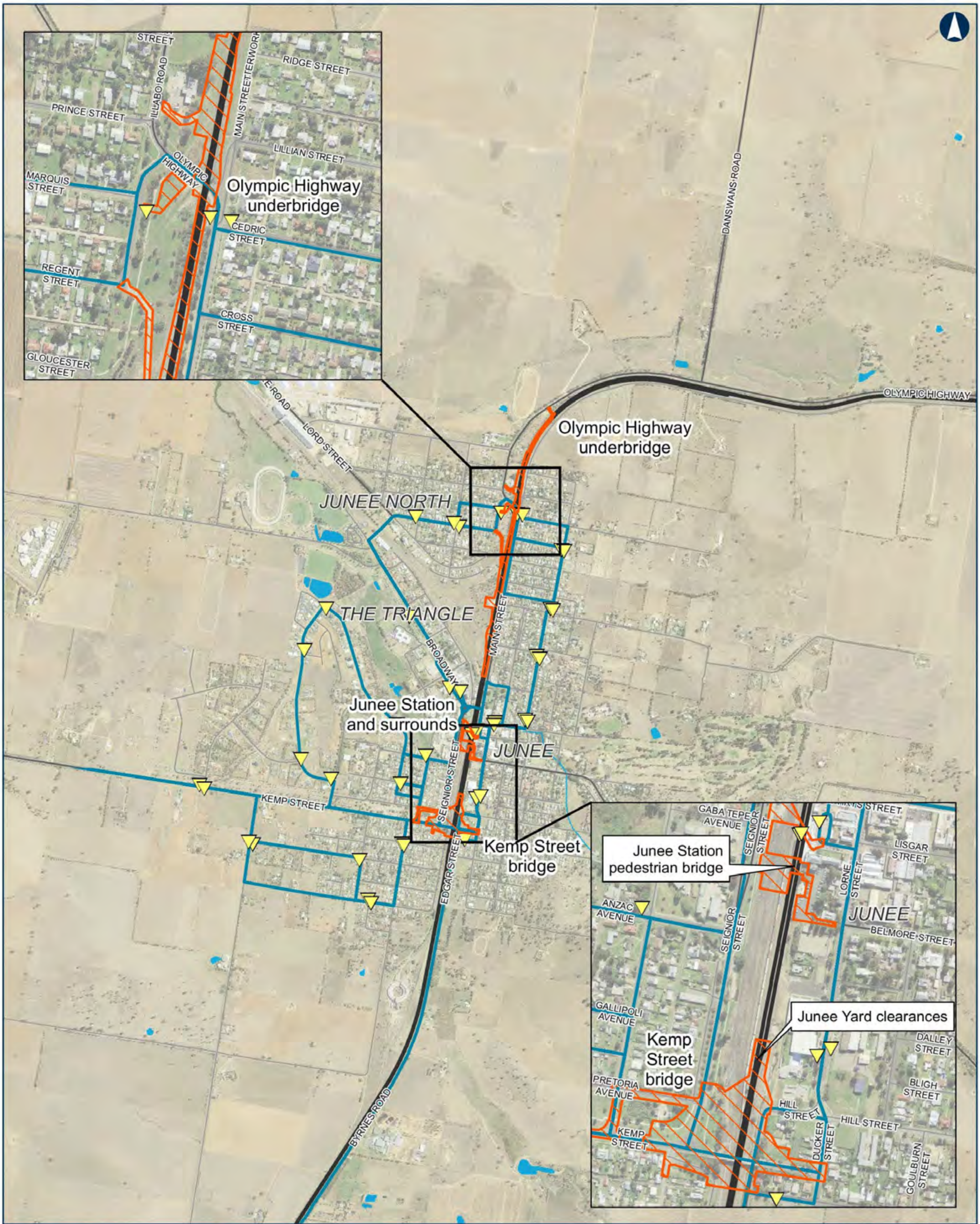
4.6.5.1 PUBLIC BUSES

Figure 4.63 shows the public bus routes that operate within the Junee precinct in the vicinity of the Kemp Street bridge, Junee Station pedestrian bridge, Junee Yard clearances and Olympic Highway underbridge enhancement sites.

Table 4.61 details the public bus routes shown in Figure 4.63.

Table 4.61 Existing public bus services – Junee precinct

SERVICE	DESTINATION	SERVICES PER DAY MON–FRI	SERVICES PER DAY SATURDAY	SERVICES PER DAY SUNDAY AND PUBLIC HOLIDAYS
921	Wagga Wagga	2	–	–
922	Wagga Wagga	2	–	–
923	Wagga Wagga	1	–	–
924	Wagga Wagga	1 (Thursdays only)	–	–
925	Wagga Wagga	1	–	–
704 (TrainLink)	Queanbeyan (Tuesdays and Thursdays only)	1	1	–



Albury to Illabo Figure 4.63 Public bus routes - Junee Precinct

0 0.25 0.5 km

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:20,000
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies
Bus stops

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The public buses services operating on roads expected to support proposal construction or operational within the Junee precinct are detailed in Table 4.62.

Table 4.62 Existing public bus routes on key road links– Junee

SERVICE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY BUS STOPS (NAME / NUMBER)
Wagga, 922 – Junee to Wagga Wagga, 924 – Junee to Wagga Wagga via Jail Break Inn, Wallacetown and Brucedale Dr	— Junee Station and surrounds — Olympic Highway underbridge	— Uses and stops on Kemp Street, Seignior Street, Harold Street, and Lorne Street	— Kemp Street after Joffre Street / 2663127 — Junee Public School / 266315 — Junee Station / 26632 — Harold Street after Thomas Street / 26631 — Lorne Street opposite Belmore Street / 266340 — Illabo Road opposite Marquis Street / 266341
921 – Junee to Wagga via Harefield	— Junee Station and surrounds — Olympic Highway underbridge — Harefield Yard clearances	— Uses Kemp Street — Uses and stops on Lorne Street — Harefield Road	— Junee Public School, Lorne Street / 266315 — George Street before Edgar Street / 266339 — Lorne Street opposite Belmore Street / 266340 — Illabo Road opposite Marquis Street / 266341 — Harefield Rd at Byrnes Rd / 2650504
923 – Junee to Wagga Wagga via Junee Station	— Junee Station and surrounds	— Uses Hill Street and Kemp Street	— Junee Public School, Lorne Street / 266315 — Lorne Street opposite Belmore Street / 266340
925 – Junee to Wagga Wagga	— Junee Station and surrounds	— Uses and stops on Lorne Street	— Junee Public School, Lorne Street / 266315

4.6.5.2 SCHOOL BUSES

The school bus routes identified in the Junee precinct are shown below in Table 4.63.

Table 4.63 Existing school bus services on key road links – Junee

SERVICE	ENHANCEMENT SITES	KEY ROAD LINKS	KEY STOPS (NAME / NUMBER)
S221 – Junee Schools	Junee Station and surrounds	Uses Olympic Highway and Kemp Street and stops on Olympic Highway	Kemp Street after Joffre Street / 2663127
S226 – Junee Reef to Junee Schools via Marinna Road	Junee Station and surrounds Olympic Highway underbridge	Uses Olympic Highway , Main Street, Regent Street, Broadway Street, Kemp Street, Lorne Street, and Peel Street. Stops on Lorne Street and Peel Street.	Lorne Street opposite Belmore Street / 266340
S242 – Illabo to Cootamundra Schools via Eurongilly and Bethungra	Junee to Illabo Yard clearances	Uses Olympic Highway and Brabins Road. Stops on Olympic Highway.	No stops on key links

4.6.6 ACTIVE TRANSPORT NETWORKS

4.6.6.1 CYCLING NETWORK

Figure 4.64 shows the designated cycle infrastructure that TfNSW has classified in Junee. No cycle infrastructure is provided in the Illabo or Harefield work sites. In all areas the existing road lanes or shoulders may be used by cyclists.

4.6.6.2 PEDESTRIAN NETWORK

Footpaths are present on some of the major roads within the urban area of the Junee precinct. Typically, there is not provision of connected pedestrian infrastructure in the vicinity of enhancement sites in rural areas such as Harefield and Illabo. There are also several opportunities to cross the rail line at level crossings and one pedestrian overpass to the Junee Railway Station platform (closed), and these locations are described in Table 4.64.

Table 4.64 Pedestrian rail crossing opportunities – Junee

ENHANCEMENT SITE	LOCATION	CROSSING TYPE
Harefield Yard clearances	Harefield Road	Railway Level Crossing
Junee Station and surrounds	Kemp Street	Grade-separated – road over rail
	Olympic Highway (between Seignior Street and Main Street)	Railway Level Crossing
Olympic Highway underbridge	Olympic Highway	Rail bridge over road/footpath
Junee to Illabo Yard clearances	Unnamed Road (near Waterworks Road at Marinna)	Railway Level Crossing
	Brabins Road	Railway Level Crossing

Figure 4.65 shows existing opportunities to cross the rail line in the Junee precinct.

Albury to Illabo Figure 4.64 Cycling infrastructure - Junee Precinct

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:15,000
Data Sources: ARTC, NSWSS, TfNSW

Proposal site
Existing railway
Main road
Local road
Waterways
Waterbodies

Cycle path type
Parking Lane
Shared Use

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Albury to Illabo | Figure 4.65 Existing pedestrian rail crossings - Junee Station and surrounds

0 100 200 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:6,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies

Pedestrian rail crossing

- Pedestrian overpass
- Road with footpath

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5 IMPACT ASSESSMENT – CONSTRUCTION

An impact assessment of the transport networks has been undertaken in accordance with the SEARs to assess the expected impacts of the proposal during construction and to guide the development of mitigation measures to minimise the consequence and/or likelihood of these impacts.

5.1 ALBURY PRECINCT

5.1.1 CONSTRUCTION PROFILE

This section outlines the construction profile for the proposal within the Albury precinct. This includes all vehicle routes, as shown in section 5.1.1.2, and all volumes of heavy and light vehicles required for construction of the proposal, as shown in section 5.1.1.3, which includes the vehicles required for the import and export of fill material. It also outlines other construction requirements, such as temporary road closures and diversions, and parking requirements for each enhancement site.

5.1.1.1 CONSTRUCTION PROGRAM

Key construction stages and work durations at each enhancement site within the Albury precinct are summarised in Table 5.1 and Figure 5.1.

Table 5.1 Summary of construction stages – Albury precinct

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Murray River bridge	— Site establishment — Rail bridge structure modifications — Demobilisation and landscaping	15 January 2024	16 December 2024	12	Yes
Albury Station pedestrian bridge	— Site establishment — Pedestrian bridge removal with crane — Pedestrian bridge replacement — Demobilisation and landscaping	1 February 2024	17 July 2024	6	Yes
Albury Yard clearances	— Site establishment — Track realignment (>300m and/or track formation replacement) — Gantry replacement — Demobilisation and landscaping	15 January 2024	4 April 2024	3	Yes
Riverina Highway bridge	— Site establishment — Track lowering — Demobilisation and landscaping	15 January 2024	21 April 2025	16	Yes

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Billy Hughes bridge	— Site establishment — Track lowering — Track realignment (>300m and/or track formation replacement) — Demobilisation and landscaping	15 January 2024	11 April 2025	16	Yes
Table Top Yard clearances	— Site establishment — Gantry removal — Demobilisation and landscaping	1 February 2024	5 February 2024	<1 month	Yes

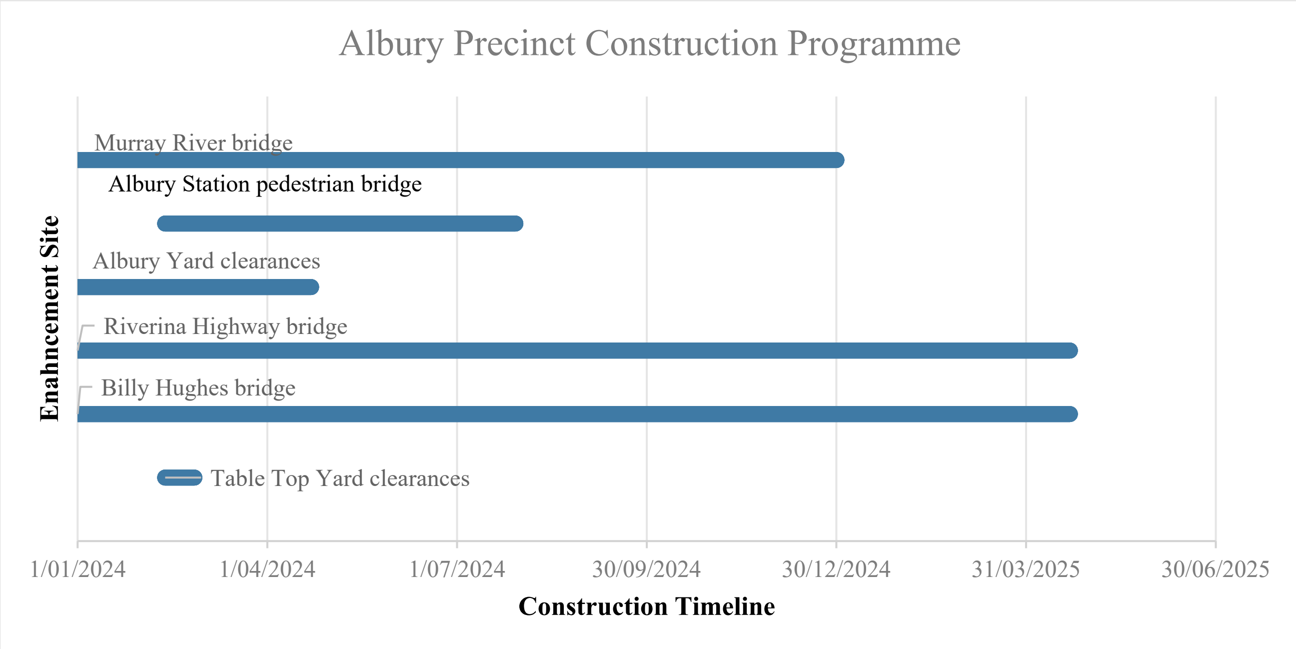

Figure 5.1 Albury precinct construction programme

5.1.1.2 CONSTRUCTION AND DIVERSION ROUTES

Proposed construction routes and accesses to enhancement sites in the Albury precinct are shown in Figure 5.2 to Figure 5.5. No vehicle diversions are required in the Albury precinct.

Construction routes have been selected to minimise the use of local roads where possible. However, use of local roads is generally required to facilitate access to enhancement sites. As shown in section 5.1.1.3, construction vehicle volumes using construction routes and accesses on local roads are generally low.

Mitigations for the use of all road types, including local roads are provided in section 8.2. In addition, mitigation measures have been identified for other assessments, including noise and vibration, visual and social, to address potential impacts from the use of construction and diversion routes.

Where diversions are required for active travel routes, the selected diversion route has considered where pedestrian infrastructure is present. Where cyclists utilise diversion routes, and an existing cycle or shared path is not present, cyclists would be required to cycle on-road. To facilitate access to the rail corridor and surrounds for construction vehicles, including surrounding residences, diversion of pedestrians and cyclists within the proposal site would also be required. Detailed consideration of the management of pedestrian and cyclist safety within the proposal site will be completed prior to and during construction. Mitigation measures, including the requirements for a Traffic Management Plan (TMP), are provided in section 8.2.

Albury to Illabo Figure 5.2 Construction routes, diversions and site accesses (Murray River bridge and Albury Yard)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 11/11/2021 Paper: A3
Author: WSP Scale: 1:7,500
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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Albury to Illabo Figure 5.3 Construction routes, diversions and site accesses (Albury footbridge and Riverina bridge)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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Albury to Illabo

Figure 5.4 Construction routes, diversions and site accesses (Billy Hughes bridge)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies

Site access points
Laydown area/compound
Key intersection

Route type
Construction routes

INLAND RAIL ARTC

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Albury to Illabo Figure 5.5 Construction routes, diversions and site accesses (Table Top Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 8/12/2021
Paper: A3
Author: WSP
Scale: 1:5,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterbodies
Site access points
Key intersection
Route type
Construction routes

INLAND RAIL
ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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Vehicle and pedestrian diversions proposed within the Albury precinct during construction include:

- Albury Station pedestrian bridge – pedestrian diversion during construction along Harold Mair Bridge to the north and along Young street.

No vehicle diversions are proposed in the Albury precinct.

5.1.1.3 VEHICLE TYPE AND QUANTITY

Table 5.2 shows the peak construction, peak hour vehicle movements at each enhancement site as identified from construction scenario data shown in Chapter 8: Construction of the proposal of the EIS. To provide a worst-case assessment, the highest traffic generating work element for these enhancement sites, typically during a possession period has been adopted for assessment.

Table 5.2 Peak hour construction movements – Albury precinct enhancement sites

ENHANCEMENT SITES	VEHICLE TYPE	PEAK HOUR MOVEMENTS	CONSTRUCTION VEHICLE PARKING AND LAYDOWN
Murray River bridge	Light vehicles	27 in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	2 in and out	
Albury Station pedestrian bridge	Light vehicles	13[1] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	8 in and out	
Albury Yard clearances	Light vehicles	27[2] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	8 in and out	
Riverina Highway bridge	Light vehicles	40[2] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	10 in and out	
Billy Hughes bridge	Light vehicles	47[2] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	10 in and out	
Table Top Yard clearances	Light vehicles	7 in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	2 in and out	

(1) Three-day possession peak (typically only 7 vehicle movements in a peak period)
(2) Three-day possession peak (typically only 13 vehicle movements in a peak period) Road Network Operation

5.1.2 ROAD NETWORK OPERATION

5.1.2.1 MURRAY RIVER BRIDGE ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Murray River bridge Enhancement Site component of the proposal is shown in Table 5.3. This assessment shows that with construction traffic all road links are expected to operate at LOS B or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.3 Murray River bridge enhancement site, construction route Road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
East Street[1]	Urban	1,231	B	29	1,260	B
Atkins Street[1]	Urban	310	B	29	339	B
Hume Highway[2]	Highway	620	B	31	651	B
Macauley Street[3]	Urban	31	A	29	60	A
Panmure Street[3]	Urban	31	A	29	60	A
Abercorn Street[3]	Urban	31	A	29	60	A
Kiewa Street[4]	Urban	93	A	29	122	A
Townsend Street[3]	Urban	31	A	29	60	A
Olive Street[4]	Urban	93	A	29	122	A

(1) Traffic survey volumes
(2) Hume Highway – 120m East of Olive Street, South Albury 2640
(3) No data available, volumes estimated as 10% of Atkins Street 10 hour
(4) No data available, volumes estimated as 30% of Atkins Street 10 hour

Note, construction peak hour volumes are higher on Hume Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Albury precinct during peak construction activities was undertaken and presented in section 5.1.2.2. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements, as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection with construction traffic in the precinct was LOS C which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Further, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Murray River bridge enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Murray River bridge enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Murray River bridge enhancement site would be provided within the proposal site and so would have minimal impact to existing on-street parking or public parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the Traffic Management Plan (TMP).

No disabled parking spaces would be impacted by the proposal.

5.1.2.2 ALBURY STATION AND SURROUNDS ENHANCEMENT SITES

The enhancement sites in the vicinity of Albury Station share the same road network and have been combined in the following section, consisting of:

- Albury Station pedestrian bridge enhancement site
- Albury Yard clearances enhancement site
- Riverina Highway bridge enhancement site.

ROAD PERFORMANCE

The link LOS assessment for the Albury Station and surrounds enhancement sites component of the proposal is shown in Table 5.4. This assessment shows that with construction traffic all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.4 Albury Station and surrounds enhancement sites, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Young Street [1]	Urban	658	A	50	708	A
Smollet Street (Railway Place) [1]	Urban	41	A	50	91	A
Borella Road [1]	Highway	1,202	C	60	1,262	C
Hume Highway Northbound Off Ramps [1]	Highway	620	B	60	680	B
Schubach Street	Urban	310	B	50	360	B

(1) Traffic survey volumes

Note, construction peak hour volumes are higher on Hume Highway and Borella Road than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

The intersection of Borella Road and Hume Highway Northbound Off Ramp, used as part of the construction route to the Albury Yard clearances enhancement site, has the highest traffic volumes of available data within the Albury precinct on a per lane basis. Therefore, the Borella Road/Hume Highway Northbound Off Ramp intersection has been assessed in SIDRA to determine the highest level of construction vehicle impact at an intersection, within the Albury precinct. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

Figure 5.6 shows the layout of the Borella Road/Hume Highway Northbound Off Ramp intersection as modelled in SIDRA and Figure 5.7 shows the signal phasing arrangement assumed for the analysis.

Hourly turning volumes for each approach at the Borella Road/Hume Highway Northbound Off Ramp intersection have been taken from a traffic survey at the intersection in 2021 and forecast 2024 volumes have been derived using a 3 per cent per year compounding growth rate. The traffic survey determined that the PM peak hour was the highest trafficked peak period at this intersection, as such the PM peak hour is the subject of this intersection assessment.

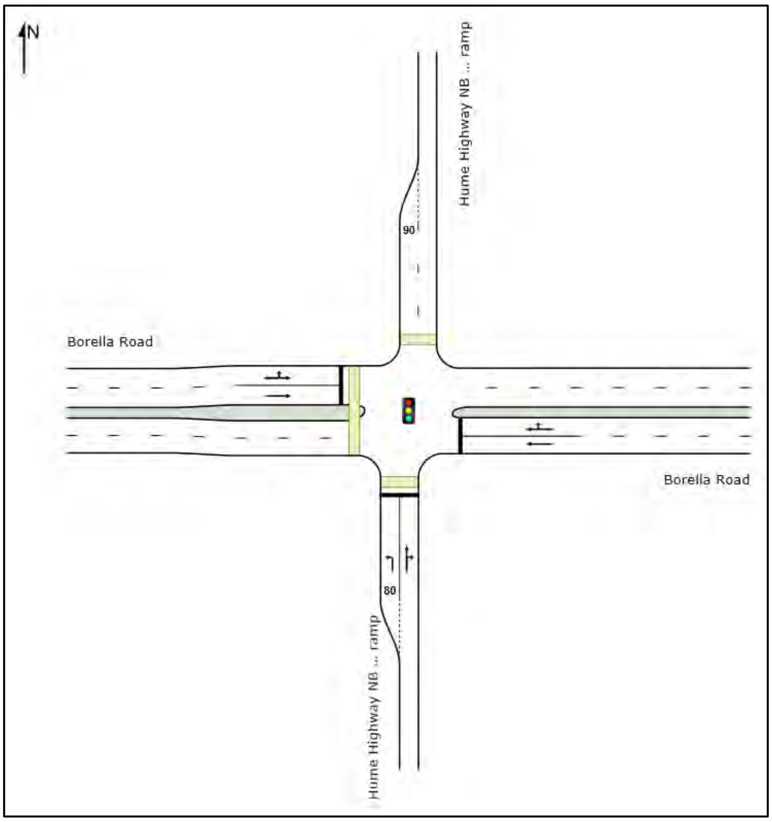

Figure 5.6 Borella Road/Hume Highway Northbound Off Ramp SIDRA intersection layout

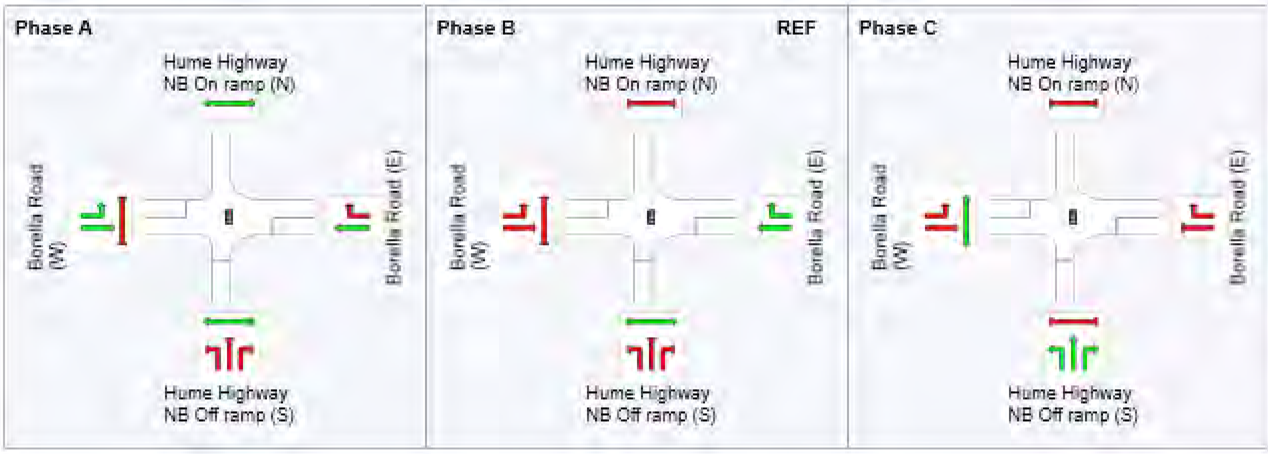

Figure 5.7 Borella Road/Hume Highway Northbound Off Ramp SIDRA modelled signal phasing

Table 5.5 shows the SIDRA results for the Borella Road / Hume Highway Northbound Off Ramp intersection during a 2024 peak hour with and without construction vehicles. The results show the performance of the intersection is not significantly impacted by construction vehicles: LOS continues to operate at an acceptable level (LOS C), DOS only increases from 0.708 – 0.779, intersection delay only increases by three seconds, and 95th percentile queue lengths only increases by 27m (approx. five vehicles). 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles.

It is noted that the West approach transitions from LOS B to LOS C, however this is the result of an increase in average delay of four seconds. It is also noted that the southern approach currently operates at LOS D and remains at LOS D (with the same amount of delay) with the proposal. The overall intersection performance remains at LOS C with the proposal.

Table 5.5 Borella Road/Hume Highway Northbound Off Ramp, 2024 construction route intersection capacity – PM Peak

	2024 PM PEAK HOUR				2024 PM PEAK HOUR WITH CONSTRUCTION			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: Hume Highway NB Off ramp	0.708	43	D	81	0.752	43	D	97
East: Borella Road	0.643	16	B	148	0.737	18	B	192
West: Borella Road	0.705	19	B	168	0.779	23	C	195
Intersection	0.708	22	C	168	0.779	25	C	195

The Borella Road/Hume Highway Northbound Off Ramp intersection is reflective of the 'worst case' expected construction vehicle impacts to intersection performance, being the highest trafficked intersection on a per lane basis. Based on the results of this assessment it is not expected that the performance of any other construction route intersection within the Albury precinct would be significantly impacted by construction vehicle movements.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or vehicle diversions are proposed for the Albury Station and surrounds enhancement sites.

PARKING

During the 5-month program for the Albury Station pedestrian bridge enhancement site the informal car park to the north of Albury bridge and part of the designated station car parking is expected to be closed due to the establishment of a site access and equipment set up in this location. Estimated impacts are shown in Table 5.6.

Table 5.6 Impacts to car parking – Albury Station and surrounds precinct

LOCATION	CARPARK CAPACITY	IMPACTED AREA	REMAINING AREA
Albury Station parking on Smollett Street and Railway Place	128 designated spaces 13 informal spaces	14 designated spaces 13 informal spaces	114 designated spaces 0 informal spaces

During the closure period described in section 5.1.1, users of these car parks would need to seek alternative locations to park. It is noted that there is on-street parking on Young Street within approximately 200m of the station, which is within the 200 – 500m acceptable walking distance to public transport noted in RTA 2002.

Except for the parking impacts described above, parking for construction workers and laydown areas for unloading of heavy vehicles at the Albury Station and surrounds enhancement sites will be provided within the enhancement site and so would have minimal impact to existing parking facilities. No impact to existing parking facilities is expected from construction worker parking. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.1.2.3 BILLY HUGHES BRIDGE ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Billy Hughes bridge enhancement site component of the proposal is shown in Table 5.7. This assessment shows that with construction traffic all road links are expected to operate at LOS C or better, which is considered stable flow conditions and an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.7 Billy Hughes bridge Clearances enhancement site – construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Wagga Road[1]	Rural	385	B	57	442	B
Hume Highway[2]	Highway	906	C	67	973	C
R W Henry Drive [3]	Rural	39	A	57	96	A

(1) No data available, volumes estimated as Wagga Road - 110m South of Waldner Court, Lavington

(2) No data available, volumes estimated as Hume Highway - 200m North of Ford Lane, Table Top

(3) No data available, volumes estimated as 10% of Wagga Road - 110m South of Waldner Court, Lavington

Note, construction peak hour volumes are higher on Hume Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Albury precinct during peak construction activities was undertaken and presented in section 5.1.2.2. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements, as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS C, which is considered stable flow conditions and an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). The assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Billy Hughes bridge enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Billy Hughes bridge enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Billy Hughes bridge enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.1.2.4 TABLE TOP YARD CLEARANCE ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Table Top Yard clearances enhancement site component of the proposal is shown in Table 5.8. This assessment shows that with construction traffic all road links are expected to operate at LOS C or better, which is considered stable flow conditions and an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected .

Table 5.8 Table Top, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Perryman Lane [1]	Rural	32	B	9	41	B
Tynan Road [2]	Rural	41	B	9	50	B
Hume Highway [3]	Highway	906	C	11	917	C

(1) No data available, volumes estimated as 5% of Hume Highway

(2) Tynan Road – between Gerogery Road and Perryman Lane, Table Top

(3) Hume Highway – 200m North of Ford Lane, Table Top

Note, construction peak hour volumes are higher on Hume Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Albury precinct during peak construction activities was undertaken and presented in section 5.1.2.2. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). The assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Table Top Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Table Top Yard clearance enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Table Top Yard clearances enhancement site would generally be provided within the proposal site and so would have minimal impact to existing parking facilities. Some parking may occur on Perryman Road, however any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.1.3 CONSTRUCTION SITE ACCESS

A turn warrant assessment for each enhancement site access in the Albury precinct have been undertaken based on The Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020). This assessment has analysed a worst-case scenario, assuming all peak generated construction traffic is distributed to each access during the road network peak period. The results of this assessment are shown in Table 5.9.

Table 5.9 Albury precinct enhancement site access turn warrant assessment

ENHANCEMENT SITE	ACCESS POINTS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Murray River bridge	36 / Townsend St	Two-way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
	35 / Olive Street	Two-way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected
	37 / Hume Highway on ramp	One way	N/A[1]	Left turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). High traffic volume highway.
Albury Station and surrounds	38 / Railway Parade	One way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
	72 / Kenilworth Street	One way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
	39 / Borella Road off ramp	One way	N/A[1]	Left turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). High traffic volume highway.

ENHANCEMENT SITE	ACCESS POINTS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Billy Hughes bridge	43 / Wagga Road	Two-way	Channelised Right-Turn / Auxiliary Left-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
	42 / Wagga Road	Two-way	Channelised Right-Turn / Auxiliary Left-Turn	Left and right turn into and out of site. Opposing movements on public road High speed environment (≥80km/h). Potential for impacts from construction vehicles movements or implementation of traffic management. Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
	74 / R W Henry Drive	Two-way	Channelised Right-Turn / BAL	Left and right turn into and out of site. Opposing movements on public road High speed environment (≥80km/h). Potential for impacts from construction vehicles movements or implementation of traffic management. Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Table Top Yard clearances	44 / Perryman Lane	Two-way	Basic Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Potential for impacts from construction vehicles movements or implementation of traffic management. Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

(1) Turn warrant assessment not required due to access intersection configuration (no opposing flows on public road or left in left out only)

Basic Left-Turn/ Basic Right-Turn and Auxiliary Left-Turn/ Channelised Right-Turn treatments are required by the intersection turn warrant assessment for some site accesses in this precinct. However, this may not be required given the temporary nature of accesses during the construction phase and the conservative nature of the assessment (peak construction vehicles assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour).

Where the turn warrant assessment methodology is unsuitable for the assessment of the enhancement site access the access arrangements as per the current road network would not have a significant impact as they are either a through movement from the end of a street, or they are impacting limited traffic movements.

The proposed accesses located on the Hume Highway entry ramp and Hume Highway exit ramps are on one-way roads and not suitable for turn warrant assessment. These proposed enhancement site accesses would potentially have a greater impact on the performance and safe operation of critical highway infrastructure due to their location on or adjacent to:

- high speed environment (110km/h posted speed limit)
- high traffic environment
- limited shoulder width to provide space for turning construction vehicles to slow down without impacting other vehicles.

More detailed assessment of the accesses will be undertaken as part of the Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans will be developed by the contractor prior to commencement of construction activities on site to moderate any potential safety issues. Design of any access treatments or modifications to roads would be undertaken in accordance with appropriate design standards and with approvals from the relevant local or state road authorities. Works Authorisation Deeds or other suitable consent or agreement with TfNSW will be made prior to undertaking any relevant works on a State Controlled Road.

5.1.4 ROAD SAFETY

During construction there would be changes to road conditions within the Albury precinct consisting of increased traffic volumes due to construction vehicles and new access points to the enhancement sites from the public road network. This assessment has primarily considered the operation and capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles.

It is noted that the construction activities at enhancement sites within the Albury precinct are expected to generate a maximum peak hour flow of 57 vehicles (during a three day possession peak period), and an appropriate LOS is maintained on all of the enhancement site access routes as discussed in section 5.1.1. Access intersections to the enhancement sites within the Albury precinct would be designed or have traffic control measures implemented to provide suitable safe access to public roads in accordance with relevant standards and guidelines.

To manage any construction impacts resulting in potential road safety issues, Road Safety Audits and Construction Traffic Transport and Access Management Plans would be required to be undertaken by the contractor prior to commencement of construction activities and the safety of all road users should be taken into account.

5.1.5 HEAVY VEHICLE ROUTES

As an appropriate LOS is maintained on roads used for construction activities at enhancement sites within the Albury precinct, it is not expected that construction heavy vehicle and workforce movements generated by the proposal, as shown in section 5.1.1.3, would impact the operations of existing heavy vehicles movements, including agricultural transport, on the routes discussed in section 4.3.3.

There is potential for construction heavy vehicles to impact road pavement conditions along haul routes. To determine the extent of the impact a road dilapidation report would be prepared for all haul routes within the precinct.

5.1.6 TRAVELLING STOCK RESERVES

As discussed in section 4.3.4, there are no Livestock Highways or TSRs in the vicinity of enhancement sites within the Albury precinct. It is expected that prior to the commencement of works that Local Land Services would be notified of temporary closures of rail level crossings in the Albury precinct so that stock handlers, including walking permit holders, can be notified of the impacts to stock movements.

5.1.7 PUBLIC TRANSPORT ROUTES

5.1.7.1 ROAD

Although there would be increased traffic resulting from construction activities at enhancement sites within the Albury precinct, it is expected to have a minimal impact on the operation of public or school bus services or bus stops due to the low traffic volumes generated by the construction activities (stable flow conditions are maintained on all of the enhancement site access routes). It is noted that the heaviest period of construction workforce movements at the start and end of construction hours (6am to 6pm) outside peak bus service periods (e.g. school times). There may be minor delays to buses passing near enhancement sites from reduced speed limits and traffic control. These impacts would be managed in accordance with the traffic management plan to ameliorate impacts to the safe and efficient travel of bus services through the affected areas. Albury station includes a bus interchange, access would be maintained through traffic management, and no impact to these services are expected as a result of the construction activities.

5.1.7.2 RAIL

Construction activities requiring possessions would occur during either:

- existing scheduled weekend rail corridor possession periods (typically 72 hours) when trains along the rail corridor are stopped for maintenance as part of operation of the existing rail line; or
- track work authorisations periods, which enable works that impact rail operations to occur outside scheduled rail possessions, but within available time windows in which train services are not scheduled.

Work during these periods would be undertaken in consultation with passenger rail operators. However, it is not expected that proposal construction works would impact upon the rail services and train station platforms will not be impacted by the enhancement sites. Impacts to pedestrian access from construction works on the Albury Station pedestrian bridge are discussed in the following section.

5.1.8 ACTIVE TRANSPORT ROUTES

Given the surrounding land uses in the vicinity of the Murray River bridge, Billy Hughes bridge and Table Top Yard clearances enhancement sites the demand for cycling and pedestrian travel in the area is likely to be low. Although there would be increased traffic from construction vehicles, the increase is minor with all road links with stable flow conditions and minimal change in LOS (LOS A to B) expected as a result of construction generated traffic with no impact to existing active transport movements expected. The largest hourly construction movements would occur outside peak traffic periods and would have minimal impact to pedestrians and cyclists.

As part of the Albury Station and surrounds Enhancement sites construction activities, the Albury Station pedestrian bridge (which does not currently cater for cyclists) replacement would require closure of the bridge. During the closure period of approximately six months, pedestrians would be diverted to the two nearest crossings; the Harold Mair Bridge located 160m (2 minutes' walk) north, and the Amatex Street bridge located 460m (6 minutes' walk) south.

Footpaths provide full pedestrian connectivity between Albury Station and Kenilworth Street (the location of the western landing of the Albury Station pedestrian bridge) via the Harold Mair Bridge and the Amatex Street Bridge. Due to the high level of connectivity of active transport infrastructure in the Albury Station area and the proximity of alternative facilities, it is expected that the impacts to pedestrians and cyclists due to diversions would be relatively minor and can be effectively managed and minimised.

There may be minor disruptions to cyclists using roads near the enhancement sites as a result of traffic control. These impacts although expected to be minimal would be managed in accordance with the TMP.

5.1.9 PROPERTY ACCESS IMPACTS

Although there may be some minor, temporary disruptions, property access is expected to be maintained throughout the duration of the construction activities in the area. Any changes to arrangements would need to be undertaken in consultation with the relevant stakeholders and in line with the TMP.

5.1.10 RAIL FREIGHT

Section 5.1.7.2 notes when construction activities requiring possessions will occur.

Work during these periods would be undertaken in consultation with freight operators. However, it is not expected that proposal construction works would impact upon the rail freight network. Note, there are no other impacts to freight operations.

5.1.11 WATER BASED TRANSPORT

As stated in section 4.3.7, the Murray River in the vicinity of the Albury precinct enhancement sites does not support public transport, trade, or shipping freight routes, and water-based transport is generally limited to recreational activities. However, the Murray River provides through access for water-based emergency services. Any changes to the access arrangement of the waterway under the Murray River bridge during construction activities (approximately 12 months) would:

- maintain the river as navigable by the provision of a channel under the bridge to maintain access for watercraft
- be undertaken in consultation with TfNSW Maritime and the relevant stakeholders (such as commercial operators, local businesses, and water-based emergency services) in line with the TMP
- observe appropriate maritime permit requirements and safety notice periods.

5.1.12 EMERGENCY VEHICLE ACCESS

Construction of the proposal would result in temporary impacts to traffic and an increase in vehicle movements on the road network. As shown in the link and intersection performance assessments, there is no significant impact to the performance of the road network due to the construction generated traffic within the Albury precinct, and there is not expected to be a significant impact to emergency vehicles movements. The traffic and access management plan would be developed in consultation with TfNSW, Albury City Council, and State emergency services and would consider and effectively manage any impacts to emergency vehicles seeking to use roads in the vicinity of the enhancement sites.

5.1.13 SEASONAL VARIATION

Temporary local events such as festivals, shows, and markets may result in minor localised traffic variations, particularly in urban environments such as Albury.

Localised seasonal traffic variation may also be experienced at enhancement sites that share land with agricultural infrastructure (grain silos, livestock loading facilities etc.) as the infrastructure will likely generate additional heavy or farm vehicle movements during harvest seasons. A review of aerial imagery of enhancement sites in the Albury precinct did not identify any agriculture infrastructure co-located with enhancement sites. The seasonal variation in traffic movements identified in section 4.2.2 is expected to be representative of enhancement sites across the Albury precinct.

More detailed assessment of the enhancement site accesses, which would consider seasonal variation due to social events and agricultural movements, will be undertaken by the contractor prior to commencement of construction activities on site. These would include Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans to moderate any potential safety issues.

5.2 GREATER HUME, LOCKHART

5.2.1 CONSTRUCTION PROFILE

This section outlines the construction profile for the proposal within the Greater Hume, Lockhart precinct. This includes all vehicle routes, as shown in section 5.2.1.2, and all volumes of heavy and light vehicles required for construction of the proposal, as shown in section 5.2.1.3, which includes the vehicles required for the import and export of fill material. It also outlines other construction requirements, such as temporary road closures and diversions, and parking requirements for each enhancement site.

5.2.1.1 CONSTRUCTION PROGRAM

Key construction stages and work durations at each enhancement site within the Greater Hume/Lockhart precinct are summarised in Table 5.10 and Figure 5.8.

Table 5.10 Summary of construction stages – Greater Hume – Lockhart enhancement sites

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Culcairn Yard clearance and Culcairn pedestrian bridge	— Site establishment — Gantry modification — Pedestrian bridge removal/relocation with crane — Demobilisation and landscaping	15 January 2024	1 April 2024	3	Yes
Henty Yard clearances	— Site establishment — Track realignment (<300mm) — Gantry modifications — Level crossing modification — Demobilisation and landscaping	15 January 2024	8 April 2024	3	No
Yerong Creek Clearances	— Site establishment — Track realignment (<300mm) — Track realignment (>300mm and/or track formation replacement) — Level crossing modification — Demobilisation and landscaping	15 January 2024	5 April 2024	3	Yes
The Rock Yard clearances	— Site establishment — Track lowering — Gantry modifications — Demobilisation and landscaping	1 February 2024	25 February 2024	<1	No

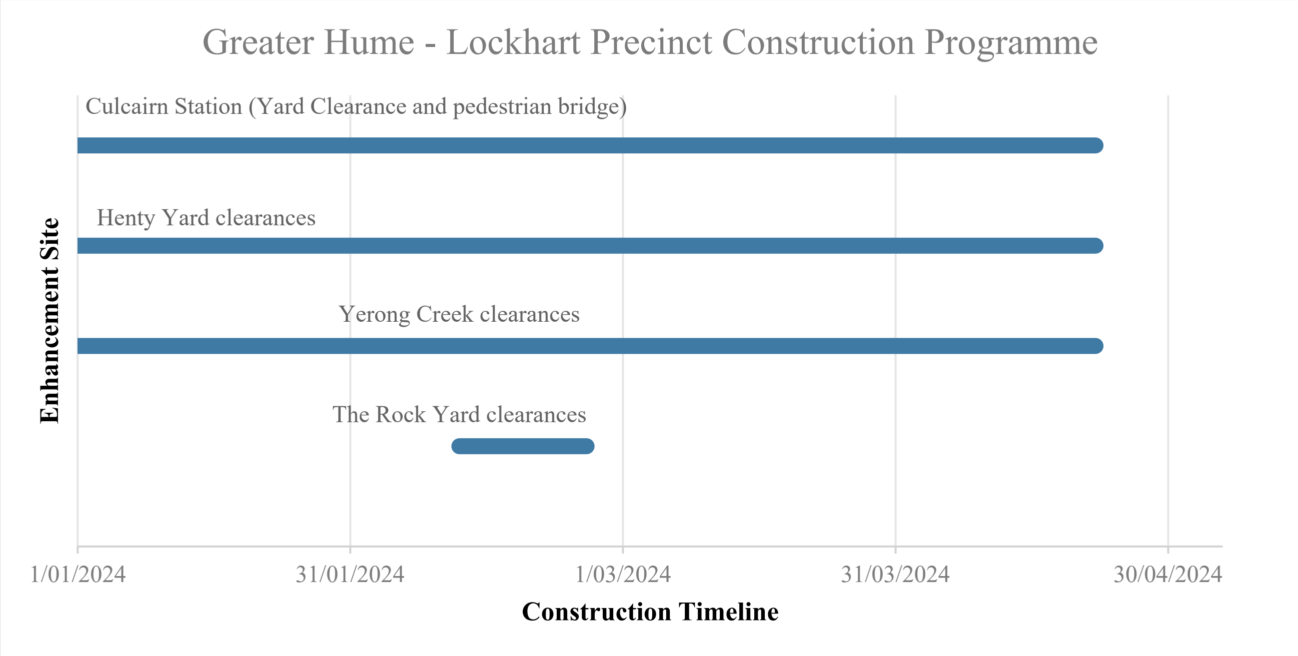

Figure 5.8 Greater Hume – Lockhart precinct construction programme

5.2.1.2 CONSTRUCTION AND DIVERSION ROUTES

Proposed construction routes and accesses to enhancement sites in the Greater Hume – Lockhart precinct are shown below in Figure 5.9 to Figure 5.12.

Construction routes have been selected to minimise the use of local roads where possible. However, use of local roads is generally required to facilitate access to enhancement sites. As shown in section 5.2.1.3, construction vehicle volumes using construction routes and accesses on local roads are generally low.

Diversion routes have been selected on roads of the same order where possible. In the instances where diversion routes have been required on roads of a lower order, the requirement for mitigation has been considered.

Mitigations for the use of all road types, including local roads are provided in section 8.2. In addition, mitigation measures have been identified for other assessments, including noise and vibration, visual and social, to address potential impacts from the use of construction and diversion routes.

Where diversions are required for active travel routes, the selected diversion route has considered where pedestrian infrastructure is present. Where cyclists utilise diversion routes, and an existing cycle or shared path is not present, cyclists would be required to cycle on-road. To facilitate access to the rail corridor and surrounds for construction vehicles, including surrounding residences, diversion of pedestrians and cyclists within the proposal site would also be required. Detailed consideration of the management of pedestrian and cyclist safety within the proposal site will be completed prior to and during construction. Mitigation measures, including the requirements for a Traffic Management Plan (TMP), are provided in section 8.2.

Albury to Illabo

Figure 5.9 Construction routes, diversions and site accesses (Culcairn Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 11/11/2021
Author: WSP
Data Sources: ARTC, NSWSS
Paper: A3
Scale: 1:3,000

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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Albury to Illabo

Figure 5.10 Construction routes, diversions and site accesses (Henty Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:4,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies
Site access points
Laydown area/compound
Key intersection
Route type
Construction routes
Diversion routes

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Albury to Illabo Figure 5.11 Construction routes, diversions and site accesses (Yerong Creek Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type
- Construction routes

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Albury to Illabo Figure 5.12 Construction routes, diversions and site accesses (The Rock Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:2,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies
- Site access points
- Key intersection

Route type

- Construction routes

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Vehicle and pedestrian diversions proposed during construction are as follows:

- Henty Yard clearances
  - Sladen Street level crossing closure (five days) – vehicle traffic to be diverted via Rosler Parade/Yankee Crossing Road level crossing. Pedestrian access would be maintained.

5.2.1.3 VEHICLE TYPE AND QUANTITY

Table 5.11 shows the peak hour two-way movements at each site as identified from construction scenario data shown in Chapter 8: Construction of the proposal of the EIS. To provide a worst-case assessment, the highest traffic generating work element for these enhancement sites, typically during a possession period has been adopted.

Table 5.11 Peak hour construction movements – Greater Hume – Lockhart precinct

ENHANCEMENT SITES	VEHICLE TYPE	PEAK HOUR MOVEMENTS	CONSTRUCTION VEHICLE PARKING AND LAYDOWN
Culcairn Station (Yard Clearance and pedestrian bridge)	Light vehicles	40[1] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	8 in and out	
Henty Yard clearances	Light vehicles	40[1] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	8 in and out	
Yerong Creek Clearances	Light vehicles	40[1] in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	8 in and out	
The Rock Yard clearances	Light vehicles	7 in (am) / out (pm)	Internal to Proposal site
	Heavy vehicles	1 in and out	

(1) Three-day possession peak (typically only 20 vehicle movements in a peak period)

5.2.2 ROAD NETWORK OPERATION

5.2.2.1 CULCAIRN ENHANCEMENT SITES

ROAD PERFORMANCE

The link LOS assessment for the Culcairn enhancement sites component of the proposal is shown in Table 5.12. This assessment shows that with construction traffic all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.12 Culcairn enhancement site, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Melville Street (Olympic Highway)[1]	Highway	231	A	56	287	A
Balfour Street	Urban	418	C	48	466	C
Railway Parade (south of Balfour Street)[2]	Urban	309	B	48	357	B
Railway Parade (north of Balfour Street)[3]	Urban	77	A	48	125	A

(1) Olympic Highway – 290m North of Calool Lane, Culcairn
(2) Railway Parade (Olympic Highway) – 80m South of Balfour Street, Culcairn
(3) Estimated conservatively as 25% of Railway Parade (south of Balfour Street) traffic volume as Railway Parade (north of Balfour Street) does not form part of the Olympic Highway, as Railway Parade (south of Balfour Street) does.

Note, construction peak hour volumes are higher on Melville Street (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles (8) required for construction.

INTERSECTION PERFORMANCE

Table 5.12 shows that Balfour Street and Railway Parade have the highest traffic volumes within the Greater Hume – Lockhart precinct on a per lane basis. Therefore, the Balfour Street/Railway Parade intersection has been assessed in SIDRA, to determine the highest level of construction vehicle impact at an intersection within the Greater Hume – Lockhart precinct. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements, as expected construction start and finish times end outside of typical peak periods.

Hourly turning volumes for each approach at the Balfour Street/ Railway Parade intersection have been calculated based on:

- AADT volumes factored to peak hour (10%)
- approach proportions of total intersection volume to determine turn movement volumes.

Figure 5.13 shows the layout of the Balfour Street / Railway Parade intersection as modelled in SIDRA.

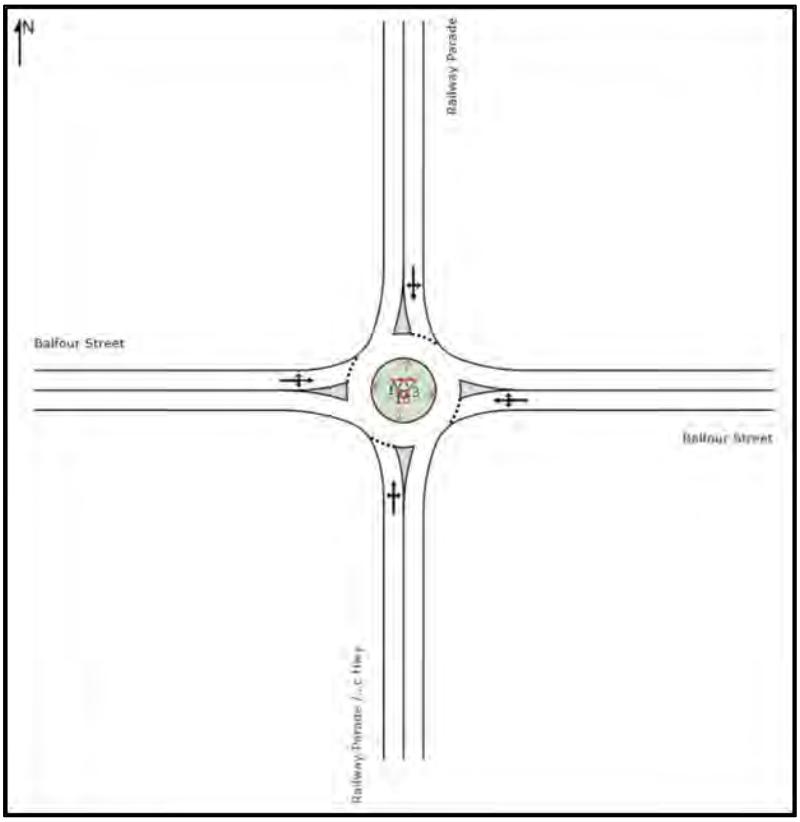


Figure 5.13 Balfour Street/Railway Parade SIDRA intersection layout

Table 5.13 shows the SIDRA results for the Balfour Street/Railway Parade intersection during a 2024 peak hour with and without construction vehicles. The results show the performance of the intersection is not significantly impacted by construction vehicles: LOS continues operates at an acceptable level (LOS A), DOS only increases from 0.446 – 0.487, intersection delay does not increase, and 95th percentile queue lengths only increases by 3m (approx. one vehicle). 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles.

Table 5.13 Balfour Street/Railway Parade, 2024 peak hour without construction vehicles – 10% of AADT

	2024 PEAK HOUR (10% AADT)				2024 PEAK HOUR (10% AADT) WITH CONSTRUCTION			
Approach	**DOS**	**Delay (s)**	**LOS**	**95th %ile queue (m)**	**DOS**	**Delay (s)**	**LOS**	**95th %ile queue (m)**
South: Railway Parade (Olympic Highway)	0.362	8	LOS A	21	0.418	8	LOS A	25
East: Balfour Street	0.442	6	LOS A	27	0.481	6	LOS A	31
North: Railway Parade	0.114	9	LOS A	6	0.128	8	LOS A	6
West: Balfour Street	0.446	7	LOS A	28	0.487	8	LOS A	31
Intersection	0.446	7	LOS A	28	0.487	7	LOS A	31

The Balfour Street/Railway Parade intersection is reflective of the 'worst case' expected construction vehicle impacts to intersection performance, being the highest trafficked intersection on a per lane basis. Based on the results of this assessment it is not expected that the performance of any other construction route intersection within the Greater Hume – Lockhart precinct would be significantly impacted by construction vehicle movements.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Culcairn enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Culcairn pedestrian bridge and Yard clearances enhancement sites would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.2.2.2 HENTY YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Henty Yard clearances enhancement site component of the proposal is shown in Table 5.14. This assessment shows that with construction traffic all road links are expected to operate at LOS A or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.14 Henty, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Railway Parade (Olympic Highway)[1]	Highway	231	A	56	287	A
Sladen Street	Urban	51	A	48	99	A
Rosler Parade/Yankee Crossing Road[2]	Urban	10	A	48	58	A
Allan Street[3]	Urban	36	A	48	84	A
Ivor Street[3]	Urban	36	A	48	84	A

(1) No data available, volumes estimated as Olympic Highway – 290m North of Calool Lane, Culcairn

(2) No data available, volumes estimated as 50% of Sladen Street

(3) No data available, volumes estimated as 20% of Railway Parade

Note, construction peak hour volumes are higher on Railway Parade (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Greater Hume – Lockhart precinct during peak construction activities was undertaken for the Culcairn enhancement sites in section 5.2.2.1. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

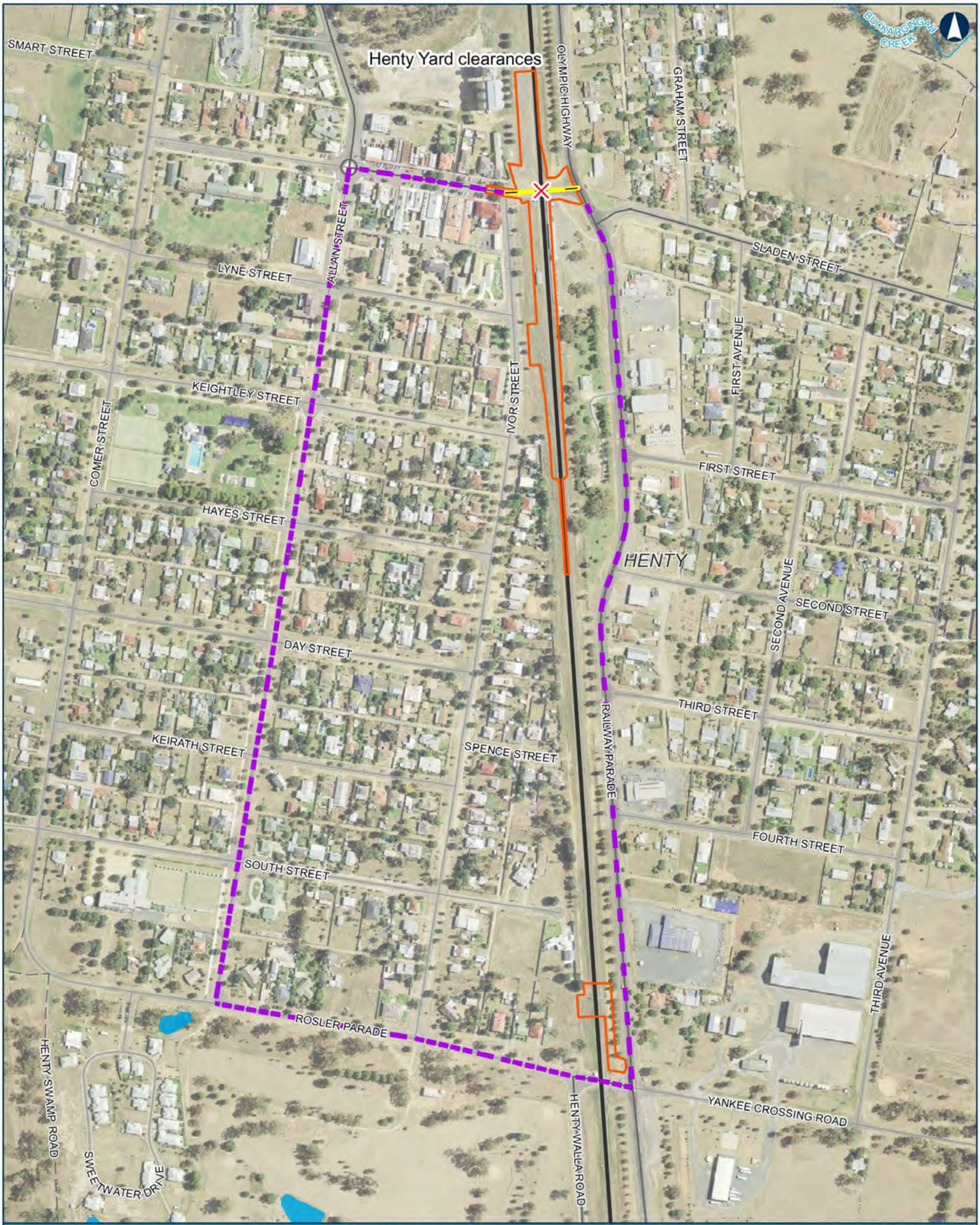
This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Further, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Henty Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

The Sladen Street rail level crossing would require a road closure as shown in Figure 5.14, for five days during the construction activities. Based on AADT data from 2014 extrapolated to 2024 (at a 3 per cent compounding per annum growth rate) this diversion is expected to impact 997 vehicles per day.

The closure requires vehicles to be diverted to the rail level crossing on Rosler Parade via the Olympic Highway on the western side of the rail line and via Allan Street on the eastern side of the railway line. Crossing the rail line with the diversion in place incurs up to a maximum 2.2km travel distance than without the diversion. As this diversion is implemented for a relatively short period (five days) the additional travel distance and time are not considered a significant impact.

Road Safety Audits and Construction Traffic Transport and Access Management Plans would be undertaken by the contractor prior to commencement of diversionary routes. Particular attention should be paid the type and size of vehicle using the level crossing on Rosler Parade so that appropriate clearance to the rail line can be maintained when giving way to vehicles on the Olympic Highway.



Albury to Illabo

Figure 5.14 Sladen Street closure diversion route

0 100 200 m

Coordinate System: GDA 1994 MGA Zone 55

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- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies

Intersection type

- Road closure

Route type

- Route to be diverted (road closure)
- Diversion routes due to road closure

INLAND RAIL

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ROAD PERFORMANCE

Traffic volumes for Rosler Parade and Allen Street were not available at the time of analysis. Traffic volumes for Sladen Street have been used to assess the road performance of diverted traffic on Rosler Parade and Allen Street. This provides a conservative assessment of the potential impacts as Sladen Street is expected to have higher traffic volumes than Rosler Parade or Allen Street, as it provides connection through the main retail area of Henty. Table 5.15 shows that Rosler Parade and Allen Street (Sladen Street) would operate at LOS A in a 2024 peak hour and that diversion related vehicles (Sladen Street traffic volumes) using these roads during a 2024 peak hour would have no impact to the LOS.

Note, Allan Street is not part of construction vehicle routes in Henty, as such construction vehicles have not been included in the assessment of diversion route link capacities.

Table 5.15 Henty, diversion route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR VEHICLES (ONE-WAY)			DIVERSION PEAK HOUR VEHICLES (ONE-WAY)		
		Volume	LOS	Construction volume	Diversion volume	Combined volume	LOS
Rosler Parade/ Yankee Crossing Road	Urban	10	A	48	51	109	A
Allan Street	Urban	36	A	-	51	87	A

INTERSECTION PERFORMANCE

A 'worst case' assessment of construction route intersection performance was undertaken for the precinct in section 5.2.2.1. The analysis showed no impact to intersection performance as a result of the 39 construction vehicles. As such, it is not considered that an additional 51 diverted vehicles per hour would impact the performance of other intersections with lower traffic volumes, such as in Henty. Therefore, no additional intersection analysis has been undertaken to assess the impact of diverted vehicles to intersections during the Sladen Street closure.

TRAVEL TIME

Figure 5.15 shows that the longest potential diversion would take a maximum of approximately five minutes of additional travel time in a vehicle. As the diversion is temporary (for a five day period), an additional four minutes travel time during the diversion is not considered a significant impact.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Henty Yard clearances enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

Albury to Illabo

Figure 5.15 Henty diversion travel time impacts

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Author: WSP Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Travel time impacts (distance, time delay)

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5.2.2.3 YERONG CREEK YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Yerong Creek Yard clearances enhancement site component of the proposal is shown in Table 5.16. This assessment shows that with construction traffic all road links are expected to operate at LOS A or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Further, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.16 Yerong Creek, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Cox Street (Olympic Highway) [1]	Highway	275	A	56	331	A
Plunkett Street[2]	Urban	51	A	48	99	A
Finlayson Lane[3]	Urban	13	A	48	62	A

(1) No data available, volumes estimated as Olympic Highway – 50m East of Mangoplah Road, The Rock 2655

(2) No data available, volumes estimated as Sladen Street, Henty (East-West road through town)

(3) No data available, volumes estimated as 25% of Plunkett St

Note, construction peak hour volumes are higher on Cox Street (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Greater Hume – Lockhart precinct during peak construction activities was undertaken for the Culcairn enhancement sites in section 5.2.2.1. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Yerong Creek Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Yerong Creek Yard clearances enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Yerong Creek Yard clearances enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.2.2.4 THE ROCK YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for The Rock Yard clearances enhancement site component of the proposal is shown in Table 5.17. This assessment shows that with construction traffic all road links are expected to operate at LOS A or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.17 The Rock Yard clearances enhancement site, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Melville Street (Olympic Highway)[1]	Highway	275	A	9	284	A
Urana Street [2]	Urban	51	A	8	59	A

(1) No data available, volumes estimated as Olympic Highway – 50m East of Mangoplah Road, The Rock 2655

(2) No data available, volumes estimated as Sladen Street, Henty

Note, construction peak hour volumes are higher on Melville Street (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked (on a per lane basis) construction route intersection in the Greater Hume – Lockhart precinct during peak construction activities was undertaken for the Culcairn enhancement sites in section 5.2.2.1. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for The Rock Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for The Rock enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at The Rock Yard clearances enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.2.3 CONSTRUCTION SITE ACCESS

A turn warrant assessment for each enhancement site access in the Greater Hume – Lockhart precinct have been undertaken based on The Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020). This assessment has analysed a worst case scenario, assuming all peak generated construction traffic is distributed to each access during the road network peak period. The results of this assessment are shown in Table 5.18.

Table 5.18 Greater Hume – Lockhart precinct enhancement site access turn warrant assessment

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Culcairn	21 / Balfour Street	Two-way	Channelised Right-Turn / Auxiliary Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
	20 / Railway Parade North	Two-way	Basic Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Henty	23 / Olympic Highway	Two-way	Channelised Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
	22 / Sladen Street	Two-way	Basic Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Yerong Creek	24 / Plunkett Street	Two-way	Basic Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
The Rock	46 / Urana Street	Two-way	Basic Right-Turn / Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

Basic Right-Turn and Auxiliary Left-Turn / Channelised Right-Turn / Channelised Left-Turn treatments are required by the intersection turn warrant assessment for some site accesses in this precinct. However, this may not be required given the temporary nature of accesses during the construction phase and the conservative nature of the assessment (peak construction vehicles assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour).

More detailed assessment of the accesses will be undertaken as part of the Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans will be developed by the contractor prior to commencement of construction activities on site to moderate any potential safety issues. Design of any access treatments or modifications to roads would be undertaken in accordance with appropriate design standards and with approvals from the relevant local or state road authorities. Works Authorisation Deeds or other suitable consent or agreement with TfNSW will be made prior to undertaking any relevant works on a State Controlled Road.

5.2.4 ROAD SAFETY

During construction there would be changes to road conditions within the Greater Hume – Lockhart precinct consisting of increased traffic volumes due to construction vehicles, temporary diversions and new access points to the enhancement sites from the public road network. This study has primarily considered the operation and capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles.

It is noted that the construction activities at enhancement sites within the Greater Hume – Lockhart precinct, are expected to generate a maximum peak hour flow of 48 vehicles (during a three-day possession peak period) and an appropriate LOS is maintained on all of the enhancement site access routes as discussed in section 5.2.2. Access intersections to the enhancement sites within the precinct would be designed or have traffic control measures implemented to provide suitable safe access to public roads in accordance with relevant standards and guidelines.

To moderate any construction impacts to potential safety issues, Road Safety Audits and Construction Traffic Transport and Access Management Plans would be required to be undertaken by the contractor prior to commencement of construction activities on site and the safety of all road users should be considered. Particular attention should be paid the type and size of vehicle using the level crossing on Rosler Parade during the five-day Sladen Street closure so that appropriate clearance to the rail line can be maintained when giving way to vehicles on the Olympic Highway.

5.2.5 HEAVY VEHICLE ROUTES

As there are no changes to background LOS resulting from the traffic generated by the construction activities at enhancement sites the within the Greater Hume – Lockhart precinct, it is not expected that construction heavy vehicle and workforce movements generated by the proposal, as shown in section 5.2.1.3, would impact the current operations of existing heavy vehicles movements, including agricultural transport, on the routes discussed in section 4.4.3.

The Henty Yard clearances enhancement site works would require Sladen Street, which forms part of the Heavy Vehicle route network, to be closed for a five-day period. This closure would require vehicles using this route to be diverted to an alternative heavy vehicle route across the southern level crossing on Rosler Parade via the Olympic Highway and Allan Street (a residential area), a diversion of approximately 2km. Rosler Parade is designated as a heavy vehicle route in only the westbound direction. Due to the short duration of the diversion, Rosler Parade may be able to be used as a two-way heavy vehicle route. A Road Safety Audit, Construction Traffic Transport and Access Management Plans, in consultation with National Heavy Vehicle Regulator and TfNSW would need to be undertaken by the contractor prior to the closure of Sladen Street to minimise the impacts of diverted heavy vehicles to the surrounding road uses. Particular attention should be paid the type and size of vehicle using the level crossing on Rosler Parade during the five-day Sladen Street closure so that appropriate clearance to the rail line can be maintained when giving way to vehicles on the Olympic Highway.

There is potential for construction heavy vehicles to impact road pavement conditions along haul routes. To determine the extent of the impact a road dilapidation report would be prepared for all haul routes within the precinct.

Beyond the increased distance and travel times (a maximum of approximately five minutes), it is not expected that heavy vehicle movements would be impacted as a result of the diversion.

5.2.6 TRAVELLING STOCK RESERVES

Travelling Stock Reserves are located on the following roads expected to support construction access for The Rock Yard clearances enhancement site:

- Olympic Highway
- Urana Street.

Based on the low traffic volumes generated by the construction activities it is not expected that heavy vehicle and workforce movements would impact the operation of these Travelling Stock Reserves. It is noted that the additional construction traffic does not result in a change of LOS on any of the construction access routes within the Greater Hume – Lockhart precinct.

It is expected that prior to the commencement of works that Local Land Services would be notified of increased vehicle movements along the TSRs and temporary closures of rail level crossings in the Greater Hume – Lockhart precinct so that stock handlers, including walking permit holders, can be notified of the impacts to stock movements.

5.2.7 PUBLIC TRANSPORT ROUTES

5.2.7.1 ROAD

Bus routes are located along the proposed construction access routes to enhancement sites within the Greater Hume – Lockhart precinct on the following road links:

- Olympic Highway
- Railway Parade
- Balfour Street
- Plunkett Street
- Finlayson Street
- Sladen Street
- Olympic Highway
- Urana Street.

Construction activities at enhancement sites within the Greater Hume – Lockhart precinct will generate increased traffic on these roads. Resulting impact on the operation of public or school bus services or bus stops are expected to be minimal due to the low traffic volumes generated by the construction activities (which do not result in a change in LOS from current operation). It is noted that the heaviest period of construction workforce movements at the start and end of construction hours (6am to 6pm) outside peak bus service periods (e.g. school times). There may be minor delays to buses passing near the enhancement sites from reduced speed limits and traffic control.

These impacts would be managed in accordance with the traffic management plan to ameliorate impacts to the safe and efficient travel of bus services through the affected areas.

The level crossing works on Sladen Street would require the road to be closed which would require existing traffic to be diverted to the southern level crossing on Rosler Parade via Allan Street. This diversion is expected to have a minimal impact on the operation of these bus services due to the on-demand nature of bus services through Henty with non-fixed routes and the limited time of the diversion (five days).

5.2.7.2 RAIL

Construction activities requiring possessions would occur during either:

- existing scheduled weekend rail corridor possession periods (typically 72 hours) when trains along the rail corridor are stopped for maintenance as part of operation of the existing rail line; or
- track work authorisations periods, which enable works that impact rail operations to occur outside scheduled rail possessions, but within available 9-hour windows in which train services are not scheduled.

Work during these periods would be undertaken in consultation with passenger rail operators. However, it is not expected that proposal construction works would impact upon the rail services and train station platforms will not be impacted by the enhancement sites.

5.2.8 ACTIVE TRANSPORT ROUTES

As shown in section 4.3.6, provision of active transport infrastructure within the Greater Hume – Lockhart precinct is minimal, and although road lanes may be used for cycling, given the surrounding land uses the demand for cycling and pedestrian travel in the area is likely to be low. Although there would be increased traffic resulting from construction activities at enhancement sites within the Greater Hume – Lockhart precinct it is expected to have a minimal impact on cycling or pedestrian movements due to the low traffic volumes generated by the construction activities (which do not result in a change in LOS from current operation).

The removal of the pedestrian overpass on Balfour Street in Culcairn will not impact pedestrian connectivity as the overpass is already closed and the pedestrian crossing facility at the level crossing adjacent to the overpass would remain open.

The level crossing works on Sladen Street in Henty would require the road to be closed temporarily (five days), however pedestrian connectivity would be maintained through the closure’s duration and would be managed in accordance with the TMP.

There may be minor disruptions to cyclists using roads near the enhancement sites as a result of traffic control. These impacts although expected to be minimal would be managed in accordance with the TMP.

5.2.9 PROPERTY ACCESS IMPACTS

It is not expected that there would be disruptions to property access associated with construction activities within the Greater Hume – Lockhart precinct. Any changes to arrangements would need to be undertaken in consultation with the relevant stakeholders and in line with the TMP.

5.2.10 RAIL FREIGHT

Section 5.2.7.2 notes when construction activities requiring possessions will occur.

Work during these periods would be undertaken in consultation with freight operators. However, it is not expected that proposal construction works would impact upon the rail freight network. Note, there are no other impacts to freight operations.

5.2.11 EMERGENCY VEHICLE ACCESS

Construction of the proposal would result in temporary impacts to traffic and an increase in vehicle movements on the road network. As shown in the link and intersection performance assessments, there is no significant impact to the performance of the road network due to the construction generated traffic within the Greater Hume – Lockhart precinct, and so there is not expected to be a significant impact to emergency vehicles movements. It is expected that the traffic and access management plan would be developed in consultation with TfNSW, Greater Hume and Lockhart Councils, and State emergency services and would consider and effectively manage any impacts to emergency vehicles seeking to use roads in the vicinity of the enhancement sites.

5.2.12 SEASONAL VARIATION

Temporary local events such as festivals, shows, and markets may result in minor localised traffic variations, particularly in urban environments. The Greater Hume – Lockhart precinct is generally less urbanised than other precincts, featuring more rural and agricultural land uses.

Localised seasonal traffic variation may be experienced at enhancement sites that share land with agricultural infrastructure (grain silos, livestock loading facilities etc.) as the infrastructure will likely generate additional heavy or farm vehicle movements during harvest seasons as discussed in section 4.2.2.

A review of aerial imagery of enhancement sites in the Greater Hume – Lockhart precinct identified grain silos in the vicinity of the following enhancement sites:

- Culcairn Yard clearances
- Yerong Creek Yard clearances
- Henty Yard clearances
- The Rock Yard clearances.

However, it is not anticipated that seasonal variation would significantly impact the outcomes of the traffic assessment as background and construction vehicle traffic volumes are low.

More detailed assessment of the enhancement site accesses, which would consider seasonal variation due to social events and agricultural movements, will be undertaken by the contractor prior to commencement of construction activities on site. These would include Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans to moderate any potential safety issues.

5.3 WAGGA WAGGA PRECINCT

5.3.1 CONSTRUCTION PROFILE

This section outlines the construction profile for the proposal within the Wagga Wagga precinct. This includes all vehicle routes, as shown in section 5.3.1.2, and all volumes of heavy and light vehicles required for construction of the proposal, as shown in section 5.3.1.3, which includes the vehicles required for the import and export of fill material. It also outlines other construction requirements, such as temporary road closures and diversions, and parking requirements for each enhancement site.

5.3.1.1 CONSTRUCTION PROGRAM

Key construction stages and work durations at each enhancement site within the Wagga Wagga precinct are summarised in Table 5.19 and Figure 5.16.

Table 5.19 Summary of construction stages – Wagga Wagga enhancement sites

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Uranquinty Yard clearances	— Site establishment — Track realignment (>300mm and/or track formation replacement) — Level crossing modification — Rail underbridge modifications — Gantry removal — Demobilisation and landscaping	15 July 2024	24 September 2024	2	Yes
Pearson Street bridge	— Site establishment — Track lowering — Demobilisation and landscaping	15 January 2024	10 April 2025	16	Yes
Cassidy Parade pedestrian bridge	— Site establishment — Pedestrian bridge replacement works — Demobilisation and landscaping	1 February 2024	17 July 2024	6	Yes
Edmondson Street bridge	— Site establishment — Track realignment (<300mm) — Road bridge replacement — Demobilisation and landscaping	20 February 2024	23 December 2024	11	Yes

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Wagga Wagga Station pedestrian bridge	— Site establishment — Gantry works — Pedestrian replacement works — Demobilisation and landscaping	15 January 2025	1 July 2025	6	Yes
Wagga Wagga Yard clearances	— Site establishment — Track realignment (>300mm and/or track formation replacement) — Gantry replacement — Demobilisation and landscaping	1 February 2024	16 April 2024	3	Yes
Bomen Yard clearances	— Site establishment — Track realignment (>300mm and/or track formation replacement) — Demobilisation and landscaping	15 July 2024	24 September 2024	2	Yes

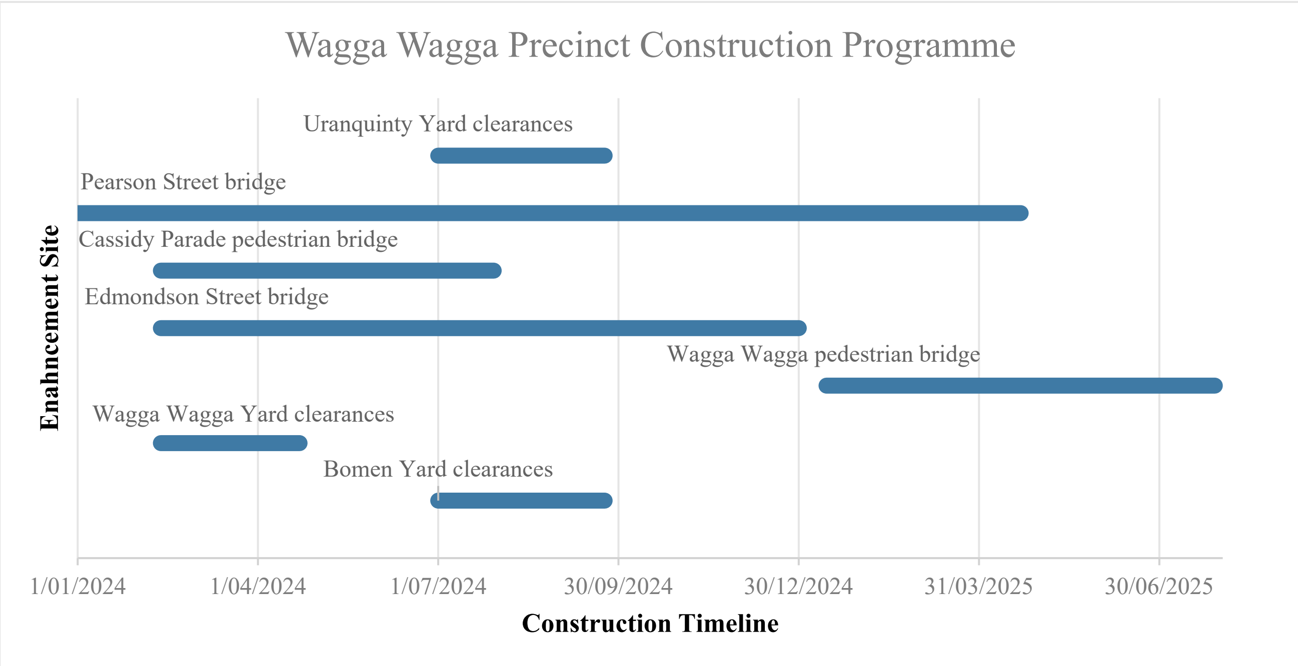


Figure 5.16 Wagga Wagga precinct construction programme

5.3.1.2 CONSTRUCTION AND DIVERSION ROUTES

Proposed construction routes and accesses to enhancement sites in the Wagga Wagga precinct are shown below in Figure 5.17 to Figure 5.21.

Vehicle and pedestrian diversions proposed during construction are as follows:

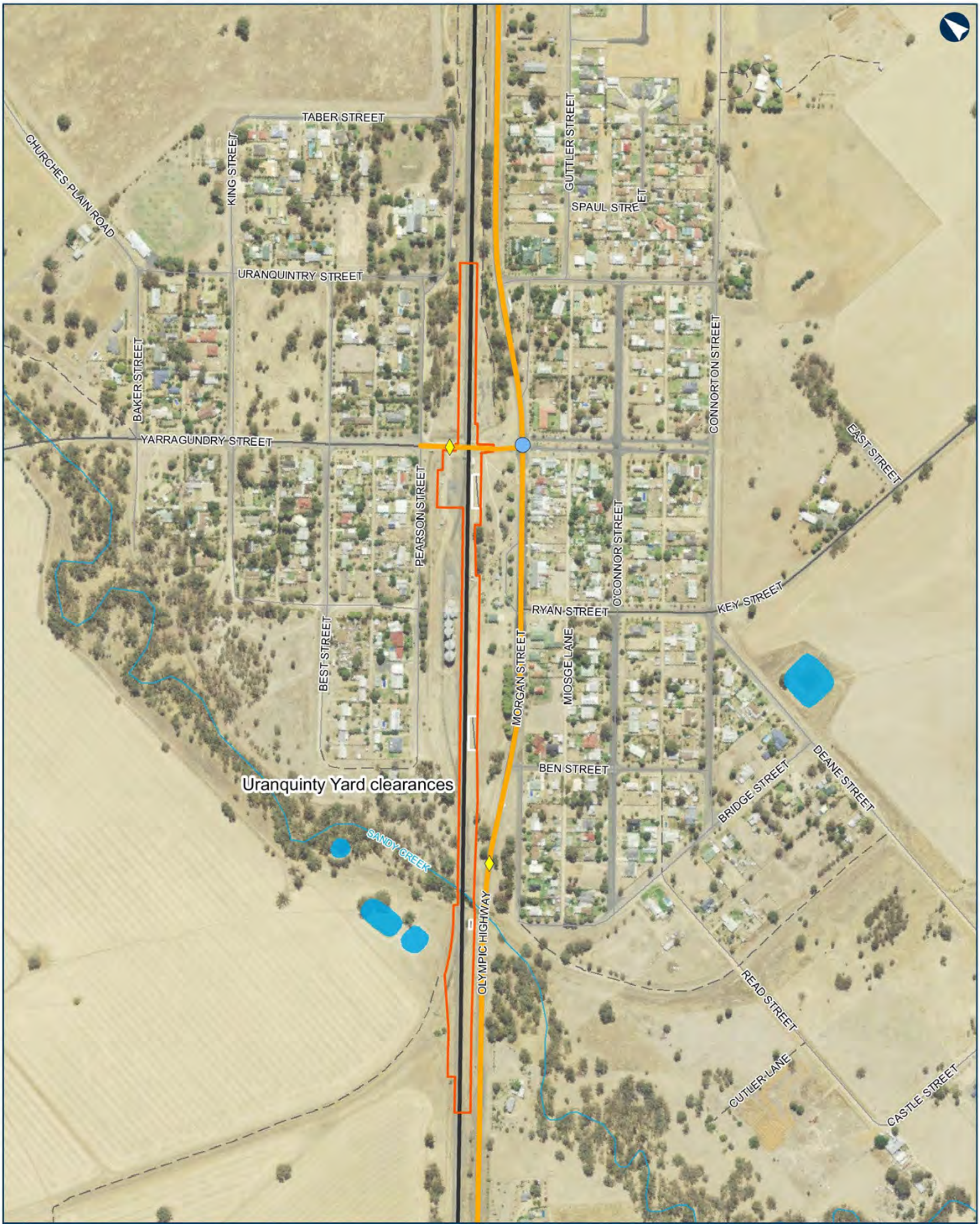
- Uranquinty Yard clearances
  - level crossing works to be completed under traffic control
  - pedestrian access to be maintained.
- Cassidy Parade pedestrian bridge:
  - Cassidy Parade closure. A small area of Cassidy Parade would be closed for a lift pad. No vehicle detour is proposed as access to properties would be maintained.
  - pedestrian detours via Wagga Wagga Station pedestrian bridge (Mothers Bridge) and the Bourke/Docker Street level crossing.
- Edmondson Street bridge
  - Erin Street closure: vehicle detour via Macleay and Coleman streets.
  - Edmondson Street closure: vehicle detour via Docker Street to the west and Lake Albert Road to the east.
  - pedestrian detours via Cassidy Parade pedestrian bridge (when completed) and Wagga Wagga Station pedestrian bridge (Mothers Bridge).
- Wagga Wagga Station pedestrian bridge
  - pedestrian detour via Edmondson Street bridge.

Construction routes have been selected to minimise the use of local roads where possible. However, use of local roads is generally required to facilitate access to enhancement sites. As shown in section 5.3.1.3, construction vehicle volumes using construction routes and accesses on local roads are generally low.

Diversion routes have been selected on roads of the same order where possible. In the instances where diversion routes have been required on roads of a lower order, the requirement for mitigation has been considered.

Mitigations for the use of all road types, including local roads are provided in section 8.2. In addition, mitigation measures have been identified for other assessments, including noise and vibration, visual and social, to address potential impacts from the use of construction and diversion routes.

Where diversions are required for active travel routes, the selected diversion route has considered where pedestrian infrastructure is present. Where cyclists utilise diversion routes, and an existing cycle or shared path is not present, cyclists would be required to cycle on-road. To facilitate access to the rail corridor and surrounds for construction vehicles, including surrounding residences, diversion of pedestrians and cyclists within the proposal site would also be required. Detailed consideration of the management of pedestrian and cyclist safety within the proposal site will be completed prior to and during construction. Mitigation measures, including the requirements for a Traffic Management Plan (TMP), are provided in section 8.2.



Albury to Illabo

Figure 5.17 Construction routes, diversions and site accesses (Uranquinty Yard clearances)

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies

Site access points
Laydown area/compound
Key intersection
Route type
Construction routes

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Albury to Illabo

Figure 5.18 Construction routes, diversions and site accesses (Pearson Street bridge)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 11/11/2021
Paper: A3
Author: WSP
Scale: 1:7,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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Albury to Illabo

Figure 5.19 Construction routes, diversions and site accesses (Edmondson Street closure - Western diversion)

0 50 100 m

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Date: 31/03/2022 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type
- Construction routes
- Diversion routes

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Albury to Illabo

Figure 5.20 Construction routes, diversions and site accesses (Edmondson Street closure - Eastern diversion)

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Albury to Illabo

Figure 5.21 Construction routes, diversions and site accesses (Bomen Yard clearances)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 3/11/2021 Paper: A3
Author: WSP Scale: 1:7,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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5.3.1.3 VEHICLE TYPE AND QUANTITY

Table 5.20 shows the peak hour two-way movements at each site as identified from construction scenario data shown in Chapter 8: Construction of the proposal of the EIS.

Table 5.20 Peak hour construction movements – Wagga Wagga precinct

ENHANCEMENT SITES	VEHICLE TYPES	PEAK HOUR MOVEMENTS	CONSTRUCTION VEHICLE PARKING AND LAYDOWN
Uranquinty Yard clearances	Light Vehicle	27[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	8 in and out	
Pearson Street bridge	Light Vehicle	33[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	3 in and out	
Cassidy Parade pedestrian bridge	Light Vehicle	13[2] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	3 in and out	
Edmondson Street bridge	Light Vehicle	20[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	5 in and out	
Wagga Wagga Station pedestrian bridge	Light Vehicle	13[2] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	3 in and out	
Wagga Wagga Yard clearances	Light Vehicle	27[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	10 in and out	
Wagga Wagga Yard clearances – Docker Street Gantry	Light Vehicle	8 in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	2 in and out	
Bomen Yard clearances	Light Vehicle	27[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	8 in and out	

(1) Possession peak (typically only 13 vehicle movements in a peak period)
(2) Possession peak (typically only 7 vehicle movements in a peak period)

5.3.2 ROAD NETWORK OPERATION

5.3.2.1 URANQUINTY YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Uranquinty Yard clearances enhancement site component of the proposal is shown in Table 5.21. This assessment shows that with construction traffic all road links are expected to operate at LOS B or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.21 Uranquinty enhancement site, construction route road performance

ROAD		2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
Road name	Road type	Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Olympic Highway[1]	Highway	323	A	43	366	A
Uranquinty Street	Urban	27	A	35	62	A
Yarragundry Street	Urban	31	A	35	66	A
Hanging Rock Road	Rural	4	B	35	39	B

(1) No data available, volumes estimated as average of Olympic Highway – Ashmont, 95065 and Olympic Highway – The Rock, 9551

(2) Estimated traffic volume based on road type and surrounding land uses

Note, construction peak hour volumes are higher on Olympic Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked, on a per lane basis, construction route intersection in the Wagga Wagga precinct (excluding the Wagga Wagga Station enhancement sites intersections, which are assessed as part of the Edmondson Street bridge diversion assessment) during peak construction activities was undertaken for the Pearson Street bridge enhancement sites in section 5.3.2.2.

This assessment showed that the expected performance of the intersection with construction traffic was LOS B, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, with the exception of the Wagga Wagga Station enhancement sites diversion assessment, no additional construction route intersection analysis has been undertaken for the Wagga Wagga precinct enhancement sites.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Uranquinty Yard clearances enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Uranquinty Yard clearances enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.3.2.2 PEARSON STREET BRIDGE ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Pearson Street bridge enhancement site component of the proposal is shown in Table 5.22. This assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected. With construction traffic, road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002), with the exception of Fernleigh Road, which operates at LOS D (close to the limit of stable flow). However, the assessment shows that this condition would occur both with and without construction traffic, and that no significant impacts to road operation and performance from the existing are expected as a result of construction activities.

Table 5.22 Pearson Street bridge, construction route road performance

ROAD		**2024 PEAK HOUR**		**2024 WITH CONSTRUCTION PEAK HOUR**		
Road name	**Road type**	**Volume – one way**	**LOS**	**Construction volume – one way**	**Combined volume – one way**	**LOS**
Edward Street (Sturt Highway) [1]	Urban	1,013	B	36	1,049	B
Moorong Street (Olympic Highway)[1]	Highway	1,003	C	39	1,042	C
Pearson Street [1]	Urban	954	B	36	990	B
Urana Street [1]	Urban	518	C	36	554	C
Cheshire Street[2]	Urban	48	A	36	84	A
Alan Turner Depot Access Road[3]	Urban	101	A	36	137	A
Fernleigh Road [1]	Urban	665	D	36	701	D

(1) 10-hour traffic volumes (5am–10am and 2pm–7pm)
(2) No data available, volumes estimated as 5% of Pearson Street 10-hour
(3) Estimate traffic volume based on road type and surrounding land uses

Note, construction peak hour volumes are higher on Moorong Street (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

The intersection of Edward Street and Pearson Street have the highest traffic volumes in the Wagga Wagga precinct on a per lane basis (excluding the Wagga Wagga Station enhancement sites, which are assessed as part of the Edmondson Street bridge diversion assessment).

Therefore, the Edward Street/Pearson Street intersection has been assessed in SIDRA to reflect a 'worst-case' scenario of construction vehicle impact at an intersection within the Wagga Wagga precinct. The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

Figure 5.22 shows the layout of the Edward Street and Pearson Street intersection as modelled in SIDRA.

The highest peak hour turning volumes at the Edward Street and Pearson Street intersection have been taken from a traffic survey at the intersection in 2021 and forecast 2024 volumes have been derived using a 3 per cent per year compounding growth rate. The traffic survey determined that the AM peak hour was the highest trafficked peak period at this intersection, as such the AM peak hour is the subject of this intersection assessment.

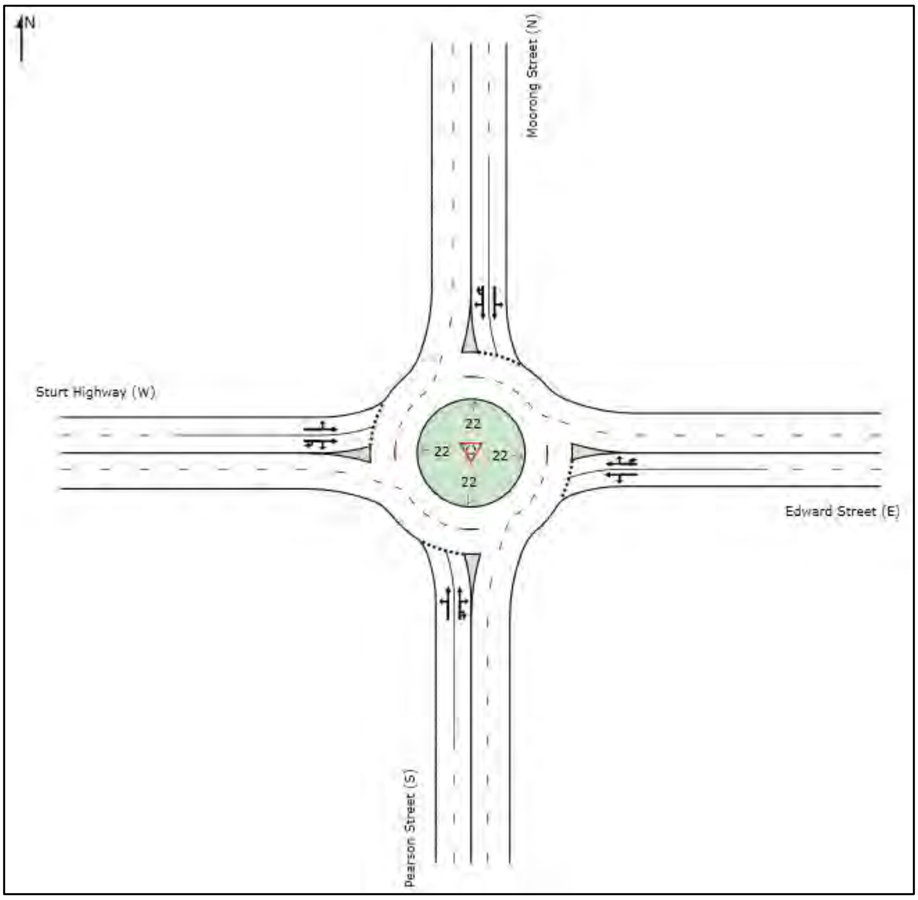

Figure 5.22 Edward Street and Pearson Street

Table 5.23 shows the SIDRA results for the Edward Street and Pearson Street intersection during a 2024 peak hour with and without construction vehicles. The results show the performance of the intersection is not significantly impacted by construction vehicles: LOS continues operates at an acceptable level (LOS B), DOS only increases from 0.682 – 0.701, intersection delay only increases by one second, and 95th percentile queue lengths only increases by 2m (approx. one vehicle). 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles.

Table 5.23 Edward Street and Pearson Street, 2024 construction route intersection capacity – AM Peak

	2024 AM PEAK HOUR				2024 AM PEAK HOUR WITH CONSTRUCTION			
Approach	**DOS**	**Delay (s)**	**LOS**	**95th %ile queue (m)**	**DOS**	**Delay (s)**	**LOS**	**95th %ile queue (m)**
South: Pearson Street (S)	0.576	10	LOS B	32	0.579	10	LOS B	33
East: Edward Street (E)	0.368	10	LOS B	17	0.386	10	LOS B	18
North: Moorong Street (Olympic Highway)(N)	0.682	13	LOS B	47	0.701	13	LOS B	49
West: Sturt Highway (W)	0.563	12	LOS B	29	0.578	12	LOS B	30
Intersection	0.682	11	LOS B	47	0.701	12	LOS B	49

As the Edward Street and Pearson Street intersection is reflective of the 'worst case' construction vehicle impact at a construction route intersection without diversion traffic in the Wagga Wagga precinct, it is not considered that the performance of any other construction route intersection within the precinct would be significantly impacted by construction vehicles alone. Further intersection analysis is presented as component of the Edmondson Street bridge closure diversions assessment to understand the impacts of diverted traffic flows on the surrounding road network.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Pearson Street bridge work site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Pearson Street bridge enhancement site would be provided within the construction site area or unused parts of the Wagga Wagga Showgrounds and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.3.2.3 WAGGA WAGGA WAGGA STATION AND SURROUNDS ENHANCEMENT SITES

The enhancement sites in the vicinity of the Wagga Wagga Station share the same road network and have been combined in the following section, for:

- Cassidy Parade pedestrian bridge enhancement site
- Edmondson Street bridge enhancement site
- Wagga Wagga Station pedestrian bridge enhancement site
- Wagga Wagga Yard clearances enhancement site.

ROAD PERFORMANCE

The link LOS assessment for the Wagga Wagga Wagga Station and surrounds enhancement sites component of the proposal is shown in Table 5.24. This road performance assessment excludes road links expected to be used as diversion routes during the Edwardson Street Bridge closure (addressed within the Edmondson Street bridge closure diversion assessment for cumulative construction and the diversion traffic). As the enhancement sites within this area are likely to use similar access routes, the combined highest construction traffic volumes generated by Cassidy Parade pedestrian bridge, Edmondson Street bridge and Wagga Wagga Yard clearances enhancement sites during possessions has been used to assess potential impacts to construction access routes. This assessment shows that with construction traffic all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002).

The assessment shows a change in LOS as a result of the construction generated traffic on Brookong Street and Fox Street from LOS A to LOS B. However, it is noted that these streets are short streets serving a local access function with limited through traffic potential, LOS B still represents stable traffic flow with drivers having reasonable freedom to choose their desired speed, and that the change does not suggest that a significant impact to road operation and performance is expected.

Table 5.24 Wagga Wagga Wagga Station and surrounds enhancement sites, construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR VEHICLES – ONE-WAY		2024 PEAK HOUR WITH CONSTRUCTION VEHICLES – ONE WAY		
		Volume	LOS	Construction volume	Combined volume	LOS
Edward Street (Sturt Highway) [1]	Urban	1,096	B	100	1,196	B
Fox Street [2]	Urban	895	A	100	995	B
Mitchelmore Street [1]	Urban	38	A	100	138	A
Edmondson Street [1]	Urban	563	A	100	663	A
Norman Street [3]	Urban	795	A	100	895	A
Coleman Street [1]	Urban	38	A	100	138	A
Cassidy Parade [4]	Urban	382	C	100	482	C
Erin Street [5]	Urban	76	A	100	176	A
Station Place [6]	Urban	52	A	100	152	A
Brookong Avenue [7]	Urban	182	A	100	282	B

(1) 10-hour (5am to 10am and 2pm to 7pm) traffic survey volumes
(2) No data available, volumes estimated as Norman Street 10-hour
(3) No data available, volumes estimated as 50% of Cassidy Street 10-hour
(4) No data available, volumes estimated as 20% of Coleman Street 10-hour
(5) No data available, volumes estimated as 10% of Urana Street 10-hour
(6) No data available, volumes estimated as Smollett Street, Albury 10-hour
(7) No data available, volumes estimated as 10% of Edward Street 10-hour

INTERSECTION PERFORMANCE

SIDRA intersection analysis was undertaken as a component of the diversion assessment associated with the Edmondson Street bridge Closure to assess the cumulative impact of diverted vehicles and construction vehicles to intersection performance in central Wagga.

As vehicle diversions are proposed to be in place for the majority of the construction period in this area (nine months closure of Edmondson Street bridge out of 11 months of construction activities at the enhancement site), it has not been deemed necessary to assess the impact of solely construction vehicles on intersection performance when diversions would not be in place. It is expected that during this period the impact to intersection performance within Wagga Wagga would be minimal (a total of 100 construction vehicles during a peak hour).

The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background and diversion traffic as a worst-case scenario as is considered a worst case scenario as construction start and finish times end outside of typical peak periods. The results of the assessment are discussed in the sections below.

TEMPORARY CLOSURES AND DIVERSIONS

The reconstruction of the Edmondson Street bridge would require a road closure on both Edmondson Street and Erin Street for a nine month period. Based on traffic counts procured as part of this study and extrapolated to the construction year of 2024 (at a 3 per cent compounding per annum growth rate) this diversion is expected to impact over 11,000 vehicles per day travelling on Edmondson Street. The road closures would require traffic diversions (as shown in Figure 5.23) for:

- Mitchelmore Street/Edmondson Street traffic:
  - traffic to/from the west and 50 per cent of the through movements on Edmondson Street assumed to be rerouted to the west via Urana Street, Docker Street, Bourke Street, and Edward Street
  - traffic to/from the east and 50 per cent of the through movements on Edmondson Street assumed to be rerouted to the east via Urana Street, MacLeay Street, Railway Street and Lake Albert Road.

It is noted that in the absence of origin-destination data for the area, the assessment of this diversion has assumed a worst-case scenario where all traffic rerouted from Edmondson Street would use the specified diversion routes.

Local traffic that currently uses Erin Street would be diverted via Coleman Street or Railway Street. Based on surrounding land uses and network connectivity, this traffic and associated impacts are expected to be minimal as only a few houses are located on the street, and as such it has not been assessed.

The assumed diversion routes have been selected to minimise impacts to the road network by using higher order roads for diverted traffic. The diversion routes have also been selected based on the shortest route available and the lowest amount of turning movements required. Road Safety Audits and Construction Traffic Transport and Access Management Plans would be undertaken by the contractor prior to commencement of diversionary routes. Note, use of diversionary routes cannot be completely controlled and would be subject to road user decisions.

Albury to Illabo

Figure 5.23 Edmondson Street closure vehicle diversions

0 100 200 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:8,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies

Route type

- Route to be diverted (road closure)
- Diversion routes due to road closure

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ROAD PERFORMANCE

The link LOS assessment for the Edmondson Street bridge diversion is shown in Table 5.25 which details a worst case assessment of road performance during the AM peak hour (the heaviest traffic peak period) including both peak construction vehicles (where applicable) and peak hour diverted vehicles.

The assessment shows that a change in link LOS is seen on all roads under assessment as a result of the diversions and construction traffic. However, impacts outside of the peak hours are anticipated to be less. Moreover, the diversionary period is temporary. LOS is expected to be restored to existing levels following the end of the diversionary period. Furthermore, it is noted that, as the diversions are proposed to occur over a ten-month (231 working days) period it is expected that a proportion of diverted vehicles may seek alternative routes to the proposed diversions across the broader network, particularly for those trips that would travel on diversion routes but that do not cross the rail line. This potential redistribution of diverted vehicles would likely reduce the impact to link LOS shown in Table 5.25 and distribute the impacts of diverted traffic more proportionally across Wagga Wagga. This effect is discussed further in Summary of diversion impacts. Moreover, as discussed in section 8.2 traffic mitigation measures will be put in place to reduce the impact of the diversions during this temporary period, including consideration of temporary changes to signal phasing to improve LOS.

Table 5.25 Edmondson Street bridge, diversion routes road performance assessment

ROAD		**2024 PEAK HOUR ONE-WAY**		**2024 WITH DIVERSION PEAK HOUR ONE-WAY**			
Road name	**Road type**	**Volume**	**LOS**	**Construction volume**	**Diverted volume**	**Combined volume**	**LOS**
Edward Street	Urban	1,096	B	100	417 [2]	1613	C
Docker Street and Bourke Street	Urban	895	A	100	417 [2]	1412	C
Urana Street[1]	Urban	518	C	100	417 [2]	1035	E
MacLeay Street[1]	Urban	182	A	100	447 [3]	729	D
Railway Street[1]	Urban	182	A	100	447 [3]	729	D
Lake Albert Road	Urban	815	A	100	447 [3]	1362	B

(1) one-lane in each direction (lower capacity than two lane roads)
(2) highest traffic volume on Edmondson Street (northbound) to be diverted to the west (one-way)
(3) highest traffic volume on Edmondson Street (northbound) to be diverted to the east (one-way)

INTERSECTION PERFORMANCE

The traffic diversions assumed for the replacement of the Edmondson Street bridge uses several intersections through Wagga Wagga. To identify intersections where significant impacts may occur as a result of the diversions and where further analysis was required, a qualitative assessment was undertaken based on changes to traffic volumes and opposing traffic flows from the diversions at each intersection. The results are shown in Table 5.26.

Table 5.26 Diversion intersection impacts – Edmondson Street bridge enhancement site

INTERSECTION	DESCRIPTION OF TRAFFIC FLOW CHANGE DURING DIVERSION	EXPECTED TRAFFIC IMPACT
Edward Street / Best Street / Edmondson Street	Changed turn movement proportions, reduced vehicles travelling to/from Edmondson Street	Minimal impact/improvement expected due to overall vehicle volumes at the intersection remaining constant/potentially reducing.
Edward Street / Docker Street	Significant increased turning movements	Potential for significant delays for vehicles turning in/out of Docker Street
Docker Street/Coleman Street/ Bourke Street	Increased through movements on Docker Street	Potential delays for vehicles turning in/ out of Coleman Street.
Bourke Street/Urana Street	Significant increased turning movements	Potential significant delays for vehicles turning in/out of Urana Street and Bourke Street.
Urana Street/Mitchelmore Street	Redistributed turn movements but no increase to overall traffic volumes at the intersection.	Minimal impact expected due to overall vehicle volumes at the intersection remaining constant.
Coleman Street/Edmondson Street/ Mitchelmore Street	Decreased through movements.	Potential increase in intersection performance.
Urana Street/MacLeay Street	Significant increased turning movements	Potential significant delays for vehicles turning in/out of Urana Street and MacLeay.
MacLeay Street/Coleman Street	Increased through movements on MacLeay Street	Potential delays for vehicles on MacLeay Street.
Lake Albert Road/Railway Street	Significant increased turning movements	Potential significant delays for vehicles turning in/out of Lake Albert Road and Railway Street.
Edward Street / Lake Albert Road	Significant increased turning movements	Potential significant delays for vehicles turning in/out of Lake Albert Road and Railway Street.

As a result of the qualitative assessment in Table 5.26, some intersections are expected to perform adequately during the diversion period, while the following intersections were identified as the most likely to be significantly impacted by the proposal:

— Edward Street/Docker Street intersection
— Bourke Street/Urana Street intersection
— Urana Street/MacLeay Street intersection
— Lake Albert Road/Railway Street intersection
— Edward Street/Lake Albert Road intersection.

These intersections have been assessed in SIDRA to determine the impacts of the proposal to intersection performance. Traffic surveys undertaken in 2021 have been used to determine the highest peak hour turning volumes at these intersections. The peak hour turning volumes have been forecast to 2024 volumes using a 3 per cent per year compounding growth rate for the without proposal analysis. The peak hour diverted traffic volumes (those currently crossing Edmondson Street bridge) and construction vehicles, were allocated to the appropriate turn movements on the diversionary routes for the with proposal analysis. The traffic survey determined that the AM peak hour was the highest trafficked peak period at these intersections, as such the AM peak hour is the subject of this intersection assessment.

EDWARD STREET / DOCKER STREET INTERSECTION

Figure 5.24 shows the layout of the Edward Street/Docker Street intersection as modelled in SIDRA.

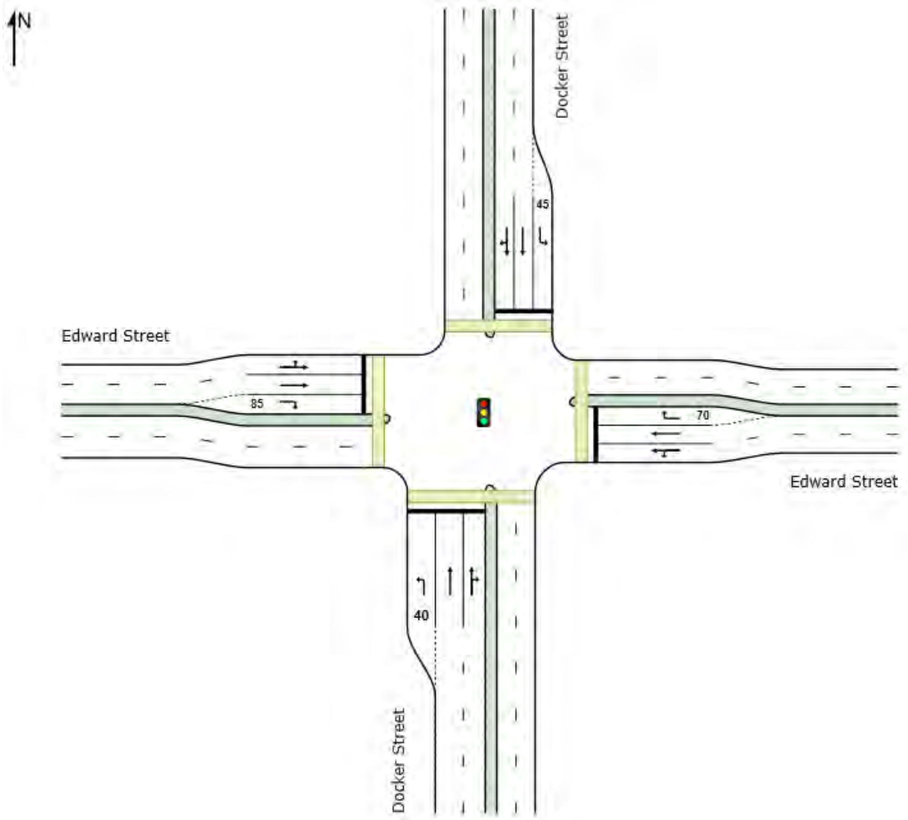

Figure 5.24 Edward Street/Docker Street SIDRA intersection layout

Table 5.27 shows the SIDRA results for the Edward Street/Docker Street intersection during a 2024 peak hour with and without diversions or construction vehicles. The results show that the intersection would operate at a DOS of (0.924) without construction or diverted vehicles. With the construction and diverted vehicles the DOS of the intersection increases from 0.924 to 1.034, and average delay increases by approximately 1 minute per vehicle, increasing the LOS from an LOS D to LOS F. 95th percentile queue lengths are also shown to increase (a maximum of 452m) as a result of the diversion. These increases to queue lengths would potentially impact the performance of adjacent intersections on Docker Street and Edward Street.

Table 5.27 Edward Street/Docker Street, 2024 SIDRA analysis – AM Peak

	2024 AM PEAK HOUR				**2024 AM PEAK HOUR WITH CONSTRUCTION + DIVERSION**			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: Docker Street	0.924	52	LOS D	171	1.034	102	LOS F	452
East: Edward Street	0.719	38	LOS D	102	1.042	122	LOS F	390
North: Docker Street	0.893	50	LOS D	97	1.056	123	LOS F	199
West: Edward Street	0.919	54	LOS D	165	1.052	88	LOS F	205
Intersection	0.924	49	LOS D	171	1.056	107	LOS F	452

Note, this assessment of intersection performance with construction and diverted vehicles is considered to be a ‘worst-case’ assessment and it is expected that a proportion of vehicles would seek alternative routes to avoid this congested intersection, particularly for those trips that would travel on diversion routes but that do not cross the rail line. This potential redistribution of diverted vehicles would likely reduce the impact to intersection performance shown in Table 5.27 and distribute the impact of diversions more proportionally across the broader network.

Moreover, the assessment of a peak hour is not reflective of intersection performance across a day, which during off-peak periods, is likely to operate more optimally with lower vehicle volumes than seen during a peak hour. Furthermore, to provide a conservative assessment, peak construction vehicles have been assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour.

Furthermore, as discussed in section 8.2 traffic mitigation measures will be put in place to reduce the impact of the diversions during this temporary period, including consideration of temporary changes to signal phasing to improve LOS.

It should be noted that the diversionary period is temporary, and that LOS is expected to be restored to existing levels following the end of the diversionary period.

BOURKE STREET / URANA STREET INTERSECTION

Figure 5.25 shows the layout of the Bourke Street/Urana Street intersection as modelled in SIDRA.

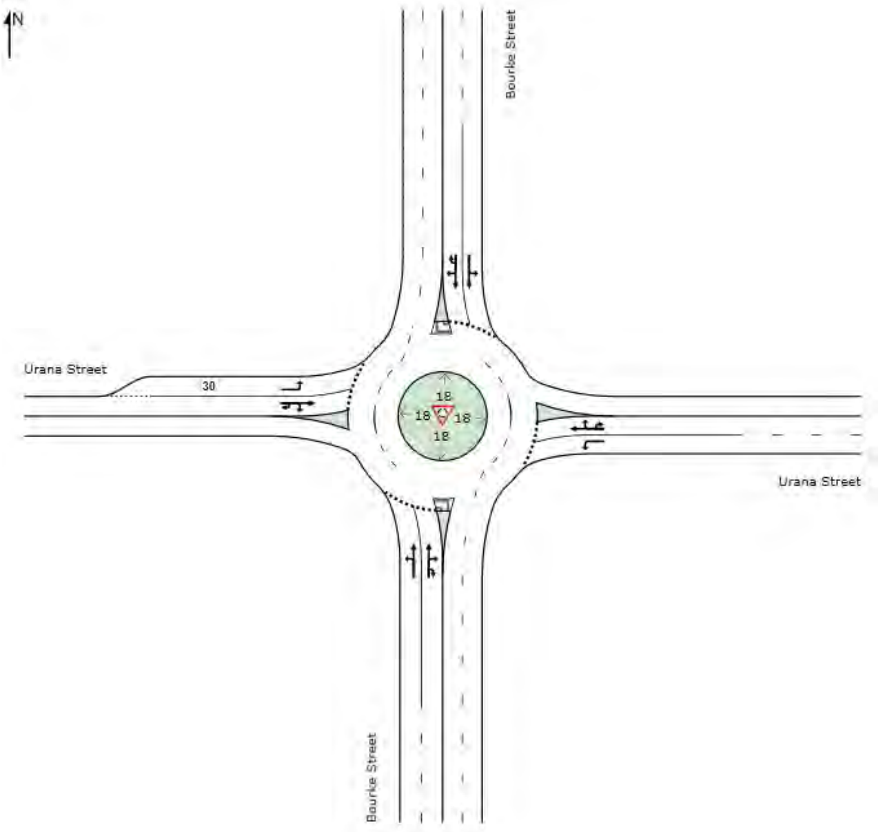

Figure 5.25 Bourke Street/Urana Street SIDRA intersection layout

Table 5.28 shows the SIDRA results for the Bourke Street/Urana Street intersection during a during a 2024 peak hour with and without construction and diverted vehicles. The results show that the intersection operates at LOS A and with 95th percentile queues up to 30m without construction or diverted vehicles. With construction and diverted vehicles, the intersection operates at a DOS over 1. Most roads do not see a significant increase in LOS, delay or queuing, in some instances delay decreases. However, the Bourke Street south approach increases from LOS A to LOS F, with 102 seconds of increased delay and significant increases in queuing due to the large increase in diverted traffic on the east approach which has priority. The increases in 95th queue lengths on the south, east and north approaches will potentially impact the performance of adjacent intersections on Bourke Street and Urana Street.

This changes the overall intersection LOS from LOS A to LOS D. The high DOS, delay, and queue length suggests that the south approach will incur the greatest impact.

Table 5.28 Bourke Street/Urana Street, 2024 construction route intersection capacity – AM Peak

	2024 AM PEAK HOUR				**2024 AM PEAK HOUR WITH CONSTRUCTION + DIVERSION**			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: Bourke Street	0.501	9	LOS A	30	1.039	111	LOS F	296
East: Urana Street	0.478	7	LOS A	20	0.911	19	LOS B	140
North: Bourke Street	0.213	7	LOS A	10	0.375	7	LOS A	20
West: Urana Street	0.426	8	LOS A	17	0.621	16	LOS B	30
Intersection	0.501	8	LOS A	30	1.039	41	LOS D	296

Note, this assessment of intersection performance with construction and diverted vehicles is considered to be a worst-case assessment and it is expected that a proportion of vehicles would seek alternative routes to avoid the Bourke Street south approach, particularly for those trips that would travel on diversion routes but that do not cross the rail line. This potential redistribution of diverted vehicles would likely reduce the impact to intersection performance shown in Table 5.28 and distribute the impact of diversions more proportionally across the broader network.

Moreover, the assessment of a peak hour is not reflective of intersection performance across a day, which during off-peak periods, is likely to operate more optimally with lower vehicle volumes than seen during a peak hour. Furthermore, to provide a conservative assessment, peak construction vehicles have been assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour.

It should be noted that the diversionary period is temporary, and that LOS is expected to be restored to existing levels following the end of the diversionary period.

URANA STREET / MACLEAY STREET INTERSECTION

Figure 5.26 shows the layout of the Urana Street/MacLeay Street intersection as modelled in SIDRA.

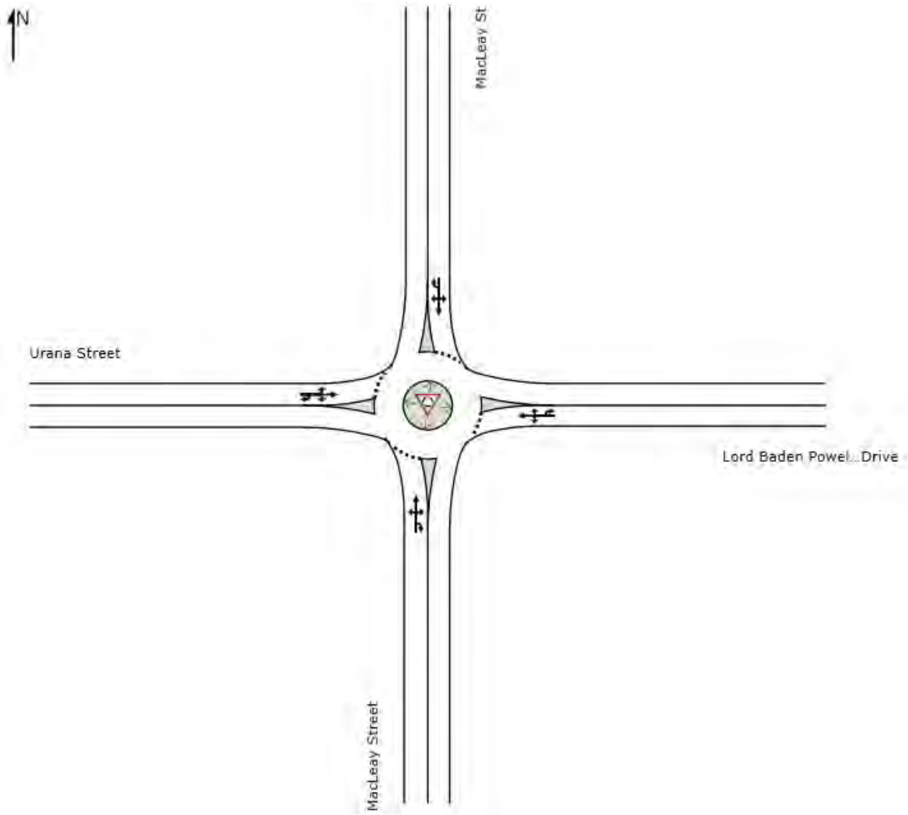

Figure 5.26 Urana Street/MacLeay Street SIDRA intersection layout

Table 5.29 shows the SIDRA results for the Urana Street/MacLeay Street intersection during a 2024 peak hour with and without diversions or construction vehicles. The results show that the intersection would operate at LOS A and with low levels of queuing and delay with and without construction and diverted vehicles. The increases in 95th queue lengths do not extend into any adjacent intersections on Bourke Street or MacLeay Street.

Table 5.29 Urana Street/MacLeay Street, 2024 SIDRA analysis – AM Peak

	2024 AM PEAK HOUR				2024 AM PEAK HOUR WITH CONSTRUCTION + DIVERSION			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: MacLeay St	0.221	6	LOS A	9	0.235	7	LOS A	9
East: Lord Baden Powell Drive	0.129	7	LOS A	5	0.137	7	LOS A	5
North: MacLeay St	0.195	6	LOS A	8	0.248	7	LOS A	12
West: Urana Street	0.132	6	LOS A	5	0.597	7	LOS A	38
Intersection	0.221	6	LOS A	9	0.597	7	LOS A	38

LAKE ALBERT ROAD / RAILWAY STREET INTERSECTION

Figure 5.27 shows the layout of the Lake Albert Road/Railway Street intersection as modelled in SIDRA.

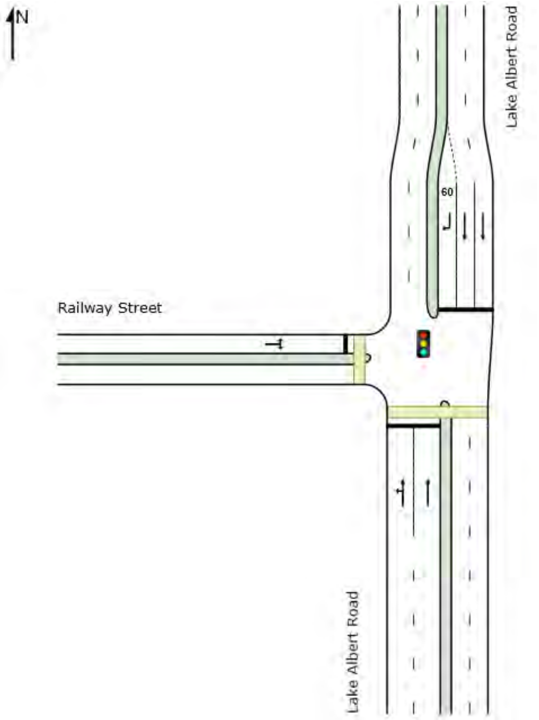

Figure 5.27 Lake Albert Road/Railway Street SIDRA intersection layout

Figure 5.28 shows the phasing modelled for the Lake Albert Road/Railway Street intersection in SIDRA. This phasing has been adopted in the with and without construction traffic to provide a comparative assessment of impacts.

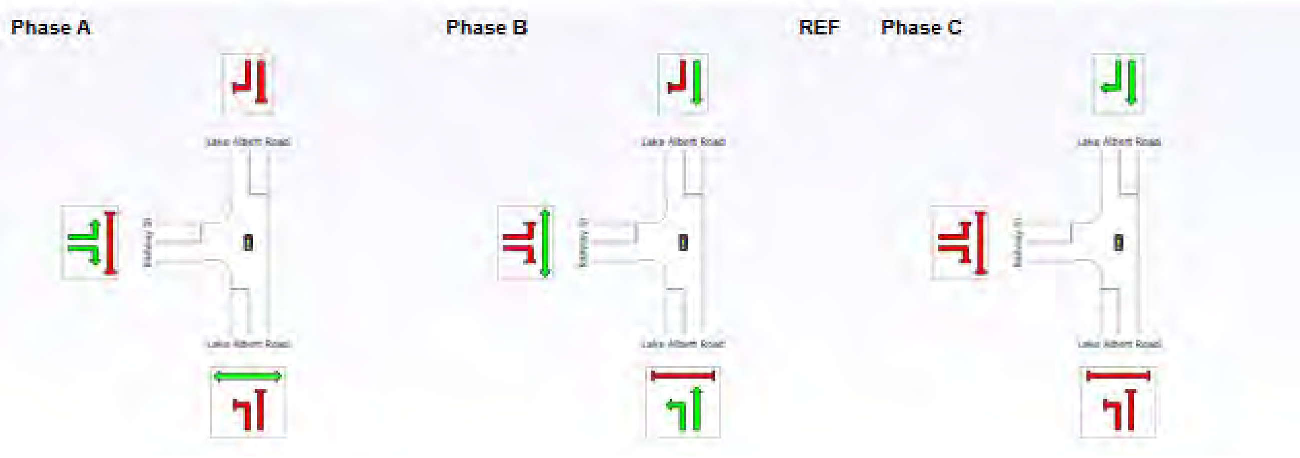

Figure 5.28 Lake Albert Road/Railway Street SIDRA phasing

Table 5.30 shows the SIDRA results for the Lake Albert Road/ Railway Street intersection during a 2024 peak hour with and without construction and diversion vehicles.

The results show that the intersection LOS would increase from LOS B to LOS E, and average delay would increase by 51 seconds with the addition of construction and diversion vehicles. There would also be increases to queuing on all approaches with additional construction vehicles and diverted vehicles, particularly on Railway Street where 95th percentile queues increase by almost 300 metres. The increases in 95th queue lengths do not extend into any adjacent intersections on Lake Albert Street/ Railway Street.

Table 5.30 Lake Albert Street/ Railway Street, 2024 SIDRA analysis – AM Peak

	2024 AM PEAK HOUR				2024 AM PEAK HOUR WITH CONSTRUCTION + DIVERSION			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: Lake Albert Road	0.738	18	LOS B	87	1.004	79	LOS E	239
North: Lake Albert Road	0.564	12	LOS B	23	0.914	31	LOS C	81
West: Railway St	0.748	29	LOS C	46	1.004	82	LOS F	345
Intersection	0.748	18	LOS B	87	1.004	69	LOS E	345

Note, this assessment of intersection performance with construction and diverted vehicles is considered to be a 'worst-case' and it is expected that a proportion of vehicles would seek alternative routes to avoid this congested intersection, particularly for those trips that would travel on diversion routes but that do not cross the rail line. This potential redistribution of diverted vehicles would likely reduce the impact to intersection performance shown in Table 5.30 and distribute the impact of diversions more proportionally across the broader network.

Moreover, the assessment of a peak hour is not reflective of intersection performance across a day, which during off-peak periods, is likely to operate more optimally with lower vehicle volumes than seen during a peak hour. Furthermore, to provide a conservative assessment, peak construction vehicles have been assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour.

Furthermore, as discussed in section 8.2 traffic mitigation measures will be put in place to reduce the impact of the diversions during this temporary period, including consideration of temporary changes to signal phasing to improve LOS.

It should be noted that the diversionary period is temporary, and that LOS is expected to be restored to existing levels following the end of the diversionary period.

EDWARD STREET / LAKE ALBERT ROAD INTERSECTION

Figure 5.29 shows the layout of the Edward Street/Lake Albert Road intersection as modelled in SIDRA.

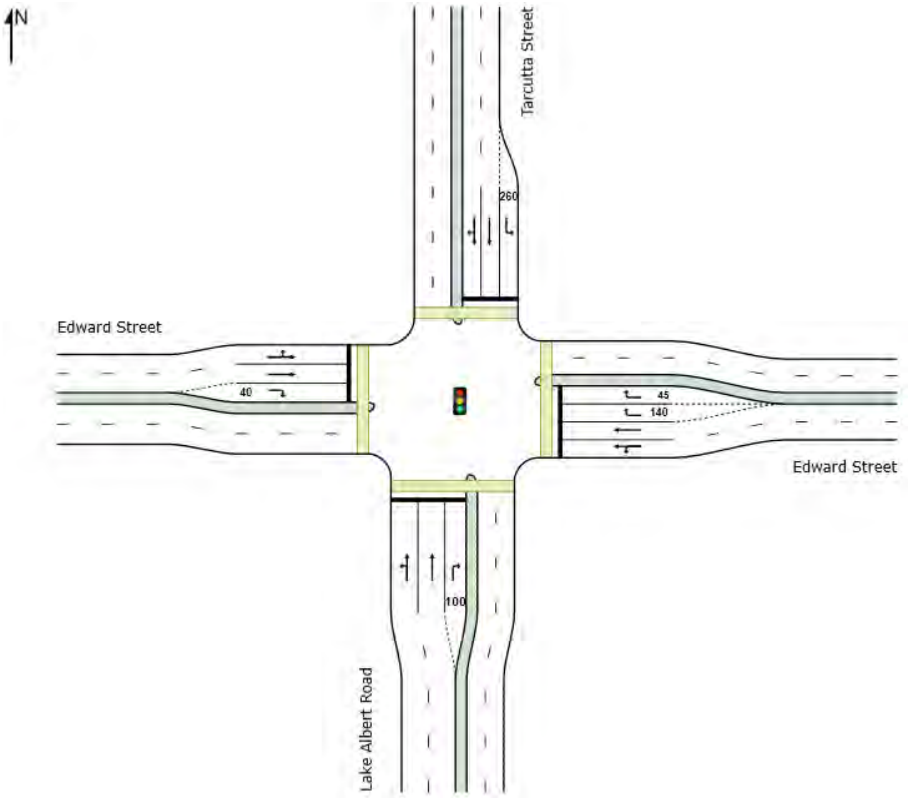

Figure 5.29 Edward Street/Lake Albert Road SIDRA intersection layout

Table 5.31 shows the SIDRA results for the Edward Street/Lake Albert Road intersection during a 2024 peak hour with and without construction and diversion vehicles. Other than the change of LOS from C to D on Edward Street, the results show that the intersection would operate with the same LOS (D) with and without construction and diversion vehicles. There are some increases to queuing and delay on all approaches.

Table 5.31 Edward Street/Lake Albert Road, 2024 SIDRA analysis – AM Peak

	2024 AM PEAK HOUR				2024 AM PEAK HOUR WITH CONSTRUCTION + DIVERSION			
Approach	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**	**DOS**	**Delay (s)**	**LOS**	**Queue (m)**
South: Lake Albert Road	0.71	36	LOS D	102	0.903	49	LOS D	178
East: Edward Street	0.65	33	LOS C	99	0.733	38	LOS D	109
North: Tarcutta Street	0.661	41	LOS D	61	0.691	41	LOS D	70
West: Edward Street	0.745	37	LOS D	119	0.841	45	LOS D	135
Intersection	0.745	36	LOS D	119	0.903	44	LOS D	178

DAILY PROFILE

Figure 5.30 shows the daily (24hr) vehicle profile of the Edmonson Street/Mitchelmore Street/Coleman Street intersection in Wagga Wagga. The daily profile has two distinctive peaks; 08:00-09:00 (AM peak) and 15:00-16:00 (PM peak).

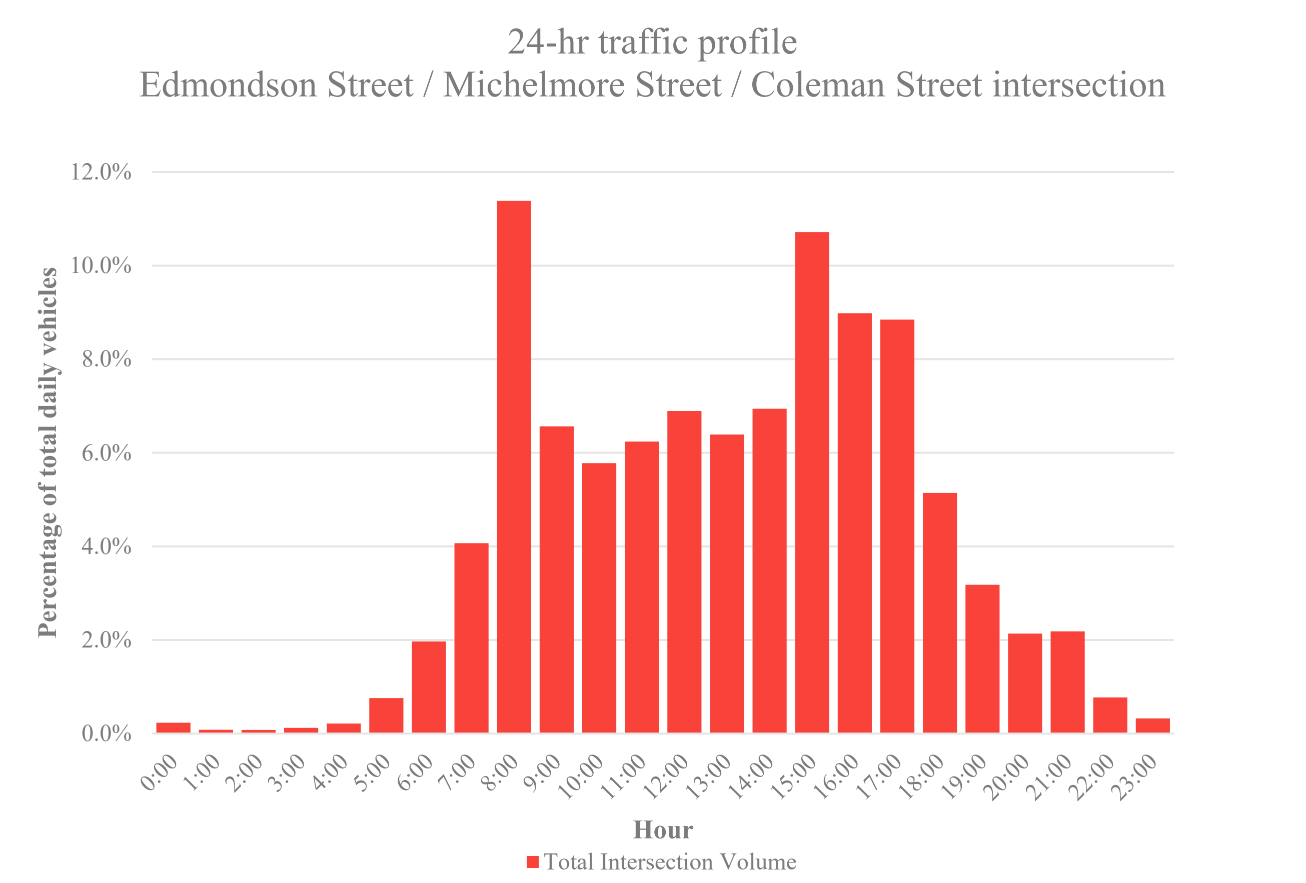

Figure 5.30 Daily (24hr) traffic profile – Edmondson Street/Mitchelmore Street/Coleman Street intersection

The traffic profile is representative of a typical intersection in an urban environment. The AM peak aligns with typical travel to work and school drop off times and the PM peak aligns with typical school pick-up times. All intersections assessed for the Wagga Wagga diversion are located in the vicinity of this intersection. As such, the daily profile is considered representative of all daily traffic profiles within the Wagga Wagga diversionary area, including diverted vehicle volumes.

Figure 5.30 shows the hourly volumes between the AM and PM peaks are approximately 60 per cent of the peak hour volumes. Hourly volumes prior to the AM peak and post the PM peak rapidly diminish to relatively low volumes. Therefore, it is not expected that the levels of link and intersection performance shown during the peak hour (temporary) diversions would be experienced outside of the peak hours.

TRAVEL TIME

Figure 5.31 shows that the western diversion would take approximately six minutes of additional travel time under existing road conditions. As shown in Table 5.27 and Table 5.28, with the proposed diversions and construction vehicles, there is a potential three minutes of additional delay along this route. As a result, the potential increase in travel time on the western diversion route is approximately nine minutes during the heaviest trafficked peak period. This additional travel time is a worst case scenario assuming an origin and destination immediately adjacent to the Edmondson Bridge closure. It is noted that outside of peak hours, intersection delay would be less, and that this assessment of additional diversion travel time represents a worst-case assessment.

Figure 5.32 shows that the eastern diversion would take approximately eight minutes of additional travel time under existing road conditions. As shown in Table 5.29 and Table 5.30, with the proposed diversions and construction vehicles, there is a potential one minute of additional delay along this route. As a result, the potential increase in travel time on the eastern diversion route is approximately nine minutes during the heaviest trafficked peak period. This additional travel time is a worst-case scenario assuming an origin and destination immediately adjacent to the Edmondson bridge closure. It is noted that outside of peak hours, intersection delay would be less, and that this assessment of additional diversion travel time represents a worst-case assessment.

Albury to Illabo

Figure 5.31 Wagga Wagga western diversion travel time impacts

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:5,000
Data Sources: ARTC, NSWSS

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Albury to Illabo Figure 5.32 Wagga Wagga eastern diversion travel time impacts

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:6,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Travel time impacts (distance, time delay)

INLAND RAIL ARTC

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SUMMARY OF DIVERSION IMPACTS

The assessment of Edmondson Street bridge traffic diversions has shown that some intersections are significantly impacted, whilst others are not.

It should be noted that the assessment of intersection performance is a worst-case assessment, and it is expected that a proportion of vehicles would seek alternative routes away from significantly impacted intersections, particularly for residents of suburbs south of the rail line such as Tolland and Mount Austin who may divert via Red Hill Road or Kooringal Road to access the Sturt Highway. This potential redistribution of vehicles would likely reduce the effects of diversions on the most heavily impacted intersections and spread the impact more proportionally across the broader network. Furthermore, as noted in section 8.2, consideration will be given to temporary changes to signal phasing at intersections along the traffic diversion routes, to mitigate performance impacts during the Edmondson Road bridge closure.

There are only a limited number of rail crossing opportunities in Wagga Wagga through which the diverted vehicles can cross the rail line, and as such these crossings will see an increase in traffic volume during the diversion period. Note that all rail crossings in Wagga Wagga that have not been assessed for diversion impacts are free-flowing infrastructure such as underpasses or overpasses and as such there will be no additional delay encountered at these rail crossings due to diverted traffic. Furthermore, the conservative approach to the road performance assessment of diversion routes (applying peak construction traffic numbers to peak background traffic numbers) has shown that most links in the study area perform acceptably during the diversion period.

Note, the assessment of a peak hour is not reflective of intersection performance across a day, which during off-peak periods is likely to operate more optimally with lower vehicle volumes than seen during a peak hour. Furthermore, following the end of the construction period, intersection performance will return to pre-construction levels.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Wagga Wagga Station precinct enhancement sites within the proposal site and so would have minimal impact to existing parking facilities.

During the nine-month closure of Edmondson Street, existing school drop off areas on Edmondson Street adjacent to Kildare Catholic College would remain viable as parents would be able to drop off their children and undertake a U turn movement at the closure on the east and west side of Edmondson Street controlled by onsite traffic management. Access to the Mt Erin Heritage Centre car park would be maintained during construction.

Parking on Edmondson Street between Edward Street and Erin Street is largely restricted and so the Edmondson Street closure would have minimal impact on parking in this area. The closure of Erin Street would remove approximately two kerbside parking spaces on Erin Street for the nine-month duration of closure of the Edmondson Street bridge. Informal parking on the verge of the eastern side and kerbside parking on the western side of Little Best Street will also be subject to temporary disruption during this period. Review of aerial imagery of the area suggests that demand for on-street parking would be relatively low in the surrounding streets, as residences in the area have space for private off-street parking, and there is kerbside parking capacity nearby to absorb the temporary parking losses.

Access to parking for the Multicultural Council of Wagga Wagga, located adjacent to the Wagga Wagga Railway Station will be closed for approximately two days for lifting of construction materials during the replacement of the Wagga Wagga Station pedestrian bridge (Mothers Bridge), as shown in section 5.3.9. Pedestrian access to the Multicultural Council of Wagga Wagga would be maintained under escort during this time. This impact is expected to be managed in consultation with stakeholders and in line with the TMP.

Expected parking impacts on key roads is detailed in Table 5.32.

No disabled parking spaces would be impacted by the proposal.

Table 5.32 Parking impacts – Wagga Station enhancement sites

LOCATION	PARKING TYPE	TIME OF DAY RESTRICTIONS	EXPECTED IMPACTS	DURATION
Edmondson Street/ Mitchelmore Street	Kerbside parking south of Erin Street	School bus zones 8am – 9:30am; 3pm – 4pm	Impacts managed with onsite traffic control	Nine months (duration of Edmondson Street bridge closure)
Little Best Street	Kerbside parking	No restrictions	Temporary disruption to kerbside parking and informal verge parking Impacts managed with onsite traffic control	Nine months (duration of Edmondson Street bridge closure)
Erin Street	Kerbside parking	No restrictions	Removal of approximately two spaces	Nine months (duration of Edmondson Street bridge closure)
Station Place	Kerbside parking Public commuter carpark Access to local business parking	Kerbside: 1P on Station Place	Access to local business parking will be impacted by construction activities	Approximately two days

5.3.2.4 BOMEN YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Bomen Yard clearances enhancement site component of the proposal is shown in Table 5.33. This assessment shows that with construction traffic all road links are expected to operate at LOS A or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.33 Bomen Yard clearances enhancement site construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
		Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Olympic Highway	Highway	323	A	43	366	A
Byrnes Road	Urban	137	A	35	172	A
Merino Drive – between Olympic and Dorsett	Urban	54	A	35	89	A
Merino Drive – between Byrnes and Dorsett	Urban	123	A	35	158	A
E Bomen Road[1]	Urban	31	A	35	66	A

(1) No data available, volumes estimated as average of Olympic Highway – Ashmont, 95065 and Olympic Highway – The Rock, 9551

Note, construction peak hour volumes are higher on Olympic Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the highest trafficked, on a per lane basis, construction route intersection in the Wagga Wagga precinct (excluding the Wagga Wagga Station and surrounds, which is assessed as part of the Edmondson Street bridge diversion assessment) during peak construction activities was undertaken for the Pearson Street bridge enhancement sites in section 5.3.2.2.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS B, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, with the exception of the Wagga Wagga Station enhancement sites Edmondson Street bridge closure diversion assessment, no additional construction route intersection analysis has been undertaken for the Wagga Wagga precinct enhancement sites.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Bomen Yard clearances enhancement site.

PARKING

Parking for construction workers and laydown areas for unloading of heavy vehicles at the Bomen Yard clearances enhancement site would be provided within the construction site area and so would have minimal impact to existing parking facilities. Any minor impacts to parking due to traffic control or site accesses on the local road network would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.3.3 CONSTRUCTION SITE ACCESS

A turn warrant assessment for each enhancement site access in the Wagga Wagga precinct have been undertaken based on The Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020). This assessment has analysed a worst case scenario, assuming all peak generated construction traffic is distributed to each access during the road network peak period. The results of this assessment are shown in Table 5.34.

Table 5.34 Wagga Wagga precinct enhancement site access turn warrant assessment

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Uranquinty Yard clearances	2 / Hanging Rock Road	One lane two way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Uranquinty Yard clearances	3 / Olympic Highway*	Two-way	Channelised Right-Turn/Basic Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Uranquinty Yard clearances	1 / Yarragundry Street	Two-way	Basic Left-Turn/Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Potential for impacts from construction vehicles movements or implementation of traffic management.
Pearson Street bridge	4 / Alan Turner Road	Two-way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Pearson Street bridge	5 and 45 / Urana Street	Two-way	Channelised Right-Turn/Auxiliary Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Pearson Street bridge	6 / Cheshire Street	Two-way	N/A[1]	Left turn into and out of site. [2] Close proximity to existing intersection. Opposing movements on public road. Low speed environment (≤60km/h). Potential for impacts from construction vehicles movements or implementation of traffic management.
Wagga Wagga Station And surrounds	7 / Brookong Avenue	Two-way	N/A[1]	Left turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Wagga Wagga Station And surrounds	9 / Norman Street	Two-way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Wagga Wagga Station And surrounds	8 / Fox/ Donnelly Avenue	Two-way	Basic Left-Turn/Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Wagga Wagga Station And surrounds	17 / Edmondson Street north	Two-way	N/A [3]	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Wagga Wagga Station And surrounds	16 / Edmondson Street south (Erin Street)	Two-way	N/A [1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Wagga Wagga Station And surrounds	11 and 18 / Railway Street	Two-way	N/A [1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Wagga Wagga Station And surrounds	10 / Station Place	Two-way	N/A[1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact to existing traffic movements expected.
Wagga Wagga Station and surrounds	73 / Docker Street (Chaston Street)	Two-way	N/A [1]	Left turn into and out of site. [2] Opposing movements on public road. Low speed environment (≤60km/h). Close proximity to existing intersection. Potential for impacts from construction vehicles movements or implementation of traffic management.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD TYPE	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Bomen Yard clearances	19 / Station Place	Two-way	Basic Left-Turn/Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

(1) Turn warrant methodology not suitable for assessment due to access intersection configuration
(2) Cannot be right turn in, right turn out
(3) Existing traffic to be diverted, auxiliary lanes already in place at signalised intersection

Basic Right-Turn and Auxiliary Left-Turn / Channelised Right-Turn / Channelised Left-Turn treatments are required by the intersection turn warrant assessment for some site accesses in this precinct. However, this may not be required given the temporary nature of accesses during the construction phase and the conservative nature of the assessment (peak construction vehicles assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour).

Where the turn warrant assessment methodology is unsuitable for the assessment of the enhancement site access the access arrangements as per the current road network would not have a significant impact as they are either a through movement from the end of a street, or they are impacting limited traffic movements.

The accesses off Cheshire Street to the Pearson Street bridge enhancement site, and the access off Chaston Street to the Wagga Wagga Yard clearances enhancement site require special consideration due to their proximity to adjacent intersections (Pearson Street/Cheshire Street and Docker Street/Chaston Street, respectively). It is recommended that these accesses be designated as left in, left out turning movements only to limit any performance or safety impacts to the surrounding road network.

More detailed assessment of the accesses will be undertaken as part of the Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans will be developed by the contractor prior to commencement of construction activities on site to moderate any potential safety issues. Design of any access treatments or modifications to roads would be undertaken in accordance with appropriate design standards and with approvals from the relevant local or state road authorities. Works Authorisation Deeds or other suitable consent or agreement with TfNSW will be made prior to undertaking any relevant works on a State Controlled Road.

5.3.4 ROAD SAFETY

During construction there would be changes to road conditions within the Wagga Wagga precinct consisting of increased traffic volumes due to construction vehicles, temporary diversions and new access points to the enhancement sites from the public road network. This study has primarily considered the operation and capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles. The suitability of access and diversion routes has not been assessed with respect to road safety.

It is noted that the construction activities at Uranquinty Yard clearances, Pearson Street bridge. Wagga Wagga Yard clearances and Bomen Yard clearances enhancement sites within the Wagga Wagga precinct, are expected to generate relatively low volumes of traffic, and an appropriate LOS is maintained on all of these enhancement site access routes as discussed in section 5.3.2. Access intersections to the enhancement sites within the Wagga Wagga precinct would be designed or have traffic control measures implemented to provide suitable safe access to public roads in accordance with relevant standards and guidelines.

Construction vehicles at Cassidy Parade pedestrian bridge, Edmondson Street bridge and Wagga Wagga Station pedestrian bridge are not expected to create significant impacts. However, the traffic diversions in place for the Edmondson Street bridge enhancement site bridge closure re-routes vehicles crossing the rail line on Edmondson Street via Lake Albert and Docker Streets, significantly increasing the traffic volumes on the diversion routes as discussed in section 5.3.2.3. Traffic management for these diversion routes would be provided for safe movements along public roads in accordance with relevant standards and guidelines. It is noted that the additional traffic on these routes impact the link and intersection LOS to LOS E and F which does not meet stable flow conditions or the acceptable performance standard, respectively.

To moderate any construction impacts to existing or potential safety issues associated with either construction vehicle movements or the additional traffic on local roads from diversions, Road Safety Audits and Construction Traffic Transport and Access Management Plans would be required to be undertaken by the contractor prior to commencement of construction activities on site or the implementation of diversionary routes and the safety of all road users should be taken into account.

5.3.5 HEAVY VEHICLE ROUTES

There are no changes to background LOS resulting from the traffic generated by the construction activities at these enhancement sites enhancement sites and it is not expected that construction heavy vehicle and workforce movements generated by the proposal, as shown in section 5.3.1.3, would impact the current operations of existing heavy vehicles movements on the routes detailed in section 4.5.3.

During the Edmondson Street closure diversion period, although no heavy vehicle routes will be directly affected by road closures, additional diverted traffic is expected on the following heavy vehicle routes:

- Sturt Highway
- Lake Albert Road.

The additional traffic at the Docker Street/Edwards Street and Lake Albert Road/Edward Street intersections is expected to increase average delay by one minute during a peak period, as shown in Table 5.27 and Table 5.30 respectively, which is not considered a significant impact to the heavy vehicle route passing though these intersections. Lake Albert Road and the Sturt Highway are not expected to be significantly impacted by the increased traffic volumes resulting from the diversion traffic. However, there may be minor delays to heavy vehicles from reduced speed limits and traffic control. Construction Traffic Transport and Access Management Plans would be developed to ameliorate impacts to safe and efficient travel of heavy vehicles through this diversionary route.

There is potential for construction heavy vehicles to impact road pavement conditions along haul routes. To determine the extent of the impact a road dilapidation report will be prepared for all haul routes within the precinct.

5.3.6 TRAVELLING STOCK RESERVES

Travelling Stock Reserves are located along the proposed construction access routes for the Uranquinty Yard clearances enhancement site, and a Livestock Highway on Bourke Street in Wagga Wagga, a diversion route during the Edmondson Street bridge closure.

Based on the low traffic volumes generated by the construction activities in Uranquinty it is not expected that heavy vehicle and workforce movements would impact the operation of the Travelling Stock Reserves here. It is noted that the additional construction traffic does not result in a change of LOS on any of the construction access routes for the Uranquinty Yard clearances enhancement site.

It is expected that prior to the commencement of this traffic diversion Local Land Services should be notified of increased vehicle movements along the TSR through Uranquinty and the Livestock Highway on Bourke Street during the construction phase to advise stock handlers, including walking permit holders, of potential impacts.

5.3.7 PUBLIC TRANSPORT ROUTES

5.3.7.1 ROAD

Construction vehicle movements are expected to have a minimal impact on the operation of bus services or bus stops along construction access routes due to the low traffic volumes generated by the construction activities (which do not result in a change in LOS from current operation) for the following enhancement sites:

- Uranquinty Yard clearances
- Pearson Street bridge
- Cassidy Parade pedestrian bridge
- Wagga Wagga Station pedestrian bridge
- Wagga Wagga Yard clearances
- Bomen Yard clearances.

It is noted that the heaviest period of construction workforce movements at the start and end of construction hours (6am to 6pm) outside peak bus service periods (e.g. school times). Other routes on the detour roads may be affected by additional diversion traffic on these roads and impacted performance at intersections. Average delays at impacted intersections will increase by one minute or less. There may be minor delays to buses passing near the enhancement sites from reduced speed limits and traffic control. These impacts would be managed in accordance with the traffic management plan to ameliorate impacts to the safe and efficient travel of bus services through the affected areas.

The closure of Edmondson and Erin Streets for a nine-month period as part of the Edmondson Street bridge enhancement site and the associated changes to road network connectivity is expected to directly impact the operation of public and school bus services bus services in the area through delays, as well as direct impact to the routes and existing bus stops. These impacts are detailed in Table 5.35 and Table 5.36.

Table 5.35 Public bus route impacts – Wagga Wagga precinct

SERVICE	IMPACT
Route 1W – Coolamon via Downside, Route 930 – Ganmain	— Directly impacted by the Edmondson Street bridge closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period.
Route 969 – Tatton to Wagga Wagga, 965 – Forest Hill	— Directly impacted by Edmondson Street and Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period. — Impact to train station connectivity for patrons during pedestrian bridge replacement works. — May require temporary stop location (Railway Street at Collins Street / 2650305 &265073) during footpath works on Railway Street.

Table 5.36 School bus route impacts – Wagga Wagga precinct

BUS ROUTE	IMPACT
S100 – Mount Austin Public School S120 – Wagga Wagga High School S122 – Gobbagombalin S123 – South Wagga Primary School S150 – The Riverina College S159 – Ashmont S171 – South Wagga Primary School S179 – South Wagga Primary School S199 – North Wagga Wagga S210 – Marrar, S215 – Lockhart S216 – Currawarna S243 – Wagga to Gundagai S188 – North Wagga Primary School S203 – TRAC to Lloyd S197 – Estella to Wagga Wagga High School S191 – The Riverina Anglican College to Kooringal via Uranquinty S185 – South Wagga Wagga Primary to Estella S173 – North Wagga Wagga Primary to Henschke Primary, S172 – Wagga Wagga Primary to Tarcutta S167 – Estella to Lake Albert Primary S162 – Glenfield Park to Kildare S149 – The Riverina Anglican College to Mangoplah S144 – Estella to Turvey Park Primary S134 – North Wagga Wagga to Wagga Wagga Primary S124 – Wagga Wagga Primary to Ashmont via The Rock	— Directly impacted by Edmondson Street and Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period.
S103 – South Wagga Primary	— Directly impacted by Edmondson Street and Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period. — Impact to train station connectivity for patrons during pedestrian bridge replacement works. — May require temporary stop location (Railway Street at Collins Street / 2650305 &265073) during footpath works on Railway Street.

BUS ROUTE	IMPACT
S109 – Wagga Wagga Primary S121 – South Wagga Primary S138 – Forest Hill S163 – Wagga Wagga Primary S190 – Uranquinty to Wagga Wagga Primary	— Impact to train station connectivity for patrons during pedestrian bridge replacement works. — May require temporary stop location (Railway Street at Collins Street / 2650305 &265073) during footpath works on Railway Street.
S126 – Lake Albert, S187 – Gumly Gumly S196 – Ladysmith	— Directly impacted by Edmondson Street and Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period.
S129 – Glenfield Park S250 – San Isidore S130 – Mater Dei College S143 – South Wagga Wagga Primary	— Directly impacted by Edmondson Street and Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops (Kildare Catholic College / 2650107 and 265098) or stopping patterns during the closure period. — Impact to train station connectivity for patrons during pedestrian bridge replacement works. — May require temporary stop location (Railway Street at Collins Street / 2650305 &265073) during footpath works on Railway Street.
S148 – Holy Trinity Primary S155 – South Wagga Wagga S151 – Forest Hill S174 – Forest Hill to Wagga Wagga High	— Directly impacted by Erin Street closures as part of Edmondson Street bridge Closure, would require rerouting and alternative stops/stopping patterns during the closure period. — Impact to train station connectivity for patrons during pedestrian bridge replacement works. — May require temporary stop location (Railway Street at Collins Street / 2650305 &265073) during footpath works on Railway Street.

Changes to bus routes and bus stops to mitigate these impacts, including establishing temporary stops, would need to be planned in consultation with the relevant stakeholders to minimise the impact on community, public transport users, and service providers.

5.3.7.2 RAIL

Construction activities requiring possessions would occur during either:

- existing scheduled weekend rail corridor possession periods (typically 72 hours) when trains along the rail corridor are stopped for maintenance as part of operation of the existing rail line; or
- track work authorisations periods, which enable works that impact rail operations to occur outside scheduled rail possessions, but within available 9-hour windows in which train services are not scheduled.

Work during these periods would be undertaken in consultation with passenger rail operators. However, it is not expected that proposal construction works would impact upon the rail services and train station platforms will not be impacted by the enhancement sites. Impacts to pedestrian access to the Wagga Wagga Station are discussed in the following section.

5.3.8 ACTIVE TRANSPORT ROUTES

As shown in section 4.5.6, provision of infrastructure for active transport in the vicinity of the Uranquinty and Bomen Yard Clearance enhancement sites is minimal, and given the surrounding land uses the demand for cycling and pedestrian travel in the area is likely to be low. Footpaths are provided on key roads in the vicinity of the Pearson enhancement site with minimal provision of dedicated cycling infrastructure on key roads. Although there would be increased traffic from construction vehicles in the vicinity of these enhancement sites, there is expected to be a minimal impact to active transport movements as there is no change in LOS expected as a result of construction generated traffic. There may be minor disruptions to cyclists using roads near access points to these enhancement sites as a result of reduced speed limits and traffic management. It is noted that during the Edmondson Street bridge closure, additional traffic would be diverted to the surrounding road network impacting the LOS of road links and intersections. These impacts, although expected to be minimal to active transport movements, would be managed in accordance with the TMP.

Dedicated cycling infrastructure is provided on some key roads in the vicinity of the Wagga Wagga Station and surrounds. Although there would be increased traffic from construction vehicles in the vicinity of these enhancement sites the increase is minor with no change in LOS expected as a result of construction generated traffic.

The closures of the Wagga Wagga Station pedestrian bridge (Mothers Bridge), Cassidy Parade pedestrian bridge, and Edmondson Street bridge would impact active transport connectivity to transport facilities (bus stops and the Wagga Wagga Railway Station) and land uses in the surrounding area. The additional distance and travel time to cross the rail line during construction of each of the bridges is shown below in Table 5.37. The distances reflect a trip to reach each side of a closed bridge via the nearest rail crossing and represents a worst-case scenario for active transport impact as actual distance would vary by individual origin and destination. Paved pedestrian footpaths provide full connectivity between each of the crossing points shown in the table.

The Edmondson Street bridge, Wagga Wagga Station pedestrian bridge (Mothers Bridge), and Cassidy Parade pedestrian bridge closures are not scheduled to all close simultaneously and so pedestrian connectivity is maintained in this area via at least one of these three bridges, throughout the construction activities in the Wagga Wagga Station and surrounds enhancement sites. During closure of the Cassidy Parade pedestrian bridge, diversion via the Bourke/Docker Street level crossing would also be possible.

Table 5.37 Bridge closure active transport impacts –Wagga Station and Surrounds

EXISTING CROSSING POINT	DURATION OF CLOSURE	NEW CROSSING POINT	DISTANCE / TIME
Cassidy Parade pedestrian bridge	6 months	Wagga Wagga Station pedestrian bridge (Mothers Bridge)	Walking: 2km / 26 minutes Cycling: 2km / 8 minutes
		Bourke/Docker Street level crossing	Walking: 1.8km / 22 minutes Cycling: 1.8km / 7 minutes
Edmondson Street bridge	9 months	Cassidy Parade pedestrian bridge	Walking: 1.6km / 20 minutes Cycling: 1.6km / 7 minutes
		Wagga Wagga Station pedestrian bridge (Mothers Bridge)	Walking: 850m / 10 minutes Cycling: 850m / 3 minutes
Wagga Wagga Station pedestrian bridge (Mothers Bridge)	6 months	Edmondson Street bridge	Walking: 850m / 10 minutes Cycling: 850m / 3 minutes

The Cassidy Parade pedestrian bridge is an existing link in the Wagga Wagga Active Travel Plan. The proposed bridge design includes a ramp on the southern side of the rail corridor. Discussions are ongoing with Wagga Wagga City Council to align plans and minimise potential impacts on the final configuration of the future infrastructure.

5.3.9 PROPERTY ACCESS IMPACTS

Some impacts to property access are expected as a result of the implementation of the Wagga Wagga Station and surrounds enhancement sites as shown in Figure 5.33.

As shown in Figure 5.33 the driveway from Station Place that gives access to the Multicultural Council of Wagga Wagga at the Wagga Wagga Station pedestrian bridge enhancement site would be used for construction activities and would require temporary closure for up to two days.

The driveway of one residential property located on Erin Street but accessed via Railway Street will be impacted, however, it is expected that this would be intermittent in response to construction activities and alternative arrangements for access would be provided for the duration of construction. Other accesses to residential properties in this area are located outside the expected construction impact zone and would not be impacted. It is expected that pedestrian access to the residential properties would be maintained during construction.

It is expected that access to properties along Little Best Street would be maintained and that residents would continue to have the option of using private off-street parking, as described in section 5.3.2.3.

The proposal will utilise the Mt Erin Heritage Centre driveway off Edmondson Street for access to the Edmondson Street bridge enhancement site. This access arrangement would need to be undertaken in consultation with Mt Erin Heritage Centre. It is expected that access to the Mt Erin Heritage Centre would be maintained through the duration of construction.

Impacts to accesses for private residences and businesses would be minimised in consultation with relevant stakeholders and managed in line with the TMP.

Albury to Illabo Figure 5.33 Edmondson Street bridge property access impacts

0 25 50 m

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Author: WSP Scale: 1:1,100
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Multicultural Council of Wagga Wagga
- Informal parking
- Site access points

Construction area
- Proposed lift pad
- Proposed laydown
- Proposed laydown and site access compound

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5.3.10 RAIL FREIGHT

Section 5.3.7.2 notes when construction activities requiring possessions will occur.

Work during these periods would be undertaken in consultation with freight operators. However, it is not expected that proposal construction works would impact upon the rail freight network. Note, there are no other impacts to freight operations.

5.3.11 EMERGENCY VEHICLE ACCESS

Construction of the proposal would result in temporary impacts to traffic and an increase in vehicle movements on the road network. As shown in the link and intersection performance assessments, there is no significant impact to the performance of the road network due to the construction generated traffic within the Wagga precinct except for the Edmondson Street bridge diversions. There is not expected to be a significant impact to emergency vehicles movements for the following enhancement areas:

- Uranquinty Yard clearances
- Pearson Street bridge
- Cassidy Parade pedestrian bridge
- Wagga Wagga Station pedestrian bridge
- Wagga Wagga Yard clearances
- Bomen Yard clearances.

As a result of the closure of the Edmondson Street bridge and the increase in vehicle movements on the diversionary route, emergency vehicles may incur some additional travel time. The maximum theoretical increase in delay was calculated at nine-minutes in the AM peak period for a trip originating from Best Street with a destination at Erin Street. This is a highly unlikely origin and destination for emergency services and so this level of delay would be highly unlikely to occur, noting that emergency services would also be able to use Coleman Street rather than Urana to shorten the distance. The actual additional travel time experienced when responding to an emergency would vary depending on the origin and destination of the emergency services vehicles, noting that emergency vehicles have priority right of way and should incur less delay at intersections than general traffic.

From Fire and Rescue NSW Wagga Wagga on The Esplanade, responding to an emergency on Erin Street would incur up to an additional 3.5 minutes due to a combination of additional distance travelled and road congestion. For the same emergency from the Wagga Wagga Base Hospital, the additional delay due to the diversions would be expected to be minimal, if any. A Traffic and Access Management Plan will be developed in consultation with TfNSW, Wagga Wagga City Council, and State emergency services and would consider and effectively manage any impacts to emergency vehicles seeking to use roads in the vicinity of the enhancement sites or diversion routes.

5.3.12 SEASONAL VARIATION

Temporary local events such as festivals, shows, and markets may result in minor localised traffic variations, particularly in urban environments such as Wagga Wagga. The Uranquinty and Bomen enhancement sites are less urbanised than Wagga Wagga, featuring more rural and agricultural land uses.

Localised seasonal traffic variation may be experienced at enhancement sites that share land with agricultural infrastructure (grain silos, livestock loading facilities etc.) as the infrastructure will likely generate additional heavy or farm vehicle movements during harvest seasons as discussed in section 4.2.2.

A review of aerial imagery of enhancement sites in the Wagga Wagga precinct identified agricultural infrastructure such as grain silos or livestock loading facilities in the vicinity of the following enhancement sites:

- Uranquinty Yard clearances
- Bomen Yard clearances.

However, it is not anticipated that seasonal variation would significantly impact the outcomes of the traffic assessment as background and construction vehicle traffic volumes are low.

More detailed assessment of the enhancement site accesses, which would consider seasonal variation due to social events and agricultural movements, will be undertaken by the contractor prior to commencement of construction activities on site. These would include Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans to moderate any potential safety issues.

5.4 JUNEE PRECINCT

5.4.1 CONSTRUCTION PROFILE

This section outlines the construction profile for the proposal within the Junee precinct. This includes all vehicle routes, as shown in section 5.4.1.2, and all volumes of heavy and light vehicles required for construction of the proposal, as shown in section 5.4.1.3, which includes the vehicles required for the import and export of fill material. It also outlines other construction requirements, such as temporary road closures and diversions, and parking requirements for each enhancement site.

5.4.1.1 CONSTRUCTION PROGRAM

Key construction stages and work durations at each enhancement site within the Junee precinct are summarised below in Table 5.38 and Figure 5.34.

Table 5.38 Summary of construction stages – Junee enhancement sites

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Harefield Yard clearances	— Site establishment — Track realignment (>300mm and/or track formation replacement) — Gantry removal — Demobilisation and landscaping	1 February 2024	2 April 2024	2	Yes
Kemp Street bridge	— Site establishment — Traffic diversion works — Road bridge replacement — Demobilisation and landscaping	1 February 2024	14 November 2024	10	Yes
Junee Station pedestrian bridge	— Site establishment — Pedestrian bridge removal or relocation works — Demobilisation and landscaping	1 February 2024	14 March 2024	1	Yes
Junee Yard clearances	— Site establishment — Track realignment (>300mm and/or track formation replacement) — Gantry removal — Demobilisation and landscaping	1 February 2024	2 April 2024	2	Yes

ENHANCEMENT SITES	CONSTRUCTION STAGES UNDERTAKEN	START	FINISH	DURATION OF WORKS (MONTHS)	RAIL POSSESSION REQUIRED
Olympic Highway underbridge	— Site establishment — Track realignment (<300mm) — Rail bridge track work — Demobilisation and landscaping	15 January 2024	3 April 2024	3	Yes
Junee to Illabo clearances	— Site establishment — Track realignment (<300mm) — Track realignment (>300mm and/or track formation replacement) — Level crossing modification — Extension or replacement of culverts — Demobilisation and landscaping	15 January 2024	6 November 2024	10	Yes

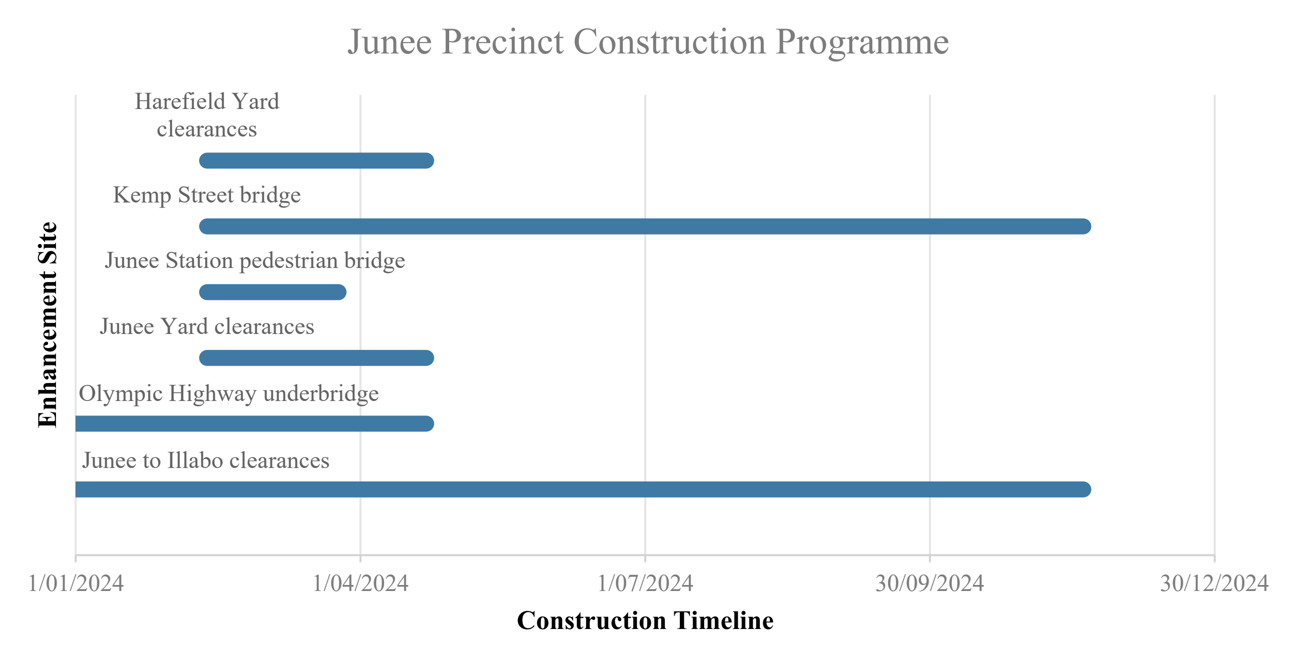

Figure 5.34 Junee precinct construction programme

5.4.1.2 CONSTRUCTION AND DIVERSION ROUTES

Proposed construction routes and diversion routes for each work site in the Junee precinct are shown in Figure 5.35 to Figure 5.38.

Vehicle and pedestrian diversions proposed within the Junee precinct during construction are:

- Kemp Street bridge
  - Kemp Street bridge traffic diverted via Joffre Street, Pretoria Avenue, Seignior Street, Lorne Street, Ducker Street, Hill Street, George Street, and Edgar Street
  - local access to Railway Lane and Railway Parade would be via Harold Street and Thomas Street
- Junee to Illabo clearances
  - upgrade of private and public level crossings. Access will be managed with local traffic control and side-tracking, with minor diversions required.

Construction routes have been selected to minimise the use of local roads where possible. However, use of local roads is generally required to facilitate access to enhancement sites. As shown in section 5.4.1.3, construction vehicle volumes using construction routes and accesses on local roads are generally low.

Diversion routes have been selected on roads of the same order where possible. In the instances where diversion routes have been required on roads of a lower order, the requirement for mitigation has been considered.

Mitigations for the use of all road types, including local roads are provided in section 8.2. In addition, mitigation measures have been identified for other assessments, including noise and vibration, visual and social, to address potential impacts from the use of construction and diversion routes.

Where diversions are required for active travel routes, the selected diversion route has considered where pedestrian infrastructure is present. Where cyclists utilise diversion routes, and an existing cycle or shared path is not present, cyclists would be required to cycle on-road. To facilitate access to the rail corridor and surrounds for construction vehicles, including surrounding residences, diversion of pedestrians and cyclists within the proposal site would also be required. Detailed consideration of the management of pedestrian and cyclist safety within the proposal site will be completed prior to and during construction. Mitigation measures, including the requirements for a Traffic Management Plan (TMP), are provided in section 8.2.

Albury to Illabo

Figure 5.35 Construction routes, diversions and site accesses (Harefield Yard clearances)

0 50 100 m

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Author: WSP
Data Sources: ARTC, NSWSS

Paper: A3
Scale: 1:6,000

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes

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Albury to Illabo Figure 5.36 Construction routes, diversions and site accesses (Junee Station and surrounds)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 8/12/2021 Paper: A3
Author: WSP Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Waterways
- Waterbodies
- Site access points
- Laydown area/compound
- Key intersection

Route type

- Construction routes
- Diversion routes

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Albury to Illabo Figure 5.37 Construction routes, diversions and site accesses (Olympic Highway underbridge)

0 50 100 m

Coordinate System: GDA 1994 MGA Zone 55

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Author: WSP Scale: 1:6,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies
Site access points
Laydown area/compound
Key intersection
Route type
Construction routes

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Albury to Illabo

Figure 5.38 Construction routes, diversions and site accesses (Junee to Illabo clearances)

0 1 2 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 2/11/2021 Paper: A3
Author: WSP Scale: 1:40,000
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Track
Waterways
Waterbodies

Site access points
Laydown area/compound
Key intersection

Route type

Construction routes

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5.4.1.3 VEHICLE TYPE AND QUANTITY

Table 5.39 shows the peak hour two-way movements at each enhancement site as identified from construction scenario data shown in Chapter 8: Construction of the proposal of the EIS.

Table 5.39 Peak hour construction movements – Junee Work precinct enhancement sites

ENHANCEMENT SITES	VEHICLE TYPES	PEAK HOUR MOVEMENTS	CONSTRUCTION VEHICLE PARKING AND LAYDOWN
Harefield	Light Vehicle	47[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	8	
Kemp Street bridge	Light Vehicle	20[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	8	
Junee Station pedestrian bridge	Light Vehicle	7 in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	1	
Junee Yard clearances	Light Vehicle	23[1] in (am) / out (pm)	Internal to Proposal site
	Heavy Vehicle	8	
Olympic Highway underbridge	Light Vehicle	53[1] in (am) / out (pm)	During possession peak some on-street parking may be utilised
	Heavy Vehicle	8	
Junee to Illabo clearances	Light Vehicle	60[2] in (am) / out (pm)	During possession peak some on-street parking may be utilised
	Heavy Vehicle	8	

(1) Three-day possession peak (typically only 13 vehicle movements in a peak period)
(2) Three-day possession peak (typically only 20 vehicle movements in a peak period)

5.4.2 ROAD NETWORK OPERATION

5.4.2.1 HAREFIELD YARD CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Harefield Yard clearances enhancement site component of the proposal is shown in Table 5.40. This assessment shows that with construction traffic all road links are expected to operate at LOS B or better, which is considered stable flow conditions and an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.40 Harefield, construction route road performance

ROAD		2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
Road name	**Road type**	**Volume – one way**	**LOS**	**Construction volume – one way**	**Combined volume – one way**	**LOS**
Harefield Road	Rural	9	B	28	37	B
Byrnes Road [1]	Rural	146	B	28	174	B
Harefield Railway Access Road [2]	Rural	135	B	28	163	B

(1) Byrnes Road, north of Harefield Road
(2) No data available, traffic volume estimated based on road type and surrounding land uses

INTERSECTION PERFORMANCE

An assessment of the performance of the expected highest trafficked (on a per lane basis) construction route intersection in the Junee precinct was undertaken for the Junee Station and surrounds. This assessment is presented in section 5.4.2.2. The intersection assessment assessed combined peak hour construction traffic in conjunction with peak hour diversion and background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction and diversion generated traffic and subsequently no significant impacts to intersection operation and performance are expected. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Harefield Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Harefield site.

PARKING

Parking for construction workers and laydown areas would be provided for unloading of heavy vehicles at the Harefield Yard clearances enhancement site within the construction site area and so would have minimal impact to existing parking facilities. There may be minor isolated impacts to parking due to traffic control and the increase of heavy vehicles on the local road network, which would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.4.2.2 JUNEE STATION AND SURROUNDS

The enhancement sites in the vicinity of the Junee Station share the same road network and have been combined in the following section, for:

— Kemp Street bridge enhancement site
— Junee Station pedestrian bridge enhancement site
— Junee Yard clearances enhancement site.

ROAD PERFORMANCE

The link LOS assessment for construction traffic from the combined Junee Station and surrounds enhancement sites component (occurring concurrently and utilising the same construction access routes) of the proposal is shown in Table 5.41. This road performance assessment excludes road links expected to be used as diversion routes during the Kemp Street Bridge closure (addressed within the Kemp Street bridge closure diversion assessment for cumulative construction and the diversion traffic).

This assessment shows that with construction traffic all road links are expected to operate at LOS B or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002).

The assessment shows a change in LOS as a result of the construction generated traffic on the Olympic Highway Level Crossing from LOS A to LOS B. However, it is noted that the forecast traffic volume was approaching the upper limit of the LOS A band, LOS B still represents stable traffic flow with drivers having reasonable freedom to choose their desired speed and, that the change does not suggest that a significant impact to road operation and performance is expected.

Table 5.41 Junee Station and surrounds enhancement sites construction route road performance

ROAD NAME	ROAD TYPE	2024 PEAK HOUR VEHICLES – ONE WAY		2024 PEAK HOUR WITH CONSTRUCTION VEHICLES – ONE WAY		
		Volume	LOS	Construction volume	Combined volume	LOS
Olympic Highway (west of Seignior Street) [1]	Highway	212	A	45	257	A
Seignior Street [1]	Urban	235	B	36	271	B
Broadway Street [1]	Urban	291	B	36	327	B
Olympic Highway Level Crossing [1]	Urban	198	A	36	234	B
Humphrys Street [2]	Urban	99	A	36	135	A
Main Street (Olympic Highway) [2]	Urban	99	A	36	135	A
Lorne Street	Urban	136	A	36	172	A
Hill Street [3]	Urban	54	A	36	90	A
Joffre Street [4]	Urban	24	A	36	60	A
Harold Street [5]	Urban	68	A	36	104	A
Thomas Street [6]	Urban	18	A	36	54	A
Railway Lane [1]	Urban	24	A	36	60	A
Railway Parade [7]	Urban	24	A	36	60	A
George Street [8]	Urban	37	A	36	73	A
Edgar Street	Urban	79	A	36	115	A

ROAD NAME	ROAD TYPE	2024 PEAK HOUR VEHICLES – ONE WAY		2024 PEAK HOUR WITH CONSTRUCTION VEHICLES – ONE WAY		
		Volume	LOS	Construction volume	Combined volume	LOS
Byrnes Road	Urban	140	A	36	176	A
Pretoria Avenue [6]	Urban	18	A	36	54	A

(1) Traffic survey volumes
(2) No data available, volumes estimated as 50% of Olympic Highway Level Crossing 10-hour
(3) No data available, volumes estimated as 40% of Lorne Street
(4) No data available, volumes estimated as Crawley Street
(5) No data available, volumes estimated as 50% of Lorne Street
(6) No data available, volumes estimated as 75% of Joffre Street
(7) No data available, volumes estimated as Railway Lane
(8) No data available, volumes estimated as 60% of the difference between Byrnes Road and Edgar Street

Note, construction peak hour volumes are higher on Olympic Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

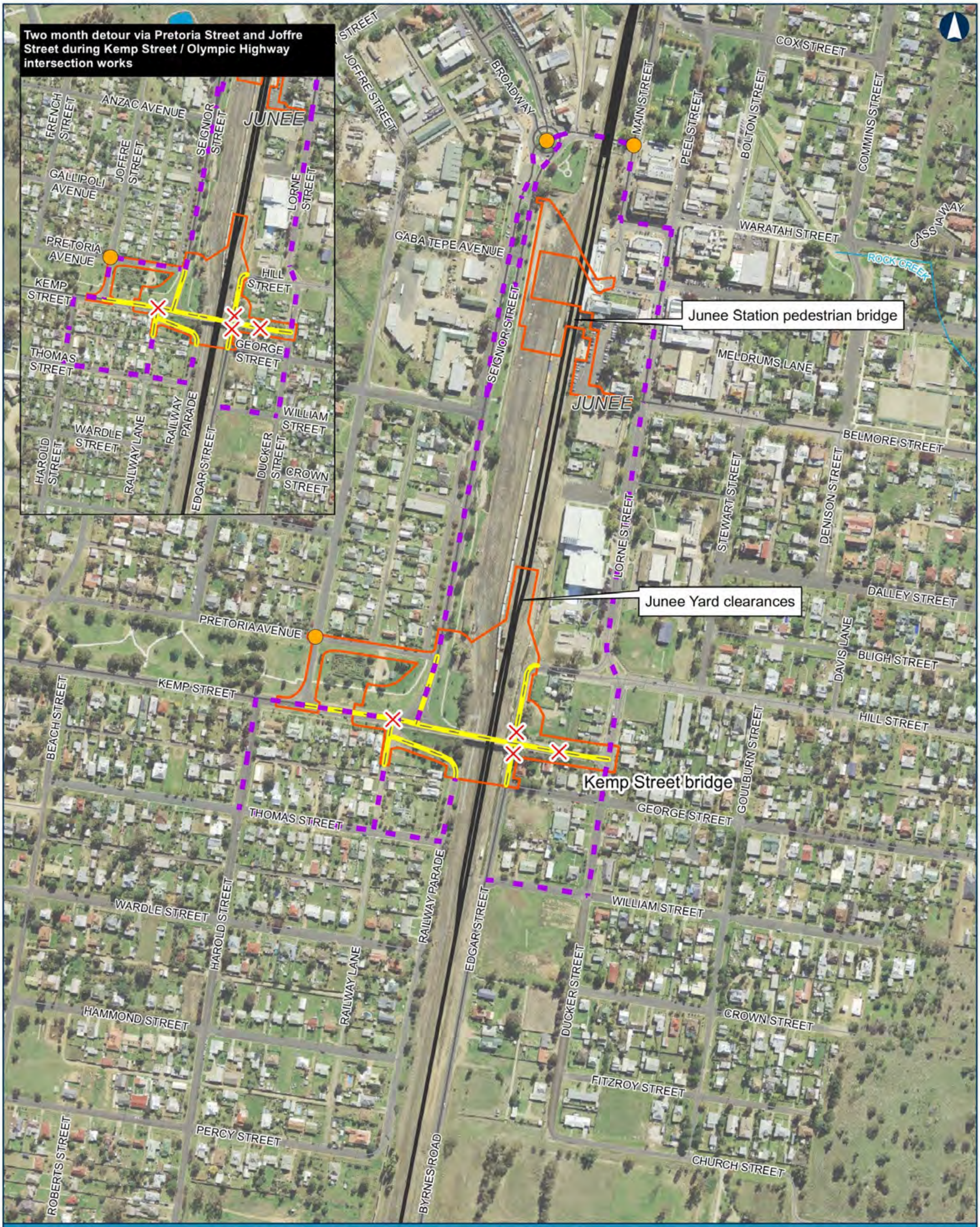
SIDRA intersection analysis was undertaken as a component of the diversion assessment associated with the Kemp Street bridge Closure to assess the cumulative impact of diverted vehicles and construction vehicles to intersection performance in Junee.

As vehicle diversions are proposed to occur over the majority of the construction period in this area, it has not been deemed necessary to assess the impact of solely construction vehicles on intersection performance during the limited period of time when diversions would not be in place. It is expected that during this limited period the impact to intersection performance within Junee would be minimal (a total of 27 construction vehicles during a peak hour).

The intersection assessment assessed peak hour construction traffic in conjunction with peak hour background and diversion traffic and is considered a worst case scenario as construction start and finish times end outside of typical road traffic peak periods. The results of the assessment are shown in the following sections.

TEMPORARY CLOSURES AND DIVERSIONS

As shown in section 5.4.1, the replacement of Kemp Street bridge would require approximately 11 months of construction activity. The Kemp Street road closure would be in effect for approximately eight months during the reconstruction of the bridge and surrounding intersections. This road closure would include the Kemp Street bridge and the adjacent intersections of Olympic Highway/Seignior Street/Kemp Street to the west of the bridge and the Kemp Street/Edgar Street overpass to the east of the rail line as shown in Figure 5.39. Based on traffic data provided by Junee Shire council for 2018 and extrapolated to 2024 (at a 1 per cent compounding per annum growth rate) this diversion is expected to impact 2,903 vehicles per day.



Albury to Illabo

Figure 5.39 Kemp Street bridge closure diversion routes

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Coordinate System: GDA 1994 MGA Zone 55

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Date: 12/04/2022
Author: WSP
Paper: A3
Scale: 1:4,000
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Local road
- Track
- Waterways
- Waterbodies

Intersection type

- Major intersection with increased traffic
- Road closure

RouteType

- Diversion routes
- Route to be diverted (road closure)

INLAND RAIL
ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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The intersection closure on the western side and the Kemp Street bridge closure requires diversions for:

- Olympic Highway traffic – rerouted via Joffre Street and Pretoria Avenue. It is expected that the intersection of Joffre Street and Pretoria Avenue would be managed under traffic control to give priority to the major movement of Joffre Street to/from Pretoria Avenue
- Kemp Street bridge traffic – eastbound traffic rerouted via the level crossing on Olympic Highway to the north, and be diverted via Joffre Street, Pretoria Avenue, Seignior Street, Main Street, Humphries Street and Lorne Street
- local traffic that currently turns right on Railway Parade would be diverted via Harold Street.

The intersection closure on the eastern side of Kemp Street bridge requires diversions for:

- north-south traffic at Edgar Street to be diverted via William Street and Lorne Street
- Kemp Street bridge traffic – westbound traffic rerouted via the level crossing on Olympic Highway to the north, and be diverted via Joffre Street, Pretoria Avenue, Seignior Street Main Street, Humphries Street and Lorne Street.

The diversion routes have been selected to minimise impact to the surrounding residential and open space park land uses. These diversion routes would be designed to provide suitable safe movements along public roads in accordance with relevant standards and guidelines.

ROAD PERFORMANCE

The link LOS assessment for the Kemp Street bridge and Junee Station pedestrian bridge enhancement site components of the proposal is shown in Table 5.42. The table details a worst-case assessment including both expected peak construction traffic and diverted traffic applied to the highest peak hour traffic volume for each link. The assessment shows that with diversions in place all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). A change in LOS as a result of the diversions and construction traffic is seen on the following roads:

- Seignior Street (LOS B to LOS C)
- Olympic Highway Level Crossing (LOS A to LOS C)
- Humphrys Street (LOS A to LOS B)
- Joffre Street (LOS A to LOS B)
- Pretoria Avenue (LOS A to LOS B).

Table 5.42 Kemp Street bridge, diversion route road performance

ROAD		**2024 PEAK HOUR**		**2024 WITH DIVERSION PEAK HOUR**			
Road name	**Road type**	**Volume – one way**	**LOS**	**Construction volume – one way**	**Diverted volume – one way**	**Combined volume – one way**	**LOS**
Seignior Street	Urban	235	B	27	173	435	C
Olympic Highway Level Crossing	Urban	198	A	27	173	398	C
Humphrys Street	Urban	99	A	27	173	299	B
Lorne Street	Urban	99	A	27	0	126	A
Joffre Street	Urban	24	A	27	173	224	B
Harold Street	Urban	68	A	27	14	109	A
Thomas Street	Urban	18	A	27	14	59	A
William Street	Urban	37	A	27	79	143	A
Pretoria Avenue	Urban	18	A	27	173	218	B

It is noted that the level crossing on the Olympic Highway in Junee closes more regularly and for a longer duration than other level crossings in the study area due to rail operations at the rail yard to the south of the crossing.

Data for the crossing in August 2021 (31 days) has been used to determine the number and frequency of level crossing closures during the peak traffic period (3:15PM to 4:15PM). The data showed the following:

- the average closure time during the traffic peak hour was under 3 minutes
- the average number of closures was less than one in a peak traffic hour.

To provide a conservative assessment of additional (diverted and construction) vehicles impacted by the crossing closures, it has been assumed that the crossing closes once during the peak hour for a duration of three minutes.

Three minutes is equivalent to 5% of the peak hour. Therefore, it is assumed that 5% of peak hour road traffic is affected by the crossing closure. The total number of vehicles two-way (with and without the diversion) is shown in Table 5.43.

Table 5.43 Olympic Highway Junee level crossing impacts (two-way)

	WITHOUT DIVERSIONS – TWO WAY	CONSTRUCTION VOLUME – TWO WAY	DIVERTED VOLUME – TWO WAY	COMBINED VOLUME – TWO WAY
Number of vehicles forecast (2024)	394	54	173	398
5% of vehicles impacted by closure	20	3	13	36

Table 5.43 presents a worst-case scenario, where all diverted traffic use the level crossing. This would result in the number of vehicles experiencing delay during the peak period increase from 20 to 36 vehicles. This is not considered a significant impact. Furthermore, the assessment was undertaken for a peak hour and at other times of the day even fewer vehicles are expected to be affected by the level crossing closures.

Moreover, it is expected that locals, with knowledge of the road network and the frequency of crossing closures, would elect to avoid the crossing and use an alternative diversion route via Broadway, Regent Street, and Illabo Road, reducing the total number of vehicles impacted by the Kemp Street bridge works diversion. Table 5.44 shows the additional travel time incurred by this alternative route for northbound and southbound traffic. Although this represents a significant additional travel time for southbound vehicles, some drivers may prefer to take this route to avoid being stationary at the level crossing.

Table 5.44 Travel times for alternative diversion route

	EXISTING TRAVEL TIME	DETOUR TRAVEL TIME	TOTAL ADDITIONAL TRAVEL TIME
Northbound traffic	2 mins	4 mins (via Broadway, Regent Street, and Illabo Road)	2 mins
Southbound traffic	0 mins	5 mins (via Broadway, Regent Street, and Illabo Road)	5 mins

INTERSECTION PERFORMANCE

As stated above, the traffic diversion required for the Kemp Street bridge Enhancement Site uses several intersections through Junee. To identify intersection(s) likely to be impacted, a qualitative assessment was undertaken based on intersection layouts and opposing traffic flows at each intersection. The results are shown in Table 5.45.

Table 5.45 Diversion intersection impacts – Kemp Street bridge enhancement site

INTERSECTION	DESCRIPTION OF TRAFFIC FLOW	EXPECTED TRAFFIC IMPACT
Olympic Highway/Joffre Street	Diverted traffic flows unopposed. Left-and right turn movements to/from Joffre Street are the only significant movement during diversion	Minimal impacts due to diversions expected.
Joffre Street/Pretoria Avenue	Most traffic unopposed. Left-and right turn movements to/from Pretoria Avenue would be given priority under traffic control	Minimal impacts due to diversions expected.
Seignior Street/Pretoria Avenue	Traffic flows unopposed. Left-and right turn movements to/from Seignior Street are the only significant movements during diversion	Minimal impacts due to diversions expected.
Seignior Street/Olympic Highway/ Broadway	Diverted traffic has the potential to create queuing issues due to proximity to level crossing	Minimal impacts due to diversions expected. Further detail provided in intersection assessment below
Main Street/Olympic Highway	Kemp street diversion traffic expected on the south approach left turn and West approach left and right turn, all of which have priority with existing intersection configuration	Minimal impacts due to diversions expected. Queuing issues at level crossing not expected due to existing intersection priorities.
Humphrys Street/Peel Street	A proportion of diverted traffic (non-Olympic Highway) would use this intersection to continue south	Due to the low estimated volumes on Humphrys Street, this intersection is expected to have sufficient capacity for a proportion of diverted traffic with minimal impacts due to diversions expected.
Edgar Street/Ducker Street	Diverted traffic would become a through movement rather than right and left turn movements	Minimal impacts due to diversions expected.
Ducker Street/William Street	Left and right turn movements on intersection with equivalent number of lanes as intersection diverted from	Minimal impacts due to diversions expected.
William Street/Edgar Street	Traffic flows unopposed. left-and right turn movements to/from Edgar Street are the only movement	Minimal impacts due to diversions expected.
Olympic Highway/Harold Street	Vehicles Diverted from Railway Lane to Harold Street	Harold Street expected to have sufficient capacity to cater for additional 14 vehicles in the peak hour from Railway Lane.

The Seignior Street/Olympic Highway/Broadway roundabout was identified as the most critical to traffic operations in Junee due to:

- road hierarchy and location on the highly trafficked Olympic Highway
- opposing traffic flow volumes to major movements
- close proximity to the railway level crossing on the Olympic Highway, and potential queuing issues at this location.

Therefore, the Seignior Street/Olympic Highway/Broadway intersection has been assessed in SIDRA to reflect a 'worst-case' scenario of construction vehicle impact at an intersection during diversions within the Junee precinct. Figure 5.40 shows the layout of the roundabout as modelled in SIDRA.

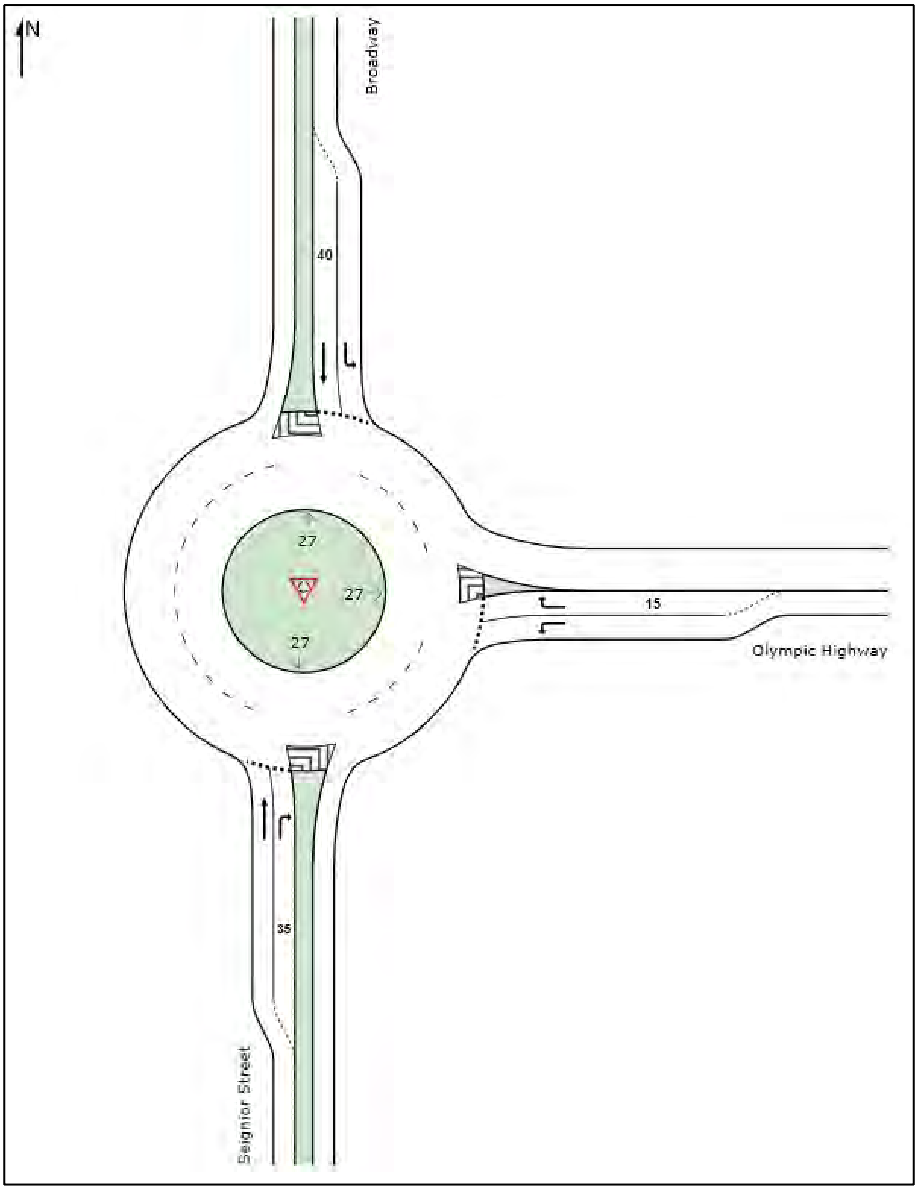

Figure 5.40 Seignior Street/Olympic Highway/Broadway SIDRA intersection configuration

Traffic counts procured for the assessment show the highest hourly volumes are during the PM peak. Table 5.46 shows the background and diverted vehicle numbers during this peak period at the intersection.

Table 5.46 Seignior Street/Olympic Highway/Broadway roundabout diversion traffic volumes – PM Peak

ROUNDABOUT APPROACH	PM PEAK VEHICLES	DIVERTED VEHICLES	CONSTRUCTION VEHICLES	TOTAL VEHICLES DURING DIVERSION
South: Seignior Street	179	83	27 lv + 9 hv	298
East: Olympic Highway	193	178	27 lv + 9 hv	407
North: Broadway	291	0	0	291

Table 5.47 shows the SIDRA results for the Seignior Street/Olympic Highway/Broadway intersection during a 2024 peak hour with and without construction vehicles. The results show the performance of the intersection is not significantly impacted by construction vehicles: LOS continues operates at an acceptable level (LOS A), DOS only increases from 0.102 – 0.207, intersection delay does not increase, and 95th percentile queue lengths only increases by 5m (approx. one vehicle). 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles.

Table 5.47 Seignior Street/Olympic Highway/Broadway, 2024 construction route intersection capacity – PM Peak

	2024 PM PEAK HOUR				2024 PM PEAK HOUR WITH CONSTRUCTION			
Approach	DOS	Delay (s)	LOS	Queue (m)	DOS	Delay (s)	LOS	Queue (m)
South: Seignior Street	0.08	6	LOS A	3	0.129	8	LOS A	6
East: Olympic Highway	0.081	6	LOS A	3	0.207	4	LOS A	9
North: Broadway	0.102	4	LOS A	4	0.113	5	LOS A	5
Intersection	0.102	5	LOS A	4	0.207	5	LOS A	9

As the Seignior Street/Olympic Highway/Broadway intersection is reflective of the ‘worst case’ impact resulting from diversion and construction route intersection in the Junee precinct, it is not considered that the performance of any other intersections forming part of the diversion routes would be significantly impacted by the proposal.

TRAVEL TIME

Figure 5.41 shows that the longest potential diversion would take approximately three-to-four minutes of additional travel time in a vehicle. As the diversion is temporary, a maximum (depending on origin and destination) four minutes travel time is not considered a significant impact.

Albury to Illabo Figure 5.41 Junee diversion travel time impacts

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Coordinate System: GDA 1994 MGA Zone 55

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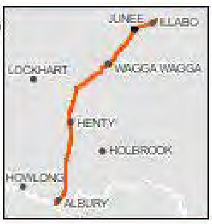
Date: 18/02/2022 Paper: A3
Author: WSP Scale: 1:2,500
Data Sources: ARTC, NSWSS

Proposal site
Existing railway
Main road
Local road
Waterways
Travel time impacts (distance, time delay)



INLAND RAIL ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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PARKING

Parking for construction workers and laydown areas would be provided for unloading of heavy vehicles at the Kemp Street bridge enhancement site within the construction site area and so would have minimal impact to existing parking facilities.

During the two-month program for the Junee Station pedestrian bridge enhancement site a portion of the Lorne Street carpark and kerbside parking on Railway Square is expected to be impacted due to the establishment of a site access and equipment set up in these locations. Table 5.48 shows the impact to car parking in the area.

Table 5.48 Impacts to car parking – Junee Station and surrounds

LOCATION	CARPARK CAPACITY	IMPACTED AREA	REMAINING AREA	DURATION
Junee Station and surrounds (off Lorne Street)	60 spaces	27 spaces	33 spaces	Two months
Railway Square (Junee Railway Station)	13 spaces One disabled parking space	Up to 2 spaces (including one disabled parking space)	11 spaces	1-2 days

One kerbside disabled parking space on Railway Square is likely to be temporarily impacted by works at Junee Station taking place on the overhead signal cables. These works are expected to last only for 1-2 days. Any user requiring this space would be accommodated in the TMP.

There may be other minor isolated impacts to parking due to traffic control and the increase of heavy vehicles on the local road network as listed in Table 5.49. Review of aerial imagery of the area suggests that in all locations demand for on-street parking would be relatively low in the surrounding streets, as the areas feature low-density residential premises with space for private off-street parking. There is also kerbside parking capacity nearby to absorb the temporary parking losses.

Table 5.49 Impacts to on-street parking – Junee Station and surrounds

LOCATION	IMPACTED AREA	DURATION
Kemp Street	19 on road spaces	Eight months (duration of Kemp Street bridge closure)
Seignior Street	18 on road spaces	
Railway Lane	13 on road spaces	
Railway Parade	3 on road spaces	
William Street	16 on road spaces	
Joffre Street	16 on road spaces	
Pretoria Avenue	27 on road spaces	

Any on-street parking impacts would be managed in line with the TMP.

5.4.2.3 OLYMPIC HIGHWAY UNDERBRIDGE ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Olympic Highway underbridge enhancement site component of the proposal is shown in Table 5.50. This assessment shows that with construction traffic all road links are expected to operate at LOS A, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.50 Olympic Highway underbridge enhancement site, construction route road performance

ROAD		2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
Road name	Road type	Volume – one way	LOS	Construction volume – one way	Combined volume – one way	LOS
Main Street (Olympic Highway) [1]	Highway	113	A	71	184	A
Illabo Road [2]	Urban	35	A	61	96	A

(1) Olympic Highway – 90m North of Illabo Road, Junee
(2) No data available, volumes estimated as John Potts Drive, Junee with equivalent HV proportion

Note, construction peak hour volumes are higher on Main Street (Olympic Highway) than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the expected highest trafficked (on a per lane basis) construction route intersection in the Junee precinct was undertaken for the Junee Station and surrounds. This assessment is presented in section 5.4.2.2. The intersection assessment assessed combined peak hour construction traffic in conjunction with peak hour diversion and background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Olympic Highway underbridge enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

No road closures or diversions are proposed for the Olympic Highway underbridge enhancement site.

PARKING

Parking for construction workers and laydown areas would be provided for unloading of heavy vehicles at the Olympic Highway underbridge enhancement site within the construction site area and so would have minimal impact to existing parking facilities. There may be minor isolated impacts to parking due to traffic control and the increase of heavy vehicles on the local road network, which would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.4.2.4 JUNEE TO ILLABO CLEARANCES ENHANCEMENT SITE

ROAD PERFORMANCE

The link LOS assessment for the Junee to Illabo Yard clearances enhancement site component of the proposal is shown in Table 5.51. This assessment shows that with construction traffic all road links are expected to operate at LOS B or better, which is considered stable flow conditions and an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to road operation and performance are expected.

Table 5.51 Junee to Illabo clearances enhancement site, construction route road performance

ROAD		2024 PEAK HOUR		2024 WITH CONSTRUCTION PEAK HOUR		
Road name	**Road type**	**Volume – one way**	**LOS**	**Construction volume – one way**	**Combined volume – one way**	**LOS**
Olympic Highway [1]	Highway	113	A	90	203	A
Brabins Road	Rural	2	B	85	87	B
Waterworks Road	Rural	15	B	85	100	B
Marinna Station Cross Road [2]	Rural	2	B	85	87	B

(1) Olympic Highway – 90m North of Illabo Road, Junee

(2) No data available, volumes estimated as Brabins Road, Illabo

Note, construction peak hour volumes are higher on Olympic Highway than on the other roads under assessment as the road performance assessment for highways requires assessment of PCUs which effectively doubles the count of heavy vehicles required for construction.

INTERSECTION PERFORMANCE

An assessment of the performance of the expected highest trafficked (on a per lane basis) construction route intersection in the Junee precinct was undertaken for the Junee Station and surrounds. This assessment is presented in section 5.4.2.2. The intersection assessment assessed combined peak hour construction traffic in conjunction with peak hour diversion and background traffic as a worst-case scenario for construction movements as expected construction start and finish times end outside of typical peak periods.

This assessment showed that the expected performance of the highest trafficked intersection in the precinct was LOS A, which is considered an acceptable LOS as per the Guide to Traffic Generating Developments (RTA 2002). Furthermore, the assessment shows no change in LOS as a result of the construction generated traffic and subsequently no significant impacts to intersection operation and performance are expected. Furthermore, 95th queuing does not extend into any additional adjacent intersections as a result of the construction vehicles. As such, it is not considered that construction vehicles would impact the performance of any other lesser trafficked construction route intersection within the precinct. Therefore, no additional construction route intersection analysis has been undertaken for the Junee to Illabo Yard clearances enhancement site.

TEMPORARY CLOSURES AND DIVERSIONS

The Junee to Illabo clearances enhancement site includes amendments to one public level crossing and three private level crossings. Table 5.52 shows the crossings to be closed, the duration of closure, and alternative access options that will be made available.

Table 5.52 Level crossing closures and diversions – Junee to Illabo clearances

LEVEL CROSSING	DURATION OF CLOSURE	ALTERNATIVE ACCESS OPTION
Waterworks Road level crossing (LX604)	Three days	Motorists would need to use Waterworks Road to travel to/from the Olympic Highway.
Wornes Gate Road level crossing (LX1472)	Five days	Alternative route using Hazeldene Road would need to be used.
Shire and Carter property level crossing (LX605)	Three days	For the Junee Shire Council property, alternative access is not available but Council has advised that access to this property is infrequent. Alternative access is available for the private Carter property via Hazeldene Road to travel west (via Ballengaoarrah Lane and Waterworks Road), or east (via Brabins Road). The number of vehicles accessing the property via the level crossing is likely low but may increase during harvest periods. The timing of this closure would be coordinated in consultation with the Junee Shire Council and the private property owner.
Olympic Highway level crossing (LX603)	Three days	A temporary crossing approximately 5m from the existing level crossing would be constructed to maintain highway access across the rail corridor. Traffic would be managed in line with the TMP.

The public level crossing between Waterworks Road and the Olympic Highway will be closed for enhancements as part of the proposal for three days. However, other connection points from Waterworks Road to the Olympic Highway are available via:

- Main Street in Junee, 1km to the west
- Wornes Gates Road in Illabo, 9km to the east
- Brabins Road in Illabo, 17km to the east.

Table 5.53 shows the additional travel time required to access the Olympic Highway via these locations and the additional travel time required to travel to the location on the Olympic Highway adjacent to Waterworks Road to represent a worst-case detour.

Table 5.53 Additional travel time and number of vehicles impacted

ROUTE FROM WATERWORKS ROAD LEVEL CROSSING TO	EXISTING TRAVEL TIME	DETOUR TRAVEL TIME	TOTAL ADDITIONAL TRAVEL TIME
Main Street, Junee	6 mins	6 mins	0 mins
Wornes Gate Road, Illabo	4 mins	10 mins	6mins
Brabins Road, Illabo	9 mins	15 mins	6 mins
Olympic Highway adjacent to Waterworks Road	<1 min	11 mins	10 mins

Table 5.53 shows that for vehicles travelling:

- west to Junee there is no additional travel time
- east to Illabo there is an additional six-minute travel time via either Wornes Gate Road or Brabins Road
- north to Olympic Highway adjacent to Waterworks Road, there is an additional 10-minute travel time.

Table 5.51 shows that during a peak hour, only 15 vehicles (one way) are present on Waterworks Road during a peak hour. 15 vehicles being impacted by the additional travel time shown in Table 5.53 is not considered significant. Noting vehicles heading west will not experience any additional travel time because of the level crossing closure. Moreover, only a small percentage of vehicles would experience the maximum additional delay of 10 minutes as most vehicles will be travelling east or west.

Other level crossing closures are expected to have minimal traffic impacts as they are for a short duration, affect single property accesses, roads that carry minimal traffic, or sufficient alternative routes are available to minimise impacts.

PARKING

Parking for construction workers and laydown areas would be provided for unloading of heavy vehicles at the Junee to Illabo clearances enhancement site within the construction site area and so would have minimal impact to existing parking facilities. There may be minor isolated impacts to parking due to traffic control and the increase of heavy vehicles on the local road network, which would be managed in line with the TMP.

No disabled parking spaces would be impacted by the proposal.

5.4.3 CONSTRUCTION SITE ACCESS

A turn warrant assessment for each enhancement site access in the Junee precinct have been undertaken based on The Guide to Traffic Management – Part 6 Intersection, Interchanges and Crossings (Austroads 2020). This assessment has analysed a worst-case scenario, assuming all peak generated construction traffic is distributed to each access during the road network peak period. The results of this assessment are shown in Table 5.54.

Table 5.54 Junee precinct enhancement site access turn warrant assessment

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD DESCRIPTION	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Harefield	26 / Harefield Road	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD DESCRIPTION	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Harefield	25 / Byrnes Road (south of Harefield Road)	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee Station and surrounds	30 / Seignior Street	Two-way	Channelised Right-Turn / Auxiliary Left-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee Station and surrounds	27 / Edgar Street / Hill Street	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. Low speed environment (≤60km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee Station and surrounds	29 / Commercial carpark off Lorne Street	Two-way	N/A [1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact expected.
Olympic Highway underbridge	31 / Regent Street	One lane two-way	N/A [1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact expected.
Olympic Highway underbridge	49 / Illabo Road	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.

ENHANCEMENT SITE	ACCESS NUMBER / ROAD	ROAD DESCRIPTION	ASSESSMENT OUTCOME (TURN TREATMENT)	CONSIDERATIONS
Olympic Highway underbridge	32 / Main Street	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Olympic Highway underbridge	48 / Olympic Highway	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee to Illabo	33, 34, 53, 47, 54, 55, 56, 57, 58, 70, 59, 60, 71, 62, 63, 64, 65, 66 / Olympic Highway	Two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee to Illabo	51, 52, 68, 69, / Waterworks Road	One lane two-way	Basic Left-Turn / Basic Right-Turn	Left and right turn into and out of site. Opposing movements on public road. High speed environment (≥80km/h). Current configuration does not meet turn warrant guidance, Road Safety Audit would investigate the need for traffic management of this access.
Junee to Illabo	61 / Brabins Road	One lane two-way	N/A [1]	Through movement into site. No opposing movements on public road. Low speed environment (≤60km/h). Minimal impact expected.

(1) Turn warrant methodology not suitable for assessment due to access intersection configuration

Basic Left-Turn/Basic Right-Turn and Channelised Right-Turn / Auxiliary Left-Turn treatments are required by the intersection turn warrant assessment for some site accesses in this precinct. However, this may not be required given the temporary nature of accesses during the construction phase and the conservative nature of the assessment (peak construction vehicles assessed during the background peak hour, when peak construction vehicles are expected outside the background peak hour).

Where the turn warrant assessment methodology is unsuitable for the assessment of the enhancement site access, access arrangements as per the current road network are not expected to have a significant impact as they are either a through movement from the end of a street or impacting limited traffic movements.

More detailed assessment of the accesses will be undertaken as part of the Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans will be developed by the contractor prior to commencement of construction activities on site to moderate any potential safety issues. Design of any access treatments or modifications to roads would be undertaken in accordance with appropriate design standards and with approvals from the relevant local or state road authorities. Works Authorisation Deeds or other suitable consent or agreement with TfNSW will be made prior to undertaking any relevant works on a State Controlled Road.

5.4.4 ROAD SAFETY

During construction there would be changes to road conditions within the Junee precinct consisting of increased traffic volumes due to construction vehicles, temporary diversions and new access points to the enhancement sites from the public road network. This study has primarily considered the operation and capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles. The suitability of access and diversion routes has not been assessed with respect to road safety.

It is noted that the construction activities at enhancement sites within the Junee precinct, are expected to generate a maximum peak hour flow of 65 vehicles (for a three-day peak possession period), which does not result in a change of LOS on any of the enhancement site access routes as discussed in section 5.4.1. Access intersections to the enhancement sites within the Junee precinct would be designed or have traffic control measures implemented to provide suitable safe access to public roads in accordance with relevant standards and guidelines.

Additionally, there would be traffic diversions in place for the Kemp Street bridge work site that re-route vehicles on the state-controlled Olympic Highway to Joffre Street and Pretoria Street. The diversion of Traffic from the Kemp Street bridge results in a change of LOS, but all road links still operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002). Traffic management for these diversion routes would be designed to provide suitable safe access to public roads in accordance with relevant standards and guidelines.

To moderate any construction impacts to existing or potential safety issues associated with either construction vehicle movements or the additional traffic on local roads from diversions, Road Safety Audits and Construction Traffic Transport and Access Management Plans would be required to be undertaken by the contractor prior to commencement of construction activities on site or the implementation of diversionary routes and the safety of all road users should be taken into account.

5.4.5 HEAVY VEHICLE ROUTES

As there are no significant changes to background LOS resulting from the traffic generated by the construction activities at enhancement sites or diversions within the Junee precinct, it is not expected that construction heavy vehicle and workforce movements generated by the proposal, as shown in section 5.4.1.3, would impact the current operations of existing heavy vehicles movements, including agricultural transport, on the routes discussed in section 4.6.3.

The Kemp Street bridge enhancement site works would require diverting of part of the Olympic Highway in southern Junee. Heavy vehicle diversionary signage would be implemented to divert traffic outside of Junee on existing heavy vehicle routes via Goldfields way and Old Junee Road resulting in an additional travel distance of 4km to reduce impact associated with heavy vehicle movements on Pretoria Street. For heavy vehicles that this diversionary route is not appropriate, a diversion on local roads within Junee via Joffre Street and Pretoria Avenue would be in place. This diversion does not represent a significant change in distance travelled. However, there may be minor delays to heavy vehicles passing through the enhancement site from reduced speed limits and traffic control. The Construction Traffic Transport and Access Management Plans would be developed to ameliorate impacts to safe and efficient travel of heavy vehicles through this diversionary route.

There is potential for construction heavy vehicles to impact road pavement conditions along haul routes. To determine the extent of the impact a road dilapidation report would be prepared for all haul routes within the precinct. Joffre Street and Pretoria Avenue would be monitored for damage during construction and any necessary repairs attended to immediately.

5.4.6 TRAVELLING STOCK RESERVES

No Travelling Stock Reserves are located on roads expected to support construction movements in the Junee precinct. A small Travelling Stock Reserve is located near the eastern end of the Junee to Illabo clearances enhancement site, which is not expected be significantly impacted as it does not cross the enhancement site. It is expected that prior to the commencement of works that Local Land Services would be notified of increased vehicle movements along the TSRs and temporary closures of rail level crossings in the Junee precinct so that stock handlers, including walking permit holders, can be notified of the impacts to stock movements.

5.4.7 PUBLIC TRANSPORT ROUTES

5.4.7.1 ROAD

Although there would be increased traffic resulting from construction activities within the Junee precinct, it is expected to have a minimal impact on the operation of public or school bus services or bus stops due to the low traffic volumes generated by the construction activities (with diversions in place all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002)). It is noted that the heaviest period of construction movements during a day is expected to occur outside peak bus service periods (e.g. school times). There may be minor delays to buses passing near the enhancement sites from reduced speed limits and traffic control. These impacts would be managed in accordance with the traffic management plan to ameliorate impacts to the safe and efficient travel of bus services through the affected areas.

The road closures associated with the Kemp Street bridge enhancement site and the associated changes in road network connectivity for eight months is expected to directly impact public and school bus services as described below in Table 5.55 and Table 5.56.

Table 5.55 Public bus route impacts – Kemp Street bridge

SERVICE	IMPACTS
Wagga, 922 – Junee to Wagga Wagga, 924 – Junee to Wagga Wagga via Jail Break Inn, Wallacetown and Brucedale Dr	These services use Kemp Street and are directly impacted by Kemp Street bridge closure. Would require rerouting and alternative stops (Kemp Street after Joffre Street / 2663127) or stopping patterns during the closure period.
921 – Junee to Wagga	These services use Kemp Street and are directly impacted by Kemp Street bridge closure. Would require rerouting during the closure period.
923 – Junee to Wagga Wagga via Junee Station	These services use Byrnes Road and are directly impacted by Kemp Street bridge closure. Would require rerouting during the closure period.

Table 5.56 School bus route impacts – Kemp Street bridge

SERVICE	IMPACTS
S221 – Junee Schools	This service uses Kemp Street and is directly impacted by Kemp Street bridge closure. Would require rerouting and alternative stops (Kemp Street after Joffre Street / 2663127) or stopping patterns during the closure period.
S226 – Junee Reef to Junee Schools via Marinna Road	These services use Kemp Street and are directly impacted by Kemp Street bridge closure. Would require rerouting during the closure period.

Changes to bus routes and bus stops would be planned in consultation with the relevant stakeholders to minimise the impact on community, public transport users, and service providers.

Further to the above impacts due to diversions, there may be minor delays to buses passing near enhancement sites from reduced speed limits and traffic control. These impacts would be managed in accordance with the traffic management plan to ameliorate impacts to the safe and efficient travel of bus services through the affected areas.

5.4.7.2 RAIL

Track works would be required for following enhancement sites:

- Harefield Yard clearances
- Junee Yard clearances
- Olympic Highway underbridge
- Junee to Illabo clearances.

These works would occur during either:

- existing scheduled weekend rail corridor possession periods (typically 72 hours) when trains along the rail corridor are stopped for maintenance as part of operation of the existing rail line; or
- track work authorisations periods, which enable works that impact rail operations to occur outside scheduled rail possessions, but within available 9-hour windows in which train services are not scheduled.

Work during these periods would be undertaken in consultation with passenger rail operators. However, it is not expected that proposal construction works would impact upon the passenger rail network. A portion of the train station platform at Junee station will be temporarily impacted during the pedestrian overpass removal works. During the works the platform will remain open and the remaining unimpacted length of platform (approximately 130m) is expected to provide sufficient capacity to operate without impact to passengers.

5.4.8 ACTIVE TRANSPORT ROUTES

As shown in section 4.6.6, provision for active transport in the vicinity of the Harefield and Junee to Illabo Yard clearances enhancement sites is minimal, and given the surrounding land uses the demand for cycling and pedestrian travel in the area is likely to be low. Although there would be increased traffic from construction vehicles, it is expected to have a minimal impact on cycling or pedestrian movements due to the low traffic volumes generated by the construction activities (with diversions in place all road links are expected to operate at LOS C or better, which is considered stable flow conditions as per the Guide to Traffic Generating Developments (RTA 2002)).

The closure of the Kemp Street bridge for approximately eight months will impact active transport connectivity. During the closure period, cross-rail pedestrian and cyclist movements would be diverted to the alternative rail crossing on Olympic Highway located 700m north. This is a potential additional diversion distance of 1.4km as a worst-case scenario as actual impacts would vary by individual origin and destination. Footpaths provide full pedestrian connectivity for the diversion route between Kemp Street and Ducker Street (the location of western landing of the Kemp Street bridge) via Seignior Street and Lorne Street. Cyclists would be required to travel on-road via the diversion route. Pretoria Avenue and Joffre Street do not have full pedestrian connectivity for the diversion route between Kemp Street and Ducker Street (as there are no formalised footpaths). The existing shared path located within the enhancement site through Endeavour Park (as shown in Figure 4.64) would remain available until it is closed for construction. At this point, pedestrians would be detoured onto Pretoria Avenue and Joffre Street. Construction staging will be planned to account for continued active transport connectivity during construction.

The Olympic Highway underbridge would require the closure of the pedestrian path under the bridge for approximately five days. Works are planned during rail possession periods when the demand for pedestrian and cyclist movement in this area is expected to be low. The nearest alternative crossing represents a detour of approximately 3.5km and so it is expected that pedestrians would be managed by on-site traffic management during this period. Cyclists would be required to travel on-road via the diversion route.

5.4.9 PROPERTY ACCESS IMPACTS

Although there may be some minor temporary disruptions, property access is expected to be maintained for the duration of the construction activities in the area, including to houses on Pretoria Avenue. Properties located adjacent to the Kemp Street bridge enhancement site on the Olympic Highway between Railway Lane and Harold Street have rear lane access, which would be maintained throughout construction. Pedestrian access to these properties would be maintained via Olympic Highway. One property on Railway Lane may be impacted by the closure of this street, however alternative access arrangements are expected to be provided.

Access to an approved development at the rear of the Locomotive Hotel off Kemp Street would be maintained via Edgar Street. More detailed assessment of this access requirement would be undertaken by the contractor prior to commencement of construction activities on site. These would include Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans to moderate any potential safety issues.

Any changes to the existing access arrangements would need to be undertaken in consultation with the relevant stakeholders and in line with the TMP.

5.4.10 RAIL FREIGHT

Track works would be required for the following enhancement sites:

- Harefield Yard clearances
- Junee Yard clearances
- Olympic Highway underbridge
- Junee to Illabo clearances.

These works would occur during either:

- existing scheduled weekend rail corridor possession periods (typically 72 hours) when trains along the rail corridor are stopped for maintenance as part of operation of the existing rail line; or
- track work authorisations periods, which enable works that impact rail operations to occur outside scheduled rail possessions, but within available 9-hour windows in which train services are not scheduled.

Work during these periods would be undertaken in consultation with freight operators. However, it is not expected that proposal construction works would impact upon the rail freight network.

5.4.11 EMERGENCY VEHICLE ACCESS

Construction of the proposal would result in temporary impacts to access and traffic with the establishment of diversions due to closure of the Kemp Street bridge, and an increase in vehicle movements on the road network. As shown in the link and intersection performance assessments, all road links are expected to operate at LOS C or better within the Junee precinct, and so there is not expected to be a significant impact to emergency vehicles. It is expected that the traffic and access management plan would be developed in consultation with TfNSW, Junee Shire Council, and State emergency services and would consider and effectively manage any impacts to emergency vehicles seeking to use roads in the vicinity of the enhancement sites or diversion routes.

5.4.12 SEASONAL VARIATION

Temporary local events such as festivals, shows, and markets may result in minor localised traffic variations, particularly in urban environments such as Junee. The Harefield and Junee to Illabo Yard clearances enhancement sites are less urbanised than those located closer to Junee, featuring more rural and agricultural land uses.

Localised seasonal traffic variation may be experienced at enhancement sites that share land with agricultural infrastructure (grain silos, livestock loading facilities etc.) as the infrastructure will likely generate additional heavy or farm vehicle movements during harvest seasons.

A review of aerial imagery of enhancement sites in the Junee precinct identified grain silos and agricultural transport facilities that may generate seasonal agricultural vehicle or machinery movements in the vicinity of the Junee to Illabo clearances enhancement site. The following rail level crossings provide access to the enhancement site and were identified as the most likely to have agricultural movements.

- LX604 – Brabins Road
- LX605 – Shire and Carter property level crossing
- LX1472 – Wornes Gate Lane
- LX606 – Waterworks Road.

However, it is not anticipated that any seasonal variation would significantly impact the outcomes of the traffic assessment as background and construction vehicle traffic volumes are low. More detailed assessment of the enhancement site accesses, which would consider seasonal variation due to social events and agricultural movements, will be undertaken by the contractor prior to commencement of construction activities on site. These would include Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans to moderate any potential safety issues.

6 IMPACT ASSESSMENT – OPERATION

In accordance with the SEARs, an impact assessment of the transport network during the operation of the proposal has been undertaken. Mitigation measures have been developed to minimise the consequence and/or likelihood of the impacts.

6.1 OPERATIONAL CONTEXT

The operational assessment of the proposal has been undertaken for the horizon years of 2025 (year of opening) and 2040 (15-year design horizon). Between 2025 – 2040 the expected number of Inland Rail services between Albury and Illabo is expected to increase. The number of freight trains movements between Albury and Illabo will increase from up to 12 per day in 2021 to up to 18 per day in 2025, further increasing to up to 20 per day in 2040.

To provide a conservative assessment of the operational period, it has been assumed that all expected growth in services (passenger and rail) after 2025 are attributed to the proposal. This methodology results in an increase of up to two daily services from 2025 to 2040. Conservatively, its assumed that a maximum of two services would operate in any one hour in 2040.

These trains would be diesel powered, and would be a mix of passenger trains, bulk freight, and containerised freight trains of up to 1,800m in length with train speeds ranging from 60 to 115km/hr. The maximum length of trains operating between Albury and Illabo would not increase due to the proposal, as trains up to 1,800m in length currently operate. The existing freight train speed limits between Albury and Illabo would apply to the Inland Rail freight trains therefore no changes to current freight train speeds are expected as a result of the proposal. The possible future use of the railway between Albury and Illabo by freight trains up to 3,600 m long would be subject to separate assessment.

An Inland Rail freight train of 1,800m in length would generally travel through any given location at the same speed a 1,800m in length freight train would under current operations. Using a level crossing as an example, the total closure time for a 1,800m in length freight train would be the same with the operation of the proposal as it would under current operations. However, as the proposal would increase the number of freight trains and particularly those up to 1,800m in length, the likelihood of experiencing the maximum delay associated with a level crossing closure for a 1,800m freight train would increase.

As the proposal only provides enhancements to the existing rail line and crossings, the potential operational impacts would be associated with:

- increased daily train services resulting in an increased frequency of closures per day at level crossings
- increased delay where level crossings on private accesses have been upgraded from passive to active.

6.2 ROAD NETWORK OPERATION

There is not expected to be any significant impact to road network performance during the operation of the proposal.

The proposal would not generate additional traffic during operation, as there would be no changes to track maintenance activities and rolling stock staffing. As such, no impacts to the road network performance during operation of the proposal from vehicle movements would occur.

Furthermore, the number of road-based freight movements utilising the wider road network may reduce as a result of the operation of the Inland Rail program as a whole. Moreover, as there are no proposed increases to passenger train services as a result of the proposal it is not expected that any additional traffic would be generated by passengers accessing existing railway stations.

It is noted that some realignment and modification of the road network occurs as a result of enhancements at the Edmondson Street bridge site in Wagga Wagga and the Kemp Street bridge site in Junee. No significant change to the geometry and functionality of the road network adjacent to the Edmondson Street bridge is expected. Therefore, no associated impacts to traffic capacity or intersection performance are expected either. The intersection of Railway Parade/ Kemp Street / Olympic Highway in Junee will be reconfigured from close-set staggered T-intersections to a four-way priority intersection, maintaining all existing traffic movements. Due to the low volumes on Railway Parade, this permanent change to the road network is not expected to have any significant impacts to intersection delay, capacity, or Level of Service.

6.3 RAIL INTERFACE OPERATION

6.3.1 APPROACH

The approach ARTC has used for considering level crossing options is outlined in Appendix A. It has taken into account relevant NSW and Australian level crossing policies, which emphasise the need to minimise the number of level crossings, as far as reasonably practicable.

The treatment options for the interaction of public roads and the rail corridor consist of:

- grade-separated crossings (via a road or rail bridge)
- level crossings.

Level crossings would be provided with warning signage, line marking, and other relevant controls, in accordance with the relevant ARTC and Australian standards, incorporating either:

- passive crossings, which involve static warning signs
- active crossings, which involve flashing lights, warning bells and boom barriers for motorists. These devices are activated prior to and during the movement of a train through the level crossing.

6.3.2 SIGHT LINES

The vegetation and topography near level crossings must be assessed for its potential to obscure visibility of signals, other transport and sight lines to the track from vehicle stop lines at level crossings (to meet ALCAM distances). Sight lines were reviewed for all modified level crossings. Sight lines at one level crossing being LX 604 (Brabins Road) were identified to be insufficient.

The deficiency is attributed to vegetation on the western side of the Brabins Road reserve. Permanent removal of the vegetation would restore the sighting distance and resolve the sight line failure. Although this option involves some limited biodiversity impacts associated with the removal of the vegetation, it provides a permanent solution that does not require the substantial upgrade of the level crossing to resolve the sight line deficiency. The upgrade of the level crossing to have additional controls would require a prolonged period of temporary level crossing closure during construction which would cause additional traffic impacts for road users.

6.3.3 CLOSURE OF LEVEL CROSSINGS

No level crossings are proposed to be closed at this stage, however ARTC are consulting with relevant stakeholders on the potential closure of LX 1472. Located in the Junee to Illabo clearances enhancement site, LX 1472 (Wornes Gate Lane) is currently a public, passive level crossing between the Olympic Highway and Wornes Gate Lane which is an unsealed road and expected to have minimal to no use by the public or for landowner access. All property adjacent to LX 1472 have primary access points elsewhere.

6.3.4 PREFERRED OPTIONS

The preferred option for public road interactions across the proposal site, based on the considerations described in section 3.3 and Appendix A involves a mix of active and passive level crossings. ARTC would continue consultation with relevant road managers during detailed design, to finalise preferred treatments at each location. The appropriate treatment would be assessed on a case-by-case basis for design purposes, with consideration given to the results of consultation; current and future usage of the asset; its location relative to other crossings of the rail corridor; and the road and rail geometry at the crossing location.

Three level crossings would be upgraded as part of the proposal:

- Henty Yard clearances: Sladen Street (LX625). At this location the pedestrian crossing would be upgraded from a passive to an active level crossing. The existing active vehicular crossing would be modified to accommodate the proposal.
- Junee to Illabo clearances: Wornes Gate Lane (LX 1472) would be upgraded from a passive to active vehicular level crossing.
- Junee to Illabo clearances: Shire and Carter Property access road (LX605) would be upgraded from a passive to active vehicular level crossing.

Elsewhere, adjustments to five open active level crossings and one closed level crossing would be required to accommodate the realigned track, or to address short stacking issues at some level crossings. Further detail is provided in the proceeding sections.

6.3.5 LEVEL CROSSINGS – SHORT STACKING ASSESSMENT

Higher train numbers in future years may present safety risks to motorists due to potential collisions with trains at level crossings. In accordance with the safety measures outlined within the ALCAM assessment process (Appendix A), where works have been carried out on level crossings, all crossing points would be designed to ensure that adequate safety measures are implemented to mitigate the likelihood of incidents between passing trains and passenger vehicles. A review of the existing level crossings has been undertaken to identify locations in the enhancement sites where short stacking may be an issue and is presented in Table 6.1.

Table 6.1 Review of Short stacking at level crossings

PRECINCT	CROSSING ROAD	ROAD TYPE	DISTANCE TO CONTROL POINT	LENGTH [1] (DESIGN VEHICLE [2] + 5m)	COMMENT
Albury	Tynan Road	Public Road	36m	24m	No short stacking issue
Greater Hume – Lockhart	Balfour Street	Public Road	70m	31m	No short stacking issue
	Sladen Street (LX625)	Public Road	20m	31m	ARTC is continuing to consult with TfNSW to determine a suitable solution to the short stacking issue which will be confirmed during the detailed design stage (further detail is provided below).
	Rosler Parade	Public Road	29m	24m [3]	No short stacking issue
	Plunkett Street (LX622)	Public Road	30	24m	No short stacking issue
	Yerong Street	Public Road	33m	24m	No short stacking issue
	Urana Street	Public Road	50m	31m	No short stacking issue

PRECINCT	CROSSING ROAD	ROAD TYPE	DISTANCE TO CONTROL POINT	LENGTH [1] (DESIGN VEHICLE [2] + 5m)	COMMENT
Wagga Wagga	Yarragundry Street (LX619)	Public Road	70m	24m	No short stacking issue
	Fernleigh Road	Public Road	240m	24m	No short stacking issue
	Bourke/Docker Street	Public Road	>400m	24m	No short stacking issue
Junee	Harefield Road	Public Road	150m	31m	No short stacking issue
	Olympic Highway (Junee)	Public Road	45m	31m	No short stacking issue
	Waterworks Road (LX606)	Public Road	24m	24m	Intersection priorities at Waterworks Road will be changed as part of construction works. Vehicles on Waterworks Road will give way to southbound vehicles crossing the rail line, eliminating a short stacking deficiency. The proposed changes to intersection priority are not expected to introduce any negative safety outcomes as vehicles will now have to slow down on the approach to the intersection, reducing the likelihood of a collision with a vehicle queued through the intersection. Furthermore, traffic counts completed for this assessment indicate vehicle volumes are low on Waterworks Road. ARTC is continuing to consult with Junee Council in regards to mitigation at this level crossing.
	Private level crossing (LX605)	Private Access off Olympic Highway	16m	31m	A storage lane will be provided on the Olympic Highway with the capacity to store heavy vehicles clear of the rail line without impacting on the Olympic Highway traffic movements. A concrete island would be established on the level crossing approach from the Olympic Highway to limit movements to left-in and left-out.

PRECINCT	CROSSING ROAD	ROAD TYPE	DISTANCE TO CONTROL POINT	LENGTH [1] (DESIGN VEHICLE [2] + 5m)	COMMENT
	Wornes Gate Lane (LX1472)	Private Access off Olympic Highway	27m	19m	No short stacking issue
	Brabins Road (LX604)	Public Road	45m	31m	No short stacking issue
	Olympic Highway (Illabo) (LX603)	Public Road	150m	31m	No short stacking issue

(1) As per Crossing Assessment Handbook, Australian Level Crossing Assessment Model, Applicable to Road Model v 2.1.1.1, Pedestrian Model v 1.2 (2017)
(2) The design vehicle is taken as a 19 m articulated vehicle except where the level crossing is located on a designated 25m B-double Route, where the design vehicle is taken as a 25 m B-double
(3) Rosler Parade is a designated heavy vehicle route only in the westbound direction. In the eastbound direction, the design vehicle length is taken at 19 m.

An existing potential short stacking deficiency has been identified at the Sladen Street level crossing as the give way line for the west approach to the intersection with Olympic Highway is set back from the conflict point to allow space for heavy vehicles to turn right into Sladen Street from the Olympic Highway. A review of the crash history from 2015 to 2019 show no crashes recorded at this level crossing (refer to section 4.4.1.2). The level crossing configuration exists with and without the proposal and that works associated with the proposal do not include any deficiencies. ARTC is continuing to consult with TfNSW to determine a suitable solution to the short stacking issue which will be confirmed during the detailed design stage.

6.3.6 LEVEL CROSSINGS – UPGRADES

The ALCAM assessment identified the need for two level crossings within the Junee to Illabo clearances enhancement site to be upgraded from passive to active for road traffic. The level crossings are:

- LX1472 (Wornes Gate Lane) – Wornes Gate Lane is a Junee Shire Council unsealed road, providing access to rural areas south of the Olympic Highway and is currently a passively controlled crossing
- LX605 (Shire and Carter property level crossing – provides access to a Junee Shire Council unsealed road, providing local access to a low intensity extractive industry site south of the Olympic Highway and is currently a passively controlled crossing.

Due to the very low daily and hourly demand expected at these level crossings, and the relatively low frequency of trains (conservatively, its assumed that a maximum of two services would operate in any one hour in 2040), the number of vehicles expected to be impacted by the proposed level crossing upgrades at these sites is low.

6.3.7 LEVEL CROSSINGS – CLOSURE TIME

An Inland Rail freight train of 1,800m in length would generally travel through any given location at the same speed a 1,800m in length freight train would under current operations. Using a level crossing as an example, the total closure time for a 1,800m in length freight train would be the same with the operation of the proposal as it would under current operations. However, as the proposal would increase the number of freight trains and particularly those up to 1,800m in length, the likelihood of experiencing the maximum closure time associated with a level crossing closure for a 1,800m freight train would increase.

Notwithstanding, where an existing level crossing is upgraded from passive to active controls, a delay from additional closure time for boom gates to close, and reopen, may be introduced. As discussed in section 6.3.6, two level crossings would be upgraded from passive to active controls as part of the proposal. To understand the relative increase in delay at a level crossing from this change, the expected closure times for both passive and active level crossings have been calculated. The following operational assumptions at a passive and active level crossing have been adopted, as shown in Table 6.2.

Table 6.2 Passive and active level crossing delay calculation

ASSUMPTIONS	PASSIVE	ACTIVE	DIFFERENCE
Train length	1,800m	1,800m	–
Train speed	80km/h	80km/h	–
Before train	20 seconds – traffic stops	30 seconds – traffic stops Flashing lights and closing boom gates	10 seconds
Train pass-by	81 seconds	81 seconds	–
After train	5 seconds – traffic recommences	10 seconds – traffic recommences Flashing lights and opening boom gates	5 seconds
Total duration	106 seconds	121 seconds	15 seconds

It is noted that train speeds would range from 60 to 115 km/h for the proposal, however the typical train speed is 80 km/h which has been used in this assessment. At any location, an active crossing has a 15 second longer closure time compared to a passive crossing, regardless of train speed. This is due to the duration of time that is programmed for the flashing lights and closing of the boom gates prior to the train pass-by and for the flashing lights and opening of the boom gates when the train has passed.

After a level crossing is upgraded from passive to active, road users would experience an additional 15 seconds of closure time during a level crossing closure. Given the increase in rail services between 2025 and 2040 of up to two daily services, level crossing closures would also be more frequent and as such road users would be more likely to encounter a level crossing closure.

6.3.8 LEVEL CROSSINGS – TRAFFIC

6.3.8.1 TRAFFIC VOLUMES

During operation of the proposal it is expected that there will be more daily rail services than at present. The increase in daily rail service numbers will increase both the number of level crossing activations per day and the likelihood that a level crossing activation may occur during a peak hour. This would therefore increase the number of vehicles stopping during the activation of a level crossing. There are 15 existing active level crossings on public roads and two existing passive level crossings on private accesses in operation along the rail line within the proposal site.

The road characteristics, applied growth rates, and extrapolated peak hour traffic volumes for the 2025 and 2040 operational horizons on the public roads with level crossings are shown in Table 6.3. It is noted that the growth rate of 3 per cent compounding per annum applied in some areas for the duration of the operational assessment period (15 years) may be considered relatively high considering land use and growth forecasting.

Table 6.3 Future traffic volumes at level crossings

PRECINCT	CROSSING ROAD	ROAD DESCRIPTION	GROWTH RATE (PER ANNUM)	2 WAY 2025 PEAK HOUR TRAFFIC VOLUMES	2 WAY 2040 PEAK HOUR TRAFFIC VOLUMES
Albury	Tynan Road[1]	Two-way, two lanes	3%	93	145
Greater Hume – Lockhart	Balfour Street[1]	Two-way, two lanes	3%	861	1,342
	Sladen Street[1]	Two-way, two lanes	3%	106	165
	Rosler Parade[1]	Two-way, two lanes	3%	106	165
	Plunkett Street[1]	Two-way, two lanes	3%	106	165
	Yerong Street[1]	Two-way, two lanes	3%	23	36
	Urana Street[1]	Two-way, two lanes	3%	87	135
Wagga Wagga	Yarragundry Street[1]	Two-way, two lanes	3%	64	100
	Fernleigh Road[2]	Two-way, two lanes	3%	1,295	2,018
	Bourke/Docker Street[2]	Two-way, Four lane	2%	1,683	2,135
Junee	Harefield Road[1]	Two-way, two lanes	1%	22	25
	Olympic Highway (between Seignior Street and Main Street[2]	Two-way, two lanes	2%	402	495
	Waterworks Road[1]	Two-way, two lanes	1%	27	31
	Brabins Road[1]	Two-way, two lanes	1%	5	6
	Shire and Carter property level crossing [1]	Private Access off Olympic Highway	1%	2	3
	Wornes Gate Lane [1]	Private Access off Olympic Highway	1%	<1	<1
	Olympic Highway (Illabo) [1]	Two-way, two lanes	1%	196	228

(1) Calculated as 10% of AADT

(2) Peak hour intersection count

6.3.8.2 IMPACTED VEHICLES

The closure time calculations show that the total closure time for vehicles at level crossings would be 121 seconds. It is noted that the closure time at a level crossing not subject to upgrade from passive to active controls would be constant with or without the proposal, with the only increase being the frequency of closures occurring.

The average number of vehicles predicted to stop during a level crossing closure in a peak hour during the 2025 and 2040 operational horizons are presented in Table 6.4. Note, the number of impacted vehicles during a level crossing closure in a peak hour would be equivalent for the with and without the proposal scenarios in both 2025 and 2040.

Table 6.4 Operational horizon active level crossing impacted vehicles during peak hour closures

PRECINCT	ROAD WITH LEVEL CROSSING	2025 IMPACTED VEHICLES (AVG PER PEAK HOUR CLOSURE)	2040 IMPACTED VEHICLES (AVG PER PEAK HOUR CLOSURE)
Albury	Tynan Road	3 vehicles	5 vehicles
Greater Hume – Lockhart	Balfour Street	29 vehicles	45 vehicles
	Sladen Street	4 vehicles	6 vehicles
	Rosler Parade	4 vehicles	6 vehicles
	Plunkett Street	4 vehicles	6 vehicles
	Yerong Street	1 vehicles	1 vehicles
	Urana Street	3 vehicles	5 vehicles
Wagga Wagga	Yarragundry Street	2 vehicles	3 vehicles
	Fernleigh Road	44 vehicles	68 vehicles
	Bourke/Docker Street	57 vehicles	72 vehicles
Junee	Harefield Road	1 vehicles	1 vehicles
	Olympic Highway (between Seignior Street and Main Street	14 vehicles	17 vehicles
	Waterworks Road	1 vehicles	1 vehicle
	Brabins Road	<1 vehicle	<1 vehicle
	Shire and Carter property level crossing	<1 vehicle	<1 vehicle
	Wornes Gate Lane	<1 vehicle	<1 vehicle
	Olympic Highway (Illabo)	7 vehicles	8 vehicles

It is noted that the number of impacted vehicles during a level crossing closure in a peak hour would be equivalent for the with and without the proposal scenarios. However, due to the increase in rail services (up to two daily services from 2025 to 2040) a level crossing closure is more likely to be encountered during a peak hour as a result of the proposal (conservatively, its assumed that a maximum of two services would operate in any one hour in 2040).

6.3.8.3 ROAD PERFORMANCE

LOS, average queue lengths and average delay on public roads at level crossings during a peak hour have been assessed using SIDRA intersection software with outcomes shown in Table 6.5. For this assessment it has been assumed that two rail services would pass through the level crossing during a peak hour. The SIDRA modelling has used a 3,600 second, 4-phase signal plan with two 121 second phases for train movements and all remaining time given to the road crossing. Where the directionality of traffic flows is known (at locations where traffic counts were undertaken for this study), queues modelled on the approach with the highest volume from the highest trafficked peak period have been reported. It is expected that queues at all other times will be less than those reported, however a conservative approach has been adopted that reports the longest expected queue length. Where the directionality of traffic flows is not known, the one-way approach volume has been taken as half of the two-way peak volume and equivalent queues would be expected on both approaches.

Table 6.5 Road performance at level crossings

PRECINCT	ROAD WITH LEVEL CROSSING	2025			2040		
		LOS	Average delay (s)	Average queue (m)	LOS	Average delay (s)	Average queue (m)
Albury	Tynan Road[1]	A	5	4	A	5	22
Greater Hume – Lockhart	Balfour Street[1]	A	6	156	A	7	294
	Sladen Street[1]	A	5	16	A	5	25
	Rosler Parade[1]	A	5	16	A	5	25
	Plunkett Street[1]	A	5	16	A	5	25
	Yerong Street[1]	A	5	4	A	5	5
	Urana Street[1]	A	5	13	A	5	20
Wagga Wagga	Yarragundry Street[1]	A	5	10	A	5	15
	Fernleigh Road[2]	A	7	304	A	11	724
	Bourke/Docker Street[2]	A	3	238	A	4	348
Junee	Harefield Road[1]	A	5	3	A	5	4
	Olympic Highway (between Seignior Street and Main Street[2]	A	5	62	A	8	80
	Waterworks Road[1]	A	5	4	A	5	4
	Brabins Road[1]	A	5	1	A	5	1
	Olympic Highway (Illabo) [1]	A	5	28	A	5	33

(1) Calculated as 5% of AADT / half of the two-way peak volume (which is 10% of AADT).

(2) Peak hour intersection count

As LOS is typically a measure of average delay over an hour. All level crossings operate at LOS A due to the relatively low frequency of closures and proportion of vehicles stopped during a closure. Some significant queues are noted at Balfour Street and Fernleigh Road. However, due to the expected time between closures these queues are likely to disperse prior to the next level crossing activation. It is noted that the delay and queues calculated by SIDRA for a peak hour closure would occur with or without the proposal. However, due to the growth in rail services (up to two daily services from 2025 to 2040) there is an increase to the likelihood of these occurring.

Potential impacts (with or without the proposal) to adjacent intersections associated with queueing from level crossing closures are shown below in Table 6.6 for the operational horizons. Queue lengths at the level crossings have been adopted from the SIDRA assessment detailed above.

Table 6.6 Adjacent intersection impacts

PRECINCT	ROAD WITH LEVEL CROSSING	DISTANCE TO ADJACENT INTERSECTIONS FROM LEVEL CROSSING APPROACHES	2025 AVERAGE QUEUE (M) ON LEVEL CROSSING APPROACHES	2040 AVERAGE QUEUE (M) ON LEVEL CROSSING APPROACHES
Albury	Tynan Road[1]	East approach: 40m to Hume Highway West approach: 70m to Perryman Road	4	22
Greater Hume – Lockhart	Balfour Street[1]	East approach: 60m to Melville Street West approach: 70m to Olympic	156	294
	Sladen Street[1]	East approach: 30m to Railway Parade West approach: 43m to Ivor St	16	25
	Rosler Parade[1]	East approach: 30m to Railway Parade West approach: 25m to Henty Walla Rd	16	25
	Plunkett Street[1]	East approach: 25m to Olympic West approach: 30m to Finlayson lane	16	25
	Yerong Street[1]	North approach: 175m to Nicholas Street South approach: 220m to Olympic	4	5
	Urana Street[1]	East approach: 50m to Olympic Highway West approach: 15m to Draper Smissen	13	20
Wagga Wagga	Yarragundry Street[1]	East approach: 70m to Olympic West approach 50m to Pearson	10	15
	Fernleigh Road[2]	East approach: 100m to Barrima West approach: 60m Bulolo	304	724
	Bourke/Docker Street[2]	North approach 20m to Chaston Street South approach 10m to Colman Street	238	348
Junee	Harefield Road[1]	East approach: 120m to Byrnes Road	3	4
	Olympic Highway (between Seignior Street and Main Street[2]	East approach: 20m to Main Street West approach: 35m to Broadway	62	80
	Waterworks Road[1]	East approach: 20m to Waterworks Road West approach: 60 to Olympic Highway	4	4
	Brabins Road[1]	East approach: 155m o Morris Street West approach: 40m to Olympic	1	1
	Olympic Highway (Illabo) [1]	West approach: 50m to Warrens lane	28	33

(1) Calculated as 5% of AADT / half of the two-way peak volume (which is 10% of AADT).

(2) Peak hour intersection count

Based on the average queue lengths calculated by SIDRA at public road level crossings, impacts to adjacent intersections during a level crossing closure may occur at the following level crossings.

- Balfour Street
- Urana Street
- Fernleigh Road
- Bourke/Docker Street
- Olympic Highway (Junee).

It is noted that these impacts to adjacent intersections would occur with or without the proposal. However, due to the increase in rail services (up to two daily services from 2025 to 2040) it would be more likely to occur.

6.4 RAIL NETWORK OPERATION

The proposal would not result in any change in operation of the existing rail network.

6.5 PARKING

As discussed in section 6.2, there would be no increases to road traffic as a result of the proposal.

At the Albury Station pedestrian bridge enhancement site, two parking spaces will not be re-instated after construction. These parking spaces would make way for a new DDA compliant ramp and associated adjustments to the existing pedestrian zebra crossing that together provide upgraded connectivity and accessibility between the station building and the pedestrian bridge. Engagement with TfNSW will be ongoing through subsequent design stages to investigate opportunities to ameliorate residual impacts to parking.

At the Wagga Wagga Station pedestrian bridge, three private parking spaces at the Multicultural Council of Wagga Wagga would be removed as the northern ramp would extend over these spaces. Opportunities to reinstate the parking spaces under the ramp would be investigated during detailed design.

6.6 ROAD SAFETY

As discussed in section 6.2 it is likely there would be no increases in road traffic as a result proposal.

The minor change to the intersection configuration at Railway Parade / Kemp Street / Olympic Highway in Junee is not expected to impact on the safety of road users at this location.

6.7 HEAVY VEHICLE ROUTES

As discussed in section 6.2, there would be no increases to road traffic as a result of the proposal.

Heavy vehicles would have a greater chance of being stopped at a level crossing, due to the increased frequency of level crossing closures as a result of the proposal. As outlined in section 6.3.7, under existing operations an activated level crossing would be closed for approximately two minutes during a 1,800m train pass by at a typical speed of 80km/h. This occurs under current operations and would not change with the operation of the proposal. As such, heavy vehicles are not expected to experience additional delay at existing, activated level crossings. However, due to the increased services (up to two daily services from 2025 to 2040) a level crossing closure is more likely to be encountered.

Potential short stacking issues at level crossings for heavy vehicles has been assessed and detailed in section 6.3.

6.8 TRAVELLING STOCK RESERVES

As discussed in section 6.3, movements on the road, such as stock movements, would have a greater chance of being stopped at a level crossing, due to the increased frequency of level crossing closures as a result of the proposal. This would result in minimal impact to the movement of stock across the corridor.

6.9 PUBLIC TRANSPORT ROUTES

As discussed in section 6.2, there would be no increases to road traffic as a result of the proposal.

Any changes to bus routes or bus stop infrastructure temporarily implemented during construction would be reinstated to the original configurations before the commencement of proposal operation.

Buses would have a greater chance of being stopped at a level crossing, due to the increased frequency of level crossing closures as a result of the proposal. Most of the bus services that may use level crossings within the study area are school bus services operating twice a day, and therefore the likelihood of being impacted by a passing train is minimal. However, if a bus is stopped at an active level crossing the level crossing closure time would be approximately two minutes for a 1,800m train to pass by at a typical speed of 80km/h. This occurs under current operations and would not change with the operation of the proposal for existing, activated level crossings.

6.10 ACTIVE TRANSPORT ROUTES

As discussed in section 6.2, there would be no increases to road traffic as a result of the proposal.

Enhancements of pedestrian rail crossings provide additional connectivity and Disability Discrimination Act (DDA) compliance for pedestrians and cyclists through the enhancement of active transport infrastructure at locations shown in Table 6.7. These enhancements may also help local councils achieve objectives for improving active transport infrastructure, such as those outlined in the Wagga Wagga Active Travel Plan.

Table 6.7 Active transport enhancements

PRECINCT	ENHANCEMENT SITE	ACTIVE TRANSPORT ENHANCEMENT
Albury	Albury Station pedestrian bridge	Ramps to be provided at the eastern and western landings, improving accessibility for a range of users, DDA compliance
Greater Hume – Lockhart	Henty Yard clearances	Upgrade of Sladen Street level crossing with activated gated pedestrian enclosure
Wagga Wagga	Cassidy Parade pedestrian bridge	Improved safety and quality of footpaths, DDA compliance
	Wagga Wagga Station pedestrian bridge	Improved safety and quality of footpaths, DDA compliance
	Edmondson Street bridge	Improved safety and quality of infrastructure with shared paths provided on both sides of the road. Due to the road gradient, the paths integrated on the bridge structure would not be DDA compliant. ARTC is committed to revising the existing design to achieve DDA compliance. To achieve this, it is expected that a pedestrian bridge independent of the road bridge may be required as a substitute for the footpath on one side of the road bridge.

PRECINCT	ENHANCEMENT SITE	ACTIVE TRANSPORT ENHANCEMENT
Junee	Kemp Street bridge	Improved safety and quality of infrastructure. A shared path would be provided on the northern side of Kemp Street from Ducker Street to the Olympic Highway. No path would be provided on the southern side, the path on the northern side of bridge improves amenity and connectivity with footpath network. Due to the road gradient, the paths integrated on the bridge structure would not be DDA compliant. ARTC is committed to revising the existing design to achieve DDA compliance. To achieve this, it is expected that a pedestrian bridge independent of the road bridge may be required as a substitute for the footpath on one side of the road bridge.

Pedestrians and cyclists would have a greater chance of being stopped at a level crossing, due to the increased frequency of level crossing closures as a result of the proposal.

The Cassidy Parade pedestrian bridge is an existing link in the Wagga Wagga Active Travel Plan. The proposed bridge design includes a ramp on the southern side of the rail corridor. Discussions are ongoing with Wagga Wagga City Council to align plans and minimise potential impacts on the final configuration of the future infrastructure.

As part of the enhancement works, existing pedestrian rail overpasses in Culcairn (adjacent to Balfour Street), and Junee (providing access to a station platform) are being removed, however, both are no longer used and their removal is not expected to have any impact to pedestrian connectivity.

6.11 PROPERTY ACCESS

Access to all properties in all precincts would be re-established post construction. There would be no ongoing operational impacts to properties, except for the Junee to Illabo clearances enhancement site, which will feature an upgraded (from passive to active) level crossing that provides access to the Shire and Carter private properties.

As discussed in section 6.3.6, an increase of 15 seconds in delay is expected at level crossing that are upgraded from passive to active. Furthermore, the increase of up to two daily services between 2025 and 2040 represents a minor increase in the likelihood of level crossing closures occurring at the property access. Due to the very low daily and hourly demand expected on the access, and the relatively low frequency of trains (conservatively, its assumed that a maximum of two services would operate in any one hour in 2040), the expected impact to property access, due to the proposed level crossing upgrade, is low.

7 CUMULATIVE IMPACTS

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor but could become significant when considered together. These impacts may result from multiple unrelated projects under construction concurrently that each add traffic to the road network and include:

- impacts to rail services
- additional delay at intersections
- additional queueing at intersections and level crossings
- reduction in road LOS performance.

The assessment of potential cumulative impacts has been undertaken in accordance with the SEARs, as detailed in the EIS, and considers the potential for impacts from other projects in the study area. The following tasks were undertaken to assess the potential for cumulative impacts:

- identifying potentially relevant projects in the study area (either proposed or approved) based on information available in the public domain
- screening identified projects for their potential to interact with the proposal
- identifying and assessing (quantitatively or qualitatively) the significance of potential cumulative impacts.

Additionally, the methodology used to assess road performance during construction and operation of the proposal assumes traffic growth factors for the background network that account for uplift in traffic due to traffic-generating developments in the area.

Potentially relevant projects in the study area were identified based on a search of the following data sources in May 2020:

- The Department of Planning, Industry and Environment's Major Projects register
- The NSW Independent Planning Commission project registers for the Albury City, Great Hume, Lockhart, Wagga Wagga City and Junee local government areas
- The NSW Southern Regional Planning Panel planning register
- proponent websites
- local council websites/DA tracking databases.

The projects identified were screened in relation to their potential for cumulative impacts with the proposal, based on:

- development size
- expected construction and operational periods
- potential to generate traffic during construction and operational periods
- proximity to the proposal site
- likelihood of sharing roads with the proposal.

Projects in the study area considered to have the potential for cumulative impacts with the proposal are shown on Figure 7.1 and detailed in Table 7.1.

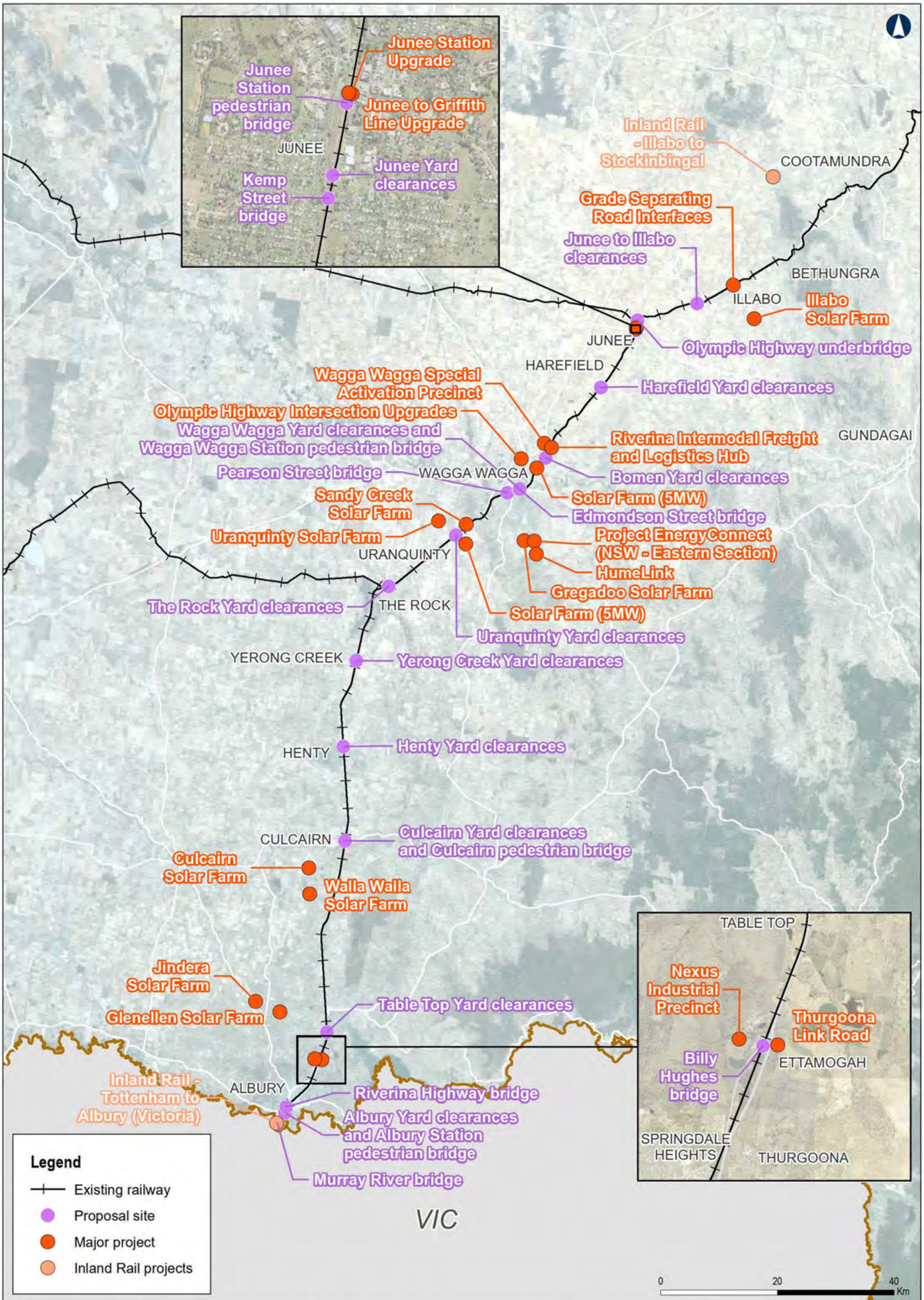

Figure 7-1 Major projects in the vicinity of the proposal

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:850,000
Paper size: A3
Date: 26/05/2022

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Table 7.1 Projects with the potential for cumulative impacts with the proposal

PROJECT	DESCRIPTION	SITE LOCATION	POTENTIAL OVERLAP
Inland Rail – Tottenham to Albury (Victoria)	Upgrade of 305km of existing rail corridor between the Victoria-NSW border at Albury and Melbourne.	Adjacent to Murray River bridge	Unlikely to share local road network. Construction routes may overlap on major highways. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Thurgoona Link Road	Construction of a new road that would provide connectivity to the Hume Freeway at Davey Road, plus an east-west link from Elizabeth Mitchell Drive to Kerr Road.	Adjacent to Billy Hughes bridge	Stage 2 adjacent to Billy Hughes bridge enhancement site is complete. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases.
Nexus Industrial precinct	A 450ha site zoned to support large or heavy industrial development.	Adjacent to Billy Hughes bridge	Operational traffic likely to use Wagga Road and Hume Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Jindera Solar Farm	120 Megawatt (MW) solar farm with energy storage and associated infrastructure.	About 10km north west of Table Top Yard clearances	Construction of the Jindera Solar Farm is expected to be finished by start of construction of the proposal. Not expected share roads with proposal.
Glenellen Solar Farm	200MW solar farm with energy storage and associated infrastructure.	About 14km north west of Table Top Yard clearances	Construction of the Glenellen Solar Farm is expected to be finished by start of construction of the proposal. Not expected share roads with proposal.
Walla Walla Solar Farm	A 300 (MW) solar farm and associated infrastructure.	About 6km south west of Culcairn Yard clearances	Construction of the Walla Walla Solar Farm is expected to be finished by start of construction of the proposal. During operation it is expected to generate up to 32 vehicle movements per day potentially using Olympic Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.

PROJECT	DESCRIPTION	SITE LOCATION	POTENTIAL OVERLAP
Culcairn Solar Farm	400MW solar farm with energy storage and associated infrastructure.	About 10 kilometres south west of Culcairn Yard clearances	Construction of the Culcairn Solar Farm is expected to be finished by start of construction of the proposal. During operation it is expected to generate up to 10 vehicle movements per day potentially using Olympic Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Uranquinty Solar Farm	5MW solar farm, battery storage and associated infrastructure.	About 2km southeast of Uranquinty Yard clearances	Expected traffic generation likely to use the Olympic Highway but is very low (15 vehicles per day). Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Uranquinty Solar Farm	200MW solar farm including, battery storage and associated infrastructure.	About 14km north west of Uranquinty Yard clearances	Expected traffic generation not available. May use Uranquinty level crossing and Olympic Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Sandy Creek Solar Farm	17MW solar farm including connection to the existing 22kV line along the Olympic Highway, via a new switching station.	Directly north of Uranquinty Yard clearances	Expected to generate less than 50 daily vehicle movements during construction using Uranquinty level crossing and Olympic Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Gregadoo Solar Farm	47MW solar farm and associated infrastructure.	About 12km east of Uranquinty Yard clearances	Not expected share roads with proposal.

PROJECT	DESCRIPTION	SITE LOCATION	POTENTIAL OVERLAP
Wagga Wagga Special Activation precinct	The Wagga Wagga precinct covers an area of approximately 4,500 hectares, including 300 hectares already developed as part of the Bomen Industrial precinct. The precinct would focus on advanced manufacturing, agribusiness, and freight and logistics.	Surrounding Bomen Yard clearances	Promotes industrial and freight growth in the Bomen area north of Wagga Wagga. Increase in traffic may be seen on Olympic Highway, Byrnes Road, and Merino Road in vicinity of proposal. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Riverina Intermodal Freight and Logistics Hub	Construction of approximately 4.9-kilometre rail siding off the Main South Line and the intermodal freight terminal.	About 1km north of the Bomen Yard clearances	Part of the Wagga Wagga Special Activation precinct. This assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Olympic Highway intersection upgrades	Upgrade of the Olympic Highway intersections at Old Narrandera Road and Travers Street, Wagga Wagga	About 3 km to the west of Bomen Yard clearances. About 4 km north of Wagga Wagga Station and Yard clearances	Construction may overlap with construction of the proposal. At peak, up to 120 heavy vehicles and 60 light vehicles would access the project each day. Likely to cause additional construction traffic on the Olympic Highway. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Solar Farm - Bomen	5MW solar farm and associated infrastructure.	About 2km south west of Bomen yard clearances	No vehicle volumes provided but noted as minor increases in traffic due to the proposal during construction. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Project EnergyConnect (NSW – Eastern Section)	Development of a new transmission line (330kV minimum) connecting Buronga Substation and Wagga Wagga Substation, and construction of the new Dinawan Substation (170km west of Wagga Wagga).	About seven kilometres south of Wagga Wagga station and yard clearances. About 3km to the south-west of Uranquinty Yard clearances.	Minimal overlap with the study area expected. Likely to cause additional construction traffic on the Olympic Highway, Sturt Highway, Edward Street. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.

PROJECT	DESCRIPTION	SITE LOCATION	POTENTIAL OVERLAP
Humelink	Construction of a new 500kV transmission line which will connect Wagga Wagga, Bannaby and Maragle.	About 14km south of Wagga Wagga Station and Yard clearances About 18km to the south west of Uranquinty Yard clearances.	Expected traffic generation not available. Minimal overlap with the study area expected. Likely to cause additional construction traffic on the Olympic Highway, Sturt Highway, Edward Street. Construction is anticipated to commence in 2024. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Junee Station Upgrade	Upgrades to Junee Station to improve accessibility for those with a disability or limited mobility.	At Junee Station	The Junee Station Upgrade is expected to be finished by start of construction of the proposal. No operational impacts.
Junee to Griffith Line Upgrade	Line upgrade work between Junee and Griffith to allow for increased train speeds to improve efficiency for freight carriers as part of the Fixing Country Rail program.	Adjacent to Junee Station	Construction of the Junee to Griffith Line Upgrade is expected to be finished by start of construction of the proposal. Increased train numbers during operation are accounted for in the operational impact assessment.
Illabo Solar Farm	80MW solar farm and associated on-site infrastructure, including a 132kV substation and overhead transmission lines.	About six kilometres south east of Junee to Illabo clearances	Traffic generation details not available. Will likely use Olympic Highway which is expected to have ample spare capacity based on similar solar farm projects. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.
Inland Rail – Illabo to Stockinbingal	Construction and operation of new rail and associated facilities to accommodate double stack freight trains up to 1800 metres long.	Adjacent to Junee to Illabo clearance	Unlikely to share local road network. Construction routes may overlap on major highways. Traffic assessment assumes a growth rate on the roads used by the proposal that accounts for traffic increases due to such developments.

PROJECT	DESCRIPTION	SITE LOCATION	POTENTIAL OVERLAP
Grade separating road interfaces	TfNSW is currently in the early planning stages to grade separate road and rail interfaces at four locations where Inland Rail crosses the NSW road network. The nearest grade separation proposal is the Olympic Highway at Harris Gates, located north of Illabo.	Intersects with the Junee to Illabo clearances	Details of construction timing and traffic generation details not available.

7.1 CONSTRUCTION

The proposal will connect into two other Inland Rail projects (Illabo to Stockinbingal and Tottenham to Albury). Both projects involve the upgrade of the existing rail lines. The generated construction traffic from these projects would be distributed over the length of the Illabo to Stockinbingal and the Tottenham to Albury project alignments, respectively. Shared construction access routes between these projects and the proposal would only be expected on highways and arterial roads. Cumulative impacts, such as additional delay and queuing, are expected to be minor due to the relatively low traffic generated by the proposal and the capacity of highways and arterial roads.

Proposed resource, logistics and infrastructure developments in the surrounding region would potentially be under construction in the same timeframe as the proposal. Due to the spatial separation of the majority of these developments and the enhancement sites, it is expected that any of the shared haulage routes are likely to be highways and arterial roads.

Based on the low traffic generation associated with the construction of the proposal, these arterial roads and highways would be appropriate to accommodate traffic movements for multiple projects. If any local roads are to be shared for construction access for adjacent sites, this would be managed through the approval process of the TMP.

The highest level of impacts during construction of the proposal result from the diversion of traffic within the Wagga Wagga urban area associated with the Edmondson Street bridge closure. Due to the unlikeliness of any concurrent project(s) construction movements significantly utilising the local streets supporting the diversions (Urana Street, Bourke Street, and Railway Street), it is not expected that there would be any cumulative impacts in this area. Project EnergyConnect is expected to use Edward Street, however Edward Street is a high capacity road that forms part of the Sturt Highway, and is expected to have ample capacity to accommodate additional traffic associated with the construction of Project EnergyConnect, even when diversionary routes are in place.

The grade separating road interfaces project by TfNSW is in its early stages of planning and the construction program is unknown. ARTC will continue to consult with TfNSW to be aware of the proposed construction timeframe to minimise cumulative impacts with works at the Junee to Illabo clearances enhancement site

Additionally, the methodology used to assess road performance assumes traffic growth factors that account for uplift in traffic due to traffic-generating developments in the area. The cumulative impacts of multiple projects are therefore not expected to cause additional delay, queuing, or other performance impacts beyond what has been assessed in Chapter 5.

7.2 OPERATION

The proposal is not expected to generate any significant additional traffic during operation. Additionally, the Inland Rail program has the potential to reduce the overall number of trucks along the north south road corridors in the region by shifting freight movements from road-based transport to the rail corridor. The potential benefits that may accrue as a result of this modal shift include:

- fewer trucks on the road would reduce the impacts to road capacity and potentially delay the need for road capacity improvements
- fewer trucks on the road would reduce the impacts to the pavement on the roads and the overall maintenance costs required on these roads
- the reduction of long-haul truck movements on the road network has potential safety improvements for the local areas near the proposal and the wider road network
- the reduction of long-haul truck movements reduces the likelihood of an incident due to driver fatigue.

The operation of other transport infrastructure projects located in the vicinity of the proposal, are not expected to generate any operational traffic beyond that already included in growth estimates used to forecast traffic volumes. Therefore, operation of the proposal is not expected to have any cumulative impact.

Renewable energy projects located in the vicinity of the Albury to Illabo section of the Inland Rail corridor may generate daily light vehicle movement (staff movements) associated with each project. It is expected that any of the shared operational access routes between the proposal and these renewable energy developments would likely be on arterial roads and highways. Similar to the operation of the proposal, the renewable energy projects are not anticipated to generate a significant number of vehicle movements once operational and therefore are anticipated to have a negligible cumulative impact on the operation of the wider road network.

Industrial and logistics developments located in the vicinity of the Albury to Illabo section of the Inland Rail corridor are likely to generate daily light vehicle movements (staff movements) and freight related heavy vehicle trips associated with each project. The staff movements generated by these developments are expected to be dispersed across the road network and heavy vehicle trips generated by the industrial and logistics developments are expected to be primarily on highways. The proposal would not generate additional traffic during operation; as such, no impacts to the road network performance during operation of the proposal from vehicle movements would occur.

Additionally, the methodology used to assess road performance assumes traffic growth factors that account for uplift in traffic due to traffic-generating developments in the area. The cumulative impacts of multiple projects are therefore not expected to cause additional delay, queuing, or other performance impacts beyond what has been assessed in Chapter 6.

The proposal includes upgrades to existing active transport infrastructure. These upgrades improve active transport accessibility and connectivity for a range of users. These upgrades may also help local councils achieve objectives for improving active transport infrastructure, such as those outlined in the Wagga Wagga Active Travel Plan.

As part of the grade separating road interfaces project, TfNSW propose to modify the Olympic Highway at Illabo, including removal of the existing level crossing (LX603). The proposal includes minor modification to the level crossing to accommodate the realigned track. The removal of a level crossing would provide a positive impact for road users utilising the Olympic Highway. ARTC will continue to consult with TfNSW to be aware of the final design solution of the grade separation project at the Olympic Highway level crossing (LX 603) to minimise cumulative impacts with works at the Junee to Illabo clearances enhancement site.

8 RECOMMENDED MITIGATION AND MANAGEMENT MEASURES

8.1 APPROACH TO MITIGATION AND MANAGEMENT

Environmental management for the proposal would be carried out in accordance with the environmental management approach as detailed in Chapter 27: Approach to mitigation and management of the EIS.

This would include a Traffic Management Plan (TMP) sub-plan, prepared as part of the Construction Environmental Management Plan (CEMP).

The TMP sub-plan would include (but is not limited to) the following management measures for impacts to the transport network (Table 8.1).

Table 8.1 Traffic management plan sub-plan

TRAFFIC MANAGEMENT SUB-PLAN OUTLINE	
Objectives	— Ensure appropriate controls and procedures are implemented to minimise potential traffic, transport and access impacts. — Identify appropriate traffic management measures and establish a framework for coordinating their implementation. — Maintain network safety, journey times and congestion at acceptable levels. — Ensure access to properties are maintained.
Purpose and requirements	— The plan will detail processes and responsibilities to minimise traffic and access delays and disruptions, and identify and respond to changes in road safety. — The plan will be prepared in consultation with Transport for NSW; relevant councils; and public transport/bus operators (as relevant). The plan will include measures to: — identify haulage routes and access points — identify and manage diversionary routes for motorists, cyclists and pedestrians, maintain access to individual residences, public transport services and infrastructure, services and businesses, and for livestock across the proposal site — identify alternative routes for construction traffic activities in the event roads are closed by relevant authorities — communicate changes in traffic conditions and access arrangements with relevant stakeholders — provide safe routes for pedestrians and cyclists during construction — minimise the number of changes to road users' travel paths — manage the movements of construction-related traffic to minimise traffic and access disruptions in the public road network — manage temporary access arrangements where required — provide a mechanism for the monitoring, review and amendment of the plan.

TRAFFIC MANAGEMENT SUB-PLAN OUTLINE	
Relevant guidelines and standards	The plan will be prepared in accordance with relevant legislation, guidelines and standards, including: — *Roads act 1993* — traffic control at work sites (roads and maritime services, 2018b) — As 1742.3–2009: *manual of uniform traffic control devices – traffic control for works on Roads*.
Example management measures	Management measures to be included in the plan and implemented during construction will include (but not be limited to): — adequate road signage will be provided to inform drivers and pedestrians of the work, timing and alternative access arrangements — heavy vehicle movements will be minimised during peak traffic times — measures to manage traffic flows around the area affected by construction will be provided, including required regulatory and directional signposting, line marking, variable message signs, and all other necessary traffic control devices — consultation with relevant road authorities regarding the potential for preventative road improvements to be undertaken prior to construction to minimise potential road damage — adequate signage for road and pedestrian diversions will be provided, clearly articulating alternative routes — designated queuing and idling areas will be determined near work areas to minimise disruption to the local community — appropriate controls will be established where vehicles are required to cross footpaths to access construction sites. This may include manual supervision, physical barriers or temporary traffic signals as required — construction vehicles will park within the construction compound where practicable — the timing of deliveries accessing the site will be programmed to ensure there is sufficient space within the proposal site to accommodate deliveries.
Related strategies, plans or requirements	— Road safety audits — Road dilapidation report — TMP s for each enhancement site.

8.2 SUMMARY OF MITIGATION AND MANAGEMENT MEASURES

The mitigation measures to manage impacts to transport from the proposal during pre-construction, construction and operations are outlined in Table 8.2.

Table 8.2 Pre-construction, construction and operational mitigation measures

IMPACT	MITIGATION MEASURE	TIMING
Road operations	Early consultation will be undertaken with road authorities (local councils and Transport for NSW) and public transport service providers for aspects of the proposal that may require changes to the road network. This includes consideration of temporary changes to signal phasing at intersections along the traffic diversion routes in Wagga Wagga during the Edmondson Street bridge closure.	Detailed design/ pre-construction
Bus services	Changes to bus routes and bus stops to mitigate impacts to bus services, including establishing temporary stops, would need to be planned in consultation with TfNSW, bus operators, and other key stakeholders such as schools to minimise the impact on community, public transport users, and service providers.	Detailed design/ pre-construction
Emergency Services	Consultation will be undertaken with emergency services to plan alternative routes that avoid the heaviest impacted areas of the road network during the Edmondson Street bridge and Kemp Street bridge closures and associated diversions to minimise travel time delay experienced by emergency service vehicles. Consultation will also be undertaken with emergency services regarding the disruption to access on the Murray River.	Detailed design/ pre-construction
Stock movements	Prior to the commencement of works, Local Land Services will be notified of increased vehicle movements along the TSRs and temporary closures of any level crossings during the construction phase so that stock handlers, including walking permit holders, can be notified of the impacts to stock movements.	Detailed design/ pre-construction
Water based transport	Restrictions on navigation of the Murray River beneath and in the vicinity of the Murray River bridge site as result of the construction will be planned prior to commencing construction and handled in accordance with the Marine Safety Act 1998 (NSW). Transport for NSW will be notified of the proposed works and will be consulted in regard to Navigational marks, signage and marine notices.	Detailed design/ pre-construction
Impacts on existing roads	Consultation with Junee Shire Council will be undertaken regarding the potential for preventative road works, prior to road diversions in Junee on Joffre Street and Pretoria Avenue, to offset impacts from higher than typical traffic and heavy vehicle movements on some local roads due to diverted traffic.	Detailed design/ pre-construction

IMPACT	MITIGATION MEASURE	TIMING
Road safety	Development of Road Safety Audits (RSAs) and risk assessments, prior to commencement of construction, for each enhancement site where changes to the road network are required or where increased traffic movements or diversions during the construction phase may present an increased crash risk. These will be undertaken by the contractor and developed in accordance with the Austroads guidelines to provide for safe movements of construction vehicles on public roads, and will consider the safety of all road users. A safe system approach will be adopted to minimise harm caused to all road users through the use of appropriate road design features and speeds.	Detailed design/ pre-construction
Active transport connectivity	Construction staging will be planned to account for continued active transport connectivity during construction.	Detailed design/ pre-construction
Active transport integration	ARTC will continue to work with Wagga Wagga City Council on the integration of the new Cassidy Parade pedestrian bridge to align and minimise impacts to the Wagga Wagga Active Travel Plan. Further work with Wagga Wagga City Council and Junee Shire Council will pursue and adopt, an alternative design that will provide DDA compliant access for pedestrians at Edmondson Street bridge and Kemp Street bridge.	Detailed design/ pre-construction/ construction
Impacts on existing roads	Appropriate signage and warnings, including variable messaging signs, will be considered in the Construction Traffic Transport and Access Management Plans. These will be deployed as considered appropriate in the vicinity of the enhancement sites to provide early warning for road users of disruptions due to construction activities and road closures.	Pre-construction/ construction
Road pavement	A Road Dilapidation Report will be prepared for all haul routes within each precinct. Should damage to the road occur as a result of construction, the damage will be rectified to restore the road to the pre-work condition as identified in the road dilapidation report or as otherwise agreed with the relevant road authority. Joffre Street and Pretoria Avenue will be monitored for damage during construction and any necessary repairs attended to as soon as possible.	Pre-construction/ Construction
Impacts on existing roads	Heavy vehicle diversionary signage will be implemented to encourage the diversion of heavy vehicle traffic outside of Junee on the existing heavy vehicle routes via Goldfields Way and Old Junee Road during closure of the Kemp Street bridge.	Construction

IMPACT	MITIGATION MEASURE	TIMING
Access	Communication with relevant stakeholders will be undertaken regularly to minimise congestion and inconvenience to road users in areas affected by diversions, such as during the works for the replacement of the Edmondson Street Bridge in Wagga Wagga and Kemp Street Bridge in Junee, or level crossing closures (including full or partial closure). Stakeholders will include the relevant local council, bus operators, state government departments, emergency services and affected property owners/occupants. The community will be notified in advance of pedestrian bridge closures and any proposed road or pedestrian network closures and diversions through signage, the local media and other appropriate forms of communication. Appropriate wayfinding signage for road and pedestrian diversions will be provided, clearly articulating alternative routes. Consultation would also discuss opportunities for broader diversions away from congested roads. Additional measures identified as an outcome of consultation would be implemented during construction where practicable.	Construction
Road operations	The construction access off Cheshire Street to the Pearson Bridge enhancement site and Chaston Street to Wagga Wagga Station and surrounds will be designated a left in, left out turning movement only to limit any performance or safety impacts to the surrounding road network.	Pre-construction/ construction
Access	Where changes to access arrangements to businesses and residences are required as part of the proposal construction activities, ARTC will advise property owners/occupants and consult with them in advance regarding temporary disruption to existing accesses. Temporary changes to access arrangements during construction will include (but not limited to): — Edmondson Street bridge — Wagga Wagga station and surrounds — Kemp Street bridge.	Pre-construction/ construction
Seasonal/ agricultural impacts	Special consideration would be given to enhancement sites that are located on land with agricultural storage or transportation infrastructure, such as grain silos, due to the high localised seasonal freight movements accessing them. Detailed assessment of the site accesses will be undertaken as part of the Road Safety Audits and appropriate Construction Traffic Transport and Access Management Plans will be developed by the contractor in consultation with the site operator prior to commencement of construction activities on site to moderate any potential safety issues.	Pre-construction/ construction
Active travel	ARTC will continue to work with Wagga Wagga City Council on the integration of the new Cassidy Parade pedestrian bridge to align and minimise impacts to the Wagga Wagga Active Travel Plan.	Detailed design/ pre-construction/ construction
Level crossing safety	In accordance with national and state rail safety law requirements, public road crossings would be subject to an Interface Agreement with the relevant road manager in order to identify and minimise safety risks as far as practicable during operations.	Operation

IMPACT	MITIGATION MEASURE	TIMING
Level crossing safety	Opportunities to consolidate low use level crossings will be progressed with key stakeholders as per the Transport for NSW Level crossing closure policy where appropriate. Any closures will be progressed in accordance with the requirements of the *Transport Administration Act 1988*.	Pre-construction/ construction
Parking	All parking impacted by the construction phase will be re-instated and lines remarked to previous condition or better where necessary, with the exception of Albury Station pedestrian bridge and the Wagga Wagga Station pedestrian bridge enhancement site. At the Albury Station pedestrian bridge enhancement site, two parking spaces will not be re-instated after construction. These parking spaces will make way for a new DDA compliant ramp. Engagement with TfNSW will be ongoing through subsequent design stages to investigate opportunities to ameliorate residual impacts to parking. At the Wagga Wagga Station pedestrian bridge enhancement site, three private parking spaces will not be re-instated after construction. Opportunities to reinstate the parking spaces under the ramp would be investigated during detailed design.	Operation
Cumulative impacts	ARTC will continue to consult with TfNSW to be aware of the final design solution of the grade separation project at the Olympic Highway level crossing (LX 603) and proposed construction timeframe to minimise cumulative impacts with works at the Junee to Illabo clearances enhancement site.	Detailed design/ pre-construction

8.3 EFFECTIVENESS OF PROPOSED MITIGATION MEASURES

The mitigation measures specified above are anticipated to reduce the likelihood and/or consequence of the identified risks.

Transport elements with the potential for residual impact to transport users, local businesses and residents during the construction phase are:

- Wagga Wagga urban road network during the diversion of traffic associated with the Edmondson Street bridge closure
- cross rail active transport network connectivity in Wagga Wagga and Junee during closures of pedestrian rail crossing facilities.

If any issues are unable to be mitigated through the design, construction or operational process such as intersection performance during diversions or reduced pavement condition following the construction process (heavy vehicle activity), further consultation would be required to develop management measures to limit impacts as far as is practicable.

During operation of the proposal no residual impacts are expected.

9 CONCLUSION

The proposed Albury to Illabo section of Inland involves enhancement works to provide the increased vertical and horizontal clearances required for double-stacked freight trains. The proposal is generally within the existing active rail corridor between the towns of Albury and Illabo. Works are proposed at 24 locations along the ‘Main South Line’ corridor, described as ‘enhancement sites’ within four precincts aligned with the local government areas of Albury, Greater Hume and Lockhart, Wagga Wagga and Junee.

This report has provided a description of the existing conditions on the transport network, detailed expected construction activities and timeframes and presented an assessment of the impact of the construction and operation of the proposal.

It has found that the proposal would have different impacts during construction and operation as discussed below. The recommended mitigations have sought to identify and eliminate or minimise risks so far as is reasonably practicable during the construction and operational phases.

9.1 CONSTRUCTION IMPACTS

During construction, the movement of construction vehicles is expected to have minimal impact on the transport network. Although unlikely to occur, a conservative approach was taken in the assessment of construction vehicle impact on the road network by assuming that peak hour construction vehicle trips would occur during the existing network peak hour. The assessment found that an adequate level of service was maintained on the assessed roads and intersections affected by the additional traffic generated during construction in 2024. Due to the low construction traffic volumes generated by the proposal, impacts to other transport facilities such as public transport, heavy vehicle and active transport routes and Traveling Stock Reserves are not expected.

Road closures to facilitate construction in Henty, Wagga Wagga, and Junee would result in temporary localised road and intersection performance and travel time impacts, particularly in the denser urban area of Wagga Wagga. The traffic diversions associated with the Edmondson Street bridge closure would result in inappropriate LOS for E and F for some intersections and travel time impacts of up to nine minutes. In addition, this bridge closure would impact public and school bus routes requiring rerouting and alternative stop locations.

9.2 OPERATIONAL IMPACTS

Expected operational impacts would results from:

- increased daily train services resulting in an increased frequency of closures per day at level crossings
- increased delay where level crossings on private accesses have been upgraded from passive to active.

There would be no increases to road traffic as a result of the proposal.

The maximum rail service increase between 2025 and 2040 is up to two daily services. It is anticipated that the maximum closure time encountered at an active level crossing (with or without the proposal) would be 121 seconds. An assessment of active level crossing LOS was undertaken and found that all level crossings on public roads would operate at a delay-based LOS of A.

Amendments to the road network as part of the permanent works would not remove any existing turn movements and are not expected to impact on the current capacity or level of service of any intersections.

Short stacking deficiencies at the existing level crossings were assessed and potential deficiencies identified at two of the level crossings.

It is noted that all operational impacts would be expected to occur both with and without the proposal, however the likelihood of these impacts occurring is expected to increase due to the larger number of rail services per day.

9.3 MITIGATIONS

During construction of the proposal a Traffic Management Plan (TMP) sub-plan will be prepared as part of the Construction Environmental Management Plan (CEMP) detailing construction sites activities and impacted transport facilities and specify the mitigation measure to reduce the impacts. Key mitigation measures that will be undertaken include:

- road safety audits where changes to the road network are required or increased traffic movements during the construction phase may present an increased crash risk
- consultation with relevant stakeholders (state, local government, emergency services transport service providers and impacted property owners)
- heavy vehicle diversionary signage would be implemented to divert Heavy vehicle traffic outside of Junee on the existing heavy vehicle routes via Goldfields Way and Old Junee Road
- community notification of any proposed road or pedestrian network closures and diversions and provision of appropriate wayfinding signage for road and pedestrian diversions will be provided, clearly articulating alternative routes.
- rectification of pavement where necessary to support diversion of vehicles from the Olympic Highway to local roads in Junee
- restricted access to level crossings for oversize vehicles that may present a short-stacking risk.

With these mitigation measures in place the proposal construction activities are expected to have minimal impact on the transport network. Residual traffic impacts are likely to be experienced during construction of the proposal, particularly associated with road closures and diversions in Wagga Wagga and Junee. The post-construction operation of the proposal has been shown to have no significant impact to the transport network in this assessment.

10 REFERENCES

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TECHNICAL PAPER 01

Traffic and transport

Appendix A Public level crossing treatment methodology

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

Public level crossing treatment methodology

Introduction

The key principles guiding the decision-making process for determining treatments at public road–rail interfaces includes:

- Using a risk-based decision-making process focused on minimising risk So Far As Is Reasonably Practicable (SFAIRP)
- Consistency in the determination of road–rail interface treatments across the projects of the Inland Rail Program
- Applying a consistent methodology to determine if the cost of the potential available treatment is grossly disproportionate to the level of risk to safety and the projected benefits
- Ensuring the feasibility of the Inland Rail Program by proposing cost-effective solutions.

An overview of the process followed in the assessment of road–rail interfaces across the proposal and the methodology followed in the development of road–rail interface treatments is outlined below.

Process overview—determination of road rail interface treatments

Identification of all potential road–rail interfaces within the proposal site

An important objective of level crossing investigations is the clear and accurate identification of all road–rail interfaces within the proposal site. The list of identified road–rail interfaces is then provided to the relevant road manager for review in order to ensure that all interfaces and the associated road infrastructure managers have been correctly identified.

Identify opportunities to minimise the number of proposed road–rail interfaces

Initial consideration will be given to the elimination of level crossing risks by assessing all road–rail interfaces for closure. This is in line with the Transport for New South Wales (TfNSW) *Level Crossing Closures Policy* (n.d.), which notes that:

> *'in order to manage the risks to safety associated with road and rail interfaces, the closure of public and private level crossings in NSW is to be pursued, where it is practical and cost effective to do so'.*

Road closures will only be progressed if endorsed by the relevant road manager.

Review whether the road–rail interfaces meet the criteria for automatic grades separation

ARTC's policy is that road-rail interfaces will be automatically grade separated in the following three instances:

1. Road-rail interfaces with four rail tracks (current)
2. Road-rail interfaces of freeways and highways of four or more lanes (current and committed future plans)
3. Where grade separation is the logical option for topographical or other technical engineering reasons.

All other crossings will be assessed using the Inland Rail Level Crossing Risk Tool.

Inland Rail Level Crossing Risk Tool

Where a road–rail interface is required, a methodology has been developed to identify what risk treatments should be implemented at individual road–rail interfaces as part of the Inland Rail project scope. This methodology is in the form of a formalised Level Crossing Risk Tool that identifies risk treatments and assists ARTC in being able to demonstrate that risks to safety would be managed SFAIRP for both new and existing road–rail interfaces.

The Australian Transport Council, in May 2003, agreed to adopt the Australian Level Crossing Assessment Model (ALCAM) as the only comprehensive level crossing assessment model in Australia. ALCAM is an assessment tool used to identify key potential risks at level crossings and assess the overall effects of proposed treatments. It does not specify what treatment is warranted at level road-rail crossing sites nor attempt to define a 'safe' or acceptable level of risk. This is a decision for each rail infrastructure manager.

In line with Office of the National Rail Safety Regulator (ONRSR) recommendation around the use of quantitative risk assessment techniques, a tool was developed which moved from a 'warrant' approach (e.g. decisions around control types based on basic metrics such as road type or traffic volumes) to a cost benefit analysis (CBA) approach for safety risk management. The approach uses ALCAM as one of the main inputs into the decision process for the recommended level of control at Inland Rail level crossings.

ARTC use a consistent methodology to develop all proposed road–rail interface treatments across the Inland Rail Program. In June 2020, the ONRSR finalised an audit of the *Inland Rail Road–Rail Crossing Strategy*, which included a number of the TfNSW level crossing interfaces on the N2N project. The audit recognised a consistent, systematic and comprehensive process for the assessment of level crossings is applied to determine adequate treatments, noting that the approach ensures level crossing safety risks are eliminated or minimised, SFAIRP. There were no findings or recommendations identified by the audit requiring action by ARTC.

Section 10 of ONRSR's *Policy on Level Crossings* (ONRSR, 2019) provides support for the use of ALCAM as follows:

> *'ONRSR accepts the use of ALCAM as a tool to help prioritise investment (when used in conjunction with other relevant factors, such as recent occurrence history). This tool has been endorsed by state and territory ministers.'*

Consideration of factors other than ALCAM that may influence the recommended level of control are also taken into account, where relevant, on a case-by-case basis, including:

- Collision and near-collision history
- Traffic and transport impacts
- Local knowledge of driver or pedestrian behaviour.

The assessment incorporates a compliance check against *AS1742.7-2016 Manual of uniform traffic control devices, Part 7: Railway crossings* (Standards Australia, 2016).

Level crossing treatment (control) options considered as part of the process include:

- Installation of passive (stop sign) level crossings—compliant with AS1742.7-2016
- Installation of active level crossings (flashing lights and boom barriers)
- Grade separation
- Other treatments identified based on-site specific risks.

Active controls are where a device, such as flashing lights or boom barriers, is activated prior to and during the passage of a train through the level crossing.

Cost benefit analysis

Part of the test as to whether risks have been managed SFAIRP is to determine whether the cost of the additional control is grossly disproportionate to the benefit gained via a CBA. From a financial perspective, three key inputs are required for the CBA:

1. *The avoided cost if an additional risk control is implemented*—the risk tool relies on ALCAM, which provides a quantitative measure of risk, which also enables the modelling of risk reduction generated by changing the controls at the level crossing. Risk reduction (benefits) can be calculated by comparing two risk scores for two scenarios, e.g. one level crossing with stop signs and one with flashing lights and boom barriers.
2. *The cost of implementing the additional risk control*—this is a combination of the capital cost of the additional control and the annual maintenance and repair cost over the life of the additional control.
3. *What would be considered grossly disproportionate*—from a legal perspective, the ONRSR *Meaning of Duty to Ensure Safety So Far As Is Reasonably Practicable Guideline* provides some guidance on what would be considered grossly disproportionate—the 'Grossly Disproportionate Factor' or GDF. The guideline suggests that the GDF may be dependent on the likelihood and consequence, with low risks having a factor of 2 and high risks having a factor of 10.

The use of ALCAM assessments in the determination of level crossing treatments

ALCAM assessments are undertaken for all proposed public road level crossings in the proposal site, thus providing a baseline risk score. The proposal functionality in the ALCAM system is used to model what the ALCAM risk score would be, assuming the introduction of Inland Rail. This incorporates forecast train speeds, volumes and train lengths. Updated road traffic counts, including a breakdown between light are heavy vehicles, are also collected for all public roads and included in this analysis.

If a crossing is assessed as being non-compliant for a passive stop sign control, the next level of control is applied. For example, if, based on the updated train speeds, sufficient sighting distance for a stop sign crossing as per *AS 1742.7-2016 Manual of uniform traffic control devices Part 7: Railway crossings* (Standards Australia, 2016) cannot be achieved, then the minimum control is flashing lights and boom barriers.

Even when a crossing is compliant for a passive stop sign control, the next level of control is modelled in ALCAM and a cost benefit/GDF analysis is undertaken, until the risk factor is reduced and a cost-effective level of crossing protection is established. For example, a passive control would be compared to a boom barrier control, which would then be compared to a grade separated control.

Preliminary design

A preliminary level of design is first undertaken to confirm that a level crossing with the proposed control, which complies with the relevant standards, can be constructed. This design incorporates any road design standards that have been provided by the relevant road infrastructure manager.

Site-specific level crossing treatments are then reviewed with the respective road infrastructure managers as the project progresses through the design process.

Interface agreements

In accordance with National and State Rail Safety Law requirements, all current and proposed public road crossings will be subject to an Interface Agreement.

Conclusion

The objective is to develop a consistent methodology in the selection of level crossing treatments that is acceptable to key stakeholders and minimises risk SFAIRP.

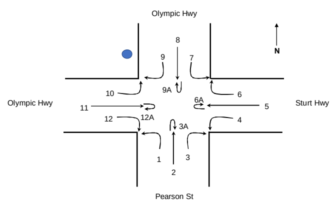
TECHNICAL PAPER 01

Traffic and transport

Appendix B Traffic counts

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

Client : WSP
Job : Regional NSW
Day/Date Average 22/06/2021 to 24/06/2021
Survey Location : Sturt Hwy & Olympic Hwy & Pearson St



AM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 5:15	1	0	1	26	0	26	2	1	2	0	0	0	2	1	3	5	4	8	4	1	5	0	1	2
5:15 - 5:30	0	0	0	27	0	28	3	0	3	0	0	0	0	1	1	5	4	10	9	1	10	0	0	0
5:30 - 5:45	1	1	2	51	1	52	4	1	5	0	0	0	1	0	1	8	6	14	14	1	14	0	0	0
5:45 - 6:00	1	0	2	39	2	41	6	2	8	0	0	0	2	0	2	9	9	17	10	1	11	0	0	1
6:00 - 6:15	2	0	2	30	2	32	7	1	8	0	0	0	5	1	6	12	8	20	14	1	14	0	1	1
6:15 - 6:30	2	1	3	42	2	44	5	1	5	0	0	0	5	0	6	16	6	21	17	1	18	1	0	1
6:30 - 6:45	5	0	5	61	6	67	14	2	15	1	0	1	6	2	7	19	10	29	23	5	28	1	1	2
6:45 - 7:00	5	0	6	85	4	89	21	4	25	0	0	0	9	1	10	22	6	28	34	4	38	2	1	3
7:00 - 7:15	8	0	8	73	9	82	22	3	25	0	0	0	10	3	13	28	12	40	26	4	30	1	0	1
7:15 - 7:30	4	1	5	82	6	87	24	5	29	0	0	0	8	2	10	25	5	30	30	2	32	2	0	2
7:30 - 7:45	7	1	8	88	6	94	31	4	34	1	0	1	10	2	12	30	8	38	28	2	30	1	0	1
7:45 - 8:00	7	3	10	120	8	128	51	4	55	2	0	2	18	3	21	29	7	36	39	3	42	4	1	5
8:00 - 8:15	7	2	9	125	7	132	53	5	57	2	0	2	21	3	24	32	7	39	34	3	37	6	1	7
8:15 - 8:30	6	1	7	132	5	137	71	3	74	1	0	1	26	2	28	30	8	38	38	3	40	5	0	5
8:30 - 8:45	9	2	10	149	5	154	73	4	77	3	0	3	21	3	24	33	8	41	47	4	50	4	1	5
8:45 - 9:00	8	2	10	125	6	131	58	8	66	1	0	1	18	3	21	34	8	42	35	2	37	5	1	7
9:00 - 9:15	8	2	10	97	6	103	56	5	62	2	0	2	28	5	32	40	6	46	37	5	42	8	1	9
9:15 - 9:30	7	1	8	83	7	90	47	5	52	1	1	2	27	4	31	39	7	46	35	2	37	10	1	11
9:30 - 9:45	9	2	10	82	2	84	46	6	52	1	1	2	30	3	33	39	5	44	34	4	38	7	0	7
9:45 - 10:00	9	1	10	82	5	86	54	3	57	1	0	1	31	4	36	38	5	43	26	4	30	7	0	7
AM Total	107	21	128	1601	88	1689	648	64	712	16	2	18	277	43	320	491	139	630	533	51	584	66	12	77
AM Peak	30	7	37	532	22	554	255	20	275	7	0	7	86	10	96	128	31	160	153	12	164	21	4	25
10hr Total	298	38	336	3359	132	3492	1431	108	1539	35	2	38	686	65	751	1735	248	1983	1534	79	1613	190	18	208

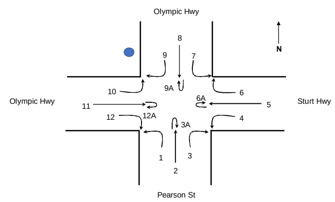
Time Period	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
5:00 - 5:15	7	0	7	5	0	5	1	0	1	0	0	0	4	0	4	7	6	13	0	0	0	0	0	0	78	5:00 - 6:00	526.33
5:15 - 5:30	10	1	11	19	0	19	5	1	5	0	0	0	7	0	7	13	2	15	0	0	0	0	0	0	109	5:15 - 6:15	615.33
5:30 - 5:45	17	1	18	20	0	20	10	1	10	0	0	0	14	1	15	18	3	20	1	1	2	0	0	0	173	5:30 - 6:30	717.33
5:45 - 6:00	21	0	22	19	1	19	8	1	9	0	0	0	12	4	16	15	4	19	0	0	0	0	0	0	166	5:45 - 6:45	868.33
6:00 - 6:15	18	1	19	24	2	26	10	1	11	0	0	0	12	1	13	11	2	14	1	0	1	0	0	0	167	6:00 - 7:00	1134
6:15 - 6:30	23	1	23	34	2	36	14	1	16	0	0	0	9	3	12	19	4	23	1	1	2	0	0	0	211	6:15 - 7:15	1364
6:30 - 6:45	41	2	43	51	2	53	18	1	19	0	0	0	13	4	17	32	3	35	1	0	2	0	0	0	324	6:30 - 7:30	1572
6:45 - 7:00	48	2	49	75	2	77	22	3	24	0	0	0	25	1	27	44	5	49	4	2	6	0	0	0	432	6:45 - 7:45	1736
7:00 - 7:15	33	1	34	63	6	69	25	3	27	0	0	0	21	3	24	34	4	38	2	1	3	0	0	0	397	7:00 - 8:00	1930
7:15 - 7:30	47	2	49	63	3	66	27	0	28	0	0	0	28	5	32	41	4	45	3	0	3	0	0	0	419	7:15 - 8:15	2173.7
7:30 - 7:45	53	2	55	80	5	85	24	3	27	0	0	0	34	4	37	56	7	63	3	0	3	0	0	0	488	7:30 - 8:30	2481
7:45 - 8:00	74	2	76	102	2	104	21	5	26	0	0	0	35	3	38	73	5	78	5	1	6	0	0	0	626	7:45 - 8:45	2716
8:00 - 8:15	70	3	73	102	3	105	25	3	29	0	0	0	35	3	38	72	7	80	8	1	9	0	0	0	640	8:00 - 9:00	2768.7
8:15 - 8:30	69	4	72	124	5	129	32	7	40	0	0	0	50	5	54	84	9	93	7	1	8	0	0	0	727	8:15 - 9:15	2731.3
8:30 - 8:45	81	1	82	104	5	109	28	3	31	0	0	0	49	4	52	71	7	78	5	1	5	0	0	0	723	8:30 - 9:30	2561.7
8:45 - 9:00	66	4	70	112	5	117	34	5	38	0	0	0	47	7	55	73	7	80	3	1	4	0	0	0	679	8:45 - 9:45	2359.7
9:00 - 9:15	53	3	56	95	4	99	17	5	22	0	0	0	37	3	40	66	5	71	8	0	8	0	0	0	603	9:00 - 10:00	2212
9:15 - 9:30	51	2	53	79	5	83	25	5	30	0	0	0	37	5	42	58	6	65	5	1	7	0	0	0	557	AM Peak	2768.7
9:30 - 9:45	45	2	47	72	5	76	13	6	19	0	0	0	24	6	30	62	9	71	7	1	8	0	0	0	521		
9:45 - 10:00	48	2	50	78	3	82	18	4	22	0	0	0	27	4	32	62	6	68	6	1	7	0	0	0	531		
AM Total	876	34	910	1320	60	1380	377	58	435	1	0	1	520	66	585	911	106	1017	70	14	85	0	1	1	8571		
AM Peak	287	11	298	441	18	460	119	19	138	0	0	0	181	18	199	300	30	330	22	3	26	0	0	0	2769		
10hr Total	1638	66	1703	3311	128	3439	1060	142	1202	4	0	4	1071	136	1207	1738	256	1994	152	30	182	1	1	2	19692		

PM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 14:15	8	2	10	67	5	72	53	4	57	1	0	1	33	1	34	67	5	71	35	1	37	8	0	8
14:15 - 14:30	14	1	15	65	3	68	45	3	47	0	0	0	26	1	27	64	5	69	44	3	47	11	1	11
14:30 - 14:45	10	1	11	73	3	76	50	2	52	2	0	2	35	4	39	65	6	71	45	3	48	8	1	9
14:45 - 15:00	12	1	14	82	4	86	43	3	47	2	0	2	29	0	29	50	5	55	44	3	47	9	0	9
15:00 - 15:15	10	3	13	95	5	100	54	5	59	2	0	2	31	2	34	60	7	67	44	1	46	9	0	9
15:15 - 15:30	12	1	13	96	5	101	50	3	53	1	0	1	27	2	28	68	5	73	47	2	49	6	0	7
15:30 - 15:45	16	0	16	113	2	115	57	3	60	1	0	1	27	1	29	57	5	62	70	4	74	8	0	8
15:45 - 16:00	12	1	13	102	2	104	53	3	56	1	0	1	27	1	28	67	6	72	59	4	63	8	0	8
16:00 - 16:15	11	2	13	120	2	122	52	4	56	3	0	3	30	2	32	70	4	74	54	1	55	9	1	10
16:15 - 16:30	13	0	13	105	1	106	40	2	42	1	0	1	22	2	24	71	9	81	48	1	50	6	1	7
16:30 - 16:45	13	1	15	112	3	115	50	1	51	1	0	1	21	0	21	63	6	69	67	1	68	6	0	6
16:45 - 17:00	12	1	13	113	1	114	43	3	46	1	0	1	20	2	22	81	6	87	67	1	68	9	0	9
17:00 - 17:15	11	1	12	115	1	116	33	3	36	1	0	1	17	0	17	96	3	99	59	0	59	4	0	4
17:15 - 17:30	9	0	9	99	1	101	40	2	42	1	0	1	19	3	21	82	7	89	66	1	67	4	0	4
17:30 - 17:45	9	0	9	109	1	109	34	2	36	0	0	0	19	0	19	77	7	84	61	0	61	6	0	6
17:45 - 18:00	4	0	5	88	0	88	25	0	25	1	0	1	7	0	7	59	4	63	44	0	44	3	0	3
18:00 - 18:15	3	0	3	62	0	62	20	0	20	0	0	0	8	0	8	48	5	53	39	0	39	2	0	2
18:15 - 18:30	4	0	5	54	0	54	16	1	16	0	0	0	4	1	4	39	3	42	38	0	38	2	0	3
18:30 - 18:45	4	0	4	52	1	53	12	1	13	0	0	0	6	0	6	36	4	40	40	0	41	4	0	4
18:45 - 19:00	2	0	3	39	2	41	14	0	14	0	0	0	2	0	2	24	5	29	28	0	28	2	0	2
PM Total	192	16	208	1759	44	1803	784	44	828	20	0	20	409	22	431	1244	109	1353	1002	28	1029	124	7	131
PM Peak	50	3	53	449	9	458	203	12	215	5	0	5	101	6	107	285	24	309	233	7	240	29	2	31

Time Period	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
14:00 - 14:15	32	3	35	75	4	78	23	6	29	0	0	0	23	3	26	43	7	50	6	0	6	0	0	0	516	14:00 - 15:00	2143
14:15 - 14:30	34	3	37	82	6	88	27	4	30	0	0	0	18	5	22	42	11	53	5	1	6	0	0	0	521	14:15 - 15:15	2279.7
14:30 - 14:45	36	2	38	86	5	91	27	6	32	0	0	0	24	3	27	40	8	48	7	1	8	0	0	0	553	14:30 - 15:30	2409.3
14:45 - 15:00	44	2	46	92	4	96	26	6	32	0	0	0	24	6	30	45	8	54	7	1	8	0	0	0	553	14:45 - 15:45	2528.3
15:00 - 15:15	43	1	44	130	4	135	35	5	40	0	0	0	33	4	37	51	11	62	5	1	6	0	0	0	652	15:00 - 16:00	2637.7
15:15 - 15:30	44	6	50	129	5	133	40	5	44	0	0	0	31	3	34	49	8	57	5	2	7	0	0	0	651	15:15 - 16:15	2662.7
15:30 - 15:45	38	2	41	113	7	120	37	5	42	0	0	0	33	5	38	52	9	61	4	1	5	0	0	0	672	15:30 - 16:30	2649.3
15:45 - 16:00	39	2	41	106	6	113	39	5	44	0	0	0	41	3	45	56	10	66	5	2	7	0	0	0	663	15:45 - 16:45	2635
16:00 - 16:15	43	2	45	121	5	126	47	3	50	0	0	0	24	5	29	49	8	57	5	1	6	0	0	0	677	16:00 - 17:00	2653.3
16:15 - 16:30	47	1	48	118	2	120	44	4	48	0	0	0	32	3	35	48	8	56	5	1	6	0	0	0	637	16:15 - 17:15	2639.7
16:30 - 16:45	46	1	47	118	4	121	47	3	51	0	0	0	33	4	37	46	4	50	5	0	5	0	0	0	658	16:30 - 17:30	2670
16:45 - 17:00	50	1	51	128	2	131	43	5	48	0	0	0	26	3	30	47	8	55	5	1	6	0	0	0	681	16:45 - 17:45	2621.3
17:00 - 17:15	45	1	46	119	5	124	57	6	63	0	0	0	28	4	32	41	8	49	4	1	5	0	0	0	664	17:00 - 18:00	2391
17:15 - 17:30	52	0	52	127	2	129	54	4	57	1	0	1	38	2	40	41	8	49	4	0	4	0	0	0	668	17:15 - 18:15	2116.7
17:30 - 17:45	39	1	41	117	3	120	44	4	48	0	0	0	29	4	33	36	5	40	2	1	3	0	0	0	609	17:30 - 18:30	1788.7
17:45 - 18:00	28	1	28	85	1	85	24	3	27	0	0	0	30	4	34	34	4	38	1	1	1	0	0	0	451	17:45 - 18:45	1486
18:00 - 18:15	30	0	30	79	1	80	20	3	23	1	0	1	25	2	27	30	8	39	2	0	3	0	0	0	389	18:00 - 19:00	1296.3
18:15 - 18:30	27	0	27	61	1	62	22	2	25	0	0	0	23	4	27	28	5	34	3	0	3	0	0	0	340	PM Peak	2670
18:30 - 18:45	21	1	22	54	1	55	13	2	16	0	0	0	19	2	21	26	4	30	2	0	2	0	0	0	306		
18:45 - 19:00	21	1	22	51	1	51	15	3	18	0	0	0	15	4	19	22	7	29	1	0	1	0	0	0	261		
PM Total	761	32	793	1991	68	2059	683	84	767	3	0	3	551	71	622	827	150	977	82	15	97	1	0	1	11121		
PM Peak	176	8	184	486	12	498	179	14	193	0	0	0	123	18	141	210	30	239	21	4	25	0	0	0	2699		

austraffic
TRAFFIC & TRANSPORT DATA SPECIALISTS



Client : WSP
Job : Regional NSW
Day/Date Average 22/06/2021 to 24/06/2021
Survey Location : Sturt Hwy & Olympic Hwy & Pearson St

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	3	1	4	143	3	146	14	3	18	0	0	0	5	2	6	26	23	49	37	3	41	1	2	3
5:15 - 6:15	5	1	6	147	5	153	20	4	24	0	0	0	7	2	9	34	27	60	47	3	50	1	1	2
5:30 - 6:30	7	2	9	162	7	169	22	4	26	0	0	0	12	1	14	44	28	72	54	4	58	1	1	2
5:45 - 6:45	11	1	13	172	12	184	32	5	37	1	0	1	17	3	20	55	32	87	64	8	72	2	2	4
6:00 - 7:00	15	1	17	219	14	232	47	7	54	2	0	2	24	4	29	68	30	98	87	11	98	4	3	6
6:15 - 7:15	21	2	23	262	21	283	62	9	71	2	0	2	30	6	36	84	34	119	100	14	114	5	2	7
6:30 - 7:30	23	2	24	301	24	326	81	13	94	1	0	2	32	8	41	93	34	127	113	15	128	6	2	9
6:45 - 7:45	24	3	27	328	24	353	98	15	113	1	0	2	37	8	45	105	31	136	118	12	130	6	1	7
7:00 - 8:00	26	5	31	363	29	392	128	15	143	3	0	3	46	10	56	112	32	144	123	11	134	8	1	9
7:15 - 8:15	25	7	32	415	27	442	158	17	175	4	0	5	57	10	66	116	27	142	130	10	141	13	2	15
7:30 - 8:30	27	7	34	466	26	491	206	15	220	5	0	6	75	9	84	121	30	151	138	11	149	16	2	18
7:45 - 8:45	28	8	36	527	25	551	248	15	263	7	0	7	86	11	96	124	30	154	157	12	169	20	3	23
8:00 - 9:00	30	7	37	532	22	554	255	20	275	7	0	7	86	10	96	128	31	160	153	12	164	21	4	25
8:15 - 9:15	31	8	38	504	21	525	259	20	279	7	1	7	93	12	105	137	31	167	156	13	169	23	3	26
8:30 - 9:30	32	7	39	455	24	478	235	22	257	7	1	8	93	15	108	146	29	175	154	12	166	28	4	32
8:45 - 9:45	32	7	39	387	21	409	207	24	231	5	2	7	102	15	117	152	26	178	141	12	154	30	3	34
9:00 - 10:00	33	6	39	344	20	364	204	19	222	5	2	6	116	17	132	156	23	180	133	14	147	32	2	34

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	56	2	58	63	1	64	23	2	25	0	0	0	37	6	43	53	14	67	2	1	3	0	0	0	464	63	526
5:15 - 6:15	67	3	70	81	3	84	32	3	35	0	0	0	44	7	51	57	11	68	2	2	4	0	0	0	545	71	615
5:30 - 6:30	80	3	82	96	5	101	42	4	45	0	0	0	47	10	56	63	14	76	3	2	5	0	0	0	633	84	717
5:45 - 6:45	104	4	107	128	7	134	50	4	54	0	0	0	46	12	58	77	14	91	3	2	5	0	0	0	762	106	868
6:00 - 7:00	130	5	135	184	8	192	64	6	70	0	0	0	59	9	69	106	15	121	7	4	11	0	0	0	1016	118	1134
6:15 - 7:15	145	5	150	223	12	235	79	8	87	0	0	0	69	11	80	128	17	146	8	4	12	0	0	0	1218	146	1364
6:30 - 7:30	169	7	176	252	13	265	92	7	99	0	0	0	87	13	100	151	17	168	10	4	14	0	0	0	1412	160	1572
6:45 - 7:45	181	6	187	281	16	297	97	9	106	0	0	0	108	13	120	175	20	195	12	3	15	0	0	0	1572	164	1736
7:00 - 8:00	207	7	214	309	16	325	97	11	108	0	0	0	117	15	132	204	20	224	14	2	16	0	0	0	1757	173	1930
7:15 - 8:15	244	9	253	348	13	361	98	12	109	0	0	0	131	14	146	242	23	265	19	2	21	0	0	0	2001	173	2174
7:30 - 8:30	266	10	277	408	15	423	103	19	121	0	0	0	153	14	168	285	28	313	23	3	26	0	0	0	2292	189	2481
7:45 - 8:45	294	10	304	432	15	447	107	19	126	0	0	0	168	14	183	300	28	328	24	4	28	0	0	0	2523	193	2716
8:00 - 9:00	287	11	298	441	18	460	119	19	138	0	0	0	181	18	199	300	30	330	22	3	26	0	0	0	2562	207	2769
8:15 - 9:15	269	11	280	434	19	453	111	21	132	0	0	0	183	18	201	293	28	321	23	3	25	0	0	0	2522	209	2731
8:30 - 9:30	251	10	261	389	19	408	103	19	122	0	0	0	170	19	188	268	26	293	21	3	24	0	0	0	2351	210	2562
8:45 - 9:45	215	10	225	357	19	376	89	21	110	0	0	0	145	21	166	259	28	287	23	3	27	0	0	0	2146	214	2360
9:00 - 10:00	197	9	205	323	17	340	73	20	94	0	0	0	125	18	143	249	26	275	26	4	30	0	0	0	2014	198	2212

HOURLY FLOW

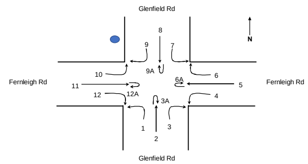
TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	45	5	50	286	15	302	191	13	203	5	0	5	122	6	129	246	20	266	168	11	179	36	2	38
14:15 - 15:15	47	5	53	314	15	329	192	13	205	5	0	5	121	7	128	239	23	262	177	11	188	36	2	38
14:30 - 15:30	45	5	50	346	17	363	198	13	211	6	0	6	122	8	130	243	23	266	181	9	190	32	2	34
14:45 - 15:45	50	5	55	385	16	401	205	14	219	6	0	6	114	6	120	235	23	258	205	10	215	31	1	32
15:00 - 16:00	50	5	55	405	15	420	214	13	228	5	0	5	113	6	119	252	24	275	221	11	231	31	1	32
15:15 - 16:15	51	4	55	431	12	443	212	13	224	6	0	6	111	6	117	262	20	282	231	10	241	31	2	33
15:30 - 16:30	52	3	56	439	8	448	201	12	213	6	0	6	107	6	113	265	24	289	232	10	242	31	3	33
15:45 - 16:45	50	4	54	439	9	448	194	10	204	6	0	6	101	5	105	271	25	296	229	7	236	29	3	32
16:00 - 17:00	50	4	54	450	8	457	184	9	194	6	0	6	94	5	99	286	26	311	237	4	242	30	3	33
16:15 - 17:15	50	3	53	445	6	451	165	9	174	4	0	4	81	4	85	311	25	336	242	4	246	25	2	27
16:30 - 17:30	45	4	49	439	6	446	166	8	174	4	0	4	77	5	82	322	23	345	259	3	263	24	0	24
16:45 - 17:45	40	2	43	436	4	440	150	10	160	4	0	4	75	5	79	336	24	359	253	2	255	24	0	24
17:00 - 18:00	33	1	34	411	3	414	132	7	140	4	0	4	61	3	64	314	22	335	230	2	231	18	0	18
17:15 - 18:15	25	1	26	358	3	361	119	4	123	3	0	3	52	3	55	266	23	289	210	1	211	16	0	16
17:30 - 18:30	21	1	21	312	1	314	95	3	98	2	0	2	37	1	38	223	19	242	182	0	182	14	0	14
17:45 - 18:45	16	1	17	255	2	257	73	1	74	1	0	1	24	1	25	182	17	199	161	1	162	11	1	12
18:00 - 19:00	14	1	15	206	3	210	62	1	63	0	0	0	19	1	20	147	18	165	146	0	146	10	1	11

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	146	10	157	335	19	354	102	21	123	0	0	0	89	17	106	169	35	204	25	4	28	0	0	0	1965	178	2143
14:15 - 15:15	158	8	166	391	19	410	114	20	134	0	0	0	99	17	116	178	39	217	24	4	28	0	0	0	2096	184	2280
14:30 - 15:30	168	10	179	437	18	455	127	21	148	0	0	0	112	15	128	186	35	221	24	4	28	0	0	0	2227	182	2409
14:45 - 15:45	170	11	181	464	20	484	138	20	158	0	0	0	122	17	139	198	36	234	21	5	26	1	0	1	2345	183	2528
15:00 - 16:00	165	11	176	479	22	501	151	19	170	0	0	0	139	14	153	209	37	246	19	6	25	0	0	0	2453	185	2638
15:15 - 16:15	165	12	177	469	23	492	163	18	181	0	0	0	130	16	146	207	34	241	19	6	25	0	0	0	2487	176	2663
15:30 - 16:30	167	8	175	459	20	479	168	17	185	0	0	0	130	16	147	205	34	240	19	5	24	0	0	0	2482	167	2649
15:45 - 16:45	175	6	181	463	17	480	178	16	193	1	0	1	130	16	146	199	30	229	20	4	24	0	0	0	2484	151	2635
16:00 - 17:00	186	5	191	485	13	498	182	15	197	0	0	0	115	16	131	190	28	218	20	2	22	0	0	0	2514	139	2653
16:15 - 17:15	189	4	192	483	13	496	192	18	210	0	0	0	119	15	133	181	29	210	19	2	22	0	0	0	2507	133	2640
16:30 - 17:30	194	3	197	492	13	505	201	18	219	1	0	1	125	13	139	175	29	204	18	2	20	0	0	0	2542	128	2670
16:45 - 17:45	187	3	190	491	12	503	197	19	216	1	0	1	122	13	135	165	29	194	15	3	18	0	0	0	2495	126	2621
17:00 - 18:00	164	3	168	447	10	458	178	17	195	1	0	1	126	13	139	152	25	177	11	3	13	0	0	0	2281	110	2391
17:15 - 18:15	149	3	151	407	7	414	141	14	155	2	0	2	123	11	134	142	25	166	9	2	11	0	0	0	2020	96	2117
17:30 - 18:30	124	3	126	342	6	347	110	13	123	1	0	1	108	13	120	129	22	151	8	2	10	0	0	0	1705	84	1789
17:45 - 18:45	106	2	108	279	4	283	80	11	90	1	0	1	98	11	108	119	22	141	7	1	9	0	0	0	1413	73	1486
18:00 - 19:00	99	2	102	245	4	249	70	11	81	1	0	1	83	11	94	107	25	132	7	1	8	0	0	0	1218	78	1296

austraffic

TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date Average 22/06/2021 to 24/06/2021
Survey Location : Glenfield Rd & Fernleigh Rd
Weather



AM

Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
5:00 - 5:15	8	0	8	21	0	21	0	0	0	0	0	0	0	0	0	2	0	2	8	0	8	0	0	0
5:15 - 5:30	10	0	10	30	1	31	1	0	1	0	0	0	1	0	1	2	0	2	5	0	5	0	0	0
5:30 - 5:45	10	0	10	47	1	48	2	0	2	0	0	0	0	0	0	6	0	6	8	0	8	0	0	0
5:45 - 6:00	14	0	14	46	1	47	2	0	2	0	0	0	1	0	1	9	0	9	8	0	8	0	0	0
6:00 - 6:15	11	0	11	36	1	36	0	0	0	0	0	0	1	0	1	7	1	8	3	0	3	0	0	0
6:15 - 6:30	22	0	22	59	2	61	1	0	1	0	0	0	0	0	0	11	0	11	4	0	4	0	0	0
6:30 - 6:45	29	1	29	84	1	85	6	0	6	0	0	0	0	0	0	14	1	15	11	1	12	0	0	0
6:45 - 7:00	32	0	32	115	2	116	6	0	7	0	0	0	1	0	2	19	2	20	14	1	15	0	0	0
7:00 - 7:15	22	1	22	82	2	84	5	0	5	0	0	0	1	0	1	10	1	11	10	1	11	0	0	0
7:15 - 7:30	23	1	23	100	3	104	6	0	6	0	0	0	3	1	4	14	1	15	14	0	14	0	0	0
7:30 - 7:45	28	2	29	111	2	114	7	0	7	0	0	1	4	0	4	14	1	16	18	0	18	0	0	0
7:45 - 8:00	30	0	30	160	3	163	12	0	12	0	0	0	3	0	4	17	0	18	22	2	23	0	0	0
8:00 - 8:15	27	1	28	156	3	159	9	0	9	0	0	0	4	0	4	21	2	22	18	0	18	0	0	0
8:15 - 8:30	33	2	34	157	3	160	29	0	29	0	0	0	10	0	10	23	0	23	15	0	15	0	0	0
8:30 - 8:45	25	1	26	144	2	145	21	0	21	0	0	0	6	2	7	35	0	35	12	0	12	0	0	0
8:45 - 9:00	23	1	24	128	3	132	11	0	11	0	0	0	11	0	11	40	5	44	15	1	16	0	0	0
9:00 - 9:15	23	1	24	108	4	113	7	0	8	0	0	0	7	0	8	32	1	32	13	0	13	0	0	0
9:15 - 9:30	24	1	25	85	3	88	6	0	6	1	0	1	7	0	7	27	1	27	8	0	8	0	0	0
9:30 - 9:45	24	1	25	80	1	81	7	0	7	0	0	0	7	0	7	26	0	26	14	0	14	0	0	0
9:45 - 10:00	21	1	22	83	2	85	6	0	6	0	0	0	7	0	7	22	0	23	10	0	10	0	0	0
AM Total	435	15	450	1832	40	1872	143	2	146	2	1	3	75	5	80	350	16	366	228	8	236	1	0	1
AM Peak	107	5	112	585	11	595	69	1	70	0	1	1	31	2	33	118	7	125	60	2	61	0	0	0
10hr Total	900	28	928	3146	73	3219	308	2	310	3	1	4	363	8	371	1029	30	1059	442	12	454	2	0	2

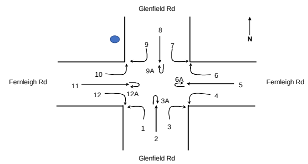
Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
5:00 - 5:15	1	0	1	2	0	2	7	0	7	0	0	0	5	1	6	2	0	2	2	0	2	0	0	0	58	5:00 - 6:00	383.33
5:15 - 5:30	2	0	2	6	0	6	5	0	5	0	0	0	9	1	10	1	0	1	3	0	3	0	0	0	77	5:15 - 6:15	439
5:30 - 5:45	7	0	7	6	0	7	6	1	6	0	0	0	15	0	15	3	0	3	4	0	4	0	0	0	116	5:30 - 6:30	535
5:45 - 6:00	2	0	2	10	0	11	9	2	11	0	0	0	13	0	13	8	0	8	6	0	6	0	0	0	133	5:45 - 6:45	676
6:00 - 6:15	3	0	3	11	1	12	12	1	13	0	0	0	11	1	12	5	0	6	6	1	7	0	0	0	114	6:00 - 7:00	891
6:15 - 6:30	4	0	4	14	2	16	14	2	16	0	0	0	18	0	18	7	1	8	11	1	11	0	0	0	173	6:15 - 7:15	1056.7
6:30 - 6:45	6	0	6	28	1	30	22	0	22	0	0	0	24	1	25	10	2	12	13	1	13	0	0	0	257	6:30 - 7:30	1215.3
6:45 - 7:00	7	1	8	41	3	44	35	2	37	1	0	1	40	1	41	12	0	12	11	1	12	1	0	1	348	6:45 - 7:45	1318.3
7:00 - 7:15	7	1	8	39	5	44	23	1	24	1	0	1	33	6	40	12	1	13	14	1	15	0	0	0	279	7:00 - 8:00	1423.7
7:15 - 7:30	9	1	10	35	4	39	31	3	34	0	0	0	35	9	44	19	0	19	19	1	20	0	0	0	332	7:15 - 8:15	1599.3
7:30 - 7:45	7	0	7	49	4	53	26	1	27	0	0	0	39	3	42	16	1	17	24	0	24	0	0	0	360	7:30 - 8:30	1803.3
7:45 - 8:00	15	0	15	52	3	55	29	5	34	1	0	1	58	4	61	22	1	23	13	1	13	0	0	0	453	7:45 - 8:45	1988
8:00 - 8:15	16	0	17	58	3	61	29	3	32	0	0	0	48	2	51	33	3	36	15	0	16	2	0	2	455	8:00 - 9:00	2067.3
8:15 - 8:30	16	1	17	65	2	67	35	2	37	0	0	0	57	3	60	53	4	57	22	1	23	2	0	2	536	8:15 - 9:15	2058.3
8:30 - 8:45	20	0	20	66	4	70	49	2	52	0	0	0	68	3	71	54	2	56	24	1	25	2	0	2	544	8:30 - 9:30	1911.3
8:45 - 9:00	20	0	20	74	3	78	61	4	66	0	0	0	51	1	53	46	2	48	24	2	27	3	0	3	532	8:45 - 9:45	1726.7
9:00 - 9:15	15	1	16	71	3	74	51	2	53	0	0	0	46	2	48	32	0	33	23	1	23	1	0	1	446	9:00 - 10:00	1592
9:15 - 9:30	12	0	12	66	3	70	39	2	41	0	0	0	49	2	52	30	0	30	20	1	21	1	0	1	389	AM Peak	2067.3
9:30 - 9:45	12	0	12	50	3	52	40	2	42	0	0	0	47	4	51	24	0	24	16	1	17	0	0	0	360		
9:45 - 10:00	13	0	13	70	4	74	51	3	53	0	0	0	43	3	46	30	0	30	24	1	25	2	0	2	398		
AM Total	194	5	199	813	50	863	574	38	613	4	1	5	712	48	759	420	19	439	295	14	309	17	0	17	6357		
AM Peak	73	1	74	263	12	276	175	12	186	1	0	1	225	10	235	187	11	198	86	5	91	10	0	10	2067		
10hr Total	591	9	600	3168	96	3264	1928	63	1991	10	1	11	1567	69	1636	1151	29	1180	912	27	938	47	1	48			

PM

Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
14:00 - 14:15	21	2	23	57	2	59	6	0	6	0	0	0	7	0	7	26	1	27	13	1	14	0	0	0
14:15 - 14:30	20	1	21	58	2	60	6	0	6	0	0	0	7	0	8	31	0	31	8	0	8	0	0	0
14:30 - 14:45	22	1	23	75	3	78	9	0	9	0	0	0	9	0	10	25	0	25	10	0	10	0	0	0
14:45 - 15:00	22	1	22	82	2	84	12	0	12	0	0	0	7	0	7	34	1	35	15	1	16	0	0	0
15:00 - 15:15	22	2	24	83	3	86	11	0	11	0	0	0	12	0	12	33	1	34	12	0	12	0	0	0
15:15 - 15:30	23	2	26	77	5	82	11	0	11	0	0	0	19	0	19	43	2	45	14	0	14	0	0	0
15:30 - 15:45	26	1	28	83	2	85	11	0	11	0	0	0	31	0	31	42	3	45	12	0	12	0	0	0
15:45 - 16:00	23	1	24	69	2	71	10	0	10	0	0	0	19	1	20	36	3	39	15	0	15	0	0	0
16:00 - 16:15	21	0	21	69	1	69	7	0	7	0	0	0	20	0	20	36	1	37	13	0	13	0	0	0
16:15 - 16:30	23	0	23	83	2	85	7	0	7	0	0	0	19	0	19	38	0	38	9	0	9	0	0	0
16:30 - 16:45	17	1	18	73	1	74	9	0	9	0	0	0	17	0	17	37	0	37	12	0	12	0	0	0
16:45 - 17:00	30	0	30	68	2	70	11	0	11	0	0	0	19	0	19	38	0	39	10	0	10	0	0	0
17:00 - 17:15	24	0	25	68	1	69	6	0	6	0	0	0	21	0	22	42	0	42	15	0	15	0	0	0
17:15 - 17:30	28	0	28	78	0	79	8	0	8	0	0	0	19	0	19	38	1	39	10	0	10	0	0	0
17:30 - 17:45	27	0	27	68	1	69	8	0	8	0	0	0	21	0	21	41	0	41	11	0	11	0	0	0
17:45 - 18:00	37	0	37	58	1	59	8	0	8	0	0	0	13	0	13	37	0	37	12	0	12	0	0	0
18:00 - 18:15	22	0	22	53	0	53	6	0	6	0	0	0	9	0	9	33	0	33	6	0	6	0	0	0
18:15 - 18:30	23	0	23	36	1	36	7	0	7	0	0	0	8	0	8	26	0	26	7	0	7	0	0	0
18:30 - 18:45	17	0	17	45	1	45	4	0	4	0	0	0	4	0	4	26	0	26	3	0	3	0	0	0
18:45 - 19:00	16	0	16	31	0	31	7	0	7	0	0	0	6	0	6	17	0	17	7	0	7	0	0	0
PM Total	465	13	478	1314	33	1347	165	0	165	2	0	2	288	3	291	680	13	693	214	4	217	1	0	1
PM Peak	94	5	99	298	9	307	38	0	38	0	0	0	89	1	91	157	8	166	54	1	54	0	0	0

Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
14:00 - 14:15	15	0	15	78	2	80	58	2	60	1	0	1	46	2	48	31	1	31	27	2	29	1	0	1	403	14:00 - 15:00	1764.3
14:15 - 14:30	19	1	20	93	4	97	63	3	66	0	0	1	39	2	41	40	1	41	23	1	23	1	0	1	425	14:15 - 15:15	1889.7
14:30 - 14:45	17	0	17	88	5	92	72	3	74	0	0	0	46	3	49	41	1	43	26	2	28	1	0	1	460	14:30 - 15:30	2045
14:45 - 15:00	19	0	19	97	4	102	63	1	64	1	0	1	48	2	50	34	1	35	27	1	28	2	0	2	477	14:45 - 15:45	2179.7
15:00 - 15:15	19	0	19	122	5	127	61	3	63	1	0	1	55	2	57	45	1	46	33	1	35	1	0	1	528	15:00 - 16:00	2249
15:15 - 15:30	24	0	24	123	2	125	78	1	79	0	0	1	56	2	59	47	3	50	40	1	41	4	0	4	580	15:15 - 16:15	2276
15:30 - 15:45	30	0	30	132	2	134	91	4	96	0	0	0	48	2	50	36	1	37	33	0	34	3	0	3	595	15:30 - 16:30	2242
15:45 - 16:00	19	0	20	134	4	138	77	1	78	0	0	0	52	1	53	37	0	37	38	0	38	2	0	2	546	15:45 - 16:45	2182.3
16:00 - 16:15	19	0	19	150	3	153	81	1	82	0	0	0	50	0	51	41	1	41	41	1	42	1	0	1	555	16:00 - 17:00	2178
16:15 - 16:30	23	0	23	141	2	142	75	1	75	0	0	0	46	2	48	39	0	39	34	2	36	1	0	2	546	16:15 - 17:15	2182.3
16:30 - 16:45	30	0	30	144	1	145	71	1	72	0	0	0	49	0	49	40	0	40	31	0	32	1	0	1	535	16:30 - 17:30	2215
16:45 - 17:00	23	0	23	138	2	140	76	0	76	0	0	0	47	0	47	42	0	42	33	0	33	2	0	2	542	16:45 - 17:45	2237
17:00 - 17:15	32	0	32	157	2	159	71	1	71	0	0	0	38	1	39	41	0	41	36	0	37	1	0	1	560	17:00 - 18:00	2156.7
17:15 - 17:30	22	0	23	170	2	172	80	0	80	0	0	0	41	0	41	38	0	38	40	0	40	1	0	1	579	17:15 - 18:15	1991
17:30 - 17:45	26	0	27	164	3	167	82	1	82	0	0	0	36	0	36	36	0	36	28	0	28	4	0	4	557	17:30 - 18:30	1750
17:45 - 18:00	11	1	11	115	0	115	65	0	66	0	0	0	37	0	37	33	0	33	30	1	30	1	0	1	461	17:45 - 18:45	1506.7
18:00 - 18:15	16	0	16	90	1	91	57	0	57	0	0	0	34	0	34	33	0	33	31	0	31	1	0	1	394	18:00 - 19:00	1311
18:15 - 18:30	14	0	14	84	2	86	48	0	49	0	0	0	30	0	30	29	0	29	20	0	21	2	0	2	338	PM Peak	2276
18:30 - 18:45	9	0	9	75	1	76	47	0	48	0	0	0	28	0	29	26	0	26	24	0	24	1	0	1	314		
18:45 - 19:00	10	0	10	60	0	60	39	0	39	0	0	0	29	0	30	22	0	22	21	0	21	0	0	0	266		
PM Total	397	4	401	2355	47	2401	1354	25	1379	6	1	6	856	21	877	731	10	741	617	12	629	30	1	31	9659		
PM Peak	92	1	93	539	11	550	327	8	335	1	0	1	207	5	212	160	5	165	153	2	154	9	0	10	2276		

Client : WSP
Job : Regional NSW
Day/Date Average 22/06/2021 to 24/06/2021
Survey Location : Glenfield Rd & Fernleigh Rd
Weather



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	41	1	42	144	3	147	5	0	5	0	0	0	2	0	2	19	0	19	28	0	29	0	0	0
5:15 - 6:15	44	1	45	159	3	162	5	0	5	0	0	0	3	0	3	24	1	25	24	0	24	0	0	0
5:30 - 6:30	57	1	58	187	5	192	5	0	5	0	0	0	2	0	2	33	1	34	23	0	23	0	0	0
5:45 - 6:45	76	1	77	224	5	230	9	0	9	0	0	0	2	0	2	41	2	43	26	2	28	0	0	0
6:00 - 7:00	93	1	95	293	6	299	13	1	14	0	0	0	3	0	3	51	3	54	32	3	35	0	0	0
6:15 - 7:15	104	2	106	339	7	346	18	1	19	0	0	0	3	1	4	54	4	58	39	4	43	0	0	0
6:30 - 7:30	105	2	107	381	9	389	23	1	24	0	0	0	6	1	7	57	4	62	49	4	53	0	0	0
6:45 - 7:45	104	3	107	408	10	418	24	0	24	0	0	1	9	2	11	57	5	62	56	3	59	0	0	0
7:00 - 8:00	102	3	105	453	11	464	29	0	29	0	0	1	11	2	13	56	4	60	64	3	67	0	0	0
7:15 - 8:15	107	4	111	527	12	539	33	0	33	0	1	1	14	1	15	66	4	71	71	2	74	0	0	0
7:30 - 8:30	117	5	122	584	11	595	56	1	56	0	1	1	21	1	22	75	4	79	73	2	75	0	0	0
7:45 - 8:45	114	4	118	616	10	627	70	1	70	0	1	1	23	2	25	95	3	98	67	2	69	0	0	0
8:00 - 9:00	107	5	112	585	11	595	69	1	70	0	1	1	31	2	33	118	7	125	60	2	61	0	0	0
8:15 - 9:15	103	5	108	537	12	549	68	1	69	0	0	1	34	3	37	129	6	135	55	2	56	0	0	0
8:30 - 9:30	94	4	98	465	12	477	46	0	46	1	0	1	31	3	34	133	6	139	47	2	49	0	0	0
8:45 - 9:45	93	4	97	402	11	413	32	1	33	1	0	1	32	1	33	124	6	130	49	1	50	0	0	0
9:00 - 10:00	91	5	96	356	10	367	26	1	27	1	0	1	29	1	29	106	2	108	44	1	45	0	0	0

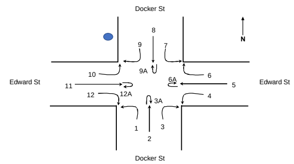
TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	12	0	12	24	1	25	26	3	29	0	0	0	42	2	44	14	0	14	15	0	15	0	0	0	373	10	383
5:15 - 6:15	14	0	14	34	2	35	32	3	35	0	0	0	49	2	50	17	0	18	19	1	20	1	0	1	425	14	439
5:30 - 6:30	16	0	16	42	4	46	41	5	46	0	0	1	57	1	58	23	2	24	27	2	29	1	0	1	514	21	535
5:45 - 6:45	15	0	15	64	5	69	57	5	62	0	0	1	66	2	68	30	4	34	36	2	38	1	0	1	647	29	676
6:00 - 7:00	20	1	21	94	7	102	83	5	88	1	0	1	94	3	97	34	4	38	41	3	43	1	0	1	854	37	891
6:15 - 7:15	24	1	25	122	11	133	94	5	99	2	0	2	116	9	124	41	5	46	49	3	51	1	0	1	1005	52	1057
6:30 - 7:30	30	2	32	143	13	156	111	6	117	1	0	2	133	17	150	53	4	57	57	3	60	1	0	1	1150	66	1215
6:45 - 7:45	30	2	33	164	16	180	115	7	122	1	0	2	148	19	167	59	3	62	68	3	71	1	0	1	1246	73	1318
7:00 - 8:00	38	2	40	175	16	191	109	10	119	2	0	2	165	22	187	70	3	73	70	3	73	1	0	1	1345	78	1424
7:15 - 8:15	47	2	49	194	14	208	115	13	128	1	0	1	180	18	198	90	5	95	71	2	73	3	0	3	1522	78	1599
7:30 - 8:30	54	2	56	224	12	236	119	11	131	1	0	1	202	12	214	125	9	133	74	3	76	5	0	5	1730	73	1803
7:45 - 8:45	68	1	69	241	12	253	143	12	155	2	0	2	232	12	244	163	9	172	74	3	77	7	0	7	1915	73	1988
8:00 - 9:00	73	1	74	263	12	276	175	12	186	1	0	1	225	10	235	187	11	198	86	5	91	10	0	10	1989	78	2067
8:15 - 9:15	72	1	73	276	12	288	197	11	208	1	0	1	223	10	232	186	8	194	93	5	98	9	0	9	1982	76	2058
8:30 - 9:30	67	1	68	278	13	291	201	11	212	1	0	1	215	9	224	163	4	168	92	5	96	8	0	8	1841	70	1911
8:45 - 9:45	59	1	59	261	12	273	192	11	202	1	0	1	194	10	204	133	3	135	83	5	88	6	0	6	1660	67	1727
9:00 - 10:00	51	1	52	256	13	270	181	9	190	1	0	1	186	11	197	116	1	117	83	4	87	5	0	5	1533	59	1592

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	85	4	90	273	10	282	34	0	34	0	0	0	31	1	32	116	2	118	46	2	48	0	0	0
14:15 - 15:15	86	5	91	299	11	309	39	0	39	0	0	0	35	1	36	123	2	125	46	1	47	0	0	0
14:30 - 15:30	89	6	95	318	13	331	43	0	43	0	0	0	47	1	48	135	4	139	52	1	53	0	0	0
14:45 - 15:45	93	6	100	326	12	337	45	0	45	0	0	0	69	0	69	152	6	158	54	1	55	0	0	0
15:00 - 16:00	95	7	102	312	12	324	43	0	43	0	0	0	81	1	83	154	9	162	53	1	54	0	0	0
15:15 - 16:15	94	5	99	298	9	307	38	0	38	0	0	0	89	1	91	157	8	166	54	1	54	0	0	0
15:30 - 16:30	93	3	96	304	7	311	34	0	34	0	0	0	89	1	90	152	7	159	48	1	49	0	0	0
15:45 - 16:45	84	2	86	293	6	300	33	0	33	0	0	0	75	1	76	147	4	151	48	1	49	0	0	0
16:00 - 17:00	90	1	92	293	6	299	33	0	33	0	0	0	74	0	75	149	1	150	43	1	44	0	0	0
16:15 - 17:15	94	1	95	292	7	299	33	0	33	0	0	0	76	0	76	154	1	155	45	1	46	0	0	0
16:30 - 17:30	99	1	100	288	5	292	34	0	34	0	0	0	76	1	77	155	1	156	47	0	47	0	0	0
16:45 - 17:45	109	1	109	283	4	287	33	0	33	0	0	0	81	1	81	159	1	160	46	0	46	0	0	0
17:00 - 18:00	116	1	117	273	3	276	31	0	31	1	0	1	75	1	76	158	1	159	48	0	48	0	0	0
17:15 - 18:15	114	0	114	257	2	260	30	0	30	1	0	1	62	0	63	150	1	150	39	0	39	0	0	0
17:30 - 18:30	109	0	109	215	3	217	29	0	29	1	0	1	51	0	51	137	0	138	36	0	37	0	0	0
17:45 - 18:45	99	0	99	192	2	194	25	0	25	1	0	1	34	0	34	123	0	123	29	0	29	0	0	0
18:00 - 19:00	79	0	79	164	2	166	24	0	24	1	0	1	26	0	26	103	0	103	23	0	24	1	0	1

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	70	1	71	356	15	371	255	9	265	2	0	3	178	10	188	146	4	150	102	5	108	4	0	5	1700	64	1764
14:15 - 15:15	74	1	75	400	18	418	258	10	268	2	0	2	187	10	197	160	4	164	109	5	114	4	0	5	1822	67	1890
14:30 - 15:30	79	1	80	430	16	446	273	8	281	2	0	2	205	10	215	167	7	174	126	5	131	8	0	8	1974	71	2045
14:45 - 15:45	92	1	93	475	13	488	293	10	302	2	0	2	207	9	216	162	6	168	134	3	137	9	0	10	2112	68	2180
15:00 - 16:00	93	1	94	511	13	524	307	10	316	2	0	2	212	7	219	165	5	170	145	2	147	9	0	9	2182	67	2249
15:15 - 16:15	92	1	93	539	11	550	327	8	335	1	0	1	207	5	212	160	5	165	153	2	154	9	0	10	2219	57	2276
15:30 - 16:30	91	1	91	557	10	567	323	8	331	1	0	1	197	4	202	153	2	155	147	3	149	7	1	7	2195	47	2242
15:45 - 16:45	90	0	91	568	9	578	303	4	308	1	0	1	198	3	200	157	1	158	145	3	147	5	1	5	2147	36	2182
16:00 - 17:00	94	0	94	573	7	580	302	3	306	1	0	1	192	2	194	162	1	163	139	3	142	5	1	6	2151	27	2178
16:15 - 17:15	107	0	107	580	7	587	292	3	295	1	0	1	180	2	182	163	0	163	135	3	137	5	0	5	2157	25	2182
16:30 - 17:30	107	1	107	609	7	617	298	2	300	1	0	1	175	1	176	162	0	162	140	1	141	4	0	4	2194	21	2215
16:45 - 17:45	103	1	104	630	9	639	308	2	310	1	0	1	162	1	163	157	0	157	136	1	137	8	0	8	2216	21	2237
17:00 - 18:00	91	1	92	606	7	613	298	2	300	1	0	1	152	1	153	149	0	149	133	1	134	7	0	7	2138	19	2157
17:15 - 18:15	76	1	77	539	6	545	284	1	286	1	0	1	147	1	148	140	0	140	128	1	129	7	0	7	1976	15	1991
17:30 - 18:30	67	1	68	452	6	458	253	1	254	1	0	1	137	0	137	131	0	131	109	1	110	9	0	9	1737	13	1750
17:45 - 18:45	50	1	51	363	4	368	218	1	219	1	0	1	129	0	129	121	0	121	105	1	107	5	0	5	1496	11	1507
18:00 - 19:00	49	0	49	309	4	313	192	1	192	0	0	0	122	1	122	110	0	110	97	1	98	4	0	4	1302	9	1311

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Edward St & Docker St



AM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 5:15	3	0	3	8	0	8	2	0	2	0	0	0	0	0	0	8	5	13	0	0	0
5:15 - 5:30	2	0	2	11	0	11	5	0	6	0	0	0	1	1	2	11	5	16	0	0	0
5:30 - 5:45	5	1	6	17	1	17	8	0	8	0	0	0	4	1	5	17	8	25	1	0	1
5:45 - 6:00	3	0	3	18	0	18	8	0	8	0	0	0	3	2	4	21	10	31	1	0	1
6:00 - 6:15	2	0	2	11	0	11	8	0	8	0	0	0	7	1	7	31	7	38	2	0	2
6:15 - 6:30	5	1	6	15	1	16	5	0	5	0	0	0	5	1	6	34	8	42	2	0	2
6:30 - 6:45	7	1	8	19	1	20	12	1	13	0	0	0	10	1	11	32	14	47	6	0	6
6:45 - 7:00	10	0	11	45	0	46	11	1	12	0	0	0	11	1	12	49	10	60	6	0	6
7:00 - 7:15	8	0	8	35	2	37	14	0	14	0	0	0	11	1	12	58	17	75	5	0	5
7:15 - 7:30	7	0	7	48	2	50	19	1	20	0	0	0	13	2	15	63	12	75	11	1	12
7:30 - 7:45	15	0	16	63	1	64	21	0	21	0	0	0	15	2	17	64	14	77	11	0	11
7:45 - 8:00	16	1	18	101	0	101	24	2	26	0	0	0	13	3	17	75	16	91	17	0	17
8:00 - 8:15	13	0	13	107	1	108	28	3	31	0	0	0	16	1	18	78	15	93	11	0	11
8:15 - 8:30	17	1	19	129	0	129	34	1	35	0	0	0	24	4	27	86	15	101	14	2	15
8:30 - 8:45	12	1	13	138	3	141	37	1	38	0	0	0	19	2	21	93	14	107	24	3	27
8:45 - 9:00	14	0	14	152	2	154	44	1	45	0	0	0	20	1	20	93	15	108	23	0	24
9:00 - 9:15	14	0	14	173	1	174	43	0	43	0	0	0	27	3	30	101	16	117	20	0	20
9:15 - 9:30	18	0	18	116	2	118	39	0	39	0	0	0	25	0	25	99	14	114	16	0	16
9:30 - 9:45	14	0	14	99	1	100	30	1	31	0	0	0	25	1	27	97	13	110	15	1	15
9:45 - 10:00	16	0	16	95	2	97	35	1	36	0	0	0	30	2	32	93	12	106	20	0	20
Total	201	9	210	1400	22	1422	427	15	442	0	0	0	279	29	308	1204	242	1446	207	7	214
AM Peak	57	2	59	592	7	599	158	3	161	0	0	0	89	9	98	372	60	432	81	5	86
10hr Total	507	13	520	3038	44	3082	1066	27	1093	0	0	0	985	49	1033	3717	426	4143	628	10	638

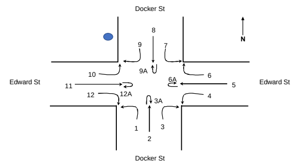
Time Period	Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
5:00 - 5:15	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	1	1	2	15	6	21	1	0	1	0	0	0	55	5:00 - 6:00	376.67
5:15 - 5:30	0	0	0	1	0	1	2	0	2	2	0	2	0	0	0	4	0	4	21	3	24	0	0	0	0	0	0	71	5:15 - 6:15	444.33
5:30 - 5:45	0	0	0	0	0	0	4	0	4	1	0	2	0	0	0	3	0	3	37	4	41	2	1	2	0	0	0	115	5:30 - 6:30	533.67
5:45 - 6:00	0	0	0	3	0	3	5	0	5	6	1	6	0	0	0	6	0	6	35	8	42	5	1	6	0	0	0	136	5:45 - 6:45	647
6:00 - 6:15	0	0	0	1	0	1	4	0	4	4	2	6	0	0	0	4	1	6	31	4	35	1	0	2	0	0	0	122	6:00 - 7:00	836.67
6:15 - 6:30	0	0	0	6	0	6	9	1	10	9	0	9	0	0	0	7	0	7	39	5	44	6	1	7	0	0	0	160	6:15 - 7:15	999.67
6:30 - 6:45	0	0	0	10	0	10	18	0	18	13	1	14	0	0	0	10	0	10	56	5	61	10	0	10	0	0	0	228	6:30 - 7:30	1181
6:45 - 7:00	0	0	0	11	1	11	25	1	26	15	1	16	0	0	0	22	1	22	83	9	92	12	1	12	0	0	0	326	6:45 - 7:45	1347.3
7:00 - 7:15	0	0	0	7	0	7	18	1	19	15	0	16	0	0	0	17	1	18	61	7	68	6	1	6	0	0	0	285	7:00 - 8:00	1550
7:15 - 7:30	0	0	0	12	0	12	24	0	24	18	1	19	0	0	0	12	0	12	76	7	83	11	0	11	0	0	0	342	7:15 - 8:15	1823.7
7:30 - 7:45	0	0	0	15	1	15	29	1	30	21	2	23	0	0	0	18	1	19	78	11	89	12	0	12	0	0	0	394	7:30 - 8:30	2152.3
7:45 - 8:00	0	0	0	14	0	14	41	1	42	29	3	32	0	0	0	31	0	31	110	10	120	18	1	19	0	0	0	529	7:45 - 8:45	2465.3
8:00 - 8:15	0	0	0	21	1	22	45	0	45	35	2	37	0	0	0	41	2	42	97	13	110	28	1	29	0	0	0	559	8:00 - 9:00	2687.7
8:15 - 8:30	0	0	0	23	0	23	57	3	60	46	2	47	0	0	0	52	1	52	116	13	129	33	0	33	0	0	0	670	8:15 - 9:15	2848.3
8:30 - 8:45	0	0	0	26	1	27	71	1	72	42	1	43	0	0	0	46	1	46	119	11	130	42	1	43	0	0	0	707	8:30 - 9:30	2823.7
8:45 - 9:00	0	0	0	27	1	28	66	3	69	51	2	53	0	0	0	58	3	61	118	19	137	37	1	38	0	0	0	751	8:45 - 9:45	2731.7
9:00 - 9:15	0	0	0	24	1	25	58	0	59	44	2	46	0	0	0	45	2	47	107	13	120	23	2	25	0	0	0	720	9:00 - 10:00	2638
9:15 - 9:30	0	0	0	23	0	24	57	1	58	51	1	53	0	0	0	38	1	39	108	14	122	20	0	20	0	0	0	646	AM Peak	2848.3
9:30 - 9:45	0	0	0	28	1	29	52	1	52	49	1	49	0	0	0	43	2	45	110	14	124	18	0	18	0	0	0	615		
9:45 - 10:00	0	0	0	30	1	31	68	1	69	61	2	63	0	0	0	47	1	49	110	10	120	19	0	19	0	0	0	657		
Total	0	0	0	281	9	291	653	15	669	514	23	537	0	0	0	504	18	522	1526	187	1713	304	10	314	0	0	0	8089		
AM Peak	0	0	0	99	4	103	252	7	259	182	7	189	0	0	0	201	6	207	460	55	515	135	4	139	0	0	0	2848		
10hr Total	1	0	1	769	17	786	2436	25	2460	1752	34	1786	0	0	0	1070	28	1098	3397	438	3835	751	17	768	1	0	1	21245		

PM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 14:15	16	0	16	80	1	81	33	1	34	0	0	0	32	1	33	125	11	136	17	1	17
14:15 - 14:30	15	0	15	75	1	76	35	2	36	0	0	0	39	2	41	133	13	145	22	0	22
14:30 - 14:45	15	1	16	73	1	74	30	1	31	0	0	0	36	1	37	143	13	156	20	1	21
14:45 - 15:00	16	1	17	91	1	92	44	1	44	0	0	0	37	3	40	124	9	134	20	0	20
15:00 - 15:15	17	0	17	96	2	98	43	1	43	0	0	0	34	2	35	116	13	129	25	0	25
15:15 - 15:30	18	1	19	95	2	97	31	1	32	0	0	0	32	0	33	142	11	153	26	0	26
15:30 - 15:45	24	0	25	114	1	115	37	0	37	0	0	0	38	1	39	153	11	164	32	0	32
15:45 - 16:00	19	1	20	112	3	115	41	1	42	0	0	0	37	0	37	144	11	155	24	0	24
16:00 - 16:15	20	0	20	97	1	98	40	1	41	0	0	0	39	0	39	156	7	163	30	0	30
16:15 - 16:30	17	0	17	92	2	94	32	1	32	0	0	0	41	3	44	142	13	155	23	0	23
16:30 - 16:45	14	0	14	92	1	93	39	1	40	0	0	0	36	1	37	139	11	150	29	0	29
16:45 - 17:00	17	0	17	96	2	98	34	1	35	0	0	0	32	1	33	141	10	151	21	0	21
17:00 - 17:15	16	0	16	89	0	90	37	0	37	0	0	0	38	1	39	153	5	158	24	0	24
17:15 - 17:30	15	0	15	88	2	90	34	1	35	0	0	0	41	0	41	151	11	162	30	0	30
17:30 - 17:45	13	0	13	81	0	81	26	0	26	0	0	0	52	0	52	128	7	136	14	0	14
17:45 - 18:00	11	0	11	62	0	62	21	0	21	0	0	0	32	2	34	103	6	109	14	0	14
18:00 - 18:15	15	0	15	64	0	64	26	1	27	0	0	0	33	0	33	84	6	90	15	0	15
18:15 - 18:30	9	0	9	53	0	54	21	0	21	0	0	0	28	0	28	89	6	95	13	0	13
18:30 - 18:45	11	0	11	40	0	41	18	0	18	0	0	0	28	0	28	78	6	84	12	0	12
18:45 - 19:00	7	0	7	49	0	49	17	0	17	0	0	0	23	0	23	66	5	71	9	0	9
Total	306	4	310	1638	22	1660	639	12	651	0	0	0	706	19	725	2513	184	2697	421	3	424
PM Peak	82	2	84	417	7	425	149	3	152	0	0	0	146	2	148	595	40	635	112	1	113

Time Period	Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
14:00 - 14:15	0	0	0	30	1	30	78	0	78	68	0	68	0	0	0	28	0	28	97	12	109	14	1	15	0	0	0	647	14:00 - 15:00	2738.3
14:15 - 14:30	0	0	0	20	2	22	75	2	77	76	1	77	0	0	0	32	0	32	99	60	159	16	1	16	0	0	0	718	14:15 - 15:15	2820.7
14:30 - 14:45	0	0	0	26	1	27	86	2	87	69	1	71	0	0	0	33	1	34	95	13	108	16	0	17	0	0	0	678	14:30 - 15:30	2857.3
14:45 - 15:00	0	0	0	31	1	32	80	1	81	66	0	67	0	0	0	34	0	34	105	13	118	17	0	17	0	0	0	695	14:45 - 15:45	2977.3
15:00 - 15:15	0	0	0	31	0	31	96	0	96	63	2	65	0	0	0	37	0	37	107	17	124	28	0	28	0	0	0	729	15:00 - 16:00	3040.3
15:15 - 15:30	0	0	0	29	0	29	113	1	114	72	1	73	0	0	0	34	2	35	106	12	118	25	1	26	0	0	0	755	15:15 - 16:15	3072.3
15:30 - 15:45	0	0	0	27	0	27	99	1	100	68	1	69	0	0	0	35	1	36	118	13	131	23	0	23	0	0	0	798	15:30 - 16:30	3043
15:45 - 16:00	0	0	0	25	0	25	98	0	98	75	1	76	0	0	0	33	0	33	99	13	112	20	1	21	0	0	0	758	15:45 - 16:45	2972.3
16:00 - 16:15	0	0	0	28	0	29	96	0	96	65	2	67	0	0	0	36	2	38	112	11	122	16	0	17	0	0	0	761	16:00 - 17:00	2928.7
16:15 - 16:30	0	0	0	25	0	25	88	1	89	65	0	65	0	0	0	29	0	29	112	13	126	26	0	26	0	0	0	726	16:15 - 17:15	2923
16:30 - 16:45	0	0	0	30	0	30	95	0	95	72	0	72	0	0	0	31	0	31	106	5	111	25	1	26	0	0	0	727	16:30 - 17:30	2953.3
16:45 - 17:00	0	0	0	21	1	21	103	0	103	75	1	76	0	0	0	35	0	35	94	9	103	21	0	21	0	0	0	714	16:45 - 17:45	2887.7
17:00 - 17:15	0	0	0	31	0	31	115	0	115	78	1	79	0	0	0	26	1	27	96	12	108	30	0	31	0	0	0	756	17:00 - 18:00	2745
17:15 - 17:30	0	0	0	29	0	29	105	0	105	69	0	69	0	0	0	27	0	27	102	8	110	42	0	42	0	0	0	756	17:15 - 18:15	2490
17:30 - 17:45	0	0	0	19	0	19	110	0	110	66	0	66	0	0	0	29	1	30	81	9	90	25	0	26	0	0	0	662	17:30 - 18:30	2178.3
17:45 - 18:00	0	0	0	24	0	24	106	0	106	55	0	55	0	0	0	20	0	20	82	4	86	29	0	29	0	0	0	572	17:45 - 18:45	1913.7
18:00 - 18:15	0	0	0	17	0	17	78	0	78	47	0	47	0	0	0	17	0	17	71	9	80	18	0	18	0	0	0	501	18:00 - 19:00	1704
18:15 - 18:30	0	0	0	17	0	18	66	0	66	33	0	33	0	0	0	19	0	20	62	7	69	20	0	20	0	0	0	444	PM Peak	3072.3
18:30 - 18:45	0	0	0	15	0	15	58	0	58	34	0	34	0	0	0	15	0	15	58	5	63	17	0	17	0	0	0	397		
18:45 - 19:00	0	0	0	14	0	14	39	0	39	21	0	21	0	0	0	16	0	16	69	7	76	18	0	18	0	0	0	362		
Total	1	0	1	488	8	496	1782	9	1792	1238	11	1249	0	0	0	566	10	575	1871	251	2122	447	7	454	1	0	1	13156		
PM Peak	0	0	0	109	1	110	405	2	407	280	4	284	0	0	0	138	5	143	434	49	483	85	2	87	0	0	0	3072		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Edward St & Docker St



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	13	1	15	54	1	55	24	1	25	0	0	0	8	3	12	57	29	86	3	0	3	0	0	0
5:15 - 6:15	12	1	14	57	1	58	30	1	30	0	0	0	15	4	19	80	30	110	5	0	5	0	0	0
5:30 - 6:30	15	2	17	61	2	63	30	0	30	0	0	0	18	4	23	103	33	136	7	0	7	0	0	0
5:45 - 6:45	17	2	19	63	2	66	33	1	35	0	0	0	24	5	29	119	39	158	12	0	12	0	0	0
6:00 - 7:00	24	2	27	91	2	93	37	2	38	0	0	0	32	4	36	147	39	186	16	0	17	0	0	0
6:15 - 7:15	30	3	32	114	4	118	42	2	44	0	0	0	36	4	40	174	50	224	20	0	20	0	0	0
6:30 - 7:30	32	2	34	147	5	152	56	3	59	0	0	0	45	5	50	203	54	257	29	1	30	0	0	0
6:45 - 7:45	40	1	42	191	5	196	65	3	68	0	0	0	50	5	55	234	54	288	34	1	35	0	0	0
7:00 - 8:00	46	2	49	246	5	252	78	4	81	0	0	0	53	8	60	260	59	319	45	1	46	0	0	0
7:15 - 8:15	51	2	54	318	5	323	92	6	98	0	0	0	58	8	66	280	57	337	50	1	51	0	0	0
7:30 - 8:30	62	3	65	399	3	402	107	6	113	0	0	0	68	10	78	303	60	362	53	2	55	0	0	0
7:45 - 8:45	58	4	62	475	5	480	123	7	130	0	0	0	72	10	82	332	60	392	65	5	70	0	0	0
8:00 - 9:00	56	2	58	526	7	533	143	6	149	0	0	0	78	8	86	349	59	408	72	5	77	0	0	0
8:15 - 9:15	57	2	59	592	7	599	158	3	161	0	0	0	89	9	98	372	60	432	81	5	86	0	0	0
8:30 - 9:30	57	1	58	580	8	588	163	2	165	0	0	0	90	6	96	386	60	445	83	3	87	0	0	0
8:45 - 9:45	59	1	59	540	6	547	155	3	158	0	0	0	97	5	102	390	59	449	74	1	75	0	0	0
9:00 - 10:00	61	1	62	483	6	489	146	3	149	0	0	0	108	7	114	391	56	447	71	1	72	0	0	0

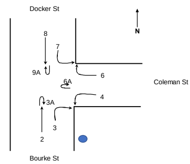
TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	5	0	5	13	0	13	10	1	11	0	0	0	14	1	15	107	21	128	8	2	10	0	0	0	316	60	376.67
5:15 - 6:15	6	0	6	15	0	15	13	3	16	0	0	0	17	1	19	123	19	142	8	2	10	0	0	0	381	63	444.33
5:30 - 6:30	11	0	11	21	1	23	21	3	23	0	0	0	20	2	22	141	21	162	14	3	17	0	0	0	462	71	533.67
5:45 - 6:45	21	0	21	35	2	37	32	3	35	0	0	0	27	2	29	160	22	182	23	2	25	0	0	0	566	81	647
6:00 - 7:00	28	1	29	55	3	58	41	3	45	0	0	0	43	2	45	208	24	232	29	2	31	0	0	0	751	85	836.67
6:15 - 7:15	34	1	35	69	3	72	52	2	54	0	0	0	55	2	58	239	27	266	33	2	36	0	0	0	899	100	999.67
6:30 - 7:30	39	1	40	84	2	87	61	3	64	0	0	0	61	2	63	276	29	305	38	2	40	0	0	0	1072	109	1181
6:45 - 7:45	44	1	46	96	3	98	70	4	74	0	0	0	68	4	72	298	35	333	40	1	42	0	0	0	1230	117	1347.3
7:00 - 8:00	47	1	48	111	3	114	84	6	90	0	0	0	78	3	81	326	35	361	46	2	48	0	0	0	1420	130	1550
7:15 - 8:15	61	2	63	139	2	141	104	8	111	0	0	0	101	4	105	362	41	403	69	2	71	0	0	0	1684	139	1823.7
7:30 - 8:30	72	3	74	172	5	177	131	9	140	0	0	0	141	4	145	401	47	448	90	2	93	0	0	0	1998	154	2152.3
7:45 - 8:45	83	3	86	214	5	219	152	7	159	0	0	0	169	3	172	442	47	489	120	4	124	0	0	0	2305	160	2465.3
8:00 - 9:00	96	4	100	239	7	246	173	7	180	0	0	0	196	6	202	450	56	505	140	3	143	0	0	0	2518	169	2687.7
8:15 - 9:15	99	4	103	252	7	259	182	7	189	0	0	0	201	6	207	460	55	515	135	4	139	0	0	0	2679	169	2848.3
8:30 - 9:30	100	4	103	252	5	257	188	6	194	0	0	0	188	6	194	452	56	509	123	4	127	0	0	0	2662	162	2823.7
8:45 - 9:45	102	4	106	233	5	237	195	6	201	0	0	0	185	7	192	443	60	503	99	2	102	0	0	0	2573	159	2731.7
9:00 - 10:00	105	3	109	235	3	238	205	6	211	0	0	0	174	6	180	435	51	486	81	2	82	0	0	0	2494	144	2638

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	62	2	64	318	4	323	142	4	145	0	0	0	143	7	150	526	45	571	78	2	80	0	0	0
14:15 - 15:15	63	1	64	335	5	340	151	4	155	0	0	0	145	7	152	517	48	564	87	1	88	0	0	0
14:30 - 15:30	66	2	68	355	6	361	147	3	150	0	0	0	138	6	144	526	46	572	91	2	92	0	0	0
14:45 - 15:45	75	2	77	396	6	402	154	2	157	0	0	0	140	6	146	535	45	580	103	1	104	0	0	0
15:00 - 16:00	78	2	80	417	8	425	152	3	154	0	0	0	141	3	144	555	46	601	107	1	108	0	0	0
15:15 - 16:15	82	2	84	417	7	425	149	3	152	0	0	0	146	2	148	595	40	635	112	1	113	0	0	0
15:30 - 16:30	81	1	82	414	7	421	150	3	153	0	0	0	155	4	159	595	42	637	110	0	110	0	0	0
15:45 - 16:45	70	1	71	392	7	399	152	3	156	0	0	0	153	4	158	582	41	623	107	0	107	0	0	0
16:00 - 17:00	68	0	68	376	6	382	146	3	149	0	0	0	148	5	153	579	40	619	104	0	104	0	0	0
16:15 - 17:15	64	0	64	369	5	374	142	2	144	0	0	0	147	6	153	576	38	614	98	0	98	0	0	0
16:30 - 17:30	62	0	62	365	5	370	145	2	147	0	0	0	146	4	150	584	36	621	105	0	105	0	0	0
16:45 - 17:45	61	0	61	354	4	358	131	2	133	0	0	0	162	3	164	574	33	607	90	0	90	0	0	0
17:00 - 18:00	56	0	56	320	2	322	118	2	120	0	0	0	162	3	165	536	29	565	82	0	83	0	0	0
17:15 - 18:15	54	0	54	295	2	297	107	3	110	0	0	0	158	2	160	466	31	497	74	0	74	0	0	0
17:30 - 18:30	48	0	48	260	1	261	94	2	95	0	0	0	145	2	147	405	25	430	56	0	56	0	0	0
17:45 - 18:45	45	0	45	220	1	221	86	1	87	0	0	0	121	2	123	355	24	378	55	0	55	0	0	0
18:00 - 19:00	42	0	42	207	1	208	82	1	83	0	0	0	112	0	112	317	23	340	50	0	50	0	0	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	107	4	111	318	5	323	279	3	283	0	0	0	127	1	129	397	97	494	63	2	65	0	0	0	2562	177	2738
14:15 - 15:15	108	4	111	336	5	341	274	5	279	0	0	0	136	1	138	406	102	509	77	1	78	0	0	0	2636	185	2821
14:30 - 15:30	116	2	119	374	4	378	271	4	275	0	0	0	138	3	141	413	55	468	87	1	88	0	0	0	2723	134	2857
14:45 - 15:45	118	1	119	387	4	391	269	4	273	0	0	0	141	3	143	436	55	490	94	1	95	0	0	0	2848	129	2977
15:00 - 16:00	111	1	112	405	2	407	278	4	282	0	0	0	139	3	142	429	55	484	97	2	99	0	0	0	2910	130	3040
15:15 - 16:15	109	1	110	405	2	407	280	4	284	0	0	0	138	5	143	434	49	483	85	2	87	0	0	0	2954	118	3072
15:30 - 16:30	105	1	106	380	2	383	273	3	277	0	0	0	133	3	137	441	50	491	85	2	87	0	0	0	2924	119	3043
15:45 - 16:45	108	1	110	377	1	378	277	3	280	0	0	0	129	2	131	428	43	471	87	3	90	0	0	0	2862	110	2972
16:00 - 17:00	104	2	106	382	1	383	277	3	280	0	0	0	130	2	133	424	39	462	87	2	90	0	0	0	2825	104	2929
16:15 - 17:15	107	1	108	401	1	403	290	1	291	0	0	0	120	1	121	408	40	448	101	2	104	0	0	0	2823	100	2923
16:30 - 17:30	111	1	112	418	1	419	294	2	295	0	0	0	119	1	120	398	34	432	118	2	120	0	0	0	2864	89	2953
16:45 - 17:45	100	1	101	433	0	433	288	2	290	0	0	0	117	3	119	373	38	411	118	1	119	0	0	0	2801	87	2888
17:00 - 18:00	103	0	103	436	0	436	268	1	269	0	0	0	102	2	104	361	33	394	126	1	127	0	0	0	2670	75	2745
17:15 - 18:15	88	0	89	399	0	399	237	0	238	0	0	0	93	1	94	336	29	365	114	1	114	0	0	0	2420	70	2490
17:30 - 18:30	77	0	77	359	0	359	201	0	201	0	0	0	85	2	86	296	29	325	92	1	93	0	0	0	2117	62	2178
17:45 - 18:45	73	1	74	308	0	308	169	0	169	0	0	0	71	1	71	274	25	298	83	0	84	0	0	0	1859	55	1914
18:00 - 19:00	63	1	64	241	0	241	135	0	136	0	0	0	67	1	68	261	27	288	73	0	73	0	0	0	1649	55	1704

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Docker St & Bourke St & Coleman St



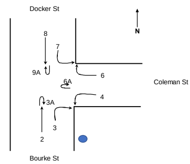
AM

Time Period	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Total of all Movements	Peak Hour Volume Determination	
5:00 - 5:15	18	1	19	1	0	1	0	0	0	2	0	2	1	0	1	0	0	0	1	0	1	2	0	2	0	0	0	24	5:00 - 6:00	187
5:15 - 5:30	29	0	29	1	0	1	0	0	0	1	0	1	2	0	2	0	0	0	2	0	2	5	0	5	0	0	0	39	5:15 - 6:15	223
5:30 - 5:45	46	1	46	0	0	0	0	0	0	1	0	1	3	0	3	0	0	0	2	0	2	6	0	6	0	0	0	58	5:30 - 6:30	272
5:45 - 6:00	46	0	46	1	0	1	0	0	0	1	0	1	2	0	2	0	0	0	2	0	2	12	1	13	0	0	0	65	5:45 - 6:45	374
6:00 - 6:15	44	0	44	2	0	2	0	0	0	0	0	0	2	0	2	0	0	0	2	0	2	9	0	10	0	0	0	60	6:00 - 7:00	544
6:15 - 6:30	60	1	61	3	0	3	0	0	0	1	0	1	5	0	5	0	0	0	3	0	3	13	2	15	0	0	0	88	6:15 - 7:15	655
6:30 - 6:45	113	2	114	8	0	8	0	0	0	2	1	3	5	0	5	0	0	0	6	1	7	22	1	22	0	0	0	160	6:30 - 7:30	772
6:45 - 7:00	155	2	158	15	0	15	0	0	0	2	0	3	12	0	12	0	0	0	8	1	9	39	1	40	0	0	0	236	6:45 - 7:45	884
7:00 - 7:15	108	2	110	2	0	2	0	0	0	5	0	5	9	0	9	0	0	0	11	0	11	31	3	34	0	0	0	171	7:00 - 8:00	1005
7:15 - 7:30	136	2	139	5	1	6	0	0	0	3	0	4	9	0	9	0	0	0	6	0	7	39	2	42	0	0	0	205	7:15 - 8:15	1168
7:30 - 7:45	174	3	177	13	0	13	0	0	0	4	0	4	9	0	10	0	0	0	15	1	16	51	2	53	0	0	0	272	7:30 - 8:30	1426
7:45 - 8:00	252	4	256	22	0	23	0	0	0	6	0	6	8	1	9	0	0	0	18	1	19	41	3	44	0	0	0	356	7:45 - 8:45	1657
8:00 - 8:15	207	3	210	28	1	29	0	0	0	6	1	7	10	0	11	0	0	0	24	0	24	52	2	54	0	0	0	334	8:00 - 9:00	1769
8:15 - 8:30	271	3	275	47	1	49	0	0	0	14	1	15	9	0	9	0	0	0	42	1	43	70	2	73	0	0	0	463	8:15 - 9:15	1777
8:30 - 8:45	274	6	280	58	2	60	0	0	0	19	0	19	11	0	11	0	0	0	45	1	46	85	2	88	0	0	0	503	8:30 - 9:30	1582
8:45 - 9:00	295	4	299	23	1	23	0	0	0	15	0	16	15	0	15	0	0	0	33	0	33	80	3	83	0	0	0	469	8:45 - 9:45	1326
9:00 - 9:15	203	3	206	9	0	10	0	0	0	7	0	7	10	0	10	0	0	0	16	1	16	90	2	92	0	0	0	342	9:00 - 10:00	1155
9:15 - 9:30	156	1	157	9	1	10	0	0	0	3	0	3	9	0	9	0	0	0	13	0	13	75	2	77	0	0	0	268	AM Peak	1777
9:30 - 9:45	146	3	149	8	0	8	0	0	0	6	0	6	10	1	10	0	0	0	12	1	13	61	1	62	0	0	0	248		
9:45 - 10:00	152	3	155	13	0	13	0	0	0	6	1	7	11	1	11	0	0	0	17	0	17	92	2	94	0	0	0	298		
Total	**2884**	**45**	**2929**	**266**	**7**	**274**	**0**	**0**	**0**	**103**	**5**	**108**	**151**	**5**	**156**	**0**	**0**	**0**	**277**	**8**	**286**	**876**	**32**	**908**	**0**	**0**	**0**	**4660**		
AM Peak	**1044**	**16**	**1060**	**137**	**4**	**141**	**0**	**0**	**0**	**55**	**1**	**56**	**44**	**1**	**45**	**0**	**0**	**0**	**136**	**3**	**139**	**326**	**10**	**336**	**0**	**0**	**0**	**1777**		
10hr Total	**5355**	**82**	**5437**	**457**	**13**	**470**	**0**	**0**	**0**	**300**	**11**	**310**	**342**	**8**	**351**	**0**	**0**	**0**	**561**	**15**	**576**	**4077**	**61**	**4138**	**1**	**0**	**1**	**11282**		

PM

Time Period	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Total of all Movements	Peak Hour Volume Determination	
14:00 - 14:15	121	2	123	10	1	11	0	0	0	9	1	10	10	1	11	0	0	0	7	0	7	108	2	110	0	0	0	271	14:00 - 15:00	1155
14:15 - 14:30	113	3	116	9	0	10	0	0	0	6	0	6	13	1	14	0	0	0	14	0	14	117	2	119	0	0	0	278	14:15 - 15:15	1250.3
14:30 - 14:45	113	1	114	10	1	11	0	0	0	4	0	4	11	0	11	0	0	0	13	0	13	138	2	141	0	0	0	293	14:30 - 15:30	1425.3
14:45 - 15:00	140	2	143	11	0	11	0	0	0	6	0	6	6	0	6	0	0	0	17	0	17	125	4	128	0	0	0	312	14:45 - 15:45	1596.7
15:00 - 15:15	128	2	130	14	0	14	0	0	0	10	0	10	12	0	12	0	0	0	24	1	24	174	2	176	0	0	0	367	15:00 - 16:00	1674.3
15:15 - 15:30	164	4	167	37	0	37	0	0	0	31	0	31	15	0	15	0	0	0	28	0	28	173	2	175	0	0	0	453	15:15 - 16:15	1686.3
15:30 - 15:45	190	2	192	11	1	12	0	0	0	23	3	26	22	1	23	0	0	0	18	2	20	189	2	191	0	0	0	464	15:30 - 16:30	1612
15:45 - 16:00	163	5	168	9	0	9	0	0	0	12	1	13	15	0	15	0	0	0	13	0	13	173	0	173	0	0	0	390	15:45 - 16:45	1507.7
16:00 - 16:15	142	2	144	10	0	10	0	0	0	8	0	8	12	0	12	0	0	0	14	1	15	188	2	190	0	0	0	379	16:00 - 17:00	1499
16:15 - 16:30	145	2	147	9	1	10	0	0	0	11	0	11	10	0	10	0	0	0	15	0	15	182	3	185	0	0	0	379	16:15 - 17:15	1542.3
16:30 - 16:45	117	2	119	9	0	9	0	0	0	12	0	12	9	0	9	0	0	0	20	0	21	190	0	190	0	0	0	360	16:30 - 17:30	1557.7
16:45 - 17:00	137	2	139	9	0	9	0	0	0	12	0	12	8	0	8	0	0	0	16	1	17	194	2	196	0	0	0	381	16:45 - 17:45	1536.3
17:00 - 17:15	127	0	128	6	0	6	0	0	0	9	0	9	8	0	8	0	0	0	17	0	17	252	1	254	0	0	0	422	17:00 - 18:00	1451
17:15 - 17:30	126	3	129	7	0	7	0	0	0	8	0	8	8	0	8	0	0	0	18	0	18	223	2	225	0	0	0	394	17:15 - 18:15	1289.7
17:30 - 17:45	105	0	105	4	0	4	0	0	0	10	0	10	8	0	8	0	0	0	14	0	15	197	0	197	0	0	0	339	17:30 - 18:30	1121.3
17:45 - 18:00	105	1	107	5	0	5	0	0	0	6	0	6	8	0	8	0	0	0	9	0	9	159	2	161	0	0	0	296	17:45 - 18:45	969
18:00 - 18:15	101	0	101	5	0	5	0	0	0	8	1	9	5	0	5	0	0	0	10	0	10	130	1	131	0	0	0	261	18:00 - 19:00	842.67
18:15 - 18:30	86	1	86	5	0	5	0	0	0	5	0	5	6	0	6	0	0	0	7	0	7	117	0	117	0	0	0	226	PM Peak	1686.3
18:30 - 18:45	71	1	72	5	0	5	0	0	0	3	0	3	4	0	4	0	0	0	6	0	6	97	0	97	0	0	0	186		
18:45 - 19:00	78	0	78	5	0	5	0	0	0	3	0	3	3	0	3	0	0	0	7	0	7	73	1	74	0	0	0	170		
Total	**2471**	**37**	**2508**	**191**	**5**	**196**	**0**	**0**	**0**	**196**	**6**	**202**	**192**	**3**	**195**	**0**	**0**	**0**	**284**	**7**	**290**	**3201**	**29**	**3230**	**1**	**0**	**1**	**6622**		
PM Peak	**658**	**13**	**671**	**66**	**1**	**68**	**0**	**0**	**0**	**74**	**4**	**78**	**63**	**1**	**65**	**0**	**0**	**0**	**72**	**3**	**75**	**723**	**6**	**729**	**0**	**0**	**0**	**1686**		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Docker St & Bourke St & Coleman St



HOURLY FLOW

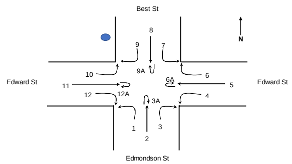
TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	138	2	140	2	0	2	0	0	0	5	0	5	8	0	8	0	0	0	7	0	7	24	1	25	0	0	0	183	3	186.67
5:15 - 6:15	164	2	166	3	0	4	0	0	0	3	0	3	9	0	10	0	0	0	8	0	8	31	1	33	0	0	0	218	4	222.67
5:30 - 6:30	196	2	198	5	0	6	0	0	0	3	0	4	12	0	12	0	0	0	8	1	9	40	3	43	0	0	0	264	7	271.67
5:45 - 6:45	263	3	266	13	1	14	0	0	0	4	2	6	14	1	15	0	0	0	13	1	14	56	4	60	0	0	0	362	12	374
6:00 - 7:00	372	5	377	27	1	28	0	0	0	6	2	7	23	1	24	0	0	0	19	2	21	83	4	87	0	0	0	530	14	544.33
6:15 - 7:15	436	7	443	27	0	28	0	0	0	10	2	12	31	0	31	0	0	0	28	2	30	105	6	111	0	0	0	637	18	655
6:30 - 7:30	512	9	521	30	1	31	0	0	0	12	2	14	35	0	35	0	0	0	31	2	33	131	7	138	0	0	0	752	21	772.33
6:45 - 7:45	573	10	583	34	1	35	0	0	0	14	1	15	39	0	40	0	0	0	40	2	43	161	8	169	0	0	0	862	22	884
7:00 - 8:00	670	11	681	42	1	43	0	0	0	17	0	18	36	2	37	0	0	0	50	3	53	163	10	173	0	0	0	977	27	1004.7
7:15 - 8:15	769	12	781	68	2	70	0	0	0	19	1	20	37	2	39	0	0	0	64	2	66	184	9	193	0	0	0	1140	28	1168
7:30 - 8:30	904	13	917	110	3	113	0	0	0	29	1	31	37	2	39	0	0	0	99	3	102	215	9	224	0	0	0	1394	31	1425.7
7:45 - 8:45	1004	16	1020	156	4	160	0	0	0	44	1	46	38	2	40	0	0	0	129	3	132	249	9	258	0	0	0	1621	36	1656.7
8:00 - 9:00	1047	16	1063	156	5	161	0	0	0	54	2	56	45	1	46	0	0	0	144	2	147	288	9	297	0	0	0	1735	34	1769.3
8:15 - 9:15	1044	16	1060	137	4	141	0	0	0	55	1	56	44	1	45	0	0	0	136	3	139	326	10	336	0	0	0	1742	35	1776.7
8:30 - 9:30	928	14	942	99	3	102	0	0	0	44	0	44	44	1	45	0	0	0	107	2	109	331	9	340	0	0	0	1552	29	1581.7
8:45 - 9:45	799	12	811	49	2	51	0	0	0	31	0	31	43	1	44	0	0	0	74	2	75	306	8	314	0	0	0	1302	25	1326.3
9:00 - 10:00	657	11	667	39	1	40	0	0	0	22	1	22	39	2	41	0	0	0	58	1	59	318	7	326	0	0	0	1132	23	1155

HOURLY FLOW

TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	487	9	496	41	3	43	0	0	0	25	1	25	40	2	42	0	0	0	50	1	51	488	10	498	0	0	0	1131	24	1155
14:15 - 15:15	494	9	503	45	1	46	0	0	0	26	0	26	42	1	43	0	0	0	67	1	68	554	10	564	0	0	0	1228	22	1250.3
14:30 - 15:30	545	9	554	73	1	74	0	0	0	51	0	52	44	0	44	0	0	0	81	1	82	610	10	620	0	0	0	1404	22	1425.3
14:45 - 15:45	622	10	632	73	2	75	0	0	0	71	3	74	55	1	56	0	0	0	86	3	89	660	10	670	1	0	1	1569	28	1596.7
15:00 - 16:00	644	13	657	71	1	72	0	0	0	76	4	80	63	1	64	0	0	0	82	3	85	709	6	715	0	0	0	1646	28	1674.3
15:15 - 16:15	658	13	671	66	1	68	0	0	0	74	4	78	63	1	65	0	0	0	72	3	75	723	6	729	0	0	0	1658	29	1686.3
15:30 - 16:30	640	11	651	38	2	40	0	0	0	54	4	58	59	1	60	0	0	0	60	3	63	732	8	740	0	0	0	1583	29	1612
15:45 - 16:45	567	11	578	36	1	38	0	0	0	42	1	43	46	1	47	0	0	0	62	2	63	733	6	739	0	0	0	1486	22	1507.7
16:00 - 17:00	541	8	549	36	1	38	0	0	0	43	0	43	40	1	40	0	0	0	65	2	68	755	7	762	0	0	0	1479	20	1499
16:15 - 17:15	526	6	533	33	1	34	0	0	0	44	0	44	36	0	36	0	0	0	68	1	70	819	6	825	0	0	0	1527	16	1542.3
16:30 - 17:30	507	7	514	31	0	31	0	0	0	42	0	42	34	0	34	0	0	0	71	1	72	860	5	865	0	0	0	1544	14	1557.7
16:45 - 17:45	495	5	500	26	0	26	0	0	0	40	0	40	32	0	32	0	0	0	65	1	66	867	5	872	0	0	0	1525	11	1536.3
17:00 - 18:00	464	5	468	23	0	23	0	0	0	33	0	34	31	0	31	0	0	0	58	0	58	832	5	837	0	0	0	1441	10	1451
17:15 - 18:15	437	5	442	21	0	21	0	0	0	32	1	33	28	0	28	0	0	0	51	0	51	710	4	714	0	0	0	1279	10	1289.7
17:30 - 18:30	397	3	400	19	0	19	0	0	0	29	1	30	26	0	26	0	0	0	40	0	40	604	3	606	0	0	0	1115	7	1121.3
17:45 - 18:45	363	4	366	20	0	20	0	0	0	23	1	24	22	0	22	0	0	0	31	0	31	503	3	506	0	0	0	961	8	969
18:00 - 19:00	335	3	338	20	0	20	0	0	0	19	1	20	17	0	17	0	0	0	29	0	29	417	1	419	0	0	0	838	5	842.67

austraffic

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Edward St & Best St



AM

Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
5:00 - 5:15	1	0	1	1	0	1	2	0	2	0	0	0	0	0	0	9	7	16	0	0	1	0	0	0
5:15 - 5:30	2	0	2	5	0	5	3	0	3	0	0	0	1	0	1	10	5	15	0	0	0	0	0	0
5:30 - 5:45	2	0	2	11	0	11	7	0	7	0	0	0	1	0	1	19	10	29	0	0	0	0	0	0
5:45 - 6:00	1	0	1	11	0	11	8	0	8	0	0	0	0	0	1	21	11	32	1	0	1	0	0	0
6:00 - 6:15	3	0	3	5	1	6	6	0	6	0	0	0	3	0	3	35	10	45	1	0	1	0	0	0
6:15 - 6:30	4	0	4	9	0	9	9	0	10	0	0	0	3	0	3	36	10	45	4	0	4	0	0	0
6:30 - 6:45	8	0	8	13	0	13	11	0	11	0	0	0	3	0	3	50	16	66	2	0	2	0	0	0
6:45 - 7:00	9	0	10	23	0	23	17	0	17	0	0	0	5	0	6	61	14	75	2	0	2	0	0	0
7:00 - 7:15	7	1	7	24	0	24	11	1	12	0	0	0	4	0	4	58	17	75	6	0	6	0	0	0
7:15 - 7:30	9	0	9	31	1	33	10	0	10	0	0	0	7	1	8	79	14	94	4	0	4	0	0	0
7:30 - 7:45	12	1	12	36	0	36	16	0	16	0	0	0	8	0	8	80	17	97	5	0	5	0	0	0
7:45 - 8:00	19	2	20	63	0	63	19	0	19	0	0	0	10	1	11	96	19	115	5	0	5	0	0	0
8:00 - 8:15	28	0	28	64	1	65	31	1	32	0	0	0	11	0	11	97	17	114	11	0	11	0	0	0
8:15 - 8:30	26	4	30	112	3	114	40	0	40	0	0	0	11	1	13	107	16	123	8	1	9	0	0	0
8:30 - 8:45	45	2	48	131	4	135	49	1	51	0	0	0	12	3	15	97	16	114	11	0	11	0	0	0
8:45 - 9:00	46	2	48	129	1	129	53	0	53	0	0	0	14	3	17	113	17	130	11	1	12	0	0	0
9:00 - 9:15	26	0	27	80	0	80	36	0	36	0	0	0	13	0	13	120	18	137	13	0	13	0	0	0
9:15 - 9:30	12	0	12	69	2	71	24	0	24	0	0	0	14	0	14	119	12	131	10	0	10	0	0	0
9:30 - 9:45	16	0	16	54	1	55	28	0	28	0	0	0	11	1	12	111	16	127	11	0	12	0	0	0
9:45 - 10:00	15	1	16	57	0	57	26	1	27	0	0	0	11	0	11	112	16	128	13	0	13	0	0	0
Total	**290**	**14**	**304**	**927**	**15**	**942**	**409**	**5**	**414**	**0**	**0**	**0**	**142**	**12**	**154**	**1430**	**278**	**1708**	**119**	**4**	**122**	**0**	**0**	**0**
AM Peak	**144**	**9**	**152**	**451**	**8**	**459**	**178**	**2**	**180**	**0**	**0**	**0**	**50**	**7**	**58**	**437**	**67**	**505**	**43**	**2**	**45**	**0**	**0**	**0**
10hr Total	**648**	**18**	**666**	**1921**	**34**	**1955**	**922**	**10**	**932**	**0**	**0**	**0**	**737**	**34**	**771**	**4031**	**476**	**4507**	**360**	**7**	**367**	**0**	**0**	**0**

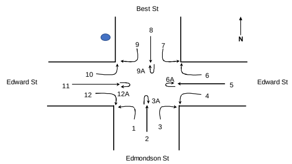
Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
5:00 - 5:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	16	5	21	1	0	1	0	0	0	**45**	**5:00 - 6:00**	**321**
5:15 - 5:30	0	0	1	2	0	2	0	0	0	0	0	0	0	0	0	25	4	29	0	0	0	0	0	0	**60**	**5:15 - 6:15**	**392**
5:30 - 5:45	1	0	1	1	0	1	3	0	3	0	0	0	3	0	3	40	4	45	2	0	2	0	0	0	**104**	**5:30 - 6:30**	**474**
5:45 - 6:00	1	0	1	2	0	2	1	0	1	0	0	0	3	0	3	42	8	50	1	0	1	0	0	0	**113**	**5:45 - 6:45**	**564**
6:00 - 6:15	1	0	1	3	0	3	1	0	1	0	0	0	2	0	2	39	5	44	0	0	0	0	0	0	**115**	**6:00 - 7:00**	**712**
6:15 - 6:30	1	0	1	3	1	4	5	0	5	0	0	0	3	0	3	47	5	52	3	0	3	0	0	0	**142**	**6:15 - 7:15**	**843**
6:30 - 6:45	4	0	4	6	0	6	7	0	7	0	0	0	3	0	3	61	6	67	4	0	4	0	0	0	**194**	**6:30 - 7:30**	**991**
6:45 - 7:00	4	0	4	13	0	13	4	0	4	0	0	0	5	0	5	84	13	97	5	0	5	0	0	0	**261**	**6:45 - 7:45**	**1136**
7:00 - 7:15	6	0	6	13	0	13	12	1	13	0	0	0	4	0	4	68	8	76	5	0	5	0	0	0	**246**	**7:00 - 8:00**	**1317**
7:15 - 7:30	3	0	3	11	0	11	8	0	8	0	0	0	6	0	6	91	9	100	5	0	6	0	0	0	**290**	**7:15 - 8:15**	**1539**
7:30 - 7:45	2	0	2	20	1	21	18	1	19	0	0	0	8	0	8	92	12	104	10	1	11	0	0	0	**340**	**7:30 - 8:30**	**1816**
7:45 - 8:00	4	0	4	34	1	36	11	0	11	0	0	0	13	0	13	115	10	125	18	0	18	0	0	0	**441**	**7:45 - 8:45**	**2124**
8:00 - 8:15	8	0	8	37	3	40	10	1	11	0	0	0	15	1	16	102	16	118	13	1	14	0	0	0	**468**	**8:00 - 9:00**	**2370**
8:15 - 8:30	5	0	5	57	3	60	17	1	18	0	0	0	18	1	19	105	13	118	18	1	19	0	0	0	**568**	**8:15 - 9:15**	**2464**
8:30 - 8:45	6	0	6	70	4	74	20	0	21	0	0	0	16	1	17	126	12	138	18	2	20	0	0	0	**648**	**8:30 - 9:30**	**2428**
8:45 - 9:00	10	0	11	66	1	67	30	1	30	0	0	0	13	1	14	141	17	158	17	1	18	0	0	0	**687**	**8:45 - 9:45**	**2271**
9:00 - 9:15	7	0	7	44	0	44	22	1	22	0	0	0	26	1	26	128	13	141	14	0	14	0	0	0	**561**	**9:00 - 10:00**	**2107**
9:15 - 9:30	7	0	7	47	0	47	27	0	27	0	0	0	19	3	22	142	15	157	8	0	8	0	0	0	**532**	**AM Peak**	**2464**
9:30 - 9:45	6	1	6	36	2	38	24	0	24	0	0	0	19	1	20	131	15	146	6	1	7	0	0	0	**491**		
9:45 - 10:00	5	0	6	50	2	52	32	1	32	0	0	0	14	1	15	140	13	153	10	1	11	0	0	0	**522**		
Total	**79**	**3**	**82**	**517**	**18**	**535**	**251**	**7**	**258**	**0**	**0**	**0**	**190**	**10**	**200**	**1733**	**204**	**1937**	**160**	**8**	**168**	**1**	**0**	**1**	**6827**		
AM Peak	**28**	**1**	**29**	**237**	**8**	**245**	**89**	**2**	**91**	**0**	**0**	**0**	**72**	**4**	**76**	**500**	**55**	**555**	**67**	**3**	**70**	**0**	**0**	**0**	**2464**		
10hr Total	**242**	**4**	**246**	**2250**	**28**	**2278**	**1045**	**11**	**1056**	**0**	**0**	**0**	**505**	**15**	**520**	**4280**	**427**	**4706**	**408**	**12**	**420**	**1**	**0**	**1**	**18426**		

PM

Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
14:00 - 14:15	14	0	14	40	1	41	22	0	22	0	0	0	29	1	29	149	11	160	10	0	10	0	0	0
14:15 - 14:30	12	0	12	40	2	42	22	0	23	0	0	0	28	0	28	128	14	142	9	0	9	0	0	0
14:30 - 14:45	12	0	12	40	0	40	26	1	27	0	0	0	25	2	27	145	13	158	14	0	15	0	0	0
14:45 - 15:00	14	0	14	51	2	53	19	0	20	0	0	0	21	1	22	138	12	150	11	0	11	0	0	0
15:00 - 15:15	22	0	22	54	1	55	23	1	23	0	0	0	22	1	22	123	14	137	15	0	15	0	0	0
15:15 - 15:30	37	0	37	64	1	65	30	0	30	0	0	0	30	5	35	143	12	155	11	1	12	0	0	0
15:30 - 15:45	49	1	50	108	7	116	42	1	43	0	0	0	28	8	36	156	12	168	14	0	14	0	0	0
15:45 - 16:00	21	1	22	84	1	85	36	0	36	0	0	0	26	0	26	156	11	167	17	1	18	0	0	0
16:00 - 16:15	21	0	21	54	1	55	25	0	25	0	0	0	37	0	37	165	9	174	12	0	12	0	0	0
16:15 - 16:30	16	0	16	55	0	55	24	0	24	0	0	0	34	0	34	145	14	159	13	0	13	0	0	0
16:30 - 16:45	24	0	24	55	1	56	28	1	29	0	0	0	25	1	26	152	10	162	9	0	9	0	0	0
16:45 - 17:00	16	0	17	58	0	59	32	0	32	0	0	0	34	0	35	139	11	150	17	1	18	0	0	0
17:00 - 17:15	14	0	14	44	0	44	26	0	26	0	0	0	45	0	45	157	6	164	15	0	15	0	0	0
17:15 - 17:30	22	0	23	44	0	44	27	0	27	0	0	0	48	0	48	149	9	158	11	0	11	0	0	0
17:30 - 17:45	16	0	16	37	0	37	24	0	24	0	0	0	36	1	37	122	9	131	8	0	8	0	0	0
17:45 - 18:00	13	0	13	43	0	43	30	0	31	0	0	0	29	1	29	117	6	123	13	0	13	0	0	0
18:00 - 18:15	9	0	9	29	0	29	18	0	18	0	0	0	28	0	28	95	6	101	9	0	9	0	0	0
18:15 - 18:30	10	0	10	37	0	37	19	0	19	0	0	0	30	0	30	84	6	89	13	0	13	0	0	0
18:30 - 18:45	7	0	7	34	0	34	22	0	22	0	0	0	23	1	24	71	6	77	11	0	11	0	0	0
18:45 - 19:00	8	0	8	23	0	23	19	0	19	0	0	0	18	0	18	68	5	73	9	0	9	0	0	0
Total	**357**	**4**	**362**	**993**	**19**	**1012**	**514**	**5**	**518**	**0**	**0**	**0**	**595**	**21**	**617**	**2602**	**197**	**2799**	**241**	**4**	**245**	**0**	**0**	**0**
PM Peak	**128**	**3**	**130**	**310**	**11**	**321**	**133**	**1**	**134**	**0**	**0**	**0**	**120**	**13**	**133**	**620**	**43**	**663**	**54**	**2**	**56**	**0**	**0**	**0**

Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
14:00 - 14:15	8	1	8	65	0	65	43	1	44	0	0	0	21	0	22	134	13	147	8	1	10	0	0	0	**572**	**14:00 - 15:00**	**2266**
14:15 - 14:30	9	1	9	62	0	63	42	1	43	0	0	0	15	1	16	129	16	145	10	0	10	0	0	0	**541**	**14:15 - 15:15**	**2300**
14:30 - 14:45	11	0	11	67	1	68	41	0	41	0	0	0	16	0	16	125	16	142	15	0	15	0	0	0	**572**	**14:30 - 15:30**	**2444**
14:45 - 15:00	8	0	8	70	2	73	40	0	40	0	0	0	20	0	20	143	15	158	13	0	13	0	0	0	**581**	**14:45 - 15:45**	**2615**
15:00 - 15:15	9	0	9	84	1	85	34	1	35	0	0	0	18	0	18	149	18	168	16	0	16	0	0	0	**606**	**15:00 - 16:00**	**2693**
15:15 - 15:30	8	0	8	109	2	111	43	0	43	0	0	0	20	1	21	141	14	155	13	0	13	0	0	0	**686**	**15:15 - 16:15**	**2748**
15:30 - 15:45	8	0	8	72	2	75	37	0	37	0	0	0	22	0	22	149	12	161	12	1	13	0	0	0	**742**	**15:30 - 16:30**	**2691**
15:45 - 16:00	10	0	10	80	0	80	38	0	38	0	0	0	17	0	17	136	13	149	11	1	12	0	0	0	**659**	**15:45 - 16:45**	**2624**
16:00 - 16:15	8	0	8	82	0	83	51	0	52	0	0	0	19	0	19	154	13	167	10	0	10	0	0	0	**662**	**16:00 - 17:00**	**2626**
16:15 - 16:30	6	0	6	96	0	96	37	0	37	0	0	0	14	0	15	148	13	161	12	0	13	0	0	0	**628**	**16:15 - 17:15**	**2668**
16:30 - 16:45	13	0	13	112	0	112	42	1	43	0	0	0	18	1	19	159	6	165	16	0	17	0	0	0	**676**	**16:30 - 17:30**	**2729**
16:45 - 17:00	11	0	11	116	0	116	46	0	47	0	0	0	19	0	19	131	11	142	16	0	16	0	0	0	**660**	**16:45 - 17:45**	**2633**
17:00 - 17:15	12	0	12	149	0	150	59	0	60	0	0	0	15	0	15	134	11	145	16	0	16	0	0	0	**703**	**17:00 - 18:00**	**2487**
17:15 - 17:30	10	0	10	135	0	135	50	0	50	0	0	0	17	1	18	133	9	142	22	0	22	0	0	0	**689**	**17:15 - 18:15**	**2213**
17:30 - 17:45	7	0	7	118	0	118	50	0	50	0	0	0	8	0	8	120	10	129	12	0	12	0	0	0	**580**	**17:30 - 18:30**	**1926**
17:45 - 18:00	7	0	7	83	0	83	30	0	30	0	0	0	14	0	14	115	4	119	10	0	10	0	0	0	**514**	**17:45 - 18:45**	**1715**
18:00 - 18:15	4	0	4	72	0	72	29	0	29	0	0	0	14	0	14	98	9	107	10	0	10	0	0	0	**429**	**18:00 - 19:00**	**1528**
18:15 - 18:30	4	0	4	58	0	58	30	0	30	0	0	0	11	0	11	85	6	91	10	0	10	0	0	0	**403**	**PM Peak**	**2748**
18:30 - 18:45	6	0	6	58	0	58	28	0	28	0	0	0	7	0	7	83	6	88	8	0	8	0	0	0	**368**		
18:45 - 19:00	5	0	5	45	0	45	23	0	23	0	0	0	9	0	9	81	7	88	7	0	7	0	0	0	**328**		
Total	**162**	**1**	**164**	**1733**	**10**	**1743**	**794**	**5**	**798**	**0**	**0**	**0**	**315**	**5**	**320**	**2547**	**223**	**2769**	**247**	**5**	**252**	**0**	**0**	**0**	**11599**		
PM Peak	**33**	**0**	**33**	**344**	**5**	**349**	**168**	**0**	**169**	**0**	**0**	**0**	**79**	**1**	**80**	**580**	**52**	**633**	**46**	**2**	**48**	**0**	**0**	**0**	**2748**		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Edward St & Best St



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	6	0	6	28	0	28	21	0	21	0	0	0	2	0	3	59	33	92	1	1	2	0	0	0
5:15 - 6:15	8	0	9	31	1	33	25	0	25	0	0	0	5	0	6	85	36	121	2	0	2	0	0	0
5:30 - 6:30	10	0	10	35	1	37	31	0	31	0	0	0	8	1	8	111	41	151	5	0	5	0	0	0
5:45 - 6:45	16	0	17	37	1	39	35	0	36	0	0	0	9	1	10	141	47	189	7	0	7	0	0	0
6:00 - 7:00	24	1	25	50	1	51	44	1	45	0	0	0	14	1	15	182	50	232	9	0	9	0	0	0
6:15 - 7:15	28	1	29	68	0	69	49	1	50	0	0	0	15	1	16	204	57	261	14	0	14	0	0	0
6:30 - 7:30	33	1	34	91	2	92	49	1	50	0	0	0	19	2	21	248	61	309	14	0	14	0	0	0
6:45 - 7:45	36	2	38	114	2	116	54	1	55	0	0	0	24	2	25	279	62	340	17	0	17	0	0	0
7:00 - 8:00	46	3	49	154	2	156	56	1	57	0	0	0	28	3	31	313	67	381	20	0	20	0	0	0
7:15 - 8:15	67	3	69	195	3	197	77	1	78	0	0	0	35	3	38	352	67	420	25	0	26	0	0	0
7:30 - 8:30	84	7	90	275	4	279	107	1	108	0	0	0	40	3	43	380	69	449	30	1	31	0	0	0
7:45 - 8:45	117	8	126	370	8	378	140	2	142	0	0	0	45	5	50	397	69	466	35	1	36	0	0	0
8:00 - 9:00	145	8	153	435	8	444	174	2	176	0	0	0	49	7	56	414	67	481	41	2	43	0	0	0
8:15 - 9:15	144	9	152	451	8	459	178	2	180	0	0	0	50	7	58	437	67	505	43	2	45	0	0	0
8:30 - 9:30	130	4	135	409	7	416	162	2	164	0	0	0	53	6	59	449	63	512	45	1	46	0	0	0
8:45 - 9:45	101	2	103	332	4	336	140	1	141	0	0	0	51	4	56	462	63	525	46	1	47	0	0	0
9:00 - 10:00	69	2	71	261	3	264	114	2	115	0	0	0	48	2	50	461	62	523	47	1	48	0	0	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	2	1	2	6	0	6	4	0	4	0	0	0	8	1	8	122	22	144	4	0	4	0	0	0	263	58	321
5:15 - 6:15	3	1	3	9	0	9	4	0	5	0	0	0	8	0	9	145	22	167	4	0	4	0	0	0	330	61	391.67
5:30 - 6:30	3	0	4	9	1	10	10	0	10	0	0	0	11	0	11	167	22	190	7	0	7	0	0	0	407	67	474
5:45 - 6:45	6	0	6	14	1	15	14	0	14	0	0	0	10	0	11	188	24	212	9	0	9	0	0	0	489	75	564.33
6:00 - 7:00	10	0	10	25	1	26	17	0	17	0	0	0	12	0	12	230	29	259	13	0	13	0	0	0	629	83	712.33
6:15 - 7:15	15	0	15	34	1	35	29	1	29	0	0	0	15	0	15	259	32	291	18	0	18	0	0	0	748	94	842.67
6:30 - 7:30	16	0	17	43	0	43	31	1	32	0	0	0	18	0	18	303	37	340	20	0	20	0	0	0	885	105	990.67
6:45 - 7:45	15	0	15	57	2	59	42	2	44	0	0	0	22	0	22	335	43	377	26	1	27	0	0	0	1021	116	1136.3
7:00 - 8:00	14	0	15	79	3	81	49	2	50	0	0	0	31	0	31	366	39	405	39	1	40	0	0	0	1195	122	1316.7
7:15 - 8:15	16	0	16	102	6	108	46	2	48	0	0	0	41	1	43	400	47	447	47	2	49	0	0	0	1404	135	1538.7
7:30 - 8:30	18	0	18	148	9	157	56	3	58	0	0	0	53	3	56	415	50	465	59	2	62	0	0	0	1664	152	1816.3
7:45 - 8:45	22	0	23	198	11	209	58	2	60	0	0	0	62	3	65	449	50	499	67	3	71	0	0	0	1960	164	2124.3
8:00 - 9:00	29	1	30	229	11	240	77	3	80	0	0	0	61	4	65	474	58	532	66	4	70	0	0	0	2196	174	2370
8:15 - 9:15	28	1	29	237	8	245	89	2	91	0	0	0	72	4	76	500	55	555	67	3	70	0	0	0	2296	168	2463.7
8:30 - 9:30	30	1	31	228	5	232	98	2	100	0	0	0	74	5	79	536	57	594	57	3	60	0	0	0	2271	157	2427.7
8:45 - 9:45	30	1	31	194	3	196	102	2	104	0	0	0	77	5	82	541	61	602	45	2	47	0	0	0	2121	150	2271.3
9:00 - 10:00	25	1	26	178	3	182	104	2	106	0	0	0	79	5	84	541	56	597	38	2	40	0	0	0	1966	141	2106.7

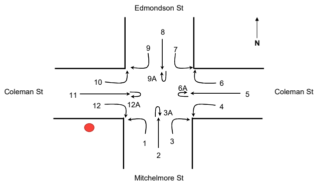
HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	52	1	52	172	4	176	90	1	91	0	0	0	104	3	107	560	50	610	44	1	44	0	0	0
14:15 - 15:15	60	1	61	185	5	190	90	2	92	0	0	0	97	3	100	534	54	587	49	1	49	0	0	0
14:30 - 15:30	85	1	86	208	4	213	98	2	100	0	0	0	98	8	107	549	51	600	51	1	53	0	0	0
14:45 - 15:45	122	1	124	277	11	288	114	2	116	0	0	0	101	14	115	560	50	610	51	1	52	0	0	0
15:00 - 16:00	129	2	132	309	11	320	130	2	132	0	0	0	105	14	119	578	49	626	57	2	59	0	0	0
15:15 - 16:15	128	3	130	310	11	321	133	1	134	0	0	0	120	13	133	620	43	663	54	2	56	0	0	0
15:30 - 16:30	107	3	110	301	10	311	126	1	127	0	0	0	124	8	132	622	45	667	56	1	57	0	0	0
15:45 - 16:45	82	2	84	248	3	251	113	1	114	0	0	0	122	1	123	618	44	662	51	1	52	0	0	0
16:00 - 17:00	77	1	78	222	2	225	109	1	109	0	0	0	130	1	132	601	44	645	51	1	52	0	0	0
16:15 - 17:15	70	1	71	212	1	213	109	1	110	0	0	0	138	1	140	593	42	635	54	1	55	0	0	0
16:30 - 17:30	76	1	77	201	2	203	113	1	114	0	0	0	152	2	154	597	37	634	52	1	53	0	0	0
16:45 - 17:45	69	1	69	183	1	184	109	0	109	0	0	0	163	2	165	567	36	603	51	1	52	0	0	0
17:00 - 18:00	65	0	66	168	0	168	108	0	108	0	0	0	157	2	159	545	31	577	47	0	47	0	0	0
17:15 - 18:15	60	0	61	153	1	154	100	1	100	0	0	0	141	2	143	483	31	514	41	0	41	0	0	0
17:30 - 18:30	48	0	48	146	1	146	91	1	92	0	0	0	123	2	125	418	27	445	43	0	43	0	0	0
17:45 - 18:45	38	0	38	142	1	143	89	1	90	0	0	0	109	2	111	367	24	391	46	0	46	0	0	0
18:00 - 19:00	34	0	34	122	1	123	77	1	78	0	0	0	99	1	100	318	23	341	42	0	42	0	0	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	35	1	36	265	4	268	166	2	168	0	0	0	72	2	74	531	60	591	46	1	48	0	0	0	2135	131	2265.7
14:15 - 15:15	37	1	37	283	5	288	157	2	159	0	0	0	68	2	70	546	66	612	54	0	54	0	0	0	2159	140	2299.7
14:30 - 15:30	36	0	36	330	7	337	158	1	159	0	0	0	74	1	75	558	64	622	57	0	57	0	0	0	2303	141	2444.3
14:45 - 15:45	33	0	33	336	8	344	154	1	155	0	0	0	80	1	81	582	60	642	54	1	55	0	0	0	2464	151	2614.7
15:00 - 16:00	35	0	35	345	6	351	151	1	152	0	0	0	78	1	79	576	57	633	52	2	54	0	0	0	2546	147	2692.7
15:15 - 16:15	33	0	33	344	5	349	168	0	169	0	0	0	79	1	80	580	52	633	46	2	48	0	0	0	2615	133	2748.3
15:30 - 16:30	32	0	32	330	3	333	162	0	163	0	0	0	73	0	73	587	51	638	45	2	47	0	0	0	2566	125	2691
15:45 - 16:45	37	0	37	370	1	370	168	1	169	0	0	0	69	1	70	597	45	642	49	2	51	0	0	0	2523	102	2624.3
16:00 - 17:00	38	0	38	406	0	407	177	1	178	0	0	0	70	1	71	592	43	636	54	1	55	0	0	0	2529	97	2626
16:15 - 17:15	42	0	42	473	0	474	185	1	186	0	0	0	66	1	67	572	41	613	61	1	62	0	0	0	2576	91	2667.7
16:30 - 17:30	46	0	46	512	0	512	198	1	200	0	0	0	69	2	70	557	37	594	71	0	71	0	0	0	2645	84	2728.7
16:45 - 17:45	40	0	40	518	0	518	206	1	207	0	0	0	59	1	60	518	41	559	66	0	66	0	0	0	2549	83	2632.7
17:00 - 18:00	36	0	36	485	0	485	190	0	190	0	0	0	54	1	55	502	34	536	60	0	61	0	0	0	2416	71	2486.7
17:15 - 18:15	28	0	28	407	0	407	159	0	159	0	0	0	53	1	54	466	32	498	54	0	54	0	0	0	2145	68	2212.7
17:30 - 18:30	22	0	22	330	0	330	139	0	139	0	0	0	47	0	48	418	29	447	42	0	42	0	0	0	1867	60	1926.3
17:45 - 18:45	20	0	20	270	0	270	116	0	117	0	0	0	46	0	46	381	25	406	38	0	38	0	0	0	1662	53	1715
18:00 - 19:00	18	0	18	232	0	232	110	0	110	0	0	0	41	0	42	346	28	374	35	0	35	0	0	0	1475	54	1528.3

EST. 1983 austraffic TRAFFIC & TRANSPORT DATA SPECIALISTS

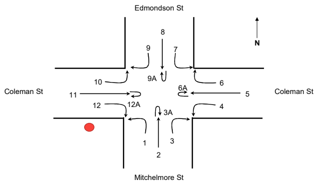
Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Coleman St & Edmondson St & Mitchelmore St



Time	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
Period	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
0:00 - 0:15	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	10	0:00 - 1:00	28
0:15 - 0:30	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	7	0:15 - 1:15	21
0:30 - 0:45	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0:30 - 1:30	17
0:45 - 1:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0:45 - 1:45	13
1:00 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1:00 - 2:00	10
1:15 - 1:30	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1:15 - 2:15	10
1:30 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1:30 - 2:30	9
1:45 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	1:45 - 2:45	10
2:00 - 2:15	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2:00 - 3:00	10
2:15 - 2:30	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	4	2:15 - 3:15	9
2:30 - 2:45	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2:30 - 3:30	10
2:45 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	2:45 - 3:45	13
3:00 - 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3:00 - 4:00	15
3:15 - 3:30	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	3:15 - 4:15	23
3:30 - 3:45	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	3:30 - 4:30	20
3:45 - 4:00	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3:45 - 4:45	20
4:00 - 4:15	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	9	4:00 - 5:00	26
4:15 - 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4:15 - 5:15	25
4:30 - 4:45	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	4:30 - 5:30	47
4:45 - 5:00	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	10	4:45 - 5:45	73
5:00 - 5:15	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	8	5:00 - 6:00	92
5:15 - 5:30	1	0	1	11	0	11	2	0	2	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	3	0	3	1	0	1	0	0	0	2	0	2	1	0	1	1	0	1	0	0	0	24	5:15 - 6:15	111
5:30 - 5:45	0	0	0	21	0	21	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	2	0	2	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	30	5:30 - 6:30	131
5:45 - 6:00	0	0	0	17	0	18	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	0	0	0	4	0	4	1	0	1	0	0	0	0	0	0	30	5:45 - 6:45	158
6:00 - 6:15	0	0	0	12	0	12	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	6	0	6	1	0	1	0	0	0	4	1	5	0	0	0	0	0	0	0	0	0	27	6:00 - 7:00	239
6:15 - 6:30	0	0	0	21	0	21	1	0	1	0	0	0	1	0	1	2	0	2	1	0	1	0	0	0	1	0	1	8	1	8	1	1	1	0	0	0	6	0	6	2	0	2	0	0	0	0	0	0	44	6:15 - 7:15	295
6:30 - 6:45	1	0	1	28	0	28	2	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	8	0	8	4	0	4	0	0	0	8	0	8	3	0	3	0	0	0	0	0	0	57	6:30 - 7:30	341
6:45 - 7:00	2	0	2	46	1	47	2	1	3	0	0	0	1	0	1	4	0	4	2	0	2	0	0	0	1	0	1	15	0	16	7	1	8	0	0	0	16	0	16	9	0	9	1	1	2	0	0	0	111	6:45 - 7:45	412
7:00 - 7:15	1	0	1	32	1	34	0	0	0	1	0	1	1	0	1	2	0	2	3	0	3	0	0	0	3	0	3	14	0	14	8	0	8	0	0	0	10	1	11	3	0	4	1	0	1	0	0	0	83	7:00 - 8:00	494
7:15 - 7:30	2	0	2	40	1	40	1	0	1	0	0	0	0	0	0	4	0	4	3	1	4	0	0	0	4	0	4	15	2	17	4	0	4	0	0	0	9	0	9	4	0	4	0	0	0	0	0	0	90	7:15 - 8:15	628
7:30 - 7:45	1	1	1	49	2	51	3	0	3	0	0	0	1	0	1	4	0	4	4	1	5	0	0	0	10	1	11	16	1	18	6	0	6	0	0	0	15	0	15	11	0	11	2	0	2	0	0	0	128	7:30 - 8:30	868
7:45 - 8:00	4	0	4	74	1	75	5	0	5	0	0	0	0	0	0	6	0	6	5	1	6	0	0	0	19	1	20	21	1	22	8	1	9	0	0	0	26	1	27	16	1	16	2	0	2	0	0	0	193	7:45 - 8:45	1191
8:00 - 8:15	10	0	11	78	0	78	4	0	4	0	0	0	3	1	4	6	0	6	11	1	12	0	0	0	10	0	10	27	1	28	12	1	13	0	0	0	29	0	29	16	0	16	4	0	4	0	0	0	216	8:00 - 9:00	1382
8:15 - 8:30	28	0	28	103	0	103	2	0	2	0	0	0	5	0	5	10	0	11	16	4	20	0	0	0	15	3	18	37	5	42	20	1	21	0	0	0	46	1	47	21	2	23	11	0	11	0	0	0	331	8:15 - 9:15	1405
8:30 - 8:45	23	0	24	114	1	115	4	0	4	0	0	0	12	0	12	16	0	16	36	6	42	0	0	0	23	2	24	39	5	45	22	2	24	0	0	0	76	0	76	26	6	31	35	1	36	0	0	0	451	8:30 - 9:30	1270
8:45 - 9:00	18	0	18	120	1	121	4	0	4	0	0	0	19	0	20	15	0	15	34	0	35	0	0	0	20	0	20	43	3	46	21	0	21	0	0	0	45	1	46	26	1	27	12	0	12	0	0	0	385	8:45 - 9:45	985
9:00 - 9:15	9	0	9	83	1	84	3	0	3	0	0	0	6	0	6	10	0	10	15	0	15	0	0	0	13	0	13	46	0	46	12	0	12	0	0	0	22	1	23	12	2	14	4	0	4	0	0	0	239	9:00 - 10:00	797
9:15 - 9:30	3	0	3	70	1	71	2	0	2	0	0	0	4	0	4	6	0	7	10	1	11	0	0	0	10	0	10	40	1	41	11	0	12	0	0	0	22	1	23	10	0	10	1	0	1	0	0	0	195	9:15 - 10:15	733
9:30 - 9:45	3	0	3	67	1	68	1	0	1	0	0	0	2	0	2	4	0	4	8	1	9	0	0	0	8	1	10	36	2	38	8	0	8	0	0	0	17	0	17	5	0	5	1	0	1	0	0	0	166	9:30 - 10:30	718
9:45 - 10:00	4	0	4	71	2	73	2	0	2	0	0	0	2	1	2	6	1	7	9	0	9	0	0	0	8	0	8	43	1	44	15	1	16	0	0	0	21	0	21	9	1	9	1	0	1	0	0	0	197	9:45 - 10:45	722
10:00 - 10:15	1	0	1	53	0	53	2	0	2	0	0	0	2	0	2	3	0	4	8	0	8	0	0	0	8	0	8	52	2	54	10	1	11	0	0	0	20	1	21	9	0	9	2	0	2	0	0	0	175	10:00 - 11:00	702
10:15 - 10:30	3	0	3	54	0	54	3	0	4	0	0	0	3	0	3	5	0	5	8	1	9	0	0	0	7	0	7	53	0	53	13	0	13	0	0	0	19	1	20	6	0	7	2	0	2	0	0	0	180	10:15 - 11:15	707
10:30 - 10:45	1	0	1	59	1	59	2	0	2	0	0	0	1	0	1	4	0	5	8	0	8	0	0	0	5	1	6	49	1	50	10	0	10	0	0	0	18	0	18	7	0	7	2	1	3	0	0	0	170	10:30 - 11:30	715
10:45 - 11:00	2	0	2	61	2	63	3	0	3	0	0	0	1	0	1	4	0	4	5	0	5	0	0	0	6	0	6	47	2	49	13	0	13	0	0	0	20	1	21	8	0	8	2	0	3	0	0	0	177	10:45 - 11:45	727
11:00 - 11:15	2	0	2	49	2	51	2	0	2	0	0	0	4	1	5	5	0	5	8	0	8	0	0	0	6	0	6	61	1	62	12	0	12	0	0	0	19	0	19	8	0	8	1	0	1	0	0	0	180	11:00 - 12:00	758
11:15 - 11:30	2	0	2	44	1	45	3	0	3	0	0	0	2	1	3	5	0	5	9	1	10	0	0	0	6	0	6	67	1	68	16	1	17	0	0	0	23	0	23	6	0	6	0	0	0	0	0	0	188	11:15 - 12:15	798
11:30 - 11:45	2	0	2	55	0	55	2	0	2	0	0	0	2	0	2	4	0	4	7	0	7	0	0	0	6	1	6	63	0	63	10	0	11	0	0	0	19	1	20	7	0	7	2	0	2	0	0	0	181	11:30 - 12:30	825
11:45 - 12:00	2	0	2	56	1	57	2	0	2	0	0	0	2	1	3	4	0	4	15	0	15	0	0	0	8	0	9	64	1	65	15	1	16	0	0	0	24	0	24	9	1	10	1	0	1	0	0	0	208	11:45 - 12:45	824
12:00 - 12:15	1	0	1	55	1	56	2	0	2	0	0	0	4	0	4	10	0	10	17	1	18	0	0	0	13	0	13	70	0	71	16	0	17	0	0	0	22	0	22	6	0	6	1	0	1	0	0	0	221	12:00 - 13:00	837
12:15 - 12:30	2	0	2	62	1	63	2	0	2	0	0	0	2	0	2	4	0	4	8	1	9	0	0	0	13	0	13	69	0	69	12	0	12	0	0	0	26	1	27	9	1	11	2	0	2	0	0	0	215	12:15 - 13:15	801
12:30 - 12:45	1	0	1	42	0	42	2	0	2	0	0	0	3	0	3	4	0	4	7	0	8	0	0	0	10	1	11	71	2	72	8	0	8	0	0	0	17	1	18	7	1	8	3	0	3	0	0	0	181	12:30 - 13:30	765

EST. 1983 austraffic TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Coleman St & Edmondson St & Mitchelmore St



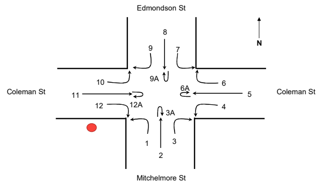
12:45 - 13:00	2	0	2	54	0	55	3	0	3	0	0	0	4	1	6	5	0	5	15	0	15	0	0	0	9	0	9	74	2	76	15	0	15	0	0	0	24	0	24	6	0	6	4	0	4	0	0	0	221	12:45 - 13:45	787
13:00 - 13:15	3	0	3	47	1	48	1	0	1	0	0	0	1	1	2	4	0	4	9	0	9	0	0	0	7	0	7	73	1	74	11	0	11	0	0	0	17	0	17	7	0	7	1	0	1	0	0	0	185	13:00 - 14:00	776
13:15 - 13:30	2	0	2	52	1	53	2	0	2	0	0	0	3	0	3	7	1	8	10	2	12	0	0	0	7	0	7	59	1	60	13	0	13	0	0	0	13	0	14	6	0	6	1	0	1	0	0	0	178	13:15 - 14:15	799
13:30 - 13:45	2	0	2	54	2	56	1	0	1	0	0	0	4	0	4	4	1	6	7	1	7	0	0	0	7	1	8	67	2	69	14	0	14	0	0	0	22	1	22	10	1	11	2	0	2	0	0	0	203	13:30 - 14:30	827
13:45 - 14:00	0	0	0	62	2	64	2	0	2	0	0	0	3	0	3	3	0	3	8	0	8	0	0	0	8	0	8	71	3	74	15	1	16	0	0	0	22	1	22	7	0	7	3	0	3	0	0	0	210	13:45 - 14:45	831
14:00 - 14:15	2	0	2	53	1	53	1	0	1	0	0	0	3	1	4	5	0	6	8	0	8	0	0	0	6	0	6	80	1	81	18	1	19	0	0	0	20	1	20	6	1	7	1	0	1	0	0	0	208	14:00 - 15:00	843
14:15 - 14:30	3	0	3	50	0	51	1	0	1	0	0	0	4	0	4	4	0	4	9	1	10	0	0	0	7	0	7	79	1	80	13	0	13	0	0	0	22	0	22	6	1	7	2	0	2	0	0	0	206	14:15 - 15:15	899
14:30 - 14:45	2	0	2	48	0	48	2	0	2	0	0	0	4	0	4	4	0	4	7	1	8	0	0	0	11	1	12	78	2	80	14	0	14	0	0	0	20	1	20	9	0	9	3	0	3	0	0	0	207	14:30 - 15:30	1074
14:45 - 15:00	4	0	4	57	0	57	4	0	4	0	0	0	8	0	8	10	0	10	14	3	16	0	0	0	10	0	10	69	2	71	17	0	17	0	0	0	17	0	18	9	0	9	0	0	0	0	0	0	222	14:45 - 15:45	1245
15:00 - 15:15	9	0	9	63	1	64	2	0	2	0	0	0	10	0	10	6	0	6	20	0	20	0	0	0	15	0	15	84	1	85	16	0	16	0	0	0	23	0	23	11	0	11	2	0	2	0	0	0	264	15:00 - 16:00	1301
15:15 - 15:30	16	0	16	70	1	72	4	0	4	0	0	0	8	0	8	13	1	14	18	3	21	0	0	0	15	2	17	87	4	91	25	0	25	0	0	0	60	0	60	25	0	25	28	0	28	0	0	0	381	15:15 - 16:15	1300
15:30 - 15:45	7	0	7	81	1	82	5	0	5	0	0	0	12	0	12	11	5	16	38	10	48	0	0	0	7	0	8	86	9	95	18	2	20	0	0	0	48	0	48	17	2	18	18	0	18	0	0	0	378	15:30 - 16:30	1186
15:45 - 16:00	3	0	3	75	0	75	6	0	6	0	0	0	5	0	5	6	1	7	13	4	17	0	0	0	7	0	7	93	1	94	16	0	16	0	0	0	30	1	31	12	2	14	4	0	4	0	0	0	279	15:45 - 16:45	1090
16:00 - 16:15	3	0	3	58	0	58	1	0	1	0	0	0	6	0	6	11	0	11	15	0	15	0	0	0	8	0	8	106	0	106	16	0	16	0	0	0	26	0	26	9	0	9	3	0	3	0	0	0	262	16:00 - 17:00	1091
16:15 - 16:30	2	0	2	56	0	56	2	0	2	0	0	0	5	0	5	12	0	12	20	0	21	0	0	0	9	0	9	106	0	106	18	0	18	0	0	0	25	0	25	8	1	9	2	0	2	0	0	0	267	16:15 - 17:15	1146
16:30 - 16:45	4	0	4	59	0	59	2	0	2	0	0	0	3	0	3	6	0	6	15	1	16	0	0	0	12	1	13	114	0	114	21	0	21	0	0	0	25	1	25	15	1	16	4	0	4	0	0	0	282	16:30 - 17:30	1183
16:45 - 17:00	2	0	2	63	0	63	3	0	3	0	0	0	4	0	4	9	0	9	14	0	14	0	0	0	11	0	11	123	0	123	16	0	16	0	0	0	21	0	21	11	0	12	2	0	2	0	0	0	279	16:45 - 17:45	1146
17:00 - 17:15	2	0	2	49	0	49	4	0	4	0	0	0	5	0	5	7	0	7	11	0	11	0	0	0	18	0	18	172	0	172	18	0	18	0	0	0	18	0	18	11	0	11	3	0	3	0	0	0	317	17:00 - 18:00	1074
17:15 - 17:30	3	0	3	57	0	57	2	0	2	0	0	0	6	0	6	8	0	8	17	1	17	0	0	0	13	0	13	154	0	154	20	0	20	0	0	0	13	0	13	9	0	9	1	0	1	0	0	0	304	17:15 - 18:15	913
17:30 - 17:45	2	0	2	44	0	44	1	0	1	0	0	0	4	0	4	9	0	9	11	0	11	0	0	0	16	1	16	117	0	117	17	0	17	0	0	0	15	0	15	7	0	7	2	0	2	0	0	0	245	17:30 - 18:30	786
17:45 - 18:00	1	0	1	49	0	49	0	0	0	0	0	0	3	0	3	6	0	6	7	0	8	0	0	0	7	0	7	104	0	104	10	0	10	0	0	0	15	0	15	5	0	5	1	0	1	0	0	0	208	17:45 - 18:45	698
18:00 - 18:15	0	0	0	36	0	36	2	0	2	0	0	0	2	0	2	4	0	4	3	0	3	0	0	0	8	0	8	79	0	79	8	0	8	0	0	0	10	0	10	4	0	4	0	0	0	0	0	0	156	18:00 - 19:00	625
18:15 - 18:30	1	0	1	47	0	47	3	0	3	0	0	0	3	0	3	4	0	4	4	0	4	0	0	0	13	0	13	72	0	72	8	0	8	0	0	0	12	0	12	7	0	7	1	0	1	0	0	0	176	18:15 - 19:15	571
18:30 - 18:45	0	0	0	40	0	40	3	0	3	0	0	0	3	0	3	4	0	4	4	0	4	0	0	0	11	0	12	66	0	66	6	0	6	0	0	0	15	0	15	4	0	4	1	0	1	0	0	0	158	18:30 - 19:30	514
18:45 - 19:00	1	0	1	35	0	35	1	0	1	0	0	0	3	0	3	3	0	3	3	0	4	0	0	0	6	0	6	57	0	57	7	0	7	0	0	0	10	0	10	5	0	5	2	0	2	0	0	0	134	18:45 - 19:45	447
19:00 - 19:15	1	0	1	24	0	24	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	4	0	4	50	0	50	6	0	6	0	0	0	9	0	9	3	0	3	1	0	1	0	0	0	103	19:00 - 20:00	386
19:15 - 19:30	1	0	1	25	0	25	1	0	1	0	0	0	1	0	1	1	0	1	2	0	2	0	0	0	4	0	4	66	0	66	6	0	6	0	0	0	8	0	8	2	0	2	1	0	1	0	0	0	119	19:15 - 20:15	368
19:30 - 19:45	1	0	1	22	0	22	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	4	0	4	47	0	47	4	0	4	0	0	0	5	0	5	3	0	4	0	0	0	0	0	0	91	19:30 - 20:30	321
19:45 - 20:00	0	0	0	16	0	16	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	2	0	2	43	0	43	4	0	4	0	0	0	3	0	3	1	0	1	2	0	2	0	0	0	73	19:45 - 20:45	282
20:00 - 20:15	0	0	0	15	0	15	0	0	0	0	0	0	0	0	0	2	0	2	3	0	3	0	0	0	3	0	3	46	0	46	7	0	7	0	0	0	5	0	5	2	0	2	1	0	1	0	0	0	85	20:00 - 21:00	259
20:15 - 20:30	0	0	0	16	0	16	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	3	0	3	38	0	38	5	0	5	0	0	0	4	0	4	1	0	1	1	0	1	0	0	0	72	20:15 - 21:15	236
20:30 - 20:45	1	0	1	13	0	13	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	2	28	0	28	4	0	4	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	52	20:30 - 21:30	247
20:45 - 21:00	1	0	1	10	0	10	1	0	1	0	0	0	1	0	1	2	0	2	1	0	1	0	0	0	2	0	2	25	0	25	4	0	4	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	51	20:45 - 21:45	266
21:00 - 21:15	1	0	1	12	0	12	0	0	0	0	0	0	2	0	2	1	0	1	3	0	3	0	0	0	2	0	2	31	0	31	3	0	3	0	0	0	5	0	5	2	0	2	0	0	0	0	0	0	62	21:00 - 22:00	265
21:15 - 21:30	0	0	0	16	0	16	1	0	1	0	0	0	8	0	8	5	0	5	11	0	11	0	0	0	7	0	7	22	0	22	4	0	5	0	0	0	4	0	4	3	0	3	0	0	0	0	0	0	82	21:15 - 22:15	232
21:30 - 21:45	0	0	0	10	0	10	0	0	0	0	0	0	9	0	9	7	0	7	12	0	12	0	0	0	5	0	5	22	0	22	2	0	2	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	71	21:30 - 22:30	181
21:45 - 22:00	0	0	0	10	0	10	1	0	1	0	0	0	2	0	2	2	0	2	6	0	6	0	0	0	1	0	1	20	0	20	3	0	3	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	50	21:45 - 22:45	132
22:00 - 22:15	0	0	0	7	0	7	0	0	0	0	0	0	1	0	1	2	0	2	2	0	2	0	0	0	0	0	0	13	0	13	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	28	22:00 - 23:00	94
22:15 - 22:30	0	0	0	5	0	5	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	1	0	1	18	0	18	2	0	2	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	31	22:15 - 23:15	75
22:30 - 22:45	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	13	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	22	22:30 - 23:30	52
22:45 - 23:00	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	12	22:45 - 23:45	42
23:00 - 23:15	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	10	23:00 - 0:00	39
23:15 - 23:30	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	AM Peak	1405
23:30 - 23:45	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	4	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	13	PM Peak	1301
23:45 - 0:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	9		
Total	213	2	216	3260	34	3295	130	4	133	1	0	1	231	9	240	350	17	367	602	50	652	0	0	0	525	20	545	3896	65	3960	733	18	751	1	0	1	1221	22	1243	514	29	543	194	4	198	0	0	0	12145		
AM Peak	78	1	79	420	3	423	13	0	14	0	0	0	42	1	43	51	1	52	101	11	112	0	0	0	70	5	75	166	13	179	75	3	78	0	0	0	190	3	193	84	10	95	62	1	63	0	0	0	1405		
PM Peak	35	0	35	290	3	293	17	0	17	0	0	0	35	0	35	36	7	43	89	18	107	0	0	0	44	2	46	351	14	365	74	3	77	0	0	0	161	2	163	65	3	68	52	0	52	0	0	0	1301		

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
0:00 - 1:00	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	0	2	14	0	14	1	0	1	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	28	0	28
0:15 - 1:15	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	2	9	0	9	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	21	0	21
0:30 - 1:30	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	2	7	0	8	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	17	0	17

EST. 1983 austraffic TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Coleman St & Edmondson St & Mitchelmore St



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1:00 - 2:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	4	1	0	1	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	10	0	10
1:15 - 2:15	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	9	0	10
1:30 - 2:30	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	9	0	9
1:45 - 2:45	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	10	0	10
2:00 - 3:00	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	9	0	10
2:15 - 3:15	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	9	0	9
2:30 - 3:30	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	10	0	10
2:45 - 3:45	0	0	0	5	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	13	0	13
3:00 - 4:00	0	0	0	8	0	8	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	15	0	15
3:15 - 4:15	0	0	0	12	0	12	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5	0	0	0	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	21	1	23
3:30 - 4:30	0	0	0	10	0	11	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5	0	0	0	0	0	0	2	0	2	1	0	1	1	0	1	0	0	0	18	1	20
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4:00 - 5:00	0	0	0	11	0	12	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	1	7	1	0	1	0	0	0	4	0	4	1	0	1	1	0	1	0	0	0	24	2	26
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4:30 - 5:30	1	0	1	22	0	22	2	0	2	0	0	0	0	0	0	3	0	3	1	0	1	0	0	0	1	0	1	7	0	7	2	0	2	0	0	0	6	0	6	2	0	2	1	0	1	0	0	0	47	0	47
4:45 - 5:45	1	0	1	42	0	42	2	0	2	0	0	0	0	0	0	4	0	4	2	0	2	0	0	0	1	0	1	7	0	7	4	0	4	0	0	0	8	0	8	2	0	2	1	0	1	0	0	0	73	0	73
5:00 - 6:00	1	0	1	54	0	54	2	0	2	0	0	0	0	0	0	5	1	6	2	0	2	0	0	0	1	0	1	7	0	7	4	0	4	0	0	0	10	0	10	3	0	3	1	0	1	0	0	0	90	2	92
5:15 - 6:15	1	0	1	62	0	62	2	0	2	0	0	0	0	0	0	5	1	6	2	0	2	0	0	0	1	0	1	12	1	12	5	0	5	0	0	0	13	1	14	3	0	3	1	0	1	0	0	0	107	4	111
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6:30 - 7:30	6	0	6	146	3	149	5	1	6	1	0	1	2	1	3	11	0	11	8	1	10	0	0	0	8	0	9	53	2	55	22	1	23	0	0	0	43	2	45	20	0	21	3	1	4	0	0	0	328	13	341
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7:30 - 8:30	43	1	45	304	4	308	14	0	14	0	0	0	9	1	10	26	1	27	36	7	42	0	0	0	54	5	59	102	8	111	45	3	48	0	0	0	116	3	119	63	3	66	19	0	19	0	0	0	832	36	868
7:45 - 8:45	66	1	67	369	3	372	15	0	16	0	0	0	20	1	21	38	1	39	68	12	80	0	0	0	67	6	73	125	12	138	62	5	67	0	0	0	177	2	179	78	8	86	53	1	54	0	0	0	1137	54	1191
8:00 - 9:00	80	1	81	415	3	418	14	1	14	0	0	0	39	1	40	47	1	48	97	12	109	0	0	0	67	5	72	147	14	161	75	4	79	0	0	0	197	2	199	88	8	97	62	1	63	0	0	0	1328	54	1382
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13:00 - 14:00	7	0	7	215	5	221	6	0	6	0	0	0	11	1	11	18	3	21	33	3	36	0	0	0	29	1	30	270	6	276	54	1	55	0	0	0	74	2	76	30	1	31	6	0	6	0	0	0	752	24	776
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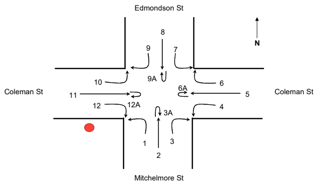
13:30 - 14:30	8	0	8	219	5	224	5	0	6	0	0	0	13	1	14	17	2	19	31	2	33	0	0	0	28	1	29	297	6	303	61	2	63	0	0	0	85	2	87	29	3	33	8	0	8	0	0	0	801	26	827
13:45 - 14:45	8	0	8	213	3	216	6	0	6	0	0	0	13	1	14	16	1	17	32	2	34	0	0	0	32	1	33	308	6	314	61	2	63	0	0	0	83	2	85	28	3	31	9	0	9	0	0	0	809	22	831

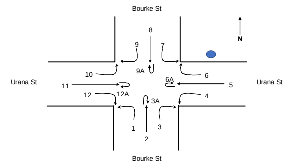
EST. 1983
austraffic
TRAFFIC & TRANSPORT
DATA SPECIALISTS



Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Coleman St & Edmondson St & Mitchelmore St

14:00 - 15:00	11	0	**11**	208	2	**209**	8	0	**8**	0	0	**0**	18	1	**19**	23	1	**24**	38	4	**42**	0	0	**0**	34	2	**35**	306	6	**312**	62	1	**63**	0	0	**0**	78	2	**80**	30	3	**32**	7	0	**7**	0	0	**0**	822	21	**843**
14:15 - 15:15	18	0	**18**	218	2	**220**	9	0	**9**	0	0	**0**	26	0	**26**	23	0	**24**	50	5	**54**	0	0	**0**	43	2	**44**	310	5	**316**	60	0	**61**	0	0	**0**	82	2	**83**	35	1	**36**	8	0	**8**	0	0	**0**	881	17	**899**
14:30 - 15:30	31	0	**31**	238	3	**241**	12	0	**12**	0	0	**0**	30	0	**30**	32	1	**33**	59	7	**65**	0	0	**0**	51	3	**54**	318	8	**327**	72	0	**72**	0	0	**0**	120	2	**122**	54	0	**54**	33	0	**33**	0	0	**0**	1049	24	**1074**
14:45 - 15:45	36	0	**36**	271	4	**275**	15	0	**15**	0	0	**0**	38	0	**38**	39	6	**45**	90	16	**106**	0	0	**0**	47	2	**50**	326	16	**342**	75	3	**78**	0	0	**0**	148	1	**150**	61	2	**63**	48	0	**48**	0	0	**0**	1196	49	**1245**
15:00 - 16:00	35	0	**35**	290	3	**293**	17	0	**17**	0	0	**0**	35	0	**35**	36	7	**43**	89	18	**107**	0	0	**0**	44	2	**46**	351	14	**365**	74	3	**77**	0	0	**0**	161	2	**163**	65	3	**68**	52	0	**52**	0	0	**0**	1249	52	**1301**
15:15 - 16:15	29	0	**29**	284	3	**287**	16	0	**16**	0	0	**0**	31	0	**31**	41	7	**48**	84	17	**102**	0	0	**0**	37	2	**39**	372	13	**386**	74	3	**77**	0	0	**0**	164	2	**166**	63	4	**66**	53	0	**53**	0	0	**0**	1249	50	**1300**
15:30 - 16:30	15	0	**15**	270	2	**272**	13	0	**13**	0	0	**0**	28	0	**28**	40	6	**46**	86	15	**101**	0	0	**0**	30	1	**31**	391	10	**401**	68	3	**71**	0	0	**0**	129	1	**130**	46	5	**51**	28	0	**28**	0	0	**0**	1145	41	**1186**
15:45 - 16:45	12	0	**12**	248	1	**248**	11	0	**11**	0	0	**0**	19	0	**19**	35	1	**36**	63	5	**68**	0	0	**0**	35	1	**36**	419	1	**420**	71	1	**71**	0	0	**0**	106	2	**107**	44	4	**48**	13	0	**13**	0	0	**0**	1076	15	**1090**
16:00 - 17:00	11	0	**11**	235	1	**236**	8	0	**8**	0	0	**0**	17	0	**17**	38	0	**38**	65	1	**66**	0	0	**0**	39	1	**40**	449	0	**449**	71	0	**71**	0	0	**0**	96	1	**97**	44	2	**46**	11	0	**11**	0	0	**0**	1084	7	**1091**
16:15 - 17:15	10	0	**10**	226	1	**227**	11	0	**11**	0	0	**0**	16	0	**16**	34	0	**34**	60	1	**61**	0	0	**0**	49	1	**51**	515	1	**515**	73	0	**73**	0	0	**0**	88	1	**89**	46	2	**48**	11	0	**11**	0	0	**0**	1138	8	**1146**
16:30 - 17:30	12	0	**12**	228	1	**228**	11	0	**11**	0	0	**0**	17	0	**17**	30	0	**30**	57	1	**58**	0	0	**0**	54	1	**55**	563	1	**564**	75	0	**75**	0	0	**0**	76	1	**77**	46	1	**47**	10	0	**10**	0	0	**0**	1176	6	**1183**
16:45 - 17:45	10	0	**10**	213	0	**213**	10	0	**10**	0	0	**0**	18	0	**18**	32	0	**32**	52	1	**53**	0	0	**0**	57	1	**58**	566	1	**567**	71	0	**71**	0	0	**0**	66	0	**66**	38	1	**39**	8	0	**8**	0	0	**0**	1142	4	**1146**
17:00 - 18:00	8	0	**8**	199	0	**199**	7	0	**7**	0	0	**0**	18	0	**18**	29	0	**29**	45	1	**46**	0	0	**0**	53	1	**54**	547	0	**548**	65	0	**65**	0	0	**0**	60	0	**60**	32	0	**32**	7	0	**7**	0	0	**0**	1071	3	**1074**
17:15 - 18:15	6	0	**6**	186	0	**186**	5	0	**5**	0	0	**0**	15	0	**15**	26	0	**26**	38	1	**39**	0	0	**0**	44	1	**45**	455	0	**455**	56	0	**56**	0	0	**0**	53	0	**53**	24	0	**24**	4	0	**4**	0	0	**0**	911	2	**913**
17:30 - 18:30	3	0	**3**	175	0	**176**	6	0	**6**	0	0	**0**	13	0	**13**	22	0	**22**	25	1	**26**	0	0	**0**	44	1	**45**	373	0	**373**	43	0	**43**	0	0	**0**	52	0	**52**	22	0	**22**	4	0	**4**	0	0	**0**	784	2	**786**
17:45 - 18:45	2	0	**2**	171	0	**171**	8	0	**8**	0	0	**0**	12	0	**12**	17	0	**17**	19	1	**20**	0	0	**0**	40	1	**40**	321	0	**322**	32	0	**32**	0	0	**0**	53	0	**53**	19	0	**19**	3	0	**3**	0	0	**0**	696	2	**698**
18:00 - 19:00	2	0	**2**	157	0	**158**	8	0	**8**	0	0	**0**	12	0	**12**	14	0	**15**	15	1	**16**	0	0	**0**	39	0	**39**	275	0	**275**	29	0	**29**	0	0	**0**	48	0	**48**	19	0	**19**	4	0	**4**	0	0	**0**	622	2	**625**
18:15 - 19:15	3	0	**3**	146	0	**146**	7	0	**7**	0	0	**0**	10	0	**10**	12	0	**12**	12	1	**13**	0	0	**0**	35	0	**35**	246	0	**246**	28	0	**28**	0	0	**0**	47	0	**47**	19	0	**19**	5	0	**5**	0	0	**0**	569	2	**571**
18:30 - 19:30	4	0	**4**	124	0	**124**	5	0	**5**	0	0	**0**	8	0	**8**	9	0	**9**	10	1	**11**	0	0	**0**	25	0	**26**	239	0	**239**	25	0	**25**	0	0	**0**	43	0	**43**	14	0	**14**	5	0	**5**	0	0	**0**	512	2	**514**
18:45 - 19:45	4	0	**4**	107	0	**107**	4	0	**4**	0	0	**0**	6	0	**6**	5	0	**6**	7	1	**7**	0	0	**0**	18	0	**18**	220	0	**220**	23	0	**23**	0	0	**0**	32	0	**32**	14	0	**14**	5	0	**5**	0	0	**0**	445	2	**447**
19:00 - 20:00	3	0	**3**	88	0	**88**	3	0	**3**	0	0	**0**	4	0	**4**	3	0	**3**	5	0	**5**	0	0	**0**	14	0	**14**	206	0	**206**	20	0	**20**	0	0	**0**	25	0	**25**	10	0	**10**	4	0	**4**	0	0	**0**	385	1	**386**
19:15 - 20:15	2	0	**2**	79	0	**79**	3	0	**3**	0	0	**0**	4	0	**4**	4	0	**4**	7	0	**7**	0	0	**0**	13	0	**13**	202	0	**202**	21	0	**21**	0	0	**0**	20	0	**20**	9	0	**9**	4	0	**4**	0	0	**0**	367	1	**368**
19:30 - 20:30	1	0	**1**	70	0	**70**	3	0	**3**	0	0	**0**	4	0	**4**	4	0	**4**	5	0	**5**	0	0	**0**	11	0	**12**	174	0	**174**	21	0	**21**	0	0	**0**	16	0	**16**	8	0	**8**	3	0	**3**	0	0	**0**	320	1	**321**
19:45 - 20:45	1	0	**1**	60	0	**60**	2	0	**2**	0	0	**0**	3	0	**3**	5	0	**5**	4	0	**4**	0	0	**0**	10	0	**10**	154	0	**154**	20	0	**20**	0	0	**0**	13	0	**13**	6	0	**6**	3	0	**3**	0	0	**0**	282	0	**282**
20:00 - 21:00	2	0	**2**	54	0	**54**	3	0	**3**	0	0	**0**	3	0	**3**	6	0	**6**	4	0	**4**	0	0	**0**	10	0	**10**	136	0	**136**	20	0	**20**	0	0	**0**	12	0	**12**	7	0	**7**	2	0	**2**	0	0	**0**	259	0	**259**
20:15 - 21:15	2	0	**2**	51	0	**51**	3	0	**3**	0	0	**0**	5	0	**5**	6	0	**6**	4	0	**4**	0	0	**0**	8	0	**8**	121	0	**121**	15	0	**15**	0	0	**0**	13	0	**13**	7	0	**7**	1	0	**1**	0	0	**0**	236	0	**236**
20:30 - 21:30	2	0	**2**	51	0	**51**	3	0	**3**	0	0	**0**	12	0	**12**	9	0	**9**	15	0	**15**	0	0	**0**	13	0	**13**	106	0	**106**	14	0	**15**	0	0	**0**	13	0	**13**	8	0	**8**	1	0	**1**	0	0	**0**	247	0	**247**
20:45 - 21:45	2	0	**2**	48	0	**48**	3	0	**3**	0	0	**0**	21	0	**21**	15	0	**15**	27	0	**27**	0	0	**0**	15	0	**15**	100	0	**100**	12	0	**13**	0	0	**0**	13	0	**13**	8	0	**8**	1	0	**1**	0	0	**0**	266	0	**266**
21:00 - 22:00	1	0	**1**	48	0	**48**	3	0	**3**	0	0	**0**	22	0	**22**	15	0	**15**	32	0	**32**	0	0	**0**	14	0	**14**	95	0	**95**	12	0	**12**	0	0	**0**	13	0	**13**	9	0	**9**	1	0	**1**	0	0	**0**	265	0	**265**
21:15 - 22:15	0	0	**0**	43	0	**43**	3	0	**3**	0	0	**0**	20	0	**20**	15	0	**15**	31	0	**31**	0	0	**0**	13	0	**13**	78	0	**78**	10	0	**10**	0	0	**0**	10	0	**10**	7	0	**7**	1	0	**1**	0	0	**0**	231	0	**232**
21:30 - 22:30	0	0	**0**	33	0	**33**	2	0	**2**	0	0	**0**	13	0	**13**	11	0	**11**	20	0	**20**	0	0	**0**	7	0	**7**	73	0	**73**	7	0	**7**	0	0	**0**	8	0	**8**	5	0	**5**	0	0	**0**	0	0	**0**	181	0	**181**
21:45 - 22:45	0	0	**0**	28	0	**28**	1	0	**1**	0	0	**0**	4	0	**4**	5	0	**5**	8	0	**8**	0	0	**0**	3	0	**3**	64	0	**64**	7	0	**7**	0	0	**0**	6	0	**6**	4	0	**4**	0	0	**0**	0	0	**0**	132	0	**132**
22:00 - 23:00	0	0	**0**	20	0	**20**	1	0	**1**	0	0	**0**	2	0	**2**	3	0	**3**	3	0	**3**	0	0	**0**	2	0	**2**	50	0	**50**	5	0	**5**	0	0	**0**	5	0	**5**	2	0	**2**	0	0	**0**	0	0	**0**	94	0	**94**
22:15 - 23:15	0	0	**0**	14	0	**14**	0	0	**0**	0	0	**0**	2	0	**2**	1	0	**1**	1	0	**1**	0	0	**0**	2	0	**2**	43	0	**43**	5	0	**5**	0	0	**0**	5	0	**5**	2	0	**2**	0	0	**0**	0	0	**0**	75	0	**75**
22:30 - 23:30	0	0	**0**	13	0	**13**	0	0	**0**	0	0	**0**	1	0	**1**	1	0	**1**	1	0	**1**	0	0	**0**	1	0	**1**	28	0	**28**	4	0	**4**	0	0	**0**	2	0	**2**	2	0	**2**	0	0	**0**	0	0	**0**	52	0	**52**
22:45 - 23:45	0	0	**0**	12	0	**12**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	19	0	**19**	4	0	**4**	0	0	**0**	4	0	**4**	0	0	**0**	0	0	**0**	0	0	**0**	42	0	**42**
23:00 - 0:00	0	0	**0**	11	0	**11**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	19	0	**19**	3	0	**3**	0	0	**0**	4	0	**4**	0	0	**0**	0	0	**0**	0	0	**0**	39	0	**39**

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Urana St & Bourke St



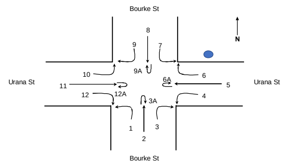
AM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
5:00 - 5:15	0	0	0	15	0	15	0	0	0	0	0	0	0	0	0	3	0	3	2	0	2	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	2	1	2	1	0	1	0	0	0	0	0	0	28	5:00 - 6:00	213
5:15 - 5:30	0	0	1	22	0	23	1	0	1	0	0	0	0	0	0	1	0	1	3	0	3	0	0	0	2	0	2	3	0	3	1	0	1	0	0	0	3	0	3	4	0	4	0	0	0	0	0	0	41	5:15 - 6:15	261
5:30 - 5:45	0	0	0	28	1	29	1	0	1	0	0	0	0	0	0	4	0	5	7	0	7	0	0	0	1	0	1	4	0	4	1	0	1	0	0	0	7	0	7	8	0	8	0	0	0	0	0	0	64	5:30 - 6:30	321
5:45 - 6:00	0	0	0	27	0	27	3	0	3	0	0	0	1	0	1	9	0	9	12	0	12	0	0	0	2	0	2	6	1	6	1	0	1	0	0	0	7	0	7	11	0	11	1	0	1	0	0	0	80	5:45 - 6:45	435
6:00 - 6:15	0	0	0	26	0	27	1	0	1	0	0	0	0	0	1	11	1	12	6	0	6	0	0	0	2	0	2	4	0	4	2	0	2	0	0	0	11	0	11	9	0	9	0	0	0	0	0	0	76	6:00 - 7:00	613
6:15 - 6:30	1	1	2	29	2	31	2	0	2	0	0	0	1	0	1	8	0	8	15	0	15	0	0	0	3	0	3	8	2	10	3	0	3	1	0	1	15	0	15	9	0	9	1	0	1	0	0	0	101	6:15 - 7:15	725
6:30 - 6:45	2	0	2	68	1	69	4	0	5	0	0	0	2	0	2	11	0	12	27	0	27	0	0	0	4	0	4	13	1	14	3	0	4	0	0	0	22	1	23	16	0	16	1	0	1	0	0	0	178	6:30 - 7:30	870
6:45 - 7:00	1	0	1	103	1	104	6	0	6	0	0	0	2	1	3	18	0	18	30	1	31	0	0	0	4	0	4	29	1	30	8	0	8	0	0	0	31	1	32	19	1	19	1	1	2	0	0	0	258	6:45 - 7:45	1004
7:00 - 7:15	4	0	4	65	1	66	5	0	5	0	0	0	2	0	2	13	0	14	21	0	22	0	0	0	4	1	5	22	2	23	6	0	6	1	0	1	13	0	13	23	1	24	1	0	2	0	0	0	187	7:00 - 8:00	1161
7:15 - 7:30	1	0	1	87	1	87	5	1	6	0	0	0	3	0	3	25	1	26	30	0	30	0	0	0	7	0	8	29	1	31	6	1	7	2	0	2	21	2	23	19	2	21	1	0	1	0	0	0	247	7:15 - 8:15	1360
7:30 - 7:45	5	0	5	116	1	117	6	0	6	0	0	0	3	0	3	20	0	20	38	0	38	0	0	0	7	0	7	38	1	39	12	0	12	1	0	1	29	1	30	29	1	30	2	0	2	0	0	0	312	7:30 - 8:30	1665
7:45 - 8:00	7	0	7	164	2	166	12	0	12	0	0	0	5	0	5	37	1	38	58	0	58	0	0	0	6	0	6	24	1	25	10	1	11	2	0	2	47	1	47	36	0	36	2	0	2	0	0	0	415	7:45 - 8:45	1964
8:00 - 8:15	5	0	5	132	2	134	10	0	10	0	0	0	4	0	4	31	0	32	42	0	42	0	0	0	10	0	10	38	1	39	10	1	11	3	0	4	53	1	54	41	0	41	1	0	1	1	0	1	386	8:00 - 9:00	2122
8:15 - 8:30	9	1	10	189	3	192	14	0	14	1	0	1	8	1	9	43	2	45	58	1	58	0	0	0	11	0	11	62	2	64	16	0	16	4	0	4	74	1	75	46	2	48	2	1	3	0	0	0	552	8:15 - 9:15	2152
8:30 - 8:45	13	0	13	194	5	199	24	1	25	1	0	1	14	0	14	44	0	45	58	1	59	0	0	0	18	0	18	70	1	71	26	1	28	5	0	5	73	1	73	54	1	55	5	0	5	0	0	0	611	8:30 - 9:30	1928
8:45 - 9:00	13	1	13	182	4	186	15	0	15	0	0	0	12	0	13	51	2	54	80	1	81	0	0	0	22	1	23	57	1	58	21	0	21	5	0	5	47	0	47	52	0	52	4	0	4	1	0	1	573	8:45 - 9:45	1612
9:00 - 9:15	4	0	4	120	2	122	10	1	11	0	0	0	10	0	10	46	0	46	40	0	40	0	0	0	20	0	20	57	1	58	16	0	16	6	0	6	41	1	42	38	0	38	3	0	3	0	0	0	417	9:00 - 10:00	1373
9:15 - 9:30	4	0	4	98	1	99	8	0	8	0	0	0	11	0	11	25	1	26	32	0	32	0	0	0	11	0	12	52	1	53	13	0	13	1	0	1	31	1	32	35	0	35	2	0	2	0	0	0	328	AM Peak	2152
9:30 - 9:45	5	0	5	92	2	93	7	0	7	0	0	0	4	0	5	24	0	24	24	0	24	0	0	0	10	0	10	41	0	41	12	1	13	2	0	2	35	1	37	30	1	32	2	0	2	0	0	0	294		
9:45 - 10:00	3	0	3	93	3	96	5	0	5	0	0	0	3	0	3	29	0	29	27	0	27	0	0	0	11	0	11	62	2	64	21	0	21	1	0	2	40	0	40	30	1	31	2	0	2	0	0	0	334		
Total	**75**	**3**	**78**	**1851**	**32**	**1883**	**140**	**3**	**143**	**3**	**0**	**4**	**86**	**3**	**89**	**454**	**10**	**463**	**611**	**4**	**615**	**1**	**0**	**1**	**156**	**4**	**160**	**619**	**19**	**639**	**189**	**7**	**196**	**36**	**1**	**37**	**603**	**12**	**615**	**509**	**11**	**521**	**34**	**2**	**36**	**2**	**0**	**2**	**5482**		
AM Peak	**38**	**2**	**40**	**685**	**14**	**699**	**63**	**1**	**64**	**3**	**0**	**3**	**45**	**1**	**46**	**185**	**5**	**189**	**236**	**2**	**238**	**0**	**0**	**0**	**71**	**2**	**73**	**246**	**5**	**251**	**80**	**2**	**82**	**20**	**0**	**20**	**234**	**3**	**237**	**190**	**3**	**193**	**14**	**1**	**15**	**1**	**0**	**1**	**2152**		
10hr Total	**153**	**7**	**161**	**3487**	**57**	**3544**	**332**	**5**	**337**	**15**	**0**	**15**	**334**	**7**	**341**	**1076**	**17**	**1093**	**1050**	**9**	**1059**	**2**	**1**	**3**	**628**	**8**	**636**	**2925**	**40**	**2965**	**763**	**13**	**776**	**121**	**1**	**122**	**1176**	**19**	**1195**	**1263**	**24**	**1287**	**126**	**7**	**134**	**4**	**0**	**4**	**13671**		

PM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
14:00 - 14:15	3	0	3	81	1	82	6	0	6	1	0	1	9	1	9	24	0	25	23	1	23	0	0	0	11	0	11	76	2	78	22	0	22	4	0	4	26	1	27	26	0	26	4	1	4	0	0	0	322	14:00 - 15:00	1406
14:15 - 14:30	2	0	2	73	2	75	6	0	6	1	0	1	10	1	11	29	0	29	21	1	22	0	0	0	15	0	15	76	0	76	29	1	31	5	0	5	27	1	28	31	0	31	2	0	2	0	0	0	334	14:15 - 15:15	1529
14:30 - 14:45	2	0	2	68	1	69	6	0	6	0	0	0	10	0	10	30	0	30	20	0	20	0	0	0	23	1	24	90	1	91	26	1	27	4	0	4	35	1	36	35	0	35	5	0	5	0	0	0	359	14:30 - 15:30	1770
14:45 - 15:00	3	0	3	93	1	94	10	0	10	0	0	0	12	0	12	26	0	26	26	0	27	0	0	0	20	0	20	84	3	87	24	0	24	4	0	4	35	1	36	43	1	44	3	0	3	0	0	0	391	14:45 - 15:45	2008
15:00 - 15:15	2	0	3	81	2	83	9	0	9	0	0	0	16	1	16	28	0	28	25	0	25	0	0	0	27	0	27	120	1	121	32	1	33	4	0	4	36	0	36	49	1	50	8	0	8	1	0	1	444	15:00 - 16:00	2098
15:15 - 15:30	13	0	13	125	2	127	23	0	23	3	0	3	15	0	15	37	1	38	28	1	29	0	0	0	26	0	26	148	1	149	43	1	44	4	0	4	43	0	43	55	2	58	4	0	4	0	0	0	575	15:15 - 16:15	2120
15:30 - 15:45	7	2	9	116	3	119	15	1	16	0	0	0	14	0	14	58	2	59	49	0	49	0	0	0	29	2	31	146	3	149	46	1	48	10	0	10	33	1	34	46	4	50	7	1	8	0	0	0	597	15:30 - 16:30	2016
15:45 - 16:00	4	0	4	98	3	100	14	0	14	1	0	1	14	0	14	41	1	42	37	1	38	0	0	0	25	0	25	120	1	121	32	0	33	10	0	10	34	0	34	41	1	42	3	1	5	0	0	0	481	15:45 - 16:45	1865
16:00 - 16:15	5	0	5	90	2	91	12	0	12	1	0	1	11	0	11	33	1	34	25	0	25	0	0	0	23	0	23	139	1	140	33	0	33	5	0	5	32	0	32	48	1	49	4	0	4	0	0	0	466	16:00 - 17:00	1855
16:15 - 16:30	4	0	4	87	3	90	8	0	8	1	0	1	12	0	13	41	1	42	30	0	30	0	0	0	31	0	31	130	2	132	31	0	32	5	0	5	32	0	32	45	1	46	5	0	5	0	0	0	471	16:15 - 17:15	1913
16:30 - 16:45	5	0	5	86	1	87	10	0	10	1	0	1	13	0	13	33	0	33	18	0	18	0	0	0	26	0	26	134	1	135	35	0	35	4	0	4	27	0	27	47	0	47	5	0	5	0	0	0	447	16:30 - 17:30	1943
16:45 - 17:00	4	0	5	94	2	96	9	0	9	0	0	0	19	0	19	33	0	33	20	0	20	0	0	0	25	0	25	144	1	145	31	0	31	4	0	4	33	0	33	46	0	46	5	0	5	0	0	0	471	16:45 - 17:45	1917
17:00 - 17:15	8	0	8	84	0	85	7	0	7	1	0	1	19	0	19	35	1	35	18	0	18	0	0	0	43	0	43	170	0	170	37	1	37	4	0	4	29	0	29	57	0	57	10	0	11	0	0	0	524	17:00 - 18:00	1806
17:15 - 17:30	4	0	4	84	1	85	8	0	8	0	0	0	20	0	20	40	0	41	20	0	20	0	0	0	32	0	32	171	0	171	36	0	36	5	0	5	29	1	29	40	0	40	10	0	10	0	0	0	502	17:15 - 18:15	1591
17:30 - 17:45	5	0	5	67	0	67	13	0	13	0	0	0	15	1	15	31	0	31	19	0	19	0	0	0	29	0	29	147	0	147	26	0	26	3	0	3	24	0	24	35	0	35	6	0	6	0	0	0	421	17:30 - 18:30	1363
17:45 - 18:00	1	0	1	74	0	74	9	0	9	0	0	0	10	0	10	28	0	28	16	0	16	0	0	0	22	0	22	110	2	112	25	0	25	3	0	3	23	0	23	32	0	32	2	0	2	0	0	0	360	17:45 - 18:45	1177
18:00 - 18:15	3	0	3	72	1	73	6	0	6	1	0	1	8	0	8	21	0	21	12	0	12	0	0	0	21	0	21	96	0	96	17	0	17	4	0	4	23	0	23	19	0	19	5	0	5	0	0	0	309	18:00 - 19:00	1024
18:15 - 18:30	1	0	1	60	1	61	8	0	8	1	0	1	12	0	12	19	0	19	10	0	10	0	0	0	15	0	15	83	0	83	21	0	21	1	0	1	17	0	17	22	0	22	2	0	2	0	0	0	274	PM Peak	2120
18:30 - 18:45	2	0	2	46	0	46	9	0	9	0	0	0	6	0	6	20	0	20	12	0	12	0	0	0	15	0	15	73	0	73	14	0	14	0	0	0	15	0	15	21	0	21	2	0	2	0	0	0	235		
18:45 - 19:00	1	0	1	58	0	58	6	0	6	0	0	0	5	0	5	16	0	16	9	0	9	0	0	0	14	0	14	49	0	49	12	0	12	1	0	1	19	0	19	15	0	15	1	0	1	0	0	0	207		
Total	**78**	**4**	**82**	**1636**	**26**	**1662**	**192**	**2**	**194**	**12**	**0**	**12**	**248**	**4**	**252**	**622**	**7**	**629**	**438**	**5**	**444**	**2**	**0**	**2**	**472**	**4**	**476**	**2306**	**20**	**2326**	**574**	**7**	**581**	**85**	**0**	**85**	**573**	**7**	**580**	**754**	**12**	**766**	**92**	**5**	**98**	**2**	**0**	**2**	**8189**		
PM Peak	**29**	**2**	**31**	**428**	**10**	**437**	**63**	**1**	**64**	**5**	**0**	**5**	**53**	**0**	**53**	**169**	**4**	**173**	**139**	**2**	**141**	**1**	**0**	**1**	**104**	**2**	**106**	**553**	**6**	**559**	**155**	**3**	**157**	**29**	**0**	**29**	**142**	**2**	**144**	**190**	**9**	**199**	**18**	**3**	**21**	**1**	**0**	**1**	**2120**		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Urana St & Bourke St



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	0	0	1	93	1	94	5	0	5	0	0	0	1	0	1	16	0	17	25	0	25	0	0	0
5:15 - 6:15	1	0	1	104	2	106	6	0	6	0	0	0	2	0	2	24	1	26	29	0	29	0	0	0
5:30 - 6:30	2	1	2	111	3	114	8	0	8	0	0	0	3	0	3	32	1	33	41	0	41	0	0	0
5:45 - 6:45	3	1	4	151	3	154	11	0	11	0	0	0	4	0	4	39	1	40	60	0	60	0	0	0
6:00 - 7:00	4	1	5	227	4	231	14	1	14	0	0	0	6	1	7	48	1	50	78	1	79	0	0	0
6:15 - 7:15	8	1	8	266	5	271	18	1	18	0	0	0	7	1	8	51	1	52	93	1	94	0	0	0
6:30 - 7:30	7	0	7	323	4	327	21	1	22	0	0	1	9	1	9	68	2	70	108	1	109	0	0	0
6:45 - 7:45	11	0	11	371	4	375	22	1	23	0	0	1	10	1	11	76	1	78	120	1	121	0	0	0
7:00 - 8:00	17	0	17	431	5	436	28	1	29	0	0	1	12	0	13	95	2	97	148	1	149	0	0	0
7:15 - 8:15	18	0	18	499	5	504	33	1	33	0	0	0	14	0	14	113	2	115	168	1	169	0	0	0
7:30 - 8:30	26	1	27	601	8	609	42	0	42	1	0	1	19	1	20	131	3	134	196	1	197	0	0	1
7:45 - 8:45	34	1	35	679	12	691	60	1	61	2	0	2	30	1	32	156	3	159	216	2	218	0	0	0
8:00 - 9:00	39	2	41	697	14	711	63	1	63	2	0	2	38	1	39	170	5	175	238	2	240	0	0	0
8:15 - 9:15	38	2	40	685	14	699	63	1	64	3	0	3	45	1	46	185	5	189	236	2	238	0	0	0
8:30 - 9:30	33	1	34	594	12	606	57	1	58	1	0	1	48	1	48	167	4	170	210	1	212	0	0	0
8:45 - 9:45	25	1	25	492	9	500	40	1	40	1	0	1	38	1	39	146	4	150	176	1	176	0	0	0
9:00 - 10:00	15	0	15	403	7	410	30	1	31	1	0	1	29	1	29	123	1	125	123	0	123	0	0	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	5	0	6	14	1	15	3	0	3	0	0	0	19	1	20	24	0	25	2	0	2	0	0	0	209	4	213.33
5:15 - 6:15	6	0	7	16	1	17	4	0	4	0	0	0	29	0	29	32	0	32	2	0	2	0	0	0	256	5	261
5:30 - 6:30	8	0	8	21	3	24	6	0	7	1	0	1	40	0	40	36	0	37	3	0	3	0	0	0	312	9	320.67
5:45 - 6:45	11	0	11	30	4	34	9	1	10	1	0	1	55	1	56	45	0	45	4	0	4	0	0	0	423	12	434.67
6:00 - 7:00	13	0	13	54	4	58	16	1	16	1	0	1	79	2	81	53	1	53	4	1	5	0	0	0	597	16	613
6:15 - 7:15	16	1	16	72	5	77	20	1	21	2	0	2	81	2	83	67	1	68	5	1	6	0	0	0	705	20	724.67
6:30 - 7:30	20	1	21	93	5	98	24	1	25	4	0	4	87	4	91	77	3	80	5	1	6	0	0	0	846	25	870.33
6:45 - 7:45	23	1	24	119	5	123	32	1	33	5	0	5	95	4	99	90	5	94	6	1	7	0	0	0	978	26	1004
7:00 - 8:00	25	1	26	113	5	118	34	2	37	6	0	6	110	4	114	107	4	111	6	0	7	0	0	0	1134	27	1160.7
7:15 - 8:15	30	1	31	129	5	134	38	3	41	9	0	9	150	5	155	125	4	128	6	0	6	1	0	1	1333	26	1359.7
7:30 - 8:30	34	0	34	161	5	167	48	3	51	10	1	11	203	4	207	152	4	156	7	1	8	1	0	1	1633	32	1665
7:45 - 8:45	44	1	45	193	5	199	63	4	66	15	1	15	246	3	250	177	3	180	10	1	11	1	0	1	1927	38	1964.3
8:00 - 9:00	61	2	62	227	5	232	74	3	76	18	1	18	247	3	250	193	3	196	12	1	13	2	0	2	2080	42	2122
8:15 - 9:15	71	2	73	246	5	251	80	2	82	20	0	20	234	3	237	190	3	193	14	1	15	1	0	1	2110	42	2152.3
8:30 - 9:30	71	2	73	236	5	240	76	2	78	17	0	17	192	3	194	178	2	180	14	0	14	1	0	1	1895	33	1928.3
8:45 - 9:45	63	2	65	206	4	210	62	1	64	14	0	14	154	3	158	155	2	157	12	0	12	1	0	1	1584	28	1611.7
9:00 - 10:00	52	1	53	211	5	216	62	1	63	11	0	11	148	3	151	133	3	136	10	0	10	0	0	0	1350	23	1373

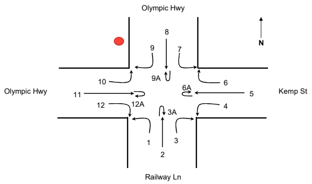
HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	10	1	10	315	6	320	28	0	28	2	0	2	40	1	41	110	1	111	90	2	92	0	0	0
14:15 - 15:15	9	1	10	315	6	321	31	0	31	1	0	1	47	1	48	113	1	114	93	1	94	0	0	0
14:30 - 15:30	20	1	21	367	6	373	48	0	48	4	0	4	52	1	53	121	1	122	100	1	101	1	0	1
14:45 - 15:45	25	3	28	415	8	423	56	1	58	4	0	4	56	1	57	149	3	151	129	1	130	1	0	1
15:00 - 16:00	26	3	28	419	10	429	60	1	62	4	0	4	58	1	59	163	4	167	139	2	141	1	0	1
15:15 - 16:15	29	2	31	428	10	437	63	1	64	5	0	5	53	0	53	169	4	173	139	2	141	1	0	1
15:30 - 16:30	20	2	22	390	11	401	48	1	49	3	0	3	51	0	51	173	4	177	140	2	142	0	0	0
15:45 - 16:45	18	0	18	361	8	369	43	0	43	3	0	3	50	0	50	148	2	150	109	2	111	1	0	1
16:00 - 17:00	18	1	19	357	7	364	38	0	39	2	0	2	55	0	55	140	1	142	93	1	93	0	0	0
16:15 - 17:15	21	1	21	352	6	358	34	0	34	2	0	2	63	0	63	142	1	143	86	0	87	1	0	1
16:30 - 17:30	21	1	22	349	4	353	34	0	34	1	0	1	70	0	71	141	1	142	76	0	76	1	0	1
16:45 - 17:45	21	1	22	329	3	332	37	0	37	1	0	1	72	1	73	139	1	140	77	0	77	0	0	1
17:00 - 18:00	18	0	18	309	1	311	37	0	37	1	0	1	63	1	65	133	1	134	73	0	74	0	0	1
17:15 - 18:15	13	0	13	297	2	299	36	0	36	1	0	1	53	1	54	120	1	120	67	0	67	0	0	0
17:30 - 18:30	10	0	10	273	1	275	36	0	36	2	0	2	45	1	46	99	0	99	57	0	58	0	0	0
17:45 - 18:45	7	0	7	252	2	254	32	0	32	2	0	2	36	0	37	88	0	88	50	1	50	0	0	0
18:00 - 19:00	6	0	6	236	2	237	29	0	29	2	0	2	32	0	32	76	0	76	43	0	43	0	0	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	69	1	70	326	6	332	102	2	104	17	0	17	123	4	127	136	1	137	14	1	15	0	0	0	1380	26	1406.3
14:15 - 15:15	85	1	86	370	5	376	112	3	115	17	0	17	133	3	136	158	2	161	18	1	18	1	0	1	1503	25	1528.7
14:30 - 15:30	96	1	97	442	6	448	126	2	128	16	0	16	149	2	151	182	5	187	19	1	20	1	0	1	1743	27	1769.7
14:45 - 15:45	102	2	104	498	8	506	146	3	149	21	0	21	147	2	150	193	9	202	21	2	23	1	0	1	1965	43	2008
15:00 - 16:00	108	2	110	534	6	540	154	3	157	27	0	27	147	2	148	191	9	200	21	3	24	1	0	1	2054	44	2098
15:15 - 16:15	104	2	106	553	6	559	155	3	157	29	0	29	142	2	144	190	9	199	18	3	21	1	0	1	2076	44	2119.7
15:30 - 16:30	108	2	111	535	7	542	143	2	145	30	0	30	131	1	133	180	7	187	19	3	22	1	0	1	1973	43	2015.7
15:45 - 16:45	105	0	105	523	5	528	132	1	133	25	0	25	125	0	125	181	3	184	17	2	19	1	0	1	1840	25	1865.3
16:00 - 17:00	105	0	105	548	5	553	130	1	131	19	0	19	124	0	124	185	2	187	19	1	20	1	0	1	1836	19	1855
16:15 - 17:15	125	0	125	578	4	582	134	1	135	18	0	18	122	0	122	194	1	195	25	1	26	0	0	0	1897	15	1912.7
16:30 - 17:30	126	0	126	619	2	621	138	1	139	18	0	18	118	1	119	189	0	189	30	1	31	0	0	0	1931	12	1943
16:45 - 17:45	129	0	129	631	2	633	129	1	130	17	0	17	115	1	116	178	0	178	31	1	32	0	0	0	1907	10	1917
17:00 - 18:00	126	0	126	597	2	600	124	1	124	16	0	16	105	1	106	164	0	165	28	1	29	0	0	0	1796	10	1805.7
17:15 - 18:15	104	0	104	523	3	526	104	0	104	15	0	15	99	1	100	126	0	127	23	0	23	0	0	0	1582	9	1591.3
17:30 - 18:30	87	0	87	436	3	438	89	0	89	11	0	11	87	0	87	109	0	109	15	0	15	0	0	0	1357	7	1363.3
17:45 - 18:45	73	0	73	362	3	365	77	0	77	8	0	8	78	0	78	94	0	94	11	0	11	0	0	0	1171	6	1177.3
18:00 - 19:00	65	0	65	301	1	302	64	0	64	6	0	6	74	0	74	77	0	77	10	0	10	0	0	0	1021	4	1024.3

EST. 1993 austraffic TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Olympic Hwy & Seignior St & Kemp St



Time	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
Period	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
0:00 - 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	5	0:00 - 1:00	13
0:15 - 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0:15 - 1:15	15
0:30 - 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	0:30 - 1:30	14
0:45 - 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0:45 - 1:45	12
1:00 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	7	1:00 - 2:00	12
1:15 - 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1:15 - 2:15	6
1:30 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1:30 - 2:30	5
1:45 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	1:45 - 2:45	5
2:00 - 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2:00 - 3:00	6
2:15 - 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2:15 - 3:15	6
2:30 - 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2:30 - 3:30	7
2:45 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2:45 - 3:45	9
3:00 - 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3:00 - 4:00	11
3:15 - 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	3:15 - 4:15	12
3:30 - 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	3	3:30 - 4:30	21
3:45 - 4:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	3	0	3	0	0	0	0	0	0	5	3:45 - 4:45	36
4:00 - 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	2	4:00 - 5:00	43
4:15 - 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	11	4:15 - 5:15	68
4:30 - 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	1	0	1	11	0	11	0	0	0	0	0	0	18	4:30 - 5:30	73
4:45 - 5:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	3	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	1	0	1	4	0	4	0	0	0	0	0	0	12	4:45 - 5:45	67
5:00 - 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	2	0	0	0	7	0	7	0	0	0	1	0	1	0	0	0	2	0	2	11	0	11	0	0	0	0	0	0	27	5:00 - 6:00	97
5:15 - 5:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	2	0	2	0	0	0	5	0	5	0	0	0	3	0	3	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	16	5:15 - 6:15	102
5:30 - 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	4	0	0	0	1	0	2	0	0	0	2	0	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	12	5:30 - 6:30	121
5:45 - 6:00	0	0	0	0	0	0	2	0	2	0	0	0	1	0	1	5	0	5	8	0	8	0	0	0	5	0	5	0	0	0	4	0	4	0	0	0	9	1	10	7	0	7	0	0	0	0	0	0	42	5:45 - 6:45	151
6:00 - 6:15	0	0	0	1	0	1	2	0	2	0	0	0	1	0	1	2	0	2	5	0	5	0	0	0	2	0	2	0	0	0	3	0	3	0	0	0	9	0	9	7	0	7	0	0	0	0	0	0	32	6:00 - 7:00	156
6:15 - 6:30	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	0	5	5	0	5	0	0	0	2	0	3	0	0	0	8	0	8	0	0	0	6	0	6	6	0	6	0	0	0	0	0	0	35	6:15 - 7:15	172
6:30 - 6:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	4	4	1	5	0	0	0	6	0	6	0	0	0	4	1	4	0	0	0	9	0	9	13	0	13	0	0	0	0	0	0	43	6:30 - 7:30	195
6:45 - 7:00	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	7	0	7	8	0	8	0	0	0	6	0	6	0	0	0	6	0	6	0	0	0	7	0	7	10	0	11	0	0	0	0	0	0	47	6:45 - 7:45	215
7:00 - 7:15	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	8	0	8	5	0	5	0	0	0	4	0	5	1	0	1	10	1	11	0	0	0	7	1	8	8	0	8	0	0	0	0	0	0	48	7:00 - 8:00	242
7:15 - 7:30	0	0	0	2	0	2	1	1	2	0	0	0	0	0	0	9	0	9	5	1	6	0	0	0	6	0	7	0	0	0	11	0	11	0	0	0	10	1	10	10	1	11	0	0	0	0	0	0	58	7:15 - 8:15	264
7:30 - 7:45	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	7	0	7	5	1	6	0	0	0	13	0	13	0	0	0	10	1	11	0	0	0	7	2	8	13	1	13	0	0	0	0	0	0	63	7:30 - 8:30	296
7:45 - 8:00	0	0	0	0	0	1	2	0	2	0	0	0	1	0	1	10	0	10	14	0	15	0	0	0	8	0	8	0	0	0	11	1	12	0	0	0	12	1	13	12	0	13	0	0	0	0	0	0	74	7:45 - 8:45	344
8:00 - 8:15	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	7	0	7	7	1	7	0	0	0	6	0	6	0	0	0	15	1	15	0	0	0	13	1	14	18	0	18	0	0	0	0	0	0	69	8:00 - 9:00	380
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8:30 - 8:45	1	0	1	1	0	1	2	0	2	0	0	0	1	0	1	19	0	19	4	0	4	0	0	0	12	0	12	1	0	1	13	0	14	0	0	0	16	1	17	39	0	39	0	0	0	0	0	0	111	8:30 - 9:30	400
8:45 - 9:00	0	0	0	2	0	2	3	0	3	0	0	0	0	0	0	15	1	16	13	0	13	0	0	0	8	1	9	2	0	2	13	0	14	0	0	0	14	2	15	34	0	34	1	0	1	0	0	0	110	8:45 - 9:45	349
9:00 - 9:15	0	0	0	2	0	2	1	0	1	0	0	0	1	0	1	17	1	17	8	0	9	0	0	0	9	0	9	2	0	2	13	1	14	0	0	0	15	0	16	25	1	26	0	0	0	0	0	0	98	9:00 - 10:00	313
9:15 - 9:30	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	13	0	13	9	0	9	0	0	0	12	1	13	2	0	2	13	1	14	0	0	0	11	1	12	16	0	16	0	0	0	0	0	0	82	9:15 - 10:15	307
9:30 - 9:45	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	11	0	11	4	0	5	0	0	0	10	0	10	1	0	1	9	0	9	0	0	0	10	2	12	9	0	9	0	0	0	0	0	0	59	9:30 - 10:30	300
9:45 - 10:00	0	0	0	1	0	1	3	0	3	0	0	0	1	0	1	11	0	12	8	0	8	0	0	0	9	1	9	1	0	1	13	1	15	0	0	0	12	1	13	10	0	10	0	0	0	0	0	0	74	9:45 - 10:45	305
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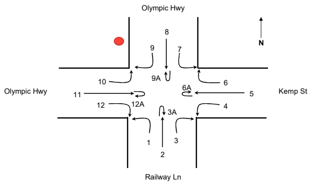
10:30 - 10:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	7	0	7	7	0	7	0	0	0	8	0	8	0	0	0	13	0	13	0	0	0	11	1	12	13	0	13	0	0	0	0	0	0	63	10:30 - 11:30	294
10:45 - 11:00	0	0	0	2	0	2	1	1	2	0	0	0	1	0	1	11	0	11	10	0	10	0	0	0	11	1	11	0	0	0	11	1	13	0	0	0	15	0	16	10	1	11	0	0	0	0	0	0	77	10:45 - 11:45	301
11:00 - 11:15	0	0	0	1	0	1	1	0	1	0	0	0	2	0	2	13	0	14	16	0	16	0	0	0	21	1	22	1	0	1	10	1	11	0	0	0	9	1	10	8	0	8	0	0	0	0	0	0	86	11:00 - 12:00	297
11:15 - 11:30	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	7	1	8	7	0	7	0	0	0	10	0	10	2	0	2	11	2	12	0	0	0	14	2	15	9	1	10	0	0	0	0	0	0	67	11:15 - 12:15	286
11:30 - 11:45	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	9	0	9	10	0	10	0	0	0	10	1	10	2	0	2	11	2	13	0	0	0	13	1	13	9	0	10	0	0	0	0	0	0	71	11:30 - 12:30	277
11:45 - 12:00	1	0	1	1	0	1	1	0	1	0	0	0	0	0	0	12	0	12	8	0	8	0	0	0	6	0	6	0	0	0	13	0	13	0	0	0	16	1	17	11	0	12	1	0	1	0	0	0	73	11:45 - 12:45	285
12:00 - 12:15	2	0	2	1	0	1	0	0	0	0	0	0	3	0	3	12	0	12	8	0	8	0	0	0	11	0	11	3	0	3	12	0	12	0	0	0	14	1	15	8	1	8	0	0	0	0	0	0	75	12:00 - 13:00	277
12:15 - 12:30	0	0	0	2	0	2	1	0	1	0	0	0	1	0	1	8	1	9	5	0	5	0	0	0	5	0	5	1	0	1	11	1	11	0	0	0	12	1	13	10	0	10	0	0	0	0	0	0	58	12:15 - 13:15	292
12:30 - 12:45	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	12	1	13	8	0	8	0	0	0	7	0	8	0	0	0	20	0	20	0	0	0	15	1	16	11	1	12	0	0	0	0	0	0	79	12:30 - 13:30	312

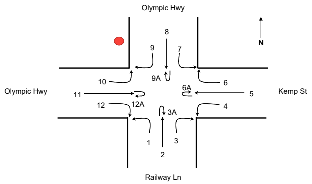


12:45 - 13:00	0	0	0	2	0	2	1	0	1	0	0	0	2	0	2	9	1	10	7	0	7	0	0	0	9	0	9	1	0	1	7	0	7	0	0	0	13	0	13	12	0	12	0	0	0	0	0	0	65	12:45 - 13:45	311
13:00 - 13:15	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	12	0	12	6	0	6	0	0	0	10	0	10	2	0	2	17	1	18	0	0	0	20	2	23	16	0	16	0	0	0	0	0	0	90	13:00 - 14:00	317
13:15 - 13:30	0	0	0	2	0	2	2	0	2	0	0	0	3	0	3	12	0	12	7	0	7	0	0	0	5	1	6	1	0	1	13	1	13	0	0	0	14	1	15	15	0	16	0	0	0	0	0	0	78	13:15 - 14:15	310
13:30 - 13:45	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	12	0	12	6	1	7	0	0	0	8	1	9	1	0	1	18	0	18	0	0	0	14	1	15	12	1	12	0	0	0	0	0	0	78	13:30 - 14:30	303
13:45 - 14:00	0	0	0	1	0	1	2	0	2	0	0	0	1	0	1	11	1	12	10	0	11	0	0	0	8	0	8	1	0	1	14	0	14	0	0	0	10	0	10	11	0	11	0	0	0	0	0	0	71	13:45 - 14:45	304
14:00 - 14:15	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2	10	0	10	7	0	7	0	0	0	9	0	9	3	0	3	15	0	15	0	0	0	17	1	17	17	0	17	0	0	0	0	0	0	82	14:00 - 15:00	330
14:15 - 14:30	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	10	0	10	7	0	7	0	0	0	8	0	8	2	0	2	13	0	13	0	0	0	16	0	16	13	0	13	0	0	0	0	0	0	71	14:15 - 15:15	357
14:30 - 14:45	0	0	0	2	0	2	1	0	1	0	0	0	2	0	2	9	0	9	7	0	7	0	0	0	11	0	11	2	0	2	11	0	11	0	0	0	15	1	16	17	0	17	0	0	0	0	0	0	79	14:30 - 15:30	417
14:45 - 15:00	0	0	0	1	0	2	2	0	2	0	0	0	2	0	2	15	1	16	8	0	8	0	0	0	12	0	12	3	0	3	16	1	16	0	0	0	14	0	14	22	1	22	0	0	0	0	0	0	98	14:45 - 15:45	457
15:00 - 15:15	0	0	0	1	0	1	2	0	2	0	0	0	1	0	1	27	1	28	8	0	8	0	0	0	8	1	9	1	0	1	14	0	14	0	0	0	14	1	15	30	0	30	0	0	0	0	0	0	109	15:00 - 16:00	467
15:15 - 15:30	0	0	0	1	0	1	1	0	1	0	0	0	3	0	3	39	2	40	13	0	13	0	0	0	13	0	13	1	0	1	20	0	21	0	0	0	13	1	13	24	1	25	1	0	1	0	0	0	131	15:15 - 16:15	478
15:30 - 15:45	0	0	0	2	0	2	1	0	1	0	0	0	2	0	2	25	0	26	13	0	13	0	0	0	18	0	18	3	0	3	22	0	23	0	0	0	14	0	14	16	1	17	0	0	0	0	0	0	119	15:30 - 16:30	455
15:45 - 16:00	1	0	1	1	0	1	1	0	1	0	0	0	3	0	4	21	0	21	10	0	11	0	0	0	11	1	12	3	0	3	17	2	19	0	0	0	13	1	13	21	0	21	1	0	1	0	0	0	107	15:45 - 16:45	430
16:00 - 16:15	1	0	1	3	0	3	2	0	2	0	0	0	1	0	1	24	0	25	13	0	13	0	0	0	15	0	15	6	0	6	19	0	20	0	0	0	18	1	19	16	1	16	0	0	0	0	0	0	120	16:00 - 17:00	436
16:15 - 16:30	0	0	0	2	0	2	1	0	1	0	0	0	3	0	3	21	0	21	10	0	10	0	0	0	14	0	14	1	0	1	25	1	25	0	0	0	14	0	14	15	1	16	1	0	1	0	0	0	108	16:15 - 17:15	418
16:30 - 16:45	0	0	0	1	0	1	1	0	1	0	0	0	3	0	3	17	1	18	14	0	14	0	0	0	11	0	11	2	0	3	13	1	14	0	0	0	11	1	13	16	0	16	0	0	0	0	0	0	94	16:30 - 17:30	416
16:45 - 17:00	1	0	1	1	0	1	2	0	2	0	0	0	4	0	4	22	0	22	21	1	22	0	0	0	11	0	11	3	0	3	22	0	23	0	0	0	9	2	11	13	0	13	0	0	0	0	0	0	114	16:45 - 17:45	420
17:00 - 17:15	1	0	1	1	0	1	1	0	1	0	0	0	3	0	3	18	0	18	14	0	14	0	0	0	13	0	13	2	0	2	16	1	16	0	0	0	17	0	18	14	0	14	0	0	0	0	0	0	102	17:00 - 18:00	403
17:15 - 17:30	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	22	0	22	15	0	15	0	0	0	12	0	12	3	0	3	17	0	17	0	0	0	16	1	16	16	0	16	1	0	1	0	0	0	106	17:15 - 18:15	370
17:30 - 17:45	0	0	0	2	0	2	0	0	0	0	0	0	2	0	2	19	0	19	11	0	11	0	0	0	10	0	10	2	0	2	17	0	17	0	0	0	18	0	18	16	0	16	0	0	0	0	0	0	98	17:30 - 18:30	332
17:45 - 18:00	1	0	1	1	0	1	1	0	1	0	0	0	1	0	1	16	0	16	15	1	16	0	0	0	8	0	9	2	0	2	14	0	14	0	0	0	23	1	23	14	0	14	0	0	0	0	0	0	97	17:45 - 18:45	295
18:00 - 18:15	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	10	0	11	13	0	13	0	0	0	10	0	10	2	0	2	8	0	8	0	0	0	14	1	15	9	0	9	0	0	0	0	0	0	69	18:00 - 19:00	243
18:15 - 18:30	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	9	0	9	7	0	7	0	0	0	11	0	11	2	0	2	17	0	17	0	0	0	13	0	13	6	0	6	0	0	0	0	0	0	68	18:15 - 19:15	209
18:30 - 18:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	8	0	8	0	0	0	11	0	11	1	0	1	11	0	11	0	0	0	8	1	9	9	0	9	0	0	0	0	0	0	61	18:30 - 19:30	171
18:45 - 19:00	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	8	0	8	4	1	4	0	0	0	4	0	4	2	0	2	9	0	9	0	0	0	8	0	8	6	0	6	0	0	0	0	0	0	44	18:45 - 19:45	134
19:00 - 19:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	8	0	8	3	0	3	0	0	0	4	0	4	1	0	1	8	0	8	0	0	0	7	0	7	2	0	2	0	0	0	0	0	0	36	19:00 - 20:00	113
19:15 - 19:30	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	7	0	7	3	0	3	0	0	0	2	0	2	1	0	1	7	0	7	0	0	0	4	0	4	4	0	4	0	0	0	0	0	0	30	19:15 - 20:15	96
19:30 - 19:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0	3	3	0	3	0	0	0	2	0	2	1	0	1	5	0	5	0	0	0	4	0	4	5	0	5	0	0	0	0	0	0	25	19:30 - 20:30	87
19:45 - 20:00	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	4	0	4	3	0	3	0	0	0	3	0	3	1	0	1	2	0	2	0	0	0	4	0	4	3	0	3	0	0	0	0	0	0	23	19:45 - 20:45	93
20:00 - 20:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0	3	1	0	1	0	0	0	2	0	2	0	0	0	4	0	4	0	0	0	5	0	5	3	0	3	0	0	0	0	0	0	18	20:00 - 21:00	94
20:15 - 20:30	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	6	1	6	1	0	1	0	0	0	1	0	1	1	0	1	4	0	4	0	0	0	3	0	3	2	0	2	0	0	0	0	0	0	22	20:15 - 21:15	93
20:30 - 20:45	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1	4	0	4	3	0	3	0	0	0	6	0	6	1	0	1	4	0	4	0	0	0	3	0	3	7	0	7	0	0	0	0	0	0	31	20:30 - 21:30	92
20:45 - 21:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5	0	5	2	0	2	0	0	0	5	0	5	0	0	0	5	0	5	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	23	20:45 - 21:45	77
21:00 - 21:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	2	2	0	2	0	0	0	6	0	6	0	0	0	2	0	2	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	18	21:00 - 22:00	66
21:15 - 21:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	4	2	0	2	0	0	0	4	0	4	1	0	1	3	0	3	0	0	0	3	0	3	2	0	2	0	0	0	0	0	0	20	21:15 - 22:15	56
21:30 - 21:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0	3	1	0	1	0	0	0	1	0	1	1	0	1	4	0	4	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	16	21:30 - 22:30	44
21:45 - 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	0	1	0	0	0	2	0	2	1	0	1	2	0	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	12	21:45 - 22:45	39
22:00 - 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	8	22:00 - 23:00	41
22:15 - 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	1	0	1	3	0	3	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	9	22:15 - 23:15	41
22:30 - 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	2	0	2	2	0	2	0	0	0	0	0	0	11	22:30 - 23:30	39
22:45 - 23:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	5	0	5	1	0	1	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	13	22:45 - 23:45	31
23:00 - 23:15	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	2	0	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	7	23:00 - 0:00	22
23:15 - 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	7	AM Peak	408
23:30 - 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	PM Peak	478
23:45 - 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	4		
Total	16	0	16	69	2	71	67	2	70	0	0	0	85	2	86	763	21	784	510	13	522	1	0	1	564	14	578	83	3	86	774	32	806	2	0	2	748	42	789	846	17	863	11	0	12	1	0	1	4687		
AM Peak	1	0	1	6	1	6	7	0	7	0	0	0	4	1	4	63	3	66	33	2	35	0	0	0	36	1	37	5	1	6	51	3	54	0	0	0	60	4	64	125	1	126	2	0	2	0	0	0	408		
PM Peak	2	0	2	7	0	7	5	0	5	0	0	0	9	0	9	110	2	112	49	0	49	0	0	0	57	1	58	12	0	12	79	3	82	0	0	0	58	2	60	77	2	79	2	0	2	0	0	0	478		

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
0:00 - 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	0	1	0	0	0	1	0	1	1	0	1	1	1	2	0	0	0	1	0	1	3	1	3	0	0	0	0	0	0	10	3	13
0:15 - 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4	2	0	2	0	0	0	0	0	0	1	0	1	2	0	3	0	0	0	1	0	1	3	0	3	0	0	0	0	0	0	13	2	15
0:30 - 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5	2	0	2	0	0	0	0	0	0	1	0	1	3	0	3	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	13	2	14

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Olympic Hwy & Seignior St & Kemp St



0:45 - 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	0	1	0	0	0	0	0	0	0	0	0	2	0	3	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	11	1	12
1:00 - 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	0	1	0	0	0	0	0	0	0	0	0	2	0	3	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	12	0	12
1:15 - 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	6	0	6
1:30 - 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	4	1	5
1:45 - 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	4	1	5
2:00 - 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	3	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	5	1	6
2:15 - 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	3	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	5	1	6
2:30 - 3:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	6	1	7
2:45 - 3:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	1	0	0	0	1	0	1	0	0	0	1	1	2	0	0	0	1	0	1	2	0	2	0	0	0	0	0	0	7	2	9
3:00 - 4:00	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	2	5	0	5	0	0	0	0	0	0	10	1	11
3:15 - 4:15	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	3	0	3	5	0	5	0	0	0	0	0	0	11	1	12
3:30 - 4:30	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	5	0	5	0	0	0	0	1	1	0	0	0	2	0	2	11	0	11	0	0	0	0	0	0	20	1	21
3:45 - 4:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	7	0	7	0	0	0	2	0	2	0	0	0	3	0	3	20	0	20	0	0	0	0	0	0	36	0	36
4:00 - 5:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	5	0	5	0	0	0	9	0	9	1	0	1	2	0	2	0	0	0	3	0	4	21	0	21	0	0	0	0	0	0	42	1	43
4:15 - 5:15	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	0	2	7	0	7	0	0	0	16	0	16	1	0	1	3	0	3	0	0	0	5	0	5	32	0	32	0	0	0	0	0	0	67	1	68
4:30 - 5:30	0	0	0	0	0	0	2	0	2	0	0	0	1	0	1	2	0	2	8	0	8	0	0	0	17	0	17	1	0	1	6	0	6	0	0	0	5	0	5	30	0	30	0	0	0	0	0	0	73	1	73
4:45 - 5:45	0	0	0	1	0	1	2	0	2	0	0	0	1	0	1	3	0	3	10	1	11	0	0	0	16	0	16	1	0	1	7	0	7	0	0	0	5	0	5	20	0	20	0	0	0	0	0	0	66	1	67
5:00 - 6:00	0	0	0	1	0	1	3	0	3	0	0	0	2	0	2	7	0	7	16	0	17	0	0	0	19	0	19	0	0	0	10	0	10	0	0	0	13	1	14	23	0	23	0	0	0	0	0	0	95	2	97
5:15 - 6:15	0	0	0	2	0	2	4	0	4	0	0	0	2	0	2	8	0	9	19	0	19	0	0	0	13	0	14	0	0	0	12	0	12	0	0	0	20	1	21	19	0	19	0	0	0	0	0	0	100	2	102
5:30 - 6:30	0	0	0	3	0	3	4	0	4	0	0	0	1	0	1	13	0	13	21	1	22	0	0	0	10	1	11	0	0	0	18	0	18	0	0	0	26	1	27	21	0	22	0	0	0	0	0	0	118	3	121
5:45 - 6:45	1	0	1	3	0	3	3	0	3	0	0	0	2	0	2	16	1	17	22	1	23	0	0	0	15	1	15	0	0	0	19	1	20	0	0	0	34	1	35	33	1	33	0	0	0	0	0	0	146	5	151
6:00 - 7:00	1	0	1	3	0	3	2	0	2	0	0	0	2	0	2	18	1	19	22	1	23	0	0	0	16	1	17	0	0	0	21	1	22	0	0	0	31	1	32	36	1	37	0	0	0	0	0	0	152	5	156
6:15 - 7:15	1	0	1	2	0	2	1	0	1	0	0	0	2	0	2	23	1	24	22	1	23	0	0	0	19	1	20	1	0	1	28	1	29	0	0	0	29	1	30	38	1	38	0	0	0	0	0	0	166	6	172
6:30 - 7:30	2	0	2	3	0	3	2	1	3	0	0	0	2	0	2	27	1	28	22	2	24	0	0	0	23	1	24	1	0	1	31	2	33	0	0	0	33	2	34	42	1	43	0	0	0	0	0	0	187	9	195
6:45 - 7:45	1	0	1	4	0	4	4	1	4	0	0	0	2	0	2	30	0	30	23	2	25	0	0	0	30	1	30	1	0	1	38	2	39	0	0	0	30	3	34	42	2	43	0	0	0	0	0	0	205	10	215
7:00 - 8:00	1	0	1	4	1	5	5	1	6	0	0	0	2	0	2	33	0	33	29	2	31	0	0	0	31	1	32	1	0	1	43	3	45	0	0	0	36	4	39	44	2	45	0	0	1	0	0	0	229	13	242
7:15 - 8:15	1	0	1	5	1	5	5	1	6	0	0	0	1	0	1	32	0	32	31	3	34	0	0	0	32	1	33	1	0	1	47	3	50	0	0	0	42	4	45	54	2	55	0	0	1	0	0	0	251	13	264
7:30 - 8:30	0	0	0	4	1	5	5	0	5	0	0	0	2	0	3	36	0	37	34	3	37	0	0	0	33	0	33	0	0	1	47	4	51	0	0	0	47	5	52	70	1	71	1	0	1	0	0	0	281	15	296
7:45 - 8:45	1	0	1	3	1	4	6	0	6	0	0	0	3	1	4	49	1	49	33	2	35	0	0	0	32	0	33	1	0	1	50	3	54	0	0	0	56	4	60	97	0	97	0	0	1	0	0	0	332	12	344
8:00 - 9:00	1	0	1	5	1	5	7	0	7	0	0	0	3	1	3	53	2	55	31	2	33	0	0	0	33	1	34	3	1	3	53	3	55	0	0	0	58	5	62	118	0	119	1	0	1	0	0	0	365	15	380
8:15 - 9:15	1	0	1	6	1	6	7	0	7	0	0	0	4	1	4	63	3	66	33	2	35	0	0	0	36	1	37	5	1	6	51	3	54	0	0	0	60	4	64	125	1	126	2	0	2	0	0	0	392	16	408
8:30 - 9:30	1	0	1	6	0	6	7	0	8	0	0	0	3	0	3	63	3	66	34	1	35	0	0	0	41	2	43	7	1	7	53	2	55	0	0	0	56	3	59	114	1	115	1	0	1	0	0	0	386	14	400
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9:00 - 10:00	0	0	0	5	0	5	6	0	6	0	0	0	4	0	4	52	2	53	30	1	31	0	0	0	40	2	42	6	1	6	48	3	51	0	0	0	48	4	52	61	1	62	1	0	1	0	0	0	300	13	313
9:15 - 10:15	1	0	1	3	0	3	6	0	6	0	0	0	5	0	5	49	1	50	30	0	30	0	0	0	45	2	47	5	1	5	53	3	56	0	0	0	46	5	52	50	1	51	0	0	0	0	0	0	294	13	307
9:30 - 10:30	1	0	1	3	0	3	6	0	6	0	0	0	5	0	5	46	1	47	30	1	31	0	0	0	42	1	43	4	0	4	55	2	57	0	0	0	49	5	53	47	1	48	1	0	1	0	0	0	289	11	300
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11:30 - 12:30	2	0	2	5	0	5	4	0	4	0	0	0	5	0	5	40	2	42	30	0	30	1	0	1	31	1	32	6	0	6	47	3	50	1	0	1	55	3	59	38	2	40	1	0	1	0	0	0	266	11	277
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12:00 - 13:00	2	0	2	5	0	5	3	0	3	0	0	0	7	0	7	41	3	44	27	0	28	0	0	0	32	0	32	5	0	5	49	2	51	0	0	0	54	3	57	40	3	43	0	0	0	0	0	0	267	11	277
12:15 - 13:15	1	0	1	5	0	5	3	0	4	0	0	0	6	0	6	41	3	44	26	0	26	0	0	0	31	0	31	4	0	4	54	3	56	0	0	0	61	4	65	48	2	50	0	0	0	0	0	0	280	12	292
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13:00 - 14:00	0	0	0	5	0	5	5	0	5	0	0	0	7	0	7	47	1	49	30	1	31	0	0	0	31	2	33	6	0	6	61	2	63	1	0	1	59	4	63	53	1	55	0	0	0	0	0	0	306	12	317
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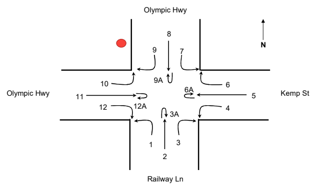
13:45 - 14:45	1	0	1	5	0	5	5	0	5	0	0	0	6	0	6	40	1	41	31	0	31	0	0	0	36	1	36	8	0	8	53	1	54	0	0	0	57	2	59	57	0	57	0	0	0	0	0	0	299	5	304

EST. 1983 austraffic TRAFFIC & TRANSPORT DATA SPECIALISTS



Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Olympic Hwy & Seignior St & Kemp St

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14:15 - 15:15	0	0	**0**	6	0	**6**	6	0	**6**	0	0	**0**	6	0	**6**	61	2	**63**	30	0	**30**	0	0	**0**	39	2	**41**	7	1	**8**	54	1	**55**	0	0	**0**	58	2	**60**	81	1	**82**	0	0	**0**	0	0	**0**	348	9	**357**
14:30 - 15:30	1	0	**1**	6	0	**6**	6	0	**6**	0	0	**0**	8	0	**8**	90	4	**94**	36	0	**36**	0	0	**0**	44	1	**45**	6	1	**6**	61	2	**62**	0	0	**0**	55	3	**58**	93	1	**94**	1	0	**1**	0	0	**0**	405	12	**417**
14:45 - 15:45	0	0	**1**	5	0	**5**	6	0	**6**	0	0	**0**	8	0	**8**	106	4	**110**	42	0	**42**	0	0	**0**	51	1	**52**	7	0	**7**	72	2	**74**	0	0	**0**	54	2	**57**	92	2	**94**	1	0	**1**	0	0	**0**	444	13	**457**
15:00 - 16:00	1	0	**1**	5	0	**5**	5	0	**5**	0	0	**0**	9	0	**9**	112	3	**115**	44	0	**45**	0	0	**0**	50	2	**52**	7	0	**7**	74	3	**76**	0	0	**0**	53	3	**56**	91	2	**93**	1	0	**1**	0	0	**0**	453	13	**467**
15:15 - 16:15	2	0	**2**	7	0	**7**	5	0	**5**	0	0	**0**	9	0	**9**	110	2	**112**	49	0	**49**	0	0	**0**	57	1	**58**	12	0	**12**	79	3	**82**	0	0	**0**	58	2	**60**	77	2	**79**	2	0	**2**	0	0	**0**	466	12	**478**
15:30 - 16:30	1	0	**2**	8	0	**8**	5	0	**6**	0	0	**0**	9	0	**9**	92	1	**93**	45	1	**46**	0	0	**0**	58	1	**59**	13	0	**13**	83	3	**86**	0	0	**0**	59	2	**61**	68	2	**70**	2	0	**2**	0	0	**0**	444	11	**455**
15:45 - 16:45	1	0	**1**	7	0	**7**	5	0	**5**	0	0	**0**	10	1	**10**	84	2	**85**	46	1	**47**	0	0	**0**	50	1	**51**	12	0	**13**	74	3	**78**	0	0	**0**	57	3	**59**	68	1	**69**	2	0	**2**	0	0	**0**	417	12	**430**
16:00 - 17:00	2	0	**2**	8	0	**8**	5	0	**6**	0	0	**0**	10	0	**10**	84	2	**86**	57	1	**58**	0	0	**0**	50	0	**50**	12	0	**13**	80	2	**82**	1	0	**1**	53	4	**57**	61	1	**62**	2	0	**2**	0	0	**0**	425	11	**436**
16:15 - 17:15	2	0	**2**	6	0	**6**	5	0	**5**	0	0	**0**	13	0	**13**	78	2	**80**	58	1	**60**	0	0	**0**	48	0	**48**	8	0	**8**	76	2	**78**	1	0	**1**	52	3	**56**	59	1	**60**	2	0	**2**	0	0	**0**	408	10	**418**
16:30 - 17:30	2	0	**2**	5	0	**5**	5	0	**5**	0	0	**0**	11	0	**12**	80	1	**81**	64	1	**65**	0	0	**0**	47	0	**47**	9	0	**10**	69	2	**70**	1	0	**1**	54	4	**58**	59	0	**60**	2	0	**2**	0	0	**0**	407	9	**416**
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17:00 - 18:00	2	0	**2**	6	0	**6**	3	0	**3**	0	0	**0**	7	0	**7**	76	0	**76**	55	1	**55**	0	0	**0**	43	0	**44**	8	0	**8**	64	1	**64**	0	0	**0**	74	2	**75**	59	1	**60**	1	0	**1**	0	0	**0**	398	5	**403**
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17:45 - 18:45	1	0	**1**	3	0	**3**	3	0	**3**	0	0	**0**	3	0	**3**	45	1	**46**	42	1	**43**	0	0	**0**	40	0	**40**	7	0	**7**	50	0	**50**	0	0	**0**	58	3	**61**	38	0	**38**	0	0	**0**	0	0	**0**	290	5	**295**
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18:30 - 19:30	1	0	**1**	2	0	**2**	1	0	**1**	0	0	**0**	4	0	**4**	34	0	**34**	17	1	**18**	0	0	**0**	20	1	**21**	5	0	**5**	35	0	**35**	0	0	**0**	27	1	**29**	22	0	**22**	0	0	**0**	0	0	**0**	167	3	**171**
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19:00 - 20:00	0	0	**0**	3	0	**3**	1	0	**1**	0	0	**0**	4	0	**4**	22	0	**22**	11	0	**11**	0	0	**0**	10	0	**11**	4	0	**4**	22	0	**23**	0	0	**0**	19	0	**19**	15	0	**15**	0	0	**0**	0	0	**0**	112	1	**113**
19:15 - 20:15	0	0	**0**	3	0	**3**	0	0	**0**	0	0	**0**	3	0	**3**	16	0	**17**	9	0	**9**	0	0	**0**	9	0	**9**	4	0	**4**	18	0	**18**	0	0	**0**	16	0	**16**	15	0	**15**	1	0	**1**	0	0	**0**	95	1	**96**
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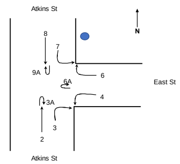
23:00 - 0:00	1	0	**1**	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	3	0	**3**	1	0	**1**	0	0	**0**	3	0	**3**	0	0	**0**	5	0	**5**	0	0	**0**	4	0	**4**	3	0	**3**	0	0	**0**	0	0	**0**	21	1	**22**

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : East St & Atkins St



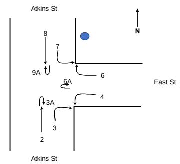
AM

Time Period	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Total of all Movements	Peak Hour Volume Determination	
5:00 - 5:15	-	-	-	2	3	5	-	-	-	10	1	11	7	1	8	0	-	0	2	-	2	1	-	1	-	-	-	27	5:00 - 6:00	153
5:15 - 5:30	-	-	-	4	3	6	-	-	-	3	2	5	8	0	8	-	-	-	7	1	8	0	0	1	-	-	-	28	5:15 - 6:15	189
5:30 - 5:45	-	0	0	5	2	7	-	-	-	7	2	9	8	0	9	-	-	-	9	-	9	1	-	1	-	-	-	34	5:30 - 6:30	233
5:45 - 6:00	-	0	0	4	4	8	-	-	-	18	2	20	26	1	28	-	-	-	6	1	7	1	1	2	-	-	-	64	5:45 - 6:45	311
6:00 - 6:15	-	-	-	6	6	12	-	-	-	18	2	20	21	1	22	0	-	0	6	0	6	1	0	1	-	-	-	62	6:00 - 7:00	436
6:15 - 6:30	0	-	0	9	6	15	-	-	-	21	2	23	20	2	22	0	-	0	10	0	11	2	-	2	-	-	-	73	6:15 - 7:15	542
6:30 - 6:45	1	-	1	14	5	19	-	-	-	35	3	38	29	2	31	1	-	1	16	1	17	4	-	4	-	-	-	112	6:30 - 7:30	630
6:45 - 7:00	0	1	1	24	5	29	-	-	-	50	1	52	72	2	73	1	-	1	27	2	29	5	-	5	-	-	-	190	6:45 - 7:45	725
7:00 - 7:15	1	-	1	24	8	33	0	-	0	46	5	51	42	4	45	-	-	-	31	4	35	4	-	4	-	-	-	168	7:00 - 8:00	821
7:15 - 7:30	2	1	2	15	6	21	-	-	-	46	2	47	56	2	59	0	-	0	29	1	30	1	0	1	-	-	-	161	7:15 - 8:15	975
7:30 - 7:45	3	-	3	36	10	46	-	-	-	33	2	35	76	2	79	1	-	1	38	2	40	2	-	2	0	-	0	206	7:30 - 8:30	1,249
7:45 - 8:00	4	-	4	34	9	43	-	-	-	55	6	61	107	3	110	1	-	1	61	3	64	4	-	4	0	-	0	286	7:45 - 8:45	1,494
8:00 - 8:15	1	1	2	27	7	34	-	-	-	50	5	55	164	3	167	0	-	0	57	2	59	4	1	5	-	-	-	322	8:00 - 9:00	1,687
8:15 - 8:30	3	1	4	34	5	39	-	-	-	64	6	70	238	3	241	1	-	1	77	2	79	1	1	2	-	-	-	435	8:15 - 9:15	1,668
8:30 - 8:45	1	0	1	29	9	38	-	-	-	53	11	64	239	4	243	1	-	1	97	1	98	4	0	5	-	-	-	450	8:30 - 9:30	1,490
8:45 - 9:00	2	1	2	35	7	42	-	-	-	68	8	77	240	1	241	1	-	1	107	5	112	4	1	5	-	-	-	479	8:45 - 9:45	1,270
9:00 - 9:15	3	1	4	28	8	37	0	-	0	43	8	51	131	2	133	0	-	0	69	4	74	5	0	5	0	-	0	304	9:00 - 10:00	1,055
9:15 - 9:30	2	1	2	27	8	35	-	-	-	37	7	44	103	3	106	0	-	0	63	2	64	2	1	3	0	-	0	256	AM Peak	1,687
9:30 - 9:45	3	1	4	23	10	33	-	-	-	26	10	36	92	2	94	1	-	1	55	3	58	4	1	4	-	-	-	231		
9:45 - 10:00	4	0	4	23	9	33	-	-	-	38	8	46	107	2	109	0	-	0	67	2	69	2	-	2	0	-	0	264		
Total	29	7	36	403	130	533	1	-	1	719	94	813	1,787	41	1,827	10	-	10	833	38	871	52	7	59	2	-	2	4,152		
AM Peak	7	2	9	125	28	152	-	-	-	236	30	266	881	11	892	2	-	2	338	10	348	14	3	17	-	-	-	1,687		
10hr Total	97	13	110	1,313	223	1,536	2	-	2	1,311	215	1,526	3,654	69	3,723	32	0	32	4,068	73	4,141	107	13	120	11	1	12	11,203		

PM

Time Period	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Total of all Movements	Peak Hour Volume Determination	
14:00 - 14:15	4	1	5	38	8	46	0	-	0	25	6	31	91	3	94	2	-	2	113	4	117	4	1	5	1	-	1	300	14:00 - 15:00	1,244
14:15 - 14:30	2	2	4	31	5	36	-	-	-	29	11	40	89	2	91	-	-	-	117	3	120	3	-	3	0	-	0	294	14:15 - 15:15	1,359
14:30 - 14:45	3	1	4	36	5	41	-	-	-	29	8	37	98	2	100	-	-	-	120	3	123	4	1	5	0	-	0	311	14:30 - 15:30	1,433
14:45 - 15:00	2	1	3	43	8	50	-	-	-	30	7	37	108	4	112	0	-	0	130	2	132	3	1	4	1	-	1	339	14:45 - 15:45	1,528
15:00 - 15:15	6	0	6	53	9	62	0	-	0	29	7	36	91	3	94	1	0	2	207	2	210	4	0	4	0	-	0	415	15:00 - 16:00	1,583
15:15 - 15:30	3	-	3	47	4	51	-	-	-	34	8	43	87	1	88	0	-	0	173	6	179	2	1	3	1	-	1	368	15:15 - 16:15	1,589
15:30 - 15:45	5	1	6	63	7	70	0	-	0	36	7	43	113	1	114	0	-	0	164	4	168	3	-	3	-	-	-	406	15:30 - 16:30	1,637
15:45 - 16:00	3	-	3	47	5	52	-	-	-	36	9	45	120	0	121	1	-	1	166	2	167	4	-	4	1	-	1	394	15:45 - 16:45	1,641
16:00 - 16:15	5	-	5	53	5	58	0	-	0	37	9	46	114	2	116	6	-	6	181	2	182	4	1	4	1	1	2	421	16:00 - 17:00	1,671
16:15 - 16:30	3	-	3	51	5	56	0	-	0	43	7	50	120	2	122	2	-	2	176	2	177	5	-	5	0	-	0	416	16:15 - 17:15	1,733
16:30 - 16:45	3	-	3	66	5	71	-	-	-	33	7	40	102	-	102	1	-	1	186	2	188	3	-	3	1	-	1	410	16:30 - 17:30	1,779
16:45 - 17:00	4	-	4	53	3	56	-	-	-	44	7	51	120	1	121	0	-	0	188	0	188	3	0	3	-	-	-	424	16:45 - 17:45	1,768
17:00 - 17:15	5	-	5	77	4	81	-	-	-	39	4	44	107	1	108	3	-	3	239	1	239	1	1	2	1	-	1	483	17:00 - 18:00	1,681
17:15 - 17:30	4	-	4	63	2	66	-	-	-	32	5	36	92	1	93	2	-	2	258	0	258	2	0	2	-	-	-	462	17:15 - 18:15	1,476
17:30 - 17:45	4	-	4	52	3	56	-	-	-	26	5	31	90	1	91	1	-	1	213	1	214	3	-	3	-	-	-	399	17:30 - 18:30	1,266
17:45 - 18:00	1	-	1	34	2	36	-	-	-	28	4	32	95	1	96	1	-	1	167	1	168	3	-	3	-	-	-	337	17:45 - 18:45	1,057
18:00 - 18:15	4	-	4	40	4	45	-	-	-	17	2	20	70	1	71	-	-	-	137	1	137	2	-	2	1	-	1	279	18:00 - 19:00	873
18:15 - 18:30	2	-	2	29	4	32	-	-	-	19	4	23	73	-	73	1	-	1	119	1	120	1	-	1	0	-	0	252	PM Peak	1,779
18:30 - 18:45	3	0	3	20	2	22	-	-	-	14	2	16	48	0	48	1	-	1	98	1	99	1	0	1	-	-	-	190		
18:45 - 19:00	-	-	-	12	2	14	-	-	-	11	2	12	40	1	41	-	-	-	83	-	83	2	-	2	-	-	-	152		
Total	68	6	74	910	93	1,002	2	-	2	592	121	713	1,867	29	1,896	22	0	23	3,235	35	3,270	55	6	62	9	1	10	7,051		
PM Peak	17	-	17	260	15	275	-	-	-	148	23	171	421	3	424	6	-	6	871	3	874	9	1	10	2	-	2	1,779		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : East St & Atkins St



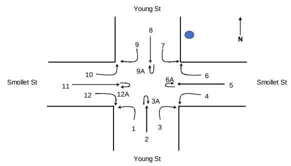
HOURLY FLOW

TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	-	1	1	14	11	25	-	-	-	37	7	44	50	3	53	0	-	0	23	2	25	4	1	5	-	-	-	129	25	153
5:15 - 6:15	-	1	1	18	14	32	-	-	-	46	8	54	64	3	67	0	-	0	27	2	29	4	1	5	-	-	-	159	29	189
5:30 - 6:30	0	1	1	23	17	41	-	-	-	64	8	72	76	5	81	1	-	1	31	1	32	5	1	6	-	-	-	200	33	233
5:45 - 6:45	1	0	2	33	21	53	-	-	-	92	9	101	97	6	103	2	-	2	38	3	40	8	1	9	-	-	-	271	40	311
6:00 - 7:00	2	1	2	53	22	75	-	-	-	125	8	133	142	6	149	3	-	3	59	4	63	11	0	12	-	-	-	394	42	436
6:15 - 7:15	2	1	3	72	24	96	0	-	0	152	11	163	163	9	172	2	-	2	84	7	92	14	-	14	-	-	-	490	52	542
6:30 - 7:30	4	1	5	78	24	102	0	-	0	177	11	188	199	9	208	2	-	2	103	8	111	13	0	14	-	-	-	577	54	630
6:45 - 7:45	5	1	7	100	29	129	0	-	0	174	10	185	246	10	256	2	-	2	125	9	134	11	0	12	0	-	0	664	60	725
7:00 - 8:00	9	1	10	109	34	143	0	-	0	179	15	194	281	11	292	2	-	2	159	10	169	10	0	11	1	-	1	750	71	821
7:15 - 8:15	9	1	11	111	32	144	-	-	-	183	15	198	403	11	414	3	-	3	185	9	193	11	1	12	1	-	1	906	69	975
7:30 - 8:30	11	1	12	130	32	162	-	-	-	202	19	221	585	11	596	3	-	3	232	10	242	11	2	13	1	-	1	1,175	75	1,249
7:45 - 8:45	9	2	11	123	30	154	-	-	-	222	28	250	748	13	761	3	-	3	291	9	300	13	2	15	0	-	0	1,410	84	1,494
8:00 - 9:00	7	2	9	125	28	152	-	-	-	236	30	266	881	11	892	2	-	2	338	10	348	14	3	17	-	-	-	1,602	84	1,687
8:15 - 9:15	9	3	12	126	29	155	0	-	0	228	33	261	848	9	857	2	-	2	350	12	363	14	3	17	0	-	0	1,579	89	1,668
8:30 - 9:30	8	3	10	120	32	152	0	-	0	201	35	236	713	10	723	2	-	2	336	12	348	15	3	18	1	-	1	1,395	95	1,490
8:45 - 9:45	10	3	13	114	33	147	0	-	0	173	34	207	566	8	574	2	-	2	295	14	308	15	3	18	1	-	1	1,176	94	1,270
9:00 - 10:00	12	3	15	102	36	138	0	-	0	143	34	177	433	9	442	2	-	2	254	11	266	12	2	15	1	-	1	960	95	1,055

HOURLY FLOW

TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	12	4	16	147	25	173	0	-	0	114	32	145	386	11	397	2	-	2	480	11	491	14	3	17	3	-	3	1,158	86	1,244
14:15 - 15:15	14	4	17	163	26	189	0	-	0	118	33	151	386	11	397	2	0	2	575	9	584	14	2	16	2	-	2	1,273	86	1,359
14:30 - 15:30	15	2	17	179	25	205	0	-	0	123	30	153	384	10	394	2	0	2	631	12	643	13	3	16	3	-	3	1,350	83	1,433
14:45 - 15:45	17	3	19	206	28	234	1	-	1	129	29	159	399	9	408	2	0	3	675	13	688	12	2	14	2	-	2	1,443	85	1,528
15:00 - 16:00	17	2	19	211	25	236	1	-	1	135	32	167	411	6	416	3	0	3	711	13	724	13	1	14	2	-	2	1,503	80	1,583
15:15 - 16:15	17	1	18	211	21	232	1	-	1	143	34	177	434	5	439	8	-	8	684	13	697	13	2	15	3	1	4	1,513	77	1,589
15:30 - 16:30	16	1	18	215	22	237	1	-	1	151	33	184	467	6	473	9	-	9	686	9	695	15	1	16	2	1	3	1,564	73	1,637
15:45 - 16:45	15	-	15	218	20	238	1	-	1	149	32	181	456	5	461	10	-	10	708	7	715	15	1	15	3	1	4	1,575	66	1,641
16:00 - 17:00	16	-	16	224	18	242	1	-	1	157	30	187	456	5	462	9	-	9	731	6	736	14	1	15	2	1	3	1,610	61	1,671
16:15 - 17:15	16	-	16	248	17	265	0	-	0	159	25	184	449	5	454	6	-	6	789	5	793	11	1	12	2	-	2	1,680	53	1,733
16:30 - 17:30	17	-	17	260	15	275	-	-	-	148	23	171	421	3	424	6	-	6	871	3	874	9	1	10	2	-	2	1,734	45	1,779
16:45 - 17:45	17	-	17	246	13	259	-	-	-	141	21	162	409	4	413	6	-	6	897	2	900	9	1	10	1	-	1	1,727	41	1,768
17:00 - 18:00	15	-	15	227	12	239	-	-	-	125	18	143	384	4	387	7	-	7	876	3	879	9	1	10	1	-	1	1,643	38	1,681
17:15 - 18:15	13	-	13	190	12	202	-	-	-	103	16	119	347	3	350	4	-	4	774	3	777	10	0	10	1	-	1	1,441	35	1,476
17:30 - 18:30	11	-	11	155	14	169	-	-	-	90	15	105	328	3	331	2	-	2	635	4	639	9	-	9	1	-	1	1,232	35	1,266
17:45 - 18:45	10	0	10	123	12	135	-	-	-	79	12	90	286	2	288	2	-	2	521	3	524	7	0	7	1	-	1	1,027	30	1,057
18:00 - 19:00	8	0	9	101	12	113	-	-	-	61	10	71	231	3	233	1	-	1	437	2	439	5	0	5	1	-	1	846	27	873

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Young St & Smollet St



AM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 5:15	-	-	-	7	0	7	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
5:15 - 5:30	-	-	-	9	1	10	-	-	-	-	-	-	-	-	-	0	-	0	0	-	0
5:30 - 5:45	0	-	0	9	0	9	-	-	-	-	-	-	0	-	0	-	-	-	0	-	0
5:45 - 6:00	1	-	1	13	1	14	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
6:00 - 6:15	3	-	3	10	0	11	0	-	0	-	-	-	0	-	0	-	0	0	1	0	1
6:15 - 6:30	3	-	3	12	2	14	-	-	-	-	-	-	-	-	-	0	-	0	1	-	1
6:30 - 6:45	2	-	2	16	0	16	-	0	0	-	-	-	0	0	1	1	-	1	2	0	2
6:45 - 7:00	5	-	5	30	2	32	0	-	0	-	-	-	-	-	-	1	-	1	-	-	-
7:00 - 7:15	5	0	6	22	3	25	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
7:15 - 7:30	9	1	10	18	2	20	-	-	-	-	-	-	0	-	0	1	-	1	1	-	1
7:30 - 7:45	12	1	12	32	2	34	1	-	1	-	-	-	-	-	-	2	-	2	0	-	0
7:45 - 8:00	16	0	16	45	3	48	0	-	0	-	-	-	-	-	-	1	-	1	3	-	3
8:00 - 8:15	24	0	24	58	3	61	-	-	-	-	-	-	-	-	-	1	-	1	3	0	4
8:15 - 8:30	46	-	46	85	2	87	0	-	0	-	-	-	1	-	1	2	-	2	4	0	5
8:30 - 8:45	41	0	42	94	3	98	1	1	2	-	-	-	2	-	2	5	1	5	3	0	3
8:45 - 9:00	39	1	39	100	5	105	0	-	0	-	-	-	0	-	0	2	-	2	7	-	7
9:00 - 9:15	25	1	26	79	3	82	0	-	0	-	-	-	1	-	1	3	-	3	4	-	4
9:15 - 9:30	22	1	23	57	5	62	2	-	2	-	-	-	1	-	1	3	-	3	5	0	5
9:30 - 9:45	17	0	17	58	4	62	1	-	1	0	-	0	-	-	-	3	-	3	3	0	4
9:45 - 10:00	20	1	21	66	2	68	1	-	1	-	-	-	1	-	1	3	-	3	4	-	4
AM Total	290	7	297	819	46	865	8	1	9	0	-	0	8	0	9	27	1	28	46	2	48
AM Peak	151	2	154	358	13	371	2	1	3	-	-	-	5	-	5	11	1	12	19	1	19
10hr Total	582	11	593	2,315	75	2,391	22	1	23	2	-	2	28	1	29	78	2	80	117	3	119

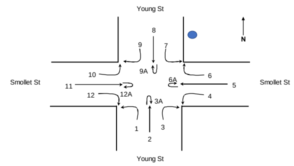
Time Period	Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
5:00 - 5:15	-	-	-	1	-	1	3	0	3	-	-	-	-	-	-	0	-	0	1	-	1	0	-	0	-	-	-	14	5:00 - 6:00	101
5:15 - 5:30	-	-	-	0	-	0	6	0	6	2	-	2	-	-	-	3	0	4	1	-	1	-	0	0	-	-	-	23	5:15 - 6:15	131
5:30 - 5:45	-	-	-	1	-	1	8	-	8	3	0	4	-	-	-	2	1	3	0	-	0	-	-	-	-	-	-	26	5:30 - 6:30	158
5:45 - 6:00	-	-	-	1	-	1	10	1	12	4	0	5	-	-	-	5	-	5	-	0	0	0	-	0	-	-	-	38	5:45 - 6:45	188
6:00 - 6:15	-	-	-	3	-	3	8	1	9	9	2	11	1	-	1	4	-	4	-	0	0	0	0	1	-	-	-	44	6:00 - 7:00	255
6:15 - 6:30	0	-	0	2	-	2	15	1	15	10	-	10	-	-	-	2	2	3	1	-	1	-	-	-	-	-	-	50	6:15 - 7:15	292
6:30 - 6:45	-	-	-	0	-	0	12	1	13	15	0	15	-	-	-	4	0	4	-	0	0	0	-	0	-	-	-	55	6:30 - 7:30	321
6:45 - 7:00	-	-	-	1	-	1	25	2	27	27	2	29	-	-	-	7	1	8	-	-	-	2	0	3	-	-	-	105	6:45 - 7:45	386
7:00 - 7:15	-	-	-	2	-	2	23	1	24	12	1	13	-	-	-	6	0	7	2	-	2	2	-	2	-	-	-	81	7:00 - 8:00	460
7:15 - 7:30	-	-	-	2	-	2	19	2	21	13	1	14	0	-	0	5	1	6	1	-	1	3	1	3	-	-	-	80	7:15 - 8:15	576
7:30 - 7:45	-	-	-	2	-	2	24	1	25	28	2	29	-	-	-	8	1	9	2	-	2	4	0	5	-	-	-	120	7:30 - 8:30	786
7:45 - 8:00	0	-	0	2	-	2	39	2	41	42	1	44	0	-	0	17	0	17	0	-	0	5	-	5	-	-	-	179	7:45 - 8:45	991
8:00 - 8:15	-	-	-	3	0	3	27	2	30	42	3	45	0	-	0	19	1	20	2	-	2	8	-	8	-	-	-	198	8:00 - 9:00	1,153
8:15 - 8:30	-	-	-	5	0	5	45	4	49	70	1	71	0	-	0	14	1	15	2	-	2	6	0	7	-	-	-	290	8:15 - 9:15	1,211
8:30 - 8:45	0	-	0	5	0	5	46	2	49	62	3	64	1	-	1	29	1	30	3	-	3	20	0	21	-	-	-	324	8:30 - 9:30	1,159
8:45 - 9:00	-	-	-	8	0	8	63	3	66	59	4	63	-	-	-	29	6	35	4	1	5	9	1	10	-	-	-	342	8:45 - 9:45	1,064
9:00 - 9:15	-	-	-	4	-	4	46	2	48	47	1	49	0	-	0	22	1	23	4	0	4	10	1	10	-	-	-	255	9:00 - 10:00	968
9:15 - 9:30	-	-	-	2	1	2	44	2	47	48	2	50	-	-	-	33	1	34	2	-	2	7	-	7	-	-	-	238	AM Peak	1,211
9:30 - 9:45	-	-	-	3	-	3	44	3	47	44	1	46	1	-	1	33	1	34	2	-	2	10	0	10	-	-	-	230		
9:45 - 10:00	-	-	-	5	-	5	49	2	51	42	2	44	0	-	0	32	1	33	3	-	3	11	1	12	-	-	-	246		
AM Total	1	-	1	51	2	53	557	32	590	580	26	606	4	-	4	275	20	294	28	2	30	99	6	104	-	-	-	2,937		
AM Peak	0	-	0	21	1	22	200	12	212	238	9	247	1	-	1	94	9	104	12	1	13	45	3	48	-	-	-	1,211		
10hr Total	1	-	1	132	5	137	1,998	58	2,056	1,423	35	1,458	11	-	11	1,280	34	1,314	78	3	81	588	8	597	-	-	-			

PM

Time Period	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 14:15	16	0	16	77	2	79	1	-	1	-	-	-	2	-	2	3	-	3	4	-	4
14:15 - 14:30	16	1	17	65	3	68	1	-	1	-	-	-	1	0	1	3	-	3	3	0	4
14:30 - 14:45	16	-	16	71	3	73	1	-	1	0	-	0	1	-	1	2	-	2	2	-	2
14:45 - 15:00	18	1	19	63	2	65	0	-	0	0	-	0	2	-	2	4	-	4	3	-	3
15:00 - 15:15	19	-	19	83	3	85	0	-	0	0	-	0	1	-	1	4	-	4	5	-	5
15:15 - 15:30	12	-	12	99	4	103	2	-	2	-	-	-	2	-	2	4	-	4	4	-	4
15:30 - 15:45	19	-	19	92	4	97	1	-	1	-	-	-	0	-	0	5	1	6	3	-	3
15:45 - 16:00	16	-	16	90	1	92	0	-	0	-	-	-	1	-	1	2	-	2	5	-	5
16:00 - 16:15	15	1	16	94	1	94	1	-	1	0	-	0	3	0	3	5	-	5	6	-	6
16:15 - 16:30	19	-	19	84	2	86	-	-	-	-	-	-	1	-	1	3	-	3	5	-	5
16:30 - 16:45	18	-	18	94	1	95	1	-	1	-	-	-	1	-	1	2	-	2	3	-	3
16:45 - 17:00	21	-	21	76	0	76	2	-	2	-	-	-	1	-	1	4	-	4	4	-	4
17:00 - 17:15	18	-	18	97	1	98	1	-	1	-	-	-	2	-	2	2	-	2	5	-	5
17:15 - 17:30	14	0	15	83	0	83	1	-	1	-	-	-	1	-	1	1	-	1	4	-	4
17:30 - 17:45	12	-	12	76	1	76	0	-	0	-	-	-	-	-	-	1	-	1	8	-	8
17:45 - 18:00	12	-	12	62	1	63	0	-	0	-	-	-	0	-	0	1	-	1	3	-	3
18:00 - 18:15	10	-	10	64	-	64	-	-	-	-	-	-	-	-	-	1	-	1	1	-	1
18:15 - 18:30	9	-	9	54	0	55	-	-	-	-	-	-	1	-	1	1	-	1	0	-	0
18:30 - 18:45	7	-	7	39	0	40	-	-	-	-	-	-	-	-	-	3	-	3	0	-	0
18:45 - 19:00	5	-	5	33	0	33	-	-	-	-	-	-	-	-	-	0	-	0	2	-	2
PM Total	292	4	296	1,496	29	1,526	15	-	15	1	-	1	20	1	20	51	1	52	71	0	71
PM Peak	71	0	71	350	3	353	5	-	5	-	-	-	4	-	4	10	-	10	17	-	17

Time Period	Movement 6A			Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
14:00 - 14:15	-	-	-	4	-	4	68	4	73	56	1	56	0	-	0	55	1	56	2	-	2	16	-	16	-	-	-	311	14:00 - 15:00	1,189
14:15 - 14:30	-	-	-	5	0	5	61	0	61	38	2	40	1	-	1	57	1	58	3	-	3	23	0	23	-	-	-	287	14:15 - 15:15	1,235
14:30 - 14:45	-	-	-	5	-	5	64	3	67	45	0	45	0	-	0	55	1	56	3	-	3	17	0	18	-	-	-	290	14:30 - 15:30	1,286
14:45 - 15:00	-	-	-	6	-	6	70	3	73	53	-	53	-	-	-	49	1	51	3	-	3	21	0	21	-	-	-	302	14:45 - 15:45	1,346
15:00 - 15:15	-	-	-	5	-	5	83	2	85	46	1	46	0	-	0	62	4	66	4	0	4	36	-	36	-	-	-	357	15:00 - 16:00	1,373
15:15 - 15:30	-	-	-	5	0	5	73	3	76	48	2	50	0	-	0	48	3	51	4	1	5	24	-	24	-	-	-	337	15:15 - 16:15	1,370
15:30 - 15:45	0	-	0	3	1	4	74	2	76	53	1	53	1	-	1	57	1	59	4	-	4	28	-	28	-	-	-	350	15:30 - 16:30	1,368
15:45 - 16:00	-	-	-	5	0	5	70	1	71	56	-	56	1	-	1	51	1	52	6	-	6	22	-	22	-	-	-	329	15:45 - 16:45	1,361
16:00 - 16:15	-	-	-	5	1	6	80	1	81	50	0	51	0	-	0	61	0	61	4	-	4	24	-	24	-	-	-	353	16:00 - 17:00	1,374
16:15 - 16:30	-	-	-	3	-	3	79	1	81	45	1	46	1	-	1	64	-	64	3	-	3	24	0	25	-	-	-	335	16:15 - 17:15	1,422
16:30 - 16:45	-	-	-	7	-	7	82	2	84	49	1	50	-	-	-	52	0	53	1	-	1	29	-	29	-	-	-	343	16:30 - 17:30	1,432
16:45 - 17:00	-	-	-	6	-	6	87	0	88	56	0	56	1	-	1	51	0	51	1	-	1	31	0	31	-	-	-	342	16:45 - 17:45	1,390
17:00 - 17:15	-	-	-	5	-	5	127	1	127	38	0	38	0	-	0	59	0	59	2	-	2	42	0	42	-	-	-	401	17:00 - 18:00	1,303
17:15 - 17:30	-	-	-	1	-	1	96	-	96	41	-	41	0	-	0	59	-	59	2	-	2	39	0	39	-	-	-	345	17:15 - 18:15	1,109
17:30 - 17:45	-	-	-	8	-	8	76	-	76	39	-	39	0	-	0	52	-	52	2	-	2	26	0	26	-	-	-	301	17:30 - 18:30	967
17:45 - 18:00	-	-	-	2	-	2	73	1	74	34	-	34	0	-	0	43	-	43	1	-	1	20	-	20	-	-	-	255	17:45 - 18:45	832
18:00 - 18:15	-	-	-	2	-	2	51	-	51	24	-	24	-	-	-	35	-	35	2	-	2	18	-	18	-	-	-	208	18:00 - 19:00	714
18:15 - 18:30	-	-	-	1	-	1	55	0	55	28	-	28	-	-	-	35	-	35	1	-	1	17	-	17	-	-	-	203	PM Peak	1,432
18:30 - 18:45	-	-	-	1	-	1	41	0	41	26	-	26	0	-	0	32	-	32	1	-	1	15	-	15	-	-	-	166		
18:45 - 19:00	-	-	-	1	-	1	30	1	31	19	0	19	-	-	-	27	-	27	2	-	2	18	-	18	-	-	-	138		
PM Total	0	-	0	82	3	84	1,441	25	1,466	843	9	851	7	-	7	1,005	14	1,019	51	1	52	490	3	492	-	-	-	5,954		
PM Peak	-	-	-	20	-	20	392	3	395	184	1	185	1	-	1	222	1	223	6	-	6	141	1	142	-	-	-	1,432		

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Young St & Smollet St



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	1	-	1	38	3	41	-	-	-	-	-	-	0	-	0	0	-	0	2	-	2	-	-	-
5:15 - 6:15	4	-	4	41	3	44	0	-	0	-	-	-	1	-	1	0	0	1	2	0	2	-	-	-
5:30 - 6:30	7	-	7	44	4	48	0	-	0	-	-	-	1	-	1	0	0	1	3	0	3	0	-	0
5:45 - 6:45	9	-	9	51	4	55	0	0	1	-	-	-	1	0	1	1	0	1	4	1	5	0	-	0
6:00 - 7:00	13	-	13	67	5	73	1	0	1	-	-	-	1	0	1	2	0	2	4	1	4	0	-	0
6:15 - 7:15	16	0	16	79	8	87	1	0	1	-	-	-	0	0	1	2	-	2	4	0	4	0	-	0
6:30 - 7:30	21	1	23	86	8	94	1	0	1	-	-	-	1	0	1	2	-	2	4	0	4	-	-	-
6:45 - 7:45	31	2	33	102	10	111	1	-	1	-	-	-	0	-	0	3	-	3	3	-	3	-	-	-
7:00 - 8:00	42	2	44	117	10	127	1	-	1	-	-	-	0	-	0	4	-	4	6	-	6	0	-	0
7:15 - 8:15	60	2	62	153	10	163	1	-	1	-	-	-	0	-	0	5	-	5	8	0	8	0	-	0
7:30 - 8:30	98	1	99	219	10	229	1	-	1	-	-	-	1	-	1	7	-	7	11	1	12	0	-	0
7:45 - 8:45	127	1	128	282	11	293	2	1	2	-	-	-	3	-	3	10	1	10	14	1	15	1	-	1
8:00 - 9:00	150	1	151	337	13	350	2	1	2	-	-	-	3	-	3	10	1	11	18	1	19	0	-	0
8:15 - 9:15	151	2	154	358	13	371	2	1	3	-	-	-	5	-	5	11	1	12	19	1	19	0	-	0
8:30 - 9:30	127	3	130	330	16	346	4	1	4	-	-	-	5	-	5	12	1	13	19	1	20	0	-	0
8:45 - 9:45	103	3	106	294	17	311	3	-	3	0	-	0	3	-	3	10	-	10	20	1	20	-	-	-
9:00 - 10:00	84	3	87	260	14	274	4	-	4	0	-	0	4	-	4	11	-	11	17	1	18	-	-	-

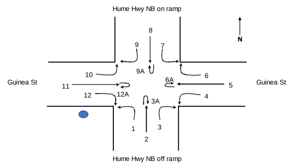
TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	3	-	3	27	2	29	9	1	10	-	-	-	11	1	12	2	0	2	1	0	1	-	-	-	94	7	101
5:15 - 6:15	4	-	4	33	3	35	19	2	21	1	-	1	14	1	15	1	1	2	1	1	1	-	-	-	120	11	131
5:30 - 6:30	6	-	6	42	3	45	27	2	30	1	-	1	13	2	15	1	1	2	1	0	1	-	-	-	145	13	158
5:45 - 6:45	5	-	5	46	4	49	39	2	41	1	-	1	14	2	16	1	1	2	1	0	1	-	-	-	173	15	188
6:00 - 7:00	5	-	5	61	4	65	61	4	65	1	-	1	16	3	19	1	1	1	3	1	4	-	-	-	235	20	255
6:15 - 7:15	5	-	5	75	4	79	64	3	67	-	-	-	18	3	22	3	0	3	4	0	5	-	-	-	271	21	292
6:30 - 7:30	5	-	5	79	6	85	67	4	71	0	-	0	22	2	24	3	0	3	7	1	8	-	-	-	297	24	321
6:45 - 7:45	7	-	7	91	6	96	80	5	85	0	-	0	26	3	29	4	-	4	11	1	12	-	-	-	359	27	386
7:00 - 8:00	8	-	8	105	5	110	95	5	100	1	-	1	36	2	39	5	-	5	14	1	15	-	-	-	434	26	460
7:15 - 8:15	9	0	10	109	7	116	125	7	132	1	-	1	49	3	52	4	-	4	20	1	21	-	-	-	546	31	576
7:30 - 8:30	12	1	12	135	9	144	182	7	188	1	-	1	58	3	62	5	-	5	24	1	25	-	-	-	754	32	786
7:45 - 8:45	15	1	16	158	10	168	216	8	223	2	-	2	79	4	82	7	-	7	40	1	41	-	-	-	953	38	991
8:00 - 9:00	20	1	21	182	12	193	232	11	243	1	-	1	91	10	101	10	1	11	44	2	46	-	-	-	1,100	53	1,153
8:15 - 9:15	21	1	22	200	12	212	238	9	247	1	-	1	94	9	104	12	1	13	45	3	48	-	-	-	1,159	52	1,211
8:30 - 9:30	18	1	20	200	10	210	216	10	226	1	-	1	113	9	122	13	1	14	46	2	48	-	-	-	1,104	55	1,159
8:45 - 9:45	17	1	18	197	10	208	199	9	208	1	-	1	118	9	126	12	1	13	35	2	38	-	-	-	1,012	53	1,064
9:00 - 10:00	14	1	15	183	9	192	182	6	188	1	-	1	121	4	124	10	0	11	38	2	39	-	-	-	929	40	968

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	66	2	68	276	9	285	4	-	4	1	-	1	6	0	6	12	-	12	13	0	13	-	-	-
14:15 - 15:15	69	2	71	282	10	292	3	-	3	1	-	1	5	0	6	13	-	13	14	0	14	-	-	-
14:30 - 15:30	65	1	66	315	11	326	4	-	4	1	-	1	6	-	6	13	-	13	14	-	14	-	-	-
14:45 - 15:45	68	1	69	337	13	350	4	-	4	1	-	1	5	-	5	16	1	17	15	-	15	0	-	0
15:00 - 16:00	67	-	67	364	13	377	4	-	4	0	-	0	4	-	4	15	1	16	17	-	17	0	-	0
15:15 - 16:15	63	1	64	375	11	386	5	-	5	0	-	0	6	0	7	16	1	17	18	-	18	0	-	0
15:30 - 16:30	69	1	70	361	8	369	3	-	3	0	-	0	6	0	6	15	1	16	19	-	19	0	-	0
15:45 - 16:45	68	1	69	362	5	367	3	-	3	0	-	0	6	0	7	12	-	12	20	-	20	-	-	-
16:00 - 17:00	73	1	74	348	4	351	4	-	4	0	-	0	6	0	6	14	-	14	19	-	19	-	-	-
16:15 - 17:15	75	-	75	351	4	355	4	-	4	-	-	-	5	-	5	12	-	12	17	-	17	-	-	-
16:30 - 17:30	71	0	71	350	3	353	5	-	5	-	-	-	4	-	4	10	-	10	17	-	17	-	-	-
16:45 - 17:45	65	0	65	332	2	334	5	-	5	-	-	-	3	-	3	9	-	9	21	-	21	-	-	-
17:00 - 18:00	56	0	56	318	3	321	3	-	3	-	-	-	3	-	3	6	-	6	19	-	19	-	-	-
17:15 - 18:15	48	0	48	285	2	287	2	-	2	-	-	-	1	-	1	4	-	4	16	-	16	-	-	-
17:30 - 18:30	43	-	43	256	2	258	1	-	1	-	-	-	1	-	1	4	-	4	12	-	12	-	-	-
17:45 - 18:45	38	-	38	220	2	222	0	-	0	-	-	-	1	-	1	5	-	5	4	-	4	-	-	-
18:00 - 19:00	31	-	31	190	1	191	-	-	-	-	-	-	1	-	1	4	-	4	3	-	3	-	-	-

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	21	0	21	263	11	274	192	3	194	1	-	1	217	4	221	11	-	11	77	1	78	-	-	-	1,158	31	1,189
14:15 - 15:15	22	0	22	278	9	286	182	3	184	1	-	1	223	7	230	13	0	13	97	1	98	-	-	-	1,203	33	1,235
14:30 - 15:30	22	0	22	290	11	301	191	3	194	1	-	1	214	9	223	14	1	15	98	1	99	-	-	-	1,249	37	1,286
14:45 - 15:45	19	1	20	300	9	309	199	3	203	2	-	2	217	10	226	15	1	16	109	0	109	-	-	-	1,306	40	1,346
15:00 - 16:00	17	2	19	300	7	307	202	3	205	2	-	2	218	9	227	17	1	18	109	-	109	-	-	-	1,338	36	1,373
15:15 - 16:15	17	2	19	297	6	304	207	3	210	2	-	2	217	5	223	18	1	18	97	-	97	-	-	-	1,339	31	1,370
15:30 - 16:30	15	2	17	304	5	309	204	2	206	3	-	3	233	2	235	16	-	16	98	0	98	-	-	-	1,346	22	1,368
15:45 - 16:45	20	1	21	311	5	316	200	2	202	2	-	2	228	1	229	13	-	13	99	0	100	-	-	-	1,346	15	1,361
16:00 - 17:00	22	1	22	328	5	333	200	2	202	2	-	2	228	1	229	9	-	9	108	1	109	-	-	-	1,360	14	1,374
16:15 - 17:15	22	-	22	375	4	379	188	2	190	2	-	2	226	1	227	7	-	7	126	1	127	-	-	-	1,410	12	1,422
16:30 - 17:30	20	-	20	392	3	395	184	1	185	1	-	1	222	1	223	6	-	6	141	1	142	-	-	-	1,423	9	1,432
16:45 - 17:45	21	-	21	386	1	387	174	1	175	2	-	2	221	1	222	8	-	8	137	1	139	-	-	-	1,384	6	1,390
17:00 - 18:00	17	-	17	372	1	373	153	0	153	1	-	1	213	0	214	8	-	8	127	1	128	-	-	-	1,297	6	1,303
17:15 - 18:15	14	-	14	296	1	297	138	-	138	1	-	1	190	-	190	8	-	8	103	1	103	-	-	-	1,106	4	1,109
17:30 - 18:30	14	-	14	255	1	256	125	-	125	1	-	1	166	-	166	6	-	6	81	0	82	-	-	-	964	3	967
17:45 - 18:45	6	-	6	220	1	221	112	-	112	1	-	1	146	-	146	5	-	5	71	-	71	-	-	-	829	3	832
18:00 - 19:00	5	-	5	177	1	179	96	0	97	0	-	0	129	-	129	6	-	6	68	-	68	-	-	-	712	3	714

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Guinea St & Hume Hwy NB on off ramps



AM

Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
5:00 - 5:15	5	0	5	-	-	-	10	0	10	-	-	-	-	-	-	22	1	23	2	-	2	-	-	-
5:15 - 5:30	6	1	6	-	-	-	21	1	22	-	-	-	-	-	-	14	1	16	3	-	3	-	-	-
5:30 - 5:45	10	-	10	-	-	-	31	1	33	-	-	-	-	-	-	28	2	30	7	-	7	-	-	-
5:45 - 6:00	11	1	12	-	-	-	36	1	37	-	-	-	-	-	-	51	0	51	7	0	7	-	-	-
6:00 - 6:15	12	1	13	-	-	-	28	2	30	-	-	-	-	-	-	43	2	45	2	1	3	-	-	-
6:15 - 6:30	16	0	17	-	-	-	39	2	41	-	-	-	-	-	-	33	2	35	7	1	8	-	-	-
6:30 - 6:45	24	2	26	0	-	0	66	5	71	-	-	-	-	-	-	73	0	73	5	0	5	-	-	-
6:45 - 7:00	34	-	34	-	-	-	80	4	84	-	-	-	-	-	-	101	1	102	9	-	9	-	-	-
7:00 - 7:15	20	1	21	-	-	-	52	2	54	-	-	-	-	-	-	68	1	69	5	1	5	-	-	-
7:15 - 7:30	28	0	29	-	-	-	61	3	64	-	-	-	-	-	-	98	3	101	13	-	13	0	-	0
7:30 - 7:45	40	1	42	-	-	-	56	3	59	-	-	-	-	-	-	125	1	126	10	0	10	-	-	-
7:45 - 8:00	70	1	71	-	-	-	68	8	76	-	-	-	-	-	-	182	1	183	12	2	13	-	-	-
8:00 - 8:15	82	1	83	0	-	0	71	9	80	-	-	-	-	-	-	204	5	209	25	1	26	0	-	0
8:15 - 8:30	88	-	88	-	-	-	64	7	71	-	-	-	-	-	-	273	6	279	12	1	13	-	-	-
8:30 - 8:45	63	2	65	-	-	-	50	6	56	-	-	-	-	-	-	247	5	252	13	0	14	-	-	-
8:45 - 9:00	66	1	67	-	-	-	54	3	58	-	-	-	-	-	-	267	4	271	14	-	14	-	-	-
9:00 - 9:15	52	1	53	0	-	0	48	4	52	-	-	-	-	-	-	183	6	189	10	1	10	-	-	-
9:15 - 9:30	41	1	42	-	-	-	38	8	46	-	-	-	-	-	-	188	3	191	12	0	12	-	-	-
9:30 - 9:45	41	1	43	-	-	-	40	7	47	-	-	-	-	-	-	173	6	178	10	1	11	-	-	-
9:45 - 10:00	38	2	40	-	-	-	46	8	55	-	-	-	-	-	-	183	3	187	10	1	11	-	-	-
AM Total	**748**	**17**	**765**	**1**	**-**	**1**	**958**	**87**	**1,045**	**-**	**-**	**-**	**-**	**-**	**-**	**2,555**	**54**	**2,610**	**186**	**11**	**197**	**1**	**-**	**1**
AM Peak	**299**	**4**	**303**	**0**	**-**	**0**	**239**	**26**	**265**	**-**	**-**	**-**	**-**	**-**	**-**	**991**	**20**	**1,011**	**64**	**2**	**66**	**0**	**-**	**0**
10hr Total	1706.3333	29.333333	1735.6667	3.6666667	0.6666667	4.3333333	1768	160	1928	0	0	0	0	0	0	5945	90.333333	6035.3333	446.33333	21.333333	467.66667	1	0	1

Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
5:00 - 5:15	-	-	-	-	-	-	-	-	-	-	-	-	4	-	4	7	0	8	-	-	-	-	-	-	52	5:00 - 6:00	434
5:15 - 5:30	-	-	-	-	-	-	-	-	-	-	-	-	6	0	6	28	1	29	-	-	-	-	-	-	82	5:15 - 6:15	536
5:30 - 5:45	-	-	-	-	-	-	-	-	-	-	-	-	5	-	5	40	1	41	-	-	-	-	-	-	126	5:30 - 6:30	604
5:45 - 6:00	-	-	-	-	-	-	-	-	-	-	-	-	15	1	16	49	2	51	-	-	-	-	-	-	174	5:45 - 6:45	737
6:00 - 6:15	-	-	-	-	-	-	-	-	-	-	-	-	13	0	14	48	1	49	-	-	-	-	-	-	154	6:00 - 7:00	906
6:15 - 6:30	-	-	-	-	-	-	-	-	-	-	-	-	8	1	9	40	1	41	-	-	-	-	-	-	150	6:15 - 7:15	990
6:30 - 6:45	-	-	-	-	-	-	-	-	-	-	-	-	17	1	18	65	1	66	-	-	-	-	-	-	259	6:30 - 7:30	1,143
6:45 - 7:00	-	-	-	-	-	-	-	-	-	-	-	-	26	1	27	85	2	87	-	-	-	-	-	-	343	6:45 - 7:45	1,238
7:00 - 7:15	-	-	-	-	-	-	-	-	-	-	-	-	20	1	21	66	2	68	-	-	-	-	-	-	238	7:00 - 8:00	1,399
7:15 - 7:30	-	-	-	-	-	-	-	-	-	-	-	-	23	1	24	68	3	71	-	-	-	-	-	-	302	7:15 - 8:15	1,711
7:30 - 7:45	-	-	-	-	-	-	-	-	-	-	-	-	27	1	28	86	3	89	-	-	-	-	-	-	354	7:30 - 8:30	2,018
7:45 - 8:00	-	-	-	-	-	-	-	-	-	-	-	-	40	1	41	117	3	120	-	-	-	-	-	-	504	7:45 - 8:45	2,196
8:00 - 8:15	-	-	-	-	-	-	-	-	-	-	-	-	32	1	33	115	3	118	-	-	-	-	-	-	550	8:00 - 9:00	2,305
8:15 - 8:30	-	-	-	-	-	-	-	-	-	-	-	-	30	1	31	124	4	128	-	-	-	-	-	-	609	8:15 - 9:15	2,219
8:30 - 8:45	-	-	-	-	-	-	-	-	-	-	-	-	31	2	33	109	4	113	-	-	-	-	-	-	533	8:30 - 9:30	2,044
8:45 - 9:00	-	-	-	-	-	-	-	-	-	-	-	-	37	-	37	162	4	166	-	-	-	-	-	-	612	8:45 - 9:45	1,946
9:00 - 9:15	-	-	-	-	-	-	-	-	-	-	-	-	35	1	35	118	7	125	-	-	-	-	-	-	465	9:00 - 10:00	1,794
9:15 - 9:30	-	-	-	-	-	-	-	-	-	-	-	-	32	1	33	108	2	110	-	-	-	-	-	-	434	AM Peak	2,305
9:30 - 9:45	-	-	-	-	-	-	-	-	-	-	-	-	32	2	33	116	6	122	-	-	-	-	-	-	434		
9:45 - 10:00	-	-	-	-	-	-	-	-	-	-	-	-	33	1	34	131	3	135	-	-	-	-	-	-	460		
AM Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**467**	**14**	**481**	**1,685**	**53**	**1,738**	**-**	**-**	**-**	**-**	**-**	**-**	**6,837**		
AM Peak	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**130**	**4**	**134**	**511**	**15**	**526**	**-**	**-**	**-**	**-**	**-**	**-**	**2,305**		
10hr Total	0	0	0	0	0	0	0	0	0	0	0	0	1659.6667	31.333333	1691	5363.6667	97	5460.6667	0	0	0	0	0	0			

PM

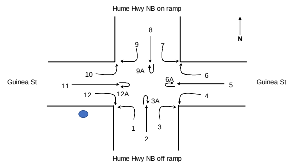
Time Period	Movement 1 Light	Movement 1 Heavy	Movement 1 Total	Movement 2 Light	Movement 2 Heavy	Movement 2 Total	Movement 3 Light	Movement 3 Heavy	Movement 3 Total	Movement 3A Light	Movement 3A Heavy	Movement 3A Total	Movement 4 Light	Movement 4 Heavy	Movement 4 Total	Movement 5 Light	Movement 5 Heavy	Movement 5 Total	Movement 6 Light	Movement 6 Heavy	Movement 6 Total	Movement 6A Light	Movement 6A Heavy	Movement 6A Total
14:00 - 14:15	34	2	36	-	0	0	41	7	48	-	-	-	-	-	-	169	3	172	11	1	12	-	-	-
14:15 - 14:30	35	1	36	0	-	0	40	4	44	-	-	-	-	-	-	164	3	166	11	2	13	-	-	-
14:30 - 14:45	36	2	38	-	-	-	39	6	45	-	-	-	-	-	-	184	3	186	14	-	14	-	-	-
14:45 - 15:00	48	2	50	0	-	0	47	7	54	-	-	-	-	-	-	175	2	177	12	1	13	-	-	-
15:00 - 15:15	32	0	32	-	-	-	33	3	35	-	-	-	-	-	-	178	3	181	17	1	17	-	-	-
15:15 - 15:30	50	1	51	0	-	0	45	7	52	-	-	-	-	-	-	191	3	195	17	1	18	-	-	-
15:30 - 15:45	63	0	63	0	-	0	57	8	65	-	-	-	-	-	-	182	3	185	15	1	16	-	-	-
15:45 - 16:00	56	0	56	-	-	-	41	6	47	-	-	-	-	-	-	178	3	181	18	1	18	-	-	-
16:00 - 16:15	53	1	54	0	-	0	49	5	54	-	-	-	-	-	-	188	3	191	17	0	18	-	-	-
16:15 - 16:30	55	0	56	-	-	-	55	4	59	-	-	-	-	-	-	186	1	188	18	1	19	-	-	-
16:30 - 16:45	54	-	54	-	0	0	45	4	49	-	-	-	-	-	-	204	1	206	18	0	18	-	-	-
16:45 - 17:00	60	0	60	-	-	-	46	4	50	-	-	-	-	-	-	199	0	200	15	0	16	-	-	-
17:00 - 17:15	57	-	57	-	-	-	42	3	46	-	-	-	-	-	-	189	1	191	13	0	13	-	-	-
17:15 - 17:30	59	0	59	-	-	-	44	2	46	-	-	-	-	-	-	184	1	185	11	1	12	-	-	-
17:30 - 17:45	56	1	57	0	-	0	37	0	37	-	-	-	-	-	-	168	1	169	13	0	13	-	-	-
17:45 - 18:00	51	0	52	0	-	0	37	2	39	-	-	-	-	-	-	170	1	171	11	0	11	-	-	-
18:00 - 18:15	48	-	48	-	-	-	35	0	35	-	-	-	-	-	-	137	0	138	7	-	7	-	-	-
18:15 - 18:30	50	0	50	-	-	-	30	2	32	-	-	-	-	-	-	144	0	144	7	-	7	0	-	0
18:30 - 18:45	30	-	30	-	-	-	24	-	24	-	-	-	-	-	-	107	1	109	9	-	9	-	-	-
18:45 - 19:00	31	-	31	0	-	0	24	1	24	-	-	-	-	-	-	91	1	92	6	-	6	-	-	-
PM Total	**958**	**12**	**971**	**3**	**1**	**3**	**810**	**73**	**883**	**-**	**-**	**-**	**-**	**-**	**-**	**3,390**	**36**	**3,426**	**260**	**11**	**271**	**0**	**-**	**0**
PM Peak	**230**	**1**	**231**	**-**	**0**	**0**	**177**	**13**	**190**	**-**	**-**	**-**	**-**	**-**	**-**	**777**	**4**	**781**	**57**	**2**	**59**	**-**	**-**	**-**

Time Period	Movement 7 Light	Movement 7 Heavy	Movement 7 Total	Movement 8 Light	Movement 8 Heavy	Movement 8 Total	Movement 9 Light	Movement 9 Heavy	Movement 9 Total	Movement 9A Light	Movement 9A Heavy	Movement 9A Total	Movement 10 Light	Movement 10 Heavy	Movement 10 Total	Movement 11 Light	Movement 11 Heavy	Movement 11 Total	Movement 12 Light	Movement 12 Heavy	Movement 12 Total	Movement 12A Light	Movement 12A Heavy	Movement 12A Total	Total of all Movements	Peak Hour Volume Determination	
14:00 - 14:15	-	-	-	-	-	-	-	-	-	-	-	-	43	1	44	178	5	183	-	-	-	-	-	-	495	14:00 - 15:00	2,007
14:15 - 14:30	-	-	-	-	-	-	-	-	-	-	-	-	42	1	43	171	3	174	-	-	-	-	-	-	477	14:15 - 15:15	2,038
14:30 - 14:45	-	-	-	-	-	-	-	-	-	-	-	-	55	2	57	184	3	187	-	-	-	-	-	-	527	14:30 - 15:30	2,140
14:45 - 15:00	-	-	-	-	-	-	-	-	-	-	-	-	55	1	56	154	3	158	-	-	-	-	-	-	508	14:45 - 15:45	2,208
15:00 - 15:15	-	-	-	-	-	-	-	-	-	-	-	-	63	1	63	192	5	197	-	-	-	-	-	-	526	15:00 - 16:00	2,261
15:15 - 15:30	-	-	-	-	-	-	-	-	-	-	-	-	63	3	65	195	2	197	-	-	-	-	-	-	578	15:15 - 16:15	2,335
15:30 - 15:45	-	-	-	-	-	-	-	-	-	-	-	-	58	2	60	201	5	206	-	-	-	-	-	-	595	15:30 - 16:30	2,344
15:45 - 16:00	-	-	-	-	-	-	-	-	-	-	-	-	60	0	61	197	1	198	-	-	-	-	-	-	561	15:45 - 16:45	2,356
16:00 - 16:15	-	-	-	-	-	-	-	-	-	-	-	-	69	2	71	210	2	212	-	-	-	-	-	-	600	16:00 - 17:00	2,389
16:15 - 16:30	-	-	-	-	-	-	-	-	-	-	-	-	60	0	60	201	5	206	-	-	-	-	-	-	587	16:15 - 17:15	2,433
16:30 - 16:45	-	-	-	-	-	-	-	-	-	-	-	-	72	3	75	204	1	204	-	-	-	-	-	-	607	16:30 - 17:30	2,485
16:45 - 17:00	-	-	-	-	-	-	-	-	-	-	-	-	68	1	68	198	2	200	-	-	-	-	-	-	594	16:45 - 17:45	2,435
17:00 - 17:15	-	-	-	-	-	-	-	-	-	-	-	-	90	1	91	246	1	247	-	-	-	-	-	-	645	17:00 - 18:00	2,367
17:15 - 17:30	-	-	-	-	-	-	-	-	-	-	-	-	79	-	79	257	1	258	-	-	-	-	-	-	639	17:15 - 18:15	2,161
17:30 - 17:45	-	-	-	-	-	-	-	-	-	-	-	-	77	0	77	203	-	203	-	-	-	-	-	-	557	17:30 - 18:30	1,936
17:45 - 18:00	-	-	-	-	-	-	-	-	-	-	-	-	65	-	65	186	3	189	-	-	-	-	-	-	526	17:45 - 18:45	1,703
18:00 - 18:15	-	-	-	-	-	-	-	-	-	-	-	-	57	0	58	154	-	154	-	-	-	-	-	-	439	18:00 - 19:00	1,464
18:15 - 18:30	-	-	-	-	-	-	-	-	-	-	-	-	45	0	45	134	1	135	-	-	-	-	-	-	414	PM Peak	2,485
18:30 - 18:45	-	-	-	-	-	-	-	-	-	-	-	-	43	-	43	109	1	109	-	-	-	-	-	-	324		
18:45 - 19:00	-	-	-	-	-	-	-	-	-	-	-	-	29	-	29	105	0	105	-	-	-	-	-	-	287		
PM Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,193**	**17**	**1,210**	**3,679**	**44**	**3,723**	**-**	**-**	**-**	**-**	**-**	**-**	**10,487**		
PM Peak	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**309**	**4**	**313**	**905**	**5**	**910**	**-**	**-**	**-**	**-**	**-**	**-**	**2,485**		

austraffic

TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Guinea St & Hume Hwy NB on off ramps



HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	32	2	33	-	-	-	98	4	102	-	-	-	-	-	-	116	5	121	18	0	18	-	-	-
5:15 - 6:15	39	3	42	-	-	-	116	5	121	-	-	-	-	-	-	137	6	143	18	1	19	-	-	-
5:30 - 6:30	50	2	52	-	-	-	133	7	140	-	-	-	-	-	-	155	7	162	23	2	25	-	-	-
5:45 - 6:45	64	4	68	0	-	0	168	11	179	-	-	-	-	-	-	199	5	204	21	2	23	-	-	-
6:00 - 7:00	87	3	90	0	-	0	212	13	226	-	-	-	-	-	-	249	6	255	23	2	25	-	-	-
6:15 - 7:15	94	3	97	0	-	0	236	14	250	-	-	-	-	-	-	274	4	278	26	2	28	-	-	-
6:30 - 7:30	106	3	109	0	-	0	258	15	273	-	-	-	-	-	-	339	5	345	31	1	32	0	-	0
6:45 - 7:45	123	3	125	-	-	-	248	13	261	-	-	-	-	-	-	392	6	398	36	1	37	0	-	0
7:00 - 8:00	158	3	162	-	-	-	236	17	253	-	-	-	-	-	-	473	7	479	39	3	42	0	-	0
7:15 - 8:15	221	3	224	0	-	0	255	24	279	-	-	-	-	-	-	608	11	619	60	3	63	1	-	1
7:30 - 8:30	280	3	283	0	-	0	259	28	286	-	-	-	-	-	-	784	14	797	59	4	63	0	-	0
7:45 - 8:45	303	4	306	0	-	0	253	30	283	-	-	-	-	-	-	906	17	923	62	4	66	0	-	0
8:00 - 9:00	299	4	303	0	-	0	239	26	265	-	-	-	-	-	-	991	20	1,011	64	2	66	0	-	0
8:15 - 9:15	269	4	273	0	-	0	217	20	237	-	-	-	-	-	-	970	20	990	49	2	50	-	-	-
8:30 - 9:30	222	5	227	0	-	0	190	21	211	-	-	-	-	-	-	885	17	902	49	1	50	-	-	-
8:45 - 9:45	201	4	205	0	-	0	180	22	202	-	-	-	-	-	-	810	18	829	45	2	48	-	-	-
9:00 - 10:00	172	5	177	0	-	0	172	27	199	-	-	-	-	-	-	727	18	744	42	3	45	-	-	-

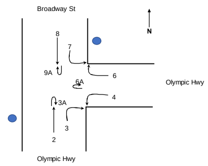
TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	-	-	-	-	-	-	-	-	-	-	-	-	30	1	31	125	4	129	-	-	-	-	-	-	419	15	434
5:15 - 6:15	-	-	-	-	-	-	-	-	-	-	-	-	39	1	41	166	4	170	-	-	-	-	-	-	515	21	536
5:30 - 6:30	-	-	-	-	-	-	-	-	-	-	-	-	42	2	43	177	5	182	-	-	-	-	-	-	580	24	604
5:45 - 6:45	-	-	-	-	-	-	-	-	-	-	-	-	54	2	56	202	4	206	-	-	-	-	-	-	709	28	737
6:00 - 7:00	-	-	-	-	-	-	-	-	-	-	-	-	65	2	67	238	4	243	-	-	-	-	-	-	875	31	906
6:15 - 7:15	-	-	-	-	-	-	-	-	-	-	-	-	72	3	75	256	5	262	-	-	-	-	-	-	959	31	990
6:30 - 7:30	-	-	-	-	-	-	-	-	-	-	-	-	87	3	90	285	8	292	-	-	-	-	-	-	1,108	35	1,143
6:45 - 7:45	-	-	-	-	-	-	-	-	-	-	-	-	97	3	100	306	10	315	-	-	-	-	-	-	1,202	36	1,238
7:00 - 8:00	-	-	-	-	-	-	-	-	-	-	-	-	110	4	114	337	11	348	-	-	-	-	-	-	1,354	44	1,399
7:15 - 8:15	-	-	-	-	-	-	-	-	-	-	-	-	122	3	126	386	13	399	-	-	-	-	-	-	1,653	58	1,711
7:30 - 8:30	-	-	-	-	-	-	-	-	-	-	-	-	129	3	132	442	13	455	-	-	-	-	-	-	1,953	64	2,018
7:45 - 8:45	-	-	-	-	-	-	-	-	-	-	-	-	133	5	138	466	14	480	-	-	-	-	-	-	2,122	74	2,196
8:00 - 9:00	-	-	-	-	-	-	-	-	-	-	-	-	130	4	134	511	15	526	-	-	-	-	-	-	2,235	70	2,305
8:15 - 9:15	-	-	-	-	-	-	-	-	-	-	-	-	133	4	136	514	19	533	-	-	-	-	-	-	2,151	68	2,219
8:30 - 9:30	-	-	-	-	-	-	-	-	-	-	-	-	135	4	138	498	17	515	-	-	-	-	-	-	1,979	65	2,044
8:45 - 9:45	-	-	-	-	-	-	-	-	-	-	-	-	135	3	138	505	19	524	-	-	-	-	-	-	1,877	69	1,946
9:00 - 10:00	-	-	-	-	-	-	-	-	-	-	-	-	131	4	135	474	19	492	-	-	-	-	-	-	1,718	75	1,794

HOURLY FLOW

TIME PERIOD	Movement 1			Movement 2			Movement 3			Movement 3A			Movement 4			Movement 5			Movement 6			Movement 6A		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	153	7	160	1	0	1	167	24	191	-	-	-	-	-	-	692	10	702	49	4	52	-	-	-
14:15 - 15:15	151	5	156	1	-	1	159	20	179	-	-	-	-	-	-	701	10	710	54	4	58	-	-	-
14:30 - 15:30	165	6	171	1	-	1	164	22	186	-	-	-	-	-	-	728	10	739	59	3	63	-	-	-
14:45 - 15:45	192	4	196	1	-	1	181	24	205	-	-	-	-	-	-	727	11	737	61	4	65	-	-	-
15:00 - 16:00	200	2	203	1	-	1	175	23	198	-	-	-	-	-	-	729	12	741	66	3	70	-	-	-
15:15 - 16:15	221	3	224	1	-	1	192	25	217	-	-	-	-	-	-	739	12	752	67	3	70	-	-	-
15:30 - 16:30	227	2	229	1	-	1	202	22	224	-	-	-	-	-	-	734	10	745	69	2	71	-	-	-
15:45 - 16:45	219	2	220	0	0	1	191	18	208	-	-	-	-	-	-	757	9	765	71	2	73	-	-	-
16:00 - 17:00	223	2	224	0	0	1	195	16	211	-	-	-	-	-	-	778	6	784	69	2	71	-	-	-
16:15 - 17:15	227	1	227	-	0	0	188	15	203	-	-	-	-	-	-	779	4	784	65	2	66	-	-	-
16:30 - 17:30	230	1	231	-	0	0	177	13	190	-	-	-	-	-	-	777	4	781	57	2	59	-	-	-
16:45 - 17:45	232	1	234	0	-	0	169	10	178	-	-	-	-	-	-	741	4	745	52	2	54	-	-	-
17:00 - 18:00	224	1	225	1	-	1	160	7	167	-	-	-	-	-	-	711	5	716	47	2	49	-	-	-
17:15 - 18:15	214	1	216	1	-	1	153	4	157	-	-	-	-	-	-	659	4	663	41	2	43	-	-	-
17:30 - 18:30	205	1	206	1	-	1	139	4	143	-	-	-	-	-	-	620	3	622	38	1	38	0	-	0
17:45 - 18:45	179	1	179	0	-	0	126	4	130	-	-	-	-	-	-	559	3	562	34	0	34	0	-	0
18:00 - 19:00	158	0	159	0	-	0	112	3	115	-	-	-	-	-	-	479	3	482	29	-	29	0	-	0

TIME PERIOD	Movement 7			Movement 8			Movement 9			Movement 9A			Movement 10			Movement 11			Movement 12			Movement 12A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	-	-	-	-	-	-	-	-	-	-	-	-	195	4	199	687	14	701	-	-	-	-	-	-	1,944	63	2,007
14:15 - 15:15	-	-	-	-	-	-	-	-	-	-	-	-	215	4	219	701	14	715	-	-	-	-	-	-	1,981	57	2,038
14:30 - 15:30	-	-	-	-	-	-	-	-	-	-	-	-	236	6	242	725	13	739	-	-	-	-	-	-	2,078	61	2,140
14:45 - 15:45	-	-	-	-	-	-	-	-	-	-	-	-	239	6	245	742	16	758	-	-	-	-	-	-	2,143	65	2,208
15:00 - 16:00	-	-	-	-	-	-	-	-	-	-	-	-	244	5	249	785	14	799	-	-	-	-	-	-	2,201	60	2,261
15:15 - 16:15	-	-	-	-	-	-	-	-	-	-	-	-	251	6	257	803	11	814	-	-	-	-	-	-	2,275	60	2,335
15:30 - 16:30	-	-	-	-	-	-	-	-	-	-	-	-	248	4	252	809	13	823	-	-	-	-	-	-	2,290	54	2,344
15:45 - 16:45	-	-	-	-	-	-	-	-	-	-	-	-	262	5	267	812	9	821	-	-	-	-	-	-	2,312	44	2,356
16:00 - 17:00	-	-	-	-	-	-	-	-	-	-	-	-	269	6	275	813	10	823	-	-	-	-	-	-	2,348	41	2,389
16:15 - 17:15	-	-	-	-	-	-	-	-	-	-	-	-	290	5	294	849	9	858	-	-	-	-	-	-	2,397	36	2,433
16:30 - 17:30	-	-	-	-	-	-	-	-	-	-	-	-	309	4	313	905	5	910	-	-	-	-	-	-	2,455	30	2,485
16:45 - 17:45	-	-	-	-	-	-	-	-	-	-	-	-	314	2	315	904	5	909	-	-	-	-	-	-	2,412	23	2,435
17:00 - 18:00	-	-	-	-	-	-	-	-	-	-	-	-	311	1	312	892	5	897	-	-	-	-	-	-	2,346	21	2,367
17:15 - 18:15	-	-	-	-	-	-	-	-	-	-	-	-	278	1	279	800	4	804	-	-	-	-	-	-	2,146	15	2,161
17:30 - 18:30	-	-	-	-	-	-	-	-	-	-	-	-	244	1	245	676	4	680	-	-	-	-	-	-	1,923	14	1,936
17:45 - 18:45	-	-	-	-	-	-	-	-	-	-	-	-	210	1	211	582	4	586	-	-	-	-	-	-	1,690	13	1,703
18:00 - 19:00	-	-	-	-	-	-	-	-	-	-	-	-	174	1	175	501	2	503	-	-	-	-	-	-	1,455	9	1,464

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Olympic Hwy & Seignior St & Broadway St



AM

Time Period	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
5:00 - 5:15	5	0	5	1	-	1	-	-	-	1	-	1	0	-	0	-	-	-	1	1	2	7	-	7	-	-	-	17	5:00 - 6:00	94
5:15 - 5:30	2	-	2	1	-	1	-	-	-	2	-	2	4	-	4	-	-	-	1	-	1	5	-	5	-	-	-	16	5:15 - 6:15	120
5:30 - 5:45	8	0	8	1	-	1	-	-	-	1	-	1	3	-	3	-	-	-	2	-	2	2	0	2	1	-	1	19	5:30 - 6:30	149
5:45 - 6:00	16	0	16	3	0	4	-	-	-	3	-	3	6	1	6	-	-	-	4	-	4	8	-	8	1	-	1	42	5:45 - 6:45	175
6:00 - 6:15	14	-	14	4	-	4	0	-	0	3	-	3	8	0	8	-	-	-	4	-	4	5	0	5	4	-	4	43	6:00 - 7:00	198
6:15 - 6:30	11	1	12	3	1	3	-	-	-	5	0	5	6	1	7	-	-	-	7	1	7	10	0	10	0	-	0	45	6:15 - 7:15	227
6:30 - 6:45	14	0	15	5	-	5	-	-	-	4	0	4	6	-	6	-	-	-	5	0	5	9	1	10	1	0	2	46	6:30 - 7:30	253
6:45 - 7:00	13	1	14	5	-	5	-	-	-	10	-	10	11	1	12	-	-	-	6	0	7	15	-	15	3	0	4	65	6:45 - 7:45	288
7:00 - 7:15	12	1	13	5	-	5	-	-	-	8	-	8	12	2	14	-	-	-	13	1	13	15	1	16	2	-	2	71	7:00 - 8:00	310
7:15 - 7:30	15	1	16	7	1	8	-	-	-	11	3	14	10	1	11	-	-	-	7	1	7	14	-	14	1	-	1	71	7:15 - 8:15	330
7:30 - 7:45	15	2	17	5	4	9	-	-	-	6	2	7	13	0	14	0	-	0	11	0	11	21	-	21	2	-	2	81	7:30 - 8:30	359
7:45 - 8:00	28	2	29	8	1	9	-	0	0	7	0	7	14	1	15	0	-	0	9	1	9	13	2	15	1	-	1	87	7:45 - 8:45	418
8:00 - 8:15	19	1	21	10	0	10	-	-	-	10	1	12	13	1	14	-	-	-	16	0	16	14	1	15	2	1	3	91	8:00 - 9:00	488
8:15 - 8:30	22	2	24	11	1	12	0	-	0	8	1	9	17	1	18	-	-	-	19	1	20	14	1	15	1	-	1	100	8:15 - 9:15	510
8:30 - 8:45	18	0	19	22	2	24	-	-	-	26	0	26	20	2	22	0	-	0	26	1	27	21	1	22	1	-	1	141	8:30 - 9:30	515
8:45 - 9:00	33	1	35	20	2	23	-	-	-	22	2	24	20	0	20	0	-	0	25	1	26	24	2	26	3	-	3	157	8:45 - 9:45	472
9:00 - 9:15	24	1	25	9	1	10	1	-	1	14	0	15	20	1	21	-	-	-	20	1	21	17	1	17	4	-	4	113	9:00 - 10:00	432
9:15 - 9:30	23	-	23	9	1	9	0	-	0	11	1	12	19	-	19	-	-	-	17	-	17	19	1	20	3	0	3	105	AM Peak	515
9:30 - 9:45	14	2	15	7	2	9	-	-	-	9	1	10	18	0	19	-	-	-	25	1	26	16	0	16	2	-	2	97		
9:45 - 10:00	18	0	19	10	1	11	1	-	1	12	0	12	29	1	31	0	-	0	18	0	18	21	2	23	3	0	3	117		
Total	325	15	340	146	17	163	3	0	3	174	13	187	250	14	265	2	-	2	234	9	243	269	13	282	36	2	38	1,522		
AM Peak	98	3	101	60	5	66	1	-	1	73	4	77	79	3	83	1	-	1	88	2	90	81	5	86	11	0	11	515		
10hr Total	826	22	848	354	32	386	17	0	18	413	30	442	672	19	692	6	-	6	740	21	761	848	22	870	92	4	96	4,118		

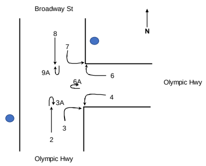
PM

Time Period	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Total of all Movements	Peak Hour Volume Determination	
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total			
14:00 - 14:15	22	-	22	8	1	9	1	-	1	13	0	13	23	0	23	-	-	-	27	1	28	26	-	26	3	0	3	125	14:00 - 15:00	507
14:15 - 14:30	20	-	20	10	-	10	-	-	-	10	-	10	21	-	21	0	-	0	26	0	26	23	-	23	3	-	3	113	14:15 - 15:15	526
14:30 - 14:45	23	-	23	12	1	13	-	-	-	10	-	10	19	1	19	1	-	1	25	1	27	22	0	23	2	-	2	117	14:30 - 15:30	591
14:45 - 15:00	25	1	26	12	1	13	1	-	1	16	1	17	28	0	28	-	-	-	30	2	32	30	2	32	4	-	4	152	14:45 - 15:45	623
15:00 - 15:15	22	0	22	15	1	15	-	-	-	18	3	21	25	1	25	-	-	-	32	0	32	23	1	24	4	1	4	144	15:00 - 16:00	616
15:15 - 15:30	26	1	27	24	2	26	0	-	0	25	2	27	32	-	32	1	-	1	31	1	32	30	1	30	3	-	3	178	15:15 - 16:15	646
15:30 - 15:45	25	-	25	10	0	10	-	-	-	12	4	16	25	0	26	0	-	0	28	-	28	42	1	43	1	-	1	149	15:30 - 16:30	624
15:45 - 16:00	25	1	26	10	1	11	1	-	1	18	2	19	22	1	23	0	-	0	32	0	32	29	1	30	2	1	3	145	15:45 - 16:45	611
16:00 - 16:15	34	1	35	13	0	14	-	-	-	12	3	15	30	0	30	0	-	0	33	1	34	43	-	43	2	-	2	174	16:00 - 17:00	615
16:15 - 16:30	26	0	26	13	0	13	-	-	-	14	1	15	26	-	26	-	-	-	29	1	30	41	-	41	4	-	4	156	16:15 - 17:15	596
16:30 - 16:45	29	-	29	9	2	10	0	-	0	11	1	11	24	0	24	0	-	0	28	1	29	27	1	28	3	-	3	136	16:30 - 17:30	578
16:45 - 17:00	31	0	31	8	2	10	0	-	0	13	1	14	25	0	26	-	-	-	29	0	29	35	0	35	5	-	5	150	16:45 - 17:45	565
17:00 - 17:15	31	1	31	14	0	15	1	-	1	13	0	14	23	0	23	-	-	-	34	0	34	33	0	34	3	-	3	154	17:00 - 18:00	536
17:15 - 17:30	31	0	31	12	1	13	1	-	1	12	-	12	20	-	20	0	-	0	25	0	26	33	-	33	2	-	2	138	17:15 - 18:15	470
17:30 - 17:45	27	-	27	11	-	11	1	-	1	9	-	9	22	0	22	-	-	-	23	1	24	26	-	26	1	-	1	122	17:30 - 18:30	434
17:45 - 18:00	34	1	35	11	0	11	2	-	2	10	-	10	17	-	17	-	-	-	18	-	18	25	1	26	3	-	3	121	17:45 - 18:45	377
18:00 - 18:15	25	0	25	4	0	4	2	-	2	3	-	3	11	-	11	-	-	-	16	-	16	23	-	23	5	-	5	88	18:00 - 19:00	321
18:15 - 18:30	20	-	20	5	1	6	1	-	1	7	-	7	13	-	13	0	-	0	20	-	20	33	-	33	3	-	3	102	PM Peak	646
18:30 - 18:45	14	-	14	3	0	3	3	-	3	5	-	5	6	-	6	0	-	0	11	-	11	19	-	19	3	-	3	65		
18:45 - 19:00	12	0	12	4	1	5	1	-	1	8	0	9	12	-	12	-	-	-	9	1	10	15	0	16	1	0	1	65		
Total	502	7	508	208	15	223	15	-	15	239	17	256	422	5	427	4	-	4	506	12	518	579	9	588	56	2	58	2,596		
PM Peak	110	3	113	58	3	61	1	-	1	67	10	77	109	2	110	2	-	2	125	2	127	143	3	146	8	1	9	646		

austraffic

TRAFFIC & TRANSPORT DATA SPECIALISTS

Client : WSP
Job : Regional NSW
Day/Date : Average 22/06/2021 to 24/06/2021
Survey Location : Olympic Hwy & Seignior St & Broadway St



HOURLY FLOW

TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
5:00 - 6:00	31	1	**32**	7	0	**7**	-	-	**-**	8	-	**8**	13	1	**14**	-	-	**-**	8	1	**9**	22	0	**23**	2	-	**2**	91	3	**94**
5:15 - 6:15	40	1	**41**	10	0	**10**	0	-	**0**	10	-	**10**	21	1	**22**	-	-	**-**	11	-	**11**	20	1	**20**	6	-	**6**	117	3	**120**
5:30 - 6:30	49	1	**50**	12	1	**13**	0	-	**0**	13	0	**13**	23	2	**25**	-	-	**-**	16	1	**17**	24	1	**25**	6	-	**6**	142	7	**149**
5:45 - 6:45	55	1	**57**	15	1	**16**	0	-	**0**	15	1	**16**	25	2	**27**	-	-	**-**	19	1	**20**	31	1	**32**	7	0	**7**	167	8	**175**
6:00 - 7:00	52	2	**54**	16	1	**17**	0	-	**0**	21	1	**22**	30	3	**33**	-	-	**-**	22	1	**23**	38	1	**39**	9	1	**9**	189	9	**198**
6:15 - 7:15	50	3	**53**	17	1	**18**	-	-	**-**	26	1	**26**	34	5	**39**	-	-	**-**	31	2	**33**	48	2	**50**	7	1	**8**	213	13	**227**
6:30 - 7:30	54	3	**57**	22	1	**23**	-	-	**-**	32	3	**35**	39	4	**43**	-	-	**-**	31	2	**33**	53	2	**54**	8	1	**8**	238	15	**253**
6:45 - 7:45	55	4	**59**	22	5	**27**	-	-	**-**	34	4	**38**	47	4	**51**	0	-	**0**	37	2	**39**	64	1	**65**	8	0	**8**	267	21	**288**
7:00 - 8:00	70	5	**75**	26	6	**31**	-	0	**0**	31	5	**36**	50	4	**54**	1	-	**1**	39	2	**41**	63	3	**66**	6	-	**6**	285	25	**310**
7:15 - 8:15	77	5	**83**	30	6	**36**	-	0	**0**	34	6	**40**	51	3	**54**	1	-	**1**	42	2	**44**	62	3	**65**	6	1	**7**	303	26	**330**
7:30 - 8:30	85	6	**91**	34	6	**40**	0	0	**1**	31	4	**36**	58	3	**61**	1	-	**1**	55	2	**57**	62	4	**66**	7	1	**7**	332	27	**359**
7:45 - 8:45	88	5	**93**	51	4	**55**	0	0	**1**	52	3	**55**	65	4	**69**	1	-	**1**	69	3	**72**	62	4	**67**	6	1	**7**	394	24	**418**
8:00 - 9:00	93	5	**98**	63	6	**69**	0	-	**0**	66	5	**71**	70	4	**74**	1	-	**1**	86	3	**88**	74	4	**78**	8	1	**9**	462	27	**488**
8:15 - 9:15	98	4	**102**	63	6	**69**	1	-	**1**	70	4	**74**	77	4	**81**	1	-	**1**	90	3	**93**	76	4	**80**	9	-	**9**	485	25	**510**
8:30 - 9:30	98	3	**101**	60	5	**66**	1	-	**1**	73	4	**77**	79	3	**83**	1	-	**1**	88	2	**90**	81	5	**86**	11	0	**11**	493	22	**515**
8:45 - 9:45	94	4	**98**	45	6	**51**	1	-	**1**	56	4	**61**	77	2	**79**	0	-	**0**	87	2	**89**	76	4	**80**	12	0	**12**	448	23	**472**
9:00 - 10:00	79	3	**82**	34	5	**39**	2	-	**2**	47	3	**49**	87	3	**90**	0	-	**0**	80	2	**82**	72	4	**76**	11	1	**12**	412	20	**432**

HOURLY FLOW

TIME PERIOD	Movement 2			Movement 3			Movement 3A			Movement 4			Movement 6			Movement 6A			Movement 7			Movement 8			Movement 9A			Grand Total		
	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total
14:00 - 15:00	90	1	**91**	42	3	**46**	2	-	**2**	48	1	**49**	90	1	**91**	1	-	**1**	108	4	**112**	101	2	**104**	11	0	**11**	494	13	**507**
14:15 - 15:15	90	1	**91**	49	3	**52**	1	-	**1**	53	4	**57**	92	2	**93**	1	-	**1**	113	4	**117**	99	3	**102**	12	1	**13**	509	17	**526**
14:30 - 15:30	96	2	**98**	63	5	**68**	1	-	**1**	68	6	**74**	103	2	**104**	1	-	**1**	119	4	**123**	105	4	**109**	12	1	**13**	569	22	**591**
14:45 - 15:45	98	2	**100**	61	4	**65**	1	-	**1**	71	9	**80**	109	1	**111**	1	-	**1**	121	3	**124**	124	5	**129**	11	1	**12**	599	24	**623**
15:00 - 16:00	98	2	**100**	59	4	**63**	1	-	**1**	73	10	**83**	103	2	**105**	1	-	**1**	123	1	**124**	124	4	**128**	10	1	**11**	592	25	**616**
15:15 - 16:15	110	3	**113**	58	3	**61**	1	-	**1**	67	10	**77**	109	2	**110**	2	-	**2**	125	2	**127**	143	3	**146**	8	1	**9**	623	24	**646**
15:30 - 16:30	110	2	**112**	46	2	**48**	1	-	**1**	56	9	**65**	103	2	**105**	1	-	**1**	123	2	**125**	154	2	**157**	10	1	**11**	604	20	**624**
15:45 - 16:45	114	2	**117**	45	3	**48**	1	-	**1**	54	6	**60**	102	2	**103**	1	-	**1**	122	4	**126**	140	2	**142**	12	1	**12**	591	20	**611**
16:00 - 17:00	120	2	**122**	42	4	**47**	1	-	**1**	50	5	**55**	105	1	**106**	1	-	**1**	119	4	**123**	146	1	**147**	15	-	**15**	598	17	**615**
16:15 - 17:15	117	1	**118**	43	4	**48**	1	-	**1**	51	2	**54**	98	1	**99**	0	-	**0**	119	3	**122**	136	2	**138**	16	-	**16**	582	14	**596**
16:30 - 17:30	121	1	**123**	43	5	**47**	3	-	**3**	50	2	**51**	92	1	**93**	1	-	**1**	115	2	**118**	129	2	**130**	13	-	**13**	566	13	**578**
16:45 - 17:45	119	1	**121**	45	3	**48**	3	-	**3**	48	1	**49**	90	1	**91**	0	-	**0**	110	2	**112**	128	1	**128**	11	-	**11**	556	9	**565**
17:00 - 18:00	123	2	**124**	48	1	**49**	5	-	**5**	45	0	**45**	82	1	**82**	0	-	**0**	100	2	**102**	118	1	**119**	9	-	**9**	529	7	**536**
17:15 - 18:15	117	1	**118**	38	1	**39**	6	-	**6**	34	-	**34**	70	0	**70**	0	-	**0**	82	1	**83**	108	1	**108**	11	-	**11**	465	5	**470**
17:30 - 18:30	106	1	**107**	31	1	**32**	5	-	**5**	29	-	**29**	63	0	**63**	0	-	**0**	76	1	**77**	108	1	**108**	12	-	**12**	429	4	**434**
17:45 - 18:45	93	1	**94**	22	2	**24**	7	-	**7**	25	-	**25**	47	-	**47**	1	-	**1**	65	-	**65**	100	1	**101**	13	-	**13**	373	3	**377**
18:00 - 19:00	71	1	**71**	16	2	**18**	6	-	**6**	23	0	**24**	42	-	**42**	1	-	**1**	56	1	**57**	90	0	**90**	12	0	**12**	317	4	**321**

TECHNICAL PAPER 01

Traffic and transport

Appendix C Key intersection configurations

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

A.1 ALBURY PRECINCT

A.1.1 MURRAY RIVER BRIDGE ENHANCEMENT SITE

1. Atkins Street / East Street

2. Atkins Street / Macauley Street

3. Panmure Street / Olive Street

4. Atkins Street / Kiewa Street

5. Abercorn Street / Kiewa Street

6. Abercorn Street / Townsend Street

A.1.2 ALBURY STATION ENHANCEMENT SITES

1. Young Street / Smollett Street / Railway Place

2. Young Street / Dean Street

3. Young Street / Wilson Street

4. Young Street / Guinea Street / Riverina Highway

5. Riverina Highway / Hume Highway northbound off ramp

6. Hume Highway northbound off ramp / Access

7. Riverina Expressway / Hume Highway southbound off ramp

8. Riverina Highway / Schubach Street / Short Street

9. Schubach Street / Kenilworth Street

A.1.3

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A.1.4 BILLY HUGHES BRIDGE ENHANCEMENT SITE

1. Wagga Road / Hume Highway Northbound Ramps

2. Wagga Road / Hume Highway Southbound Ramps

A.1.5 TABLE TOP CLEARANCES ENHANCEMENT SITE

 1. Tynan Road / Perryman Lane	 2. Tynan Road / Hume Highway

A.2 GREATER HUME – LOCKHART PRECINCT

A.2.1 CULCAIRN ENHANCEMENT SITE

	
1. Melville Street / Balfour Street / Gamble Street	2. Balfour Street / Railway Street

A.2.2 HENTY YARD CLEARNACES ENHANCEMENT SITE

<table>
<tr>
<td>


1. Olympic Highway / Sladen Street and;
2. Ivor Street / Sladen Street
</td>
<td>


3. Sladen Street / Allan Street
</td>
</tr>
<tr>
<td>


4. Rosler Street / Allan Street
</td>
<td>


5. Rosler Street / Yankee Crossing Road / Railway Parade
</td>
</tr>
</table>

A.2.3 YERONG CREEK YARD CLEAREANCES ENHANCEMENT SITE

<table>
<tr>
<td>

1. Olympic Highway / Plunkett Street / Cole Street</td>
<td>

2. Plunkett Street / Finlayson Street</td>
</tr>
</table>

A.2.4 THE ROCK YARD CLEARANCES ENHANCEMENT SITE

1. Olympic Highway / Urana Street / Mangoplah Road

A.3 WAGGA WAGGA PRECINCT

A.3.1 URANQUINTY YARD CLEARANCES ENHANCEMENT SITE

1. Olympic Highway / Yarragundry Street

A.3.2 PEARSON STREET BRIDGE ENAHANCEMENT SIET

1. Pearson Street / Edward Street / Moorong Street

2. Pearson Street / Cheshire Street

3. Pearson Street / Urana Street

4. Pearson Street / Fernleigh Road / Glenfield Road

5. Fernleigh Road / Alan Turner Depot Access Road

A.3.3 WAGGA WAGGA STATION ENHANCEMENT SITES

1. Edward Street / Docker Street

2. Edward Street / Brookong Avenue

3. Edward Street / Fox Street

4. Edward Street / Edmondson Street

<table>
<tr><td>5. Edmondson Street / Coleman Street</td><td>6. Coleman Street / Norman Street</td></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>7. Docker Street / Coleman Street</td><td>8. Edward Street / Station Place</td></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>9. Edward Street / Hammond Street / Lake Albert Road / Taracutta Street</td><td>10. Lake Albert Road / Railway Street</td></tr>
</table>

11. Erin Street / Macleay Street

12. Edmondson Street / Erin Street

13. Bourke Street / Urana Street

14. Michelmore Street / Urana Street

15. Coleman Street / Kildare Street

16. Docker Street / Chaston Street

17. Macleay / Urana Street

A.3.4 BOMEN YARD CLEARANCES ENHANCEMENT SITE

1. Merino Street / Byrnes Road / East Bomen Road

A.4 JUNEE PRECINCT

A.4.1 HAREFIELD YARD CLEARANCES ENHANCEMENT SITE

	
1. Harefield Road / Railway Access Road / Byrnes Road (stub)	2. Byrnes Road / Pattersons Road

A.4.2 KEMP STREET BRIDGE AND JUNEE STATION ENHANCEMENT SITES

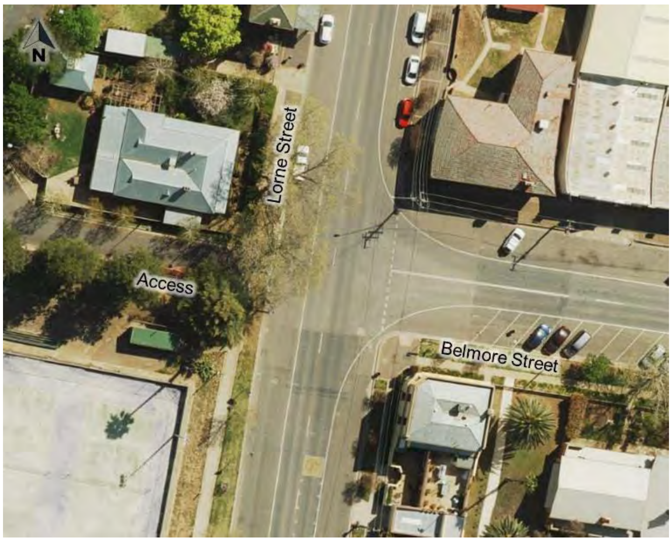
1. Olympic Highway / Seignior Street / Kemp Street / Railway Lane

2. Seignior Street / Pretoria Avenue

3. Seignior Street / Olympic Highway / Broadway Street

4. Main Street / Olympic Highway

5. Lorne Street / Peel Street / Humpreys Street



6. Lorne Street / Belmore Street / Access

7. Lorne Street / Hill Street / Ducker Street

A.4.3 OLYMPIC HIGHWAY UNDERBRIDGE ENHANCEMENT SITE

1. Illabo Road / Regent Street / Access Road

2. Byrnes Road / Pattersons Road

3. Main Street / Olympic Highway

A.4.4 JUNEE TO ILLABO CLEARANCES ENAHNCEMENT SITE

1. Olympic Highway / Waterworks Road

2. Olympic Highway / Marinna Railway Station Access Road

3. Olympic Highway / Brabins Road

4. Brabins Road / Lawford Street

TECHNICAL PAPER 01

Traffic and transport

Appendix D SIDRA results

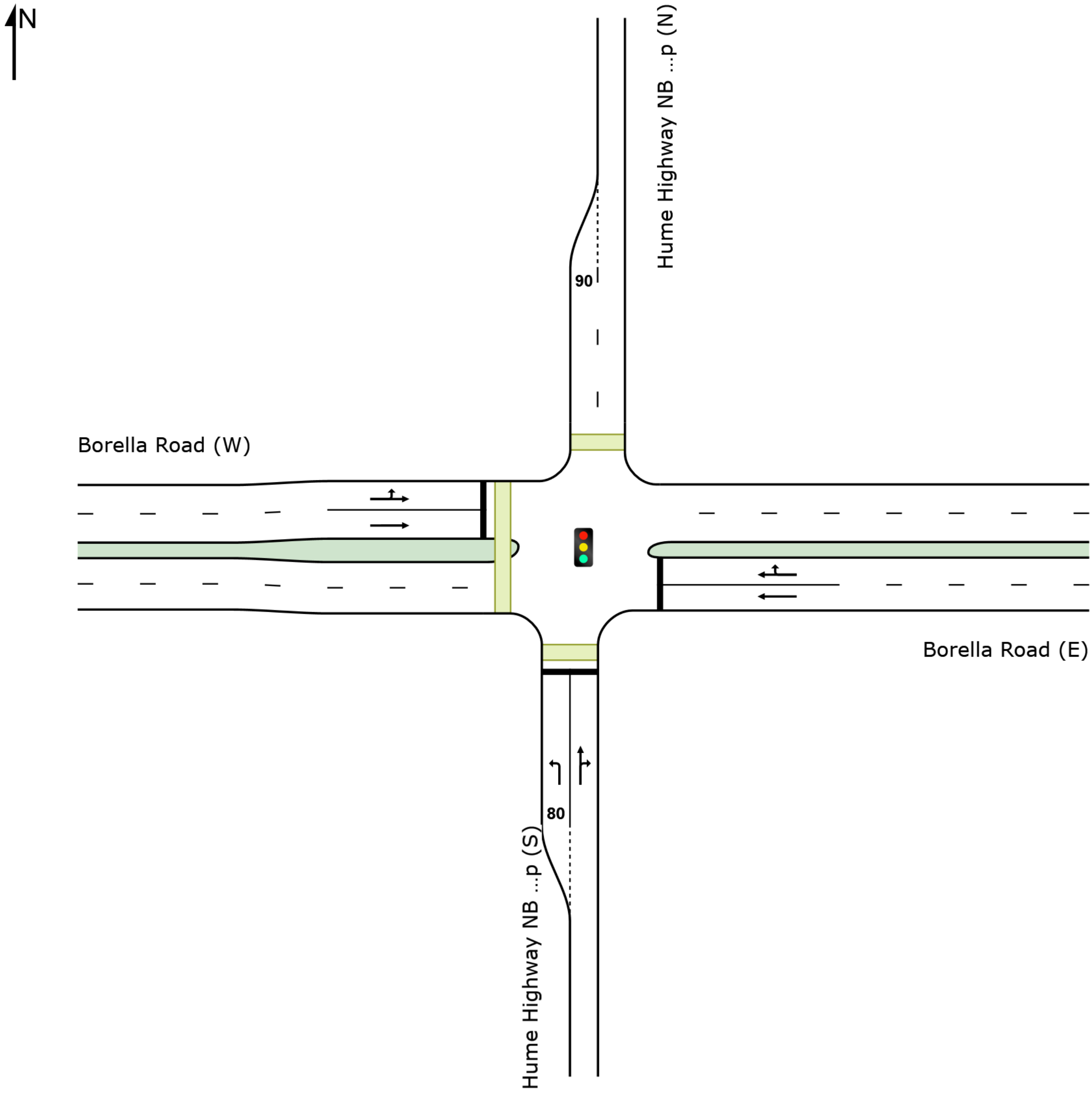
ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

SITE LAYOUT

Site: [Borella Road / Hume Highway NB off ramp - Base - PM Peak (Site Folder: Albury)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



PHASING SUMMARY

Site: [Borella Road / Hume Highway NB off ramp - Base - PM Peak (Site Folder: Albury)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 90 seconds (Site User-Given Cycle Time)

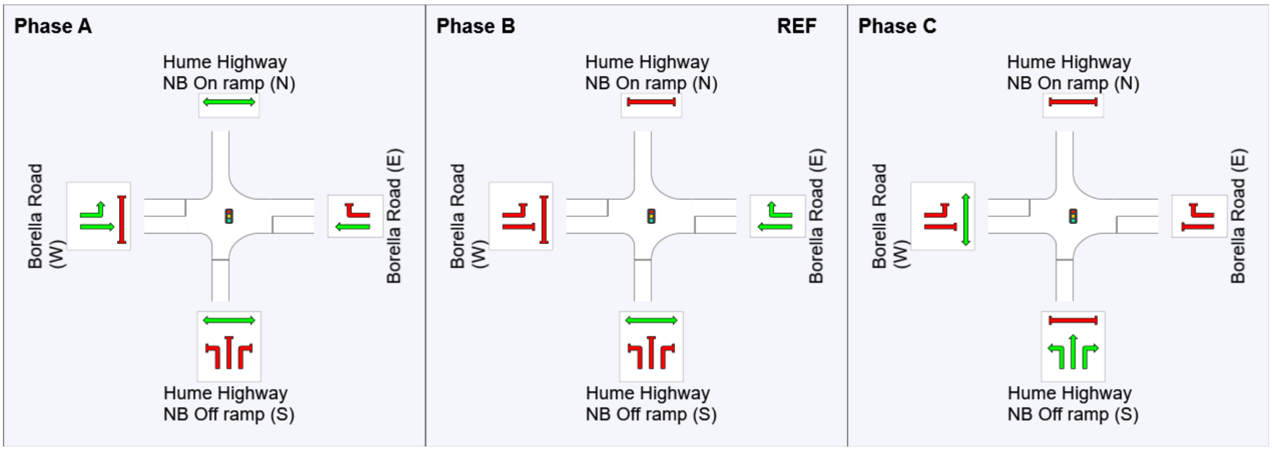
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	38	0	14
Green Time (sec)	46	8	18
Phase Time (sec)	52	14	24
Phase Split	58%	16%	27%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

MOVEMENT SUMMARY

Site: [Borella Road / Hume Highway NB off ramp - Base - PM Peak (Site Folder: Albury)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hume Highway NB Off ramp (S)														
1	L2	253	1	266	0.4	* 0.708	43.8	LOS D	11.5	80.6	0.99	0.86	1.05	27.1
2	T1	1	0	1	0.0	0.608	36.5	LOS D	9.0	66.7	0.96	0.82	0.96	38.4
3	R2	207	14	218	6.8	0.608	41.9	LOS D	9.0	66.7	0.96	0.82	0.96	26.1
Approach		461	15	485	3.3	0.708	42.9	LOS D	11.5	80.6	0.98	0.84	1.01	26.7
East: Borella Road (E)														
5	T1	854	5	899	0.6	0.643	13.4	LOS B	21.1	148.4	0.66	0.72	0.66	25.0
6	R2	64	2	67	3.1	* 0.643	48.3	LOS D	6.0	42.7	1.00	0.83	1.07	26.4
Approach		918	7	966	0.8	0.643	15.8	LOS B	21.1	148.4	0.68	0.73	0.69	25.2
West: Borella Road (W)														
10	L2	343	5	361	1.5	0.705	21.6	LOS C	23.2	164.0	0.82	0.79	0.82	39.3
11	T1	995	6	1047	0.6	* 0.705	18.0	LOS B	23.9	168.0	0.82	0.76	0.82	20.8
Approach		1338	11	1408	0.8	0.705	18.9	LOS B	23.9	168.0	0.82	0.77	0.82	27.5
All Vehicles		2717	33	2860	1.2	0.708	21.9	LOS C	23.9	168.0	0.80	0.76	0.81	26.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Hume Highway NB Off ramp (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	200.2	209.2	1.04
North: Hume Highway NB On ramp (N)												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	200.1	209.0	1.04
West: Borella Road (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	207.7	219.0	1.05
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	202.7	212.4	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: [Borella Road / Hume Highway NB Off ramps - PM Peak with Construction Traffic (Site Folder: Albury)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 90 seconds (Site User-Given Cycle Time)

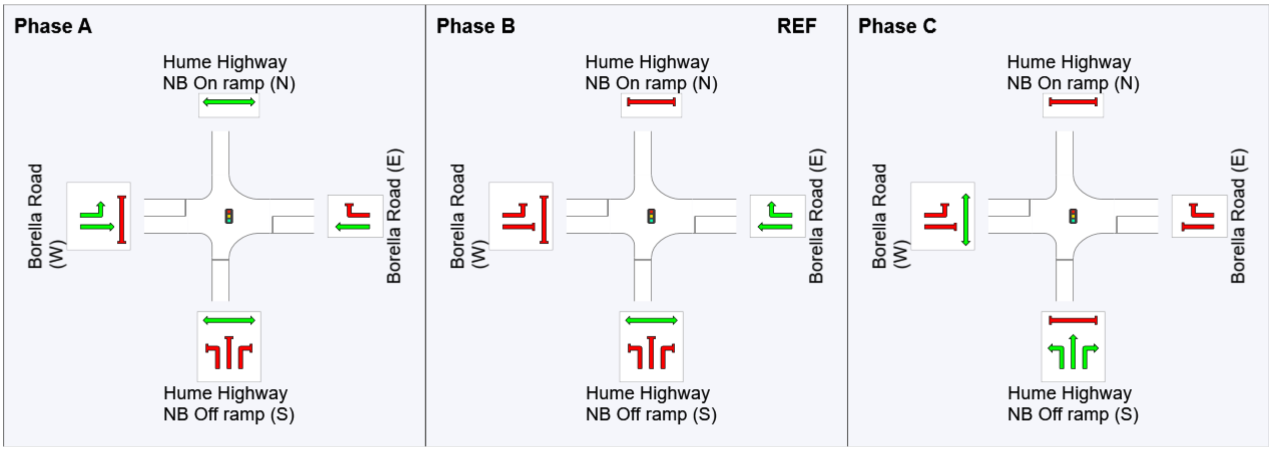
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	38	0	14
Green Time (sec)	46	8	18
Phase Time (sec)	52	14	24
Phase Split	58%	16%	27%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

MOVEMENT SUMMARY

Site: [Borella Road / Hume Highway NB Off ramps - PM Peak with Construction Traffic (Site Folder: Albury)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hume Highway NB Off ramp (S)														
1	L2	253	1	266	0.4	* 0.708	43.8	LOS D	11.5	80.6	0.99	0.86	1.05	27.1
2	T1	1	0	1	0.0	0.608	36.5	LOS D	9.0	66.7	0.96	0.82	0.96	38.4
3	R2	207	14	218	6.8	0.608	41.9	LOS D	9.0	66.7	0.96	0.82	0.96	26.1
Approach		461	15	485	3.3	0.708	42.9	LOS D	11.5	80.6	0.98	0.84	1.01	26.7
East: Borella Road (E)														
5	T1	854	5	899	0.6	0.643	13.4	LOS B	21.1	148.4	0.66	0.72	0.66	25.0
6	R2	64	2	67	3.1	* 0.643	48.3	LOS D	6.0	42.7	1.00	0.83	1.07	26.4
Approach		918	7	966	0.8	0.643	15.8	LOS B	21.1	148.4	0.68	0.73	0.69	25.2
West: Borella Road (W)														
10	L2	360	9	379	2.5	0.726	21.9	LOS C	24.2	171.8	0.84	0.80	0.84	38.9
11	T1	1012	10	1065	1.0	* 0.726	18.3	LOS B	24.9	176.1	0.84	0.77	0.84	20.6
Approach		1372	19	1444	1.4	0.726	19.3	LOS B	24.9	176.1	0.84	0.78	0.84	27.4
All Vehicles		2751	41	2896	1.5	0.726	22.1	LOS C	24.9	176.1	0.81	0.77	0.82	26.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Hume Highway NB Off ramp (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	200.2	209.2	1.04
North: Hume Highway NB On ramp (N)												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	200.1	209.0	1.04
West: Borella Road (W)												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	207.7	219.0	1.05
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	202.7	212.4	1.05

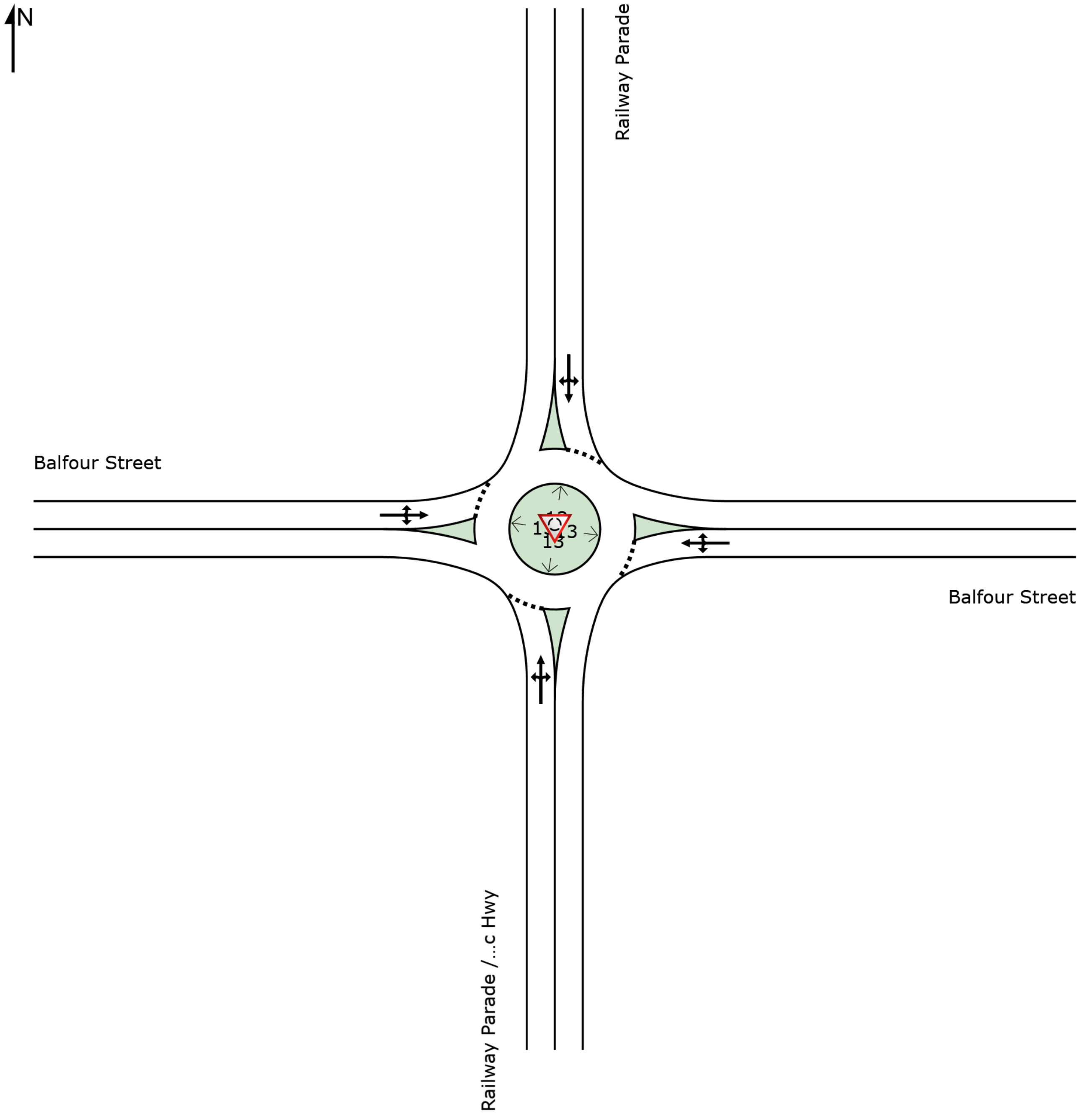
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: [Olympic Highway / Balfour Street - Base - Peak Hour (Site Folder: Culcairn, Greater Hume Lockhart)]

New Site
Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Olympic Highway / Balfour Street - Base - Peak Hour (Site Folder: Culcairn, Greater Hume Lockhart)]

New Site
Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Railway Parade / Olympic Hwy														
1	L2	130	28.0	137	28.0	0.362	6.0	LOS A	2.4	20.5	0.62	0.69	0.62	45.0
2	T1	48	28.0	51	28.0	0.362	5.9	LOS A	2.4	20.5	0.62	0.69	0.62	46.0
3	R2	130	28.0	137	28.0	0.362	9.9	LOS A	2.4	20.5	0.62	0.69	0.62	45.8
Approach		308	28.0	324	28.0	0.362	7.6	LOS A	2.4	20.5	0.62	0.69	0.62	45.5
East: Balfour Street														
4	L2	160	28.0	168	28.0	0.442	5.6	LOS A	3.1	27.2	0.59	0.61	0.59	45.6
5	T1	217	28.0	228	28.0	0.442	5.5	LOS A	3.1	27.2	0.59	0.61	0.59	46.7
6	R2	40	28.0	42	28.0	0.442	9.5	LOS A	3.1	27.2	0.59	0.61	0.59	46.5
Approach		417	28.0	439	28.0	0.442	5.9	LOS A	3.1	27.2	0.59	0.61	0.59	46.2
North: Railway Parade														
7	L2	22	28.0	23	28.0	0.114	7.4	LOS A	0.6	5.6	0.67	0.71	0.67	44.7
8	T1	33	28.0	35	28.0	0.114	7.3	LOS A	0.6	5.6	0.67	0.71	0.67	45.7
9	R2	22	28.0	23	28.0	0.114	11.3	LOS B	0.6	5.6	0.67	0.71	0.67	45.5
Approach		77	28.0	81	28.0	0.114	8.5	LOS A	0.6	5.6	0.67	0.71	0.67	45.4
West: Balfour Street														
10	L2	40	28.0	42	28.0	0.446	5.6	LOS A	3.2	27.7	0.60	0.64	0.60	45.1
11	T1	217	28.0	228	28.0	0.446	5.5	LOS A	3.2	27.7	0.60	0.64	0.60	46.1
12	R2	160	28.0	168	28.0	0.446	9.6	LOS A	3.2	27.7	0.60	0.64	0.60	45.9
Approach		417	28.0	439	28.0	0.446	7.1	LOS A	3.2	27.7	0.60	0.64	0.60	45.9
All Vehicles		1219	28.0	1283	28.0	0.446	6.9	LOS A	3.2	27.7	0.61	0.65	0.61	45.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Olympic Highway / Balfour Street - Peak Hour with Construction Traffic (Site Folder: Culcairn, Greater Hume Lockhart)]

New Site
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Railway Parade / Olympic Hwy														
1	L2	130	28.0	137	28.0	0.418	6.4	LOS A	2.9	24.8	0.68	0.73	0.68	44.9
2	T1	82	28.0	86	28.0	0.418	6.3	LOS A	2.9	24.8	0.68	0.73	0.68	45.9
3	R2	130	28.0	137	28.0	0.418	10.4	LOS B	2.9	24.8	0.68	0.73	0.68	45.7
Approach		342	28.0	360	28.0	0.418	7.9	LOS A	2.9	24.8	0.68	0.73	0.68	45.4
East: Balfour Street														
4	L2	160	28.0	168	28.0	0.481	5.7	LOS A	3.6	31.0	0.62	0.63	0.62	45.4
5	T1	217	28.0	228	28.0	0.481	5.6	LOS A	3.6	31.0	0.62	0.63	0.62	46.5
6	R2	74	28.0	78	28.0	0.481	9.6	LOS A	3.6	31.0	0.62	0.63	0.62	46.2
Approach		451	28.0	475	28.0	0.481	6.3	LOS A	3.6	31.0	0.62	0.63	0.62	46.0
North: Railway Parade														
7	L2	26	28.0	27	28.0	0.128	7.4	LOS A	0.7	6.4	0.69	0.72	0.69	44.7
8	T1	37	28.0	39	28.0	0.128	7.3	LOS A	0.7	6.4	0.69	0.72	0.69	45.7
9	R2	22	28.0	23	28.0	0.128	11.4	LOS B	0.7	6.4	0.69	0.72	0.69	45.5
Approach		85	28.0	89	28.0	0.128	8.4	LOS A	0.7	6.4	0.69	0.72	0.69	45.4
West: Balfour Street														
10	L2	40	28.0	42	28.0	0.487	6.4	LOS A	3.5	30.5	0.69	0.72	0.69	44.7
11	T1	217	28.0	228	28.0	0.487	6.3	LOS A	3.5	30.5	0.69	0.72	0.69	45.8
12	R2	160	28.0	168	28.0	0.487	10.3	LOS B	3.5	30.5	0.69	0.72	0.69	45.6
Approach		417	28.0	439	28.0	0.487	7.8	LOS A	3.5	30.5	0.69	0.72	0.69	45.6
All Vehicles		1295	28.0	1363	28.0	0.487	7.4	LOS A	3.6	31.0	0.66	0.69	0.66	45.7

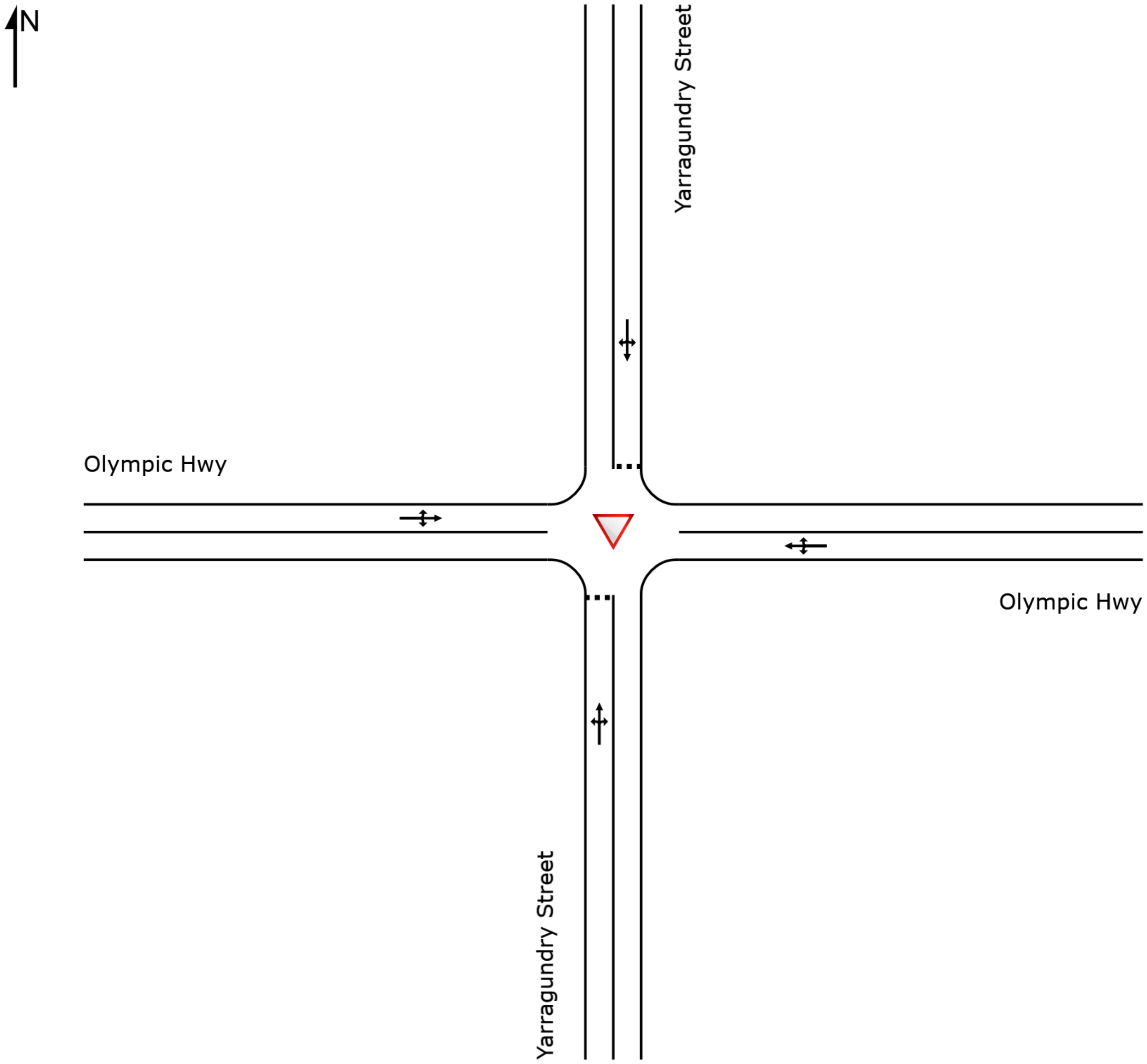
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

▽ Site: [Peak Hour Base - 2024 (Site Folder: Uranquinty, Wagga)]

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

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



MOVEMENT SUMMARY

▽ Site: [Peak Hour Base - 2024 (Site Folder: Uranquinty, Wagga)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yarragundry Street														
1	L2	14	8.0	15	8.0	0.051	4.6	LOS A	0.2	1.3	0.48	0.64	0.48	37.3
2	T1	3	8.0	3	8.0	0.051	6.5	LOS A	0.2	1.3	0.48	0.64	0.48	37.3
3	R2	14	8.0	15	8.0	0.051	9.2	LOS A	0.2	1.3	0.48	0.64	0.48	37.0
Approach		31	8.0	33	8.0	0.051	6.9	LOS A	0.2	1.3	0.48	0.64	0.48	37.2
East: Olympic Hwy														
4	L2	16	17.0	17	17.0	0.199	5.8	LOS A	0.2	1.8	0.08	0.05	0.08	48.7
5	T1	290	17.0	305	17.0	0.199	0.1	LOS A	0.2	1.8	0.08	0.05	0.08	49.5
6	R2	16	17.0	17	17.0	0.199	6.5	LOS A	0.2	1.8	0.08	0.05	0.08	48.2
Approach		322	17.0	339	17.0	0.199	0.7	NA	0.2	1.8	0.08	0.05	0.08	49.4
North: Yarragundry Street														
7	L2	14	8.0	15	8.0	0.051	4.6	LOS A	0.2	1.3	0.48	0.64	0.48	37.3
8	T1	3	8.0	3	8.0	0.051	6.5	LOS A	0.2	1.3	0.48	0.64	0.48	37.3
9	R2	14	8.0	15	8.0	0.051	9.2	LOS A	0.2	1.3	0.48	0.64	0.48	37.0
Approach		31	8.0	33	8.0	0.051	6.9	LOS A	0.2	1.3	0.48	0.64	0.48	37.2
West: Olympic Hwy														
10	L2	16	17.0	17	17.0	0.199	5.8	LOS A	0.2	1.8	0.08	0.05	0.08	48.7
11	T1	290	17.0	305	17.0	0.199	0.1	LOS A	0.2	1.8	0.08	0.05	0.08	49.5
12	R2	16	17.0	17	17.0	0.199	6.5	LOS A	0.2	1.8	0.08	0.05	0.08	48.2
Approach		322	17.0	339	17.0	0.199	0.7	NA	0.2	1.8	0.08	0.05	0.08	49.4
All Vehicles		706	16.2	743	16.2	0.199	1.3	NA	0.2	1.8	0.11	0.11	0.11	48.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: [Peak Hour Base w/ construction - 2024 (Site Folder: Uranquinty, Wagga)]

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

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yarragundry Street														
1	L2	14	8.0	15	8.0	0.054	4.6	LOS A	0.2	1.3	0.49	0.65	0.49	37.2
2	T1	3	8.0	3	8.0	0.054	7.4	LOS A	0.2	1.3	0.49	0.65	0.49	37.2
3	R2	14	8.0	15	8.0	0.054	9.8	LOS A	0.2	1.3	0.49	0.65	0.49	36.9
Approach		31	8.0	33	8.0	0.054	7.2	LOS A	0.2	1.3	0.49	0.65	0.49	37.0
East: Olympic Hwy														
4	L2	16	17.0	17	17.0	0.233	6.6	LOS A	0.6	5.2	0.20	0.11	0.20	48.1
5	T1	290	17.0	305	17.0	0.233	0.5	LOS A	0.6	5.2	0.20	0.11	0.20	48.9
6	R2	50	17.0	53	17.0	0.233	6.9	LOS A	0.6	5.2	0.20	0.11	0.20	47.6
Approach		356	17.0	375	17.0	0.233	1.7	NA	0.6	5.2	0.20	0.11	0.20	48.7
North: Yarragundry Street														
7	L2	18	8.0	19	8.0	0.068	4.7	LOS A	0.2	1.7	0.50	0.66	0.50	37.1
8	T1	3	8.0	3	8.0	0.068	7.2	LOS A	0.2	1.7	0.50	0.66	0.50	37.1
9	R2	18	8.0	19	8.0	0.068	10.1	LOS B	0.2	1.7	0.50	0.66	0.50	36.8
Approach		39	8.0	41	8.0	0.068	7.3	LOS A	0.2	1.7	0.50	0.66	0.50	37.0
West: Olympic Hwy														
10	L2	50	17.0	53	17.0	0.221	5.2	LOS A	0.2	2.0	0.08	0.10	0.08	48.5
11	T1	290	17.0	305	17.0	0.221	0.1	LOS A	0.2	2.0	0.08	0.10	0.08	49.2
12	R2	16	17.0	17	17.0	0.221	6.6	LOS A	0.2	2.0	0.08	0.10	0.08	48.0
Approach		356	17.0	375	17.0	0.221	1.2	NA	0.2	2.0	0.08	0.10	0.08	49.1
All Vehicles		782	16.2	823	16.2	0.233	1.9	NA	0.6	5.2	0.17	0.15	0.17	47.5

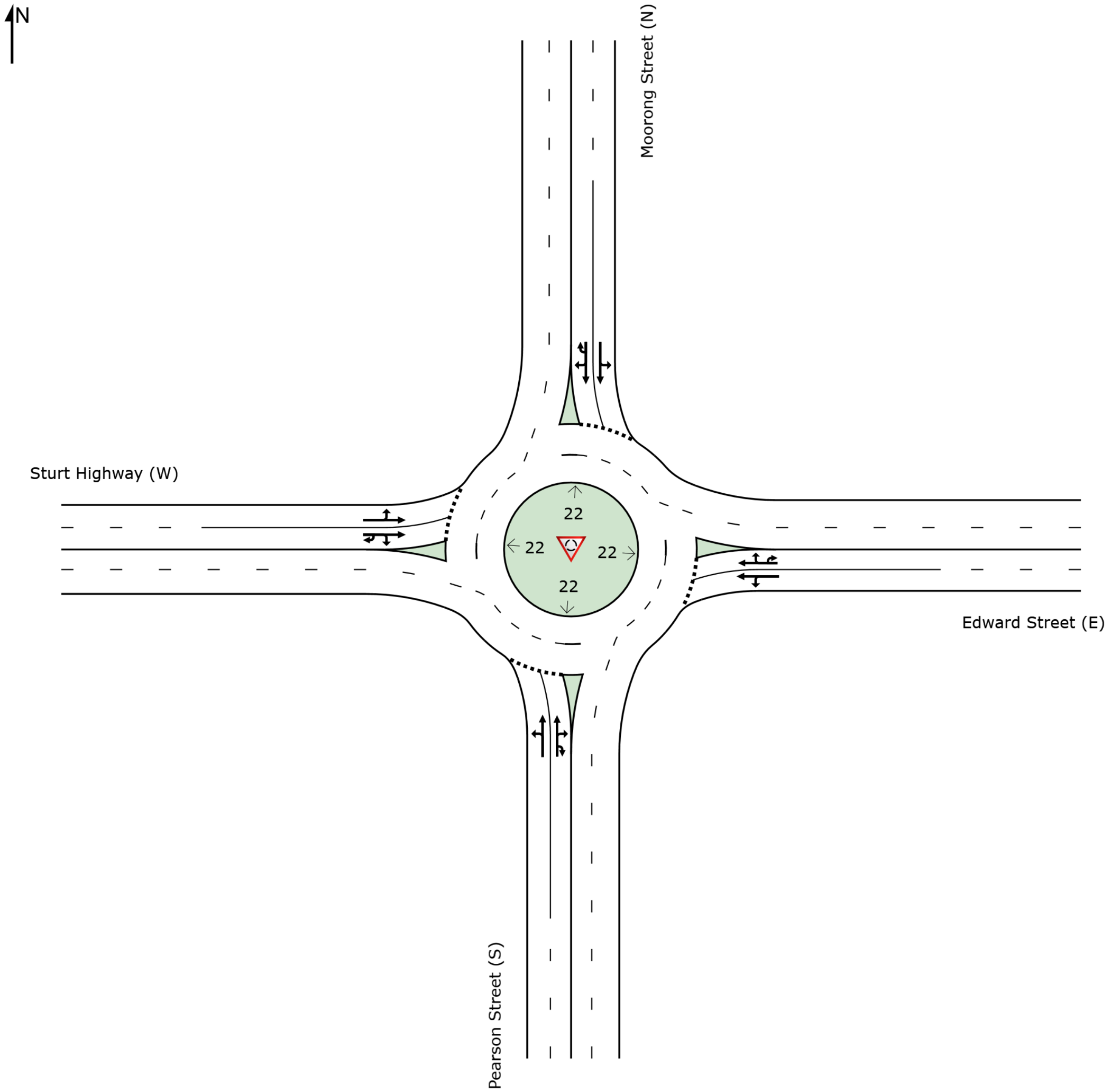
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Edward Street / Pearson Street - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Edward Street / Pearson Street - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pearson Street (S)														
1	L2	40	8	42	20.0	0.576	8.7	LOS A	4.4	32.2	0.76	0.86	0.89	49.9
2	T1	605	24	637	4.0	0.576	8.2	LOS A	4.4	32.2	0.76	0.88	0.90	51.4
3	R2	300	21	316	7.0	0.576	13.7	LOS B	4.3	31.6	0.77	0.96	0.92	45.9
3u	U	7	0	7	0.0	0.576	15.6	LOS B	4.3	31.6	0.77	0.96	0.92	48.1
Approach		952	53	1002	5.6	0.576	10.0	LOS B	4.4	32.2	0.76	0.91	0.91	49.7
East: Edward Street (E)														
4	L2	105	11	111	10.5	0.368	7.4	LOS A	2.1	17.0	0.75	0.79	0.76	48.4
5	T1	174	34	183	19.5	0.368	7.9	LOS A	2.1	17.0	0.75	0.81	0.76	51.7
6	R2	180	13	189	7.2	0.368	12.8	LOS B	2.1	15.9	0.75	0.91	0.77	48.9
6u	U	27	4	28	14.8	0.368	15.3	LOS B	2.1	15.9	0.75	0.91	0.77	45.7
Approach		486	62	512	12.8	0.368	10.0	LOS B	2.1	17.0	0.75	0.85	0.77	49.6
North: Moorong Street (N)														
7	L2	325	12	342	3.7	0.682	11.5	LOS B	6.4	46.5	0.88	1.06	1.21	48.2
8	T1	502	20	528	4.0	0.682	12.2	LOS B	6.4	46.5	0.88	1.07	1.23	48.2
9	R2	150	20	158	13.3	0.682	18.2	LOS B	6.1	45.0	0.88	1.08	1.25	49.0
9u	U	1	0	1	0.0	0.682	19.6	LOS B	6.1	45.0	0.88	1.08	1.25	50.4
Approach		978	52	1029	5.3	0.682	12.9	LOS B	6.4	46.5	0.88	1.07	1.23	48.4
West: Sturt Highway (W)														
10	L2	217	20	228	9.2	0.563	10.8	LOS B	3.8	29.0	0.86	1.00	1.09	50.3
11	T1	361	33	380	9.1	0.563	11.9	LOS B	3.8	29.0	0.85	1.00	1.10	49.1
12	R2	28	4	29	14.3	0.563	17.7	LOS B	3.5	26.8	0.85	1.00	1.11	46.6
12u	U	1	0	1	0.0	0.563	19.0	LOS B	3.5	26.8	0.85	1.00	1.11	51.4
Approach		607	57	639	9.4	0.563	11.8	LOS B	3.8	29.0	0.86	1.00	1.10	49.5
All Vehicles		3023	224	3182	7.4	0.682	11.3	LOS B	6.4	46.5	0.82	0.97	1.03	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Edward Street / Pearson Street - AM Peak with Construction Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Pearson Street (S)														
1	L2	40	8	42	20.0	0.579	8.7	LOS A	4.4	32.5	0.76	0.86	0.90	49.8
2	T1	605	24	637	4.0	0.579	8.3	LOS A	4.4	32.5	0.76	0.89	0.90	51.3
3	R2	300	21	316	7.0	0.579	13.8	LOS B	4.3	31.8	0.77	0.96	0.93	45.9
3u	U	7	0	7	0.0	0.579	15.6	LOS B	4.3	31.8	0.77	0.96	0.93	48.0
Approach		952	53	1002	5.6	0.579	10.1	LOS B	4.4	32.5	0.76	0.91	0.91	49.7
East: Edward Street (E)														
4	L2	117	12	123	10.3	0.386	7.7	LOS A	2.3	18.3	0.77	0.83	0.80	48.3
5	T1	174	34	183	19.5	0.386	8.2	LOS A	2.3	18.3	0.77	0.84	0.80	51.4
6	R2	180	13	189	7.2	0.386	13.2	LOS B	2.3	17.1	0.77	0.93	0.81	48.7
6u	U	27	4	28	14.8	0.386	15.7	LOS B	2.3	17.1	0.77	0.93	0.81	45.5
Approach		498	63	524	12.7	0.386	10.3	LOS B	2.3	18.3	0.77	0.88	0.80	49.4
North: Moorong Street (N)														
7	L2	325	12	342	3.7	0.701	11.9	LOS B	6.8	49.1	0.89	1.08	1.26	47.8
8	T1	514	21	541	4.1	0.701	12.8	LOS B	6.8	49.1	0.89	1.09	1.28	47.8
9	R2	150	20	158	13.3	0.701	18.7	LOS B	6.4	47.3	0.89	1.10	1.29	48.7
9u	U	1	0	1	0.0	0.701	20.1	LOS C	6.4	47.3	0.89	1.10	1.29	50.0
Approach		990	53	1042	5.4	0.701	13.4	LOS B	6.8	49.1	0.89	1.09	1.27	48.0
West: Sturt Highway (W)														
10	L2	217	20	228	9.2	0.578	11.0	LOS B	4.0	30.1	0.86	1.01	1.11	50.2
11	T1	361	33	380	9.1	0.578	12.1	LOS B	4.0	30.1	0.86	1.01	1.12	48.8
12	R2	41	5	43	12.2	0.578	17.8	LOS B	3.7	27.8	0.85	1.01	1.13	46.6
12u	U	1	0	1	0.0	0.578	19.2	LOS B	3.7	27.8	0.85	1.01	1.13	51.0
Approach		620	58	653	9.4	0.578	12.1	LOS B	4.0	30.1	0.86	1.01	1.12	49.2
All Vehicles		3060	227	3221	7.4	0.701	11.6	LOS B	6.8	49.1	0.82	0.98	1.05	49.0

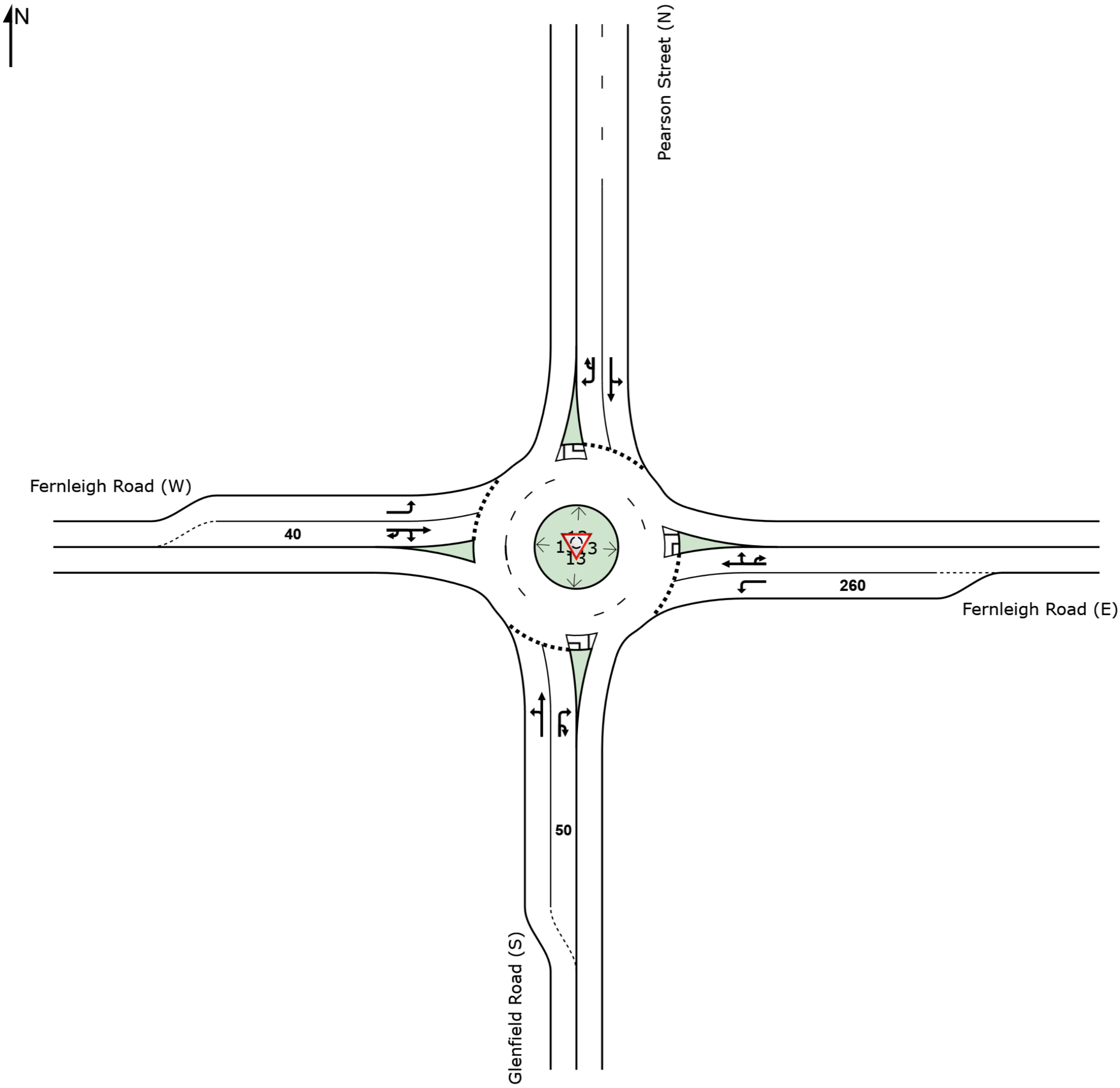
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Glenfield Road / Pearson Street / Fernleigh Road (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Glenfield Road / Pearson Street / Fernleigh Road (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Glenfield Road (S)														
1	L2	122	5	128	4.1	0.719	10.8	LOS B	9.3	66.0	0.87	0.91	1.10	49.9
2	T1	651	12	685	1.8	0.719	10.6	LOS B	9.3	66.0	0.87	0.91	1.10	50.4
3	R2	77	1	81	1.3	0.117	11.7	LOS B	0.6	4.3	0.59	0.75	0.59	50.3
3u	U	1	1	1	100.0	0.117	18.3	LOS B	0.6	4.3	0.59	0.75	0.59	47.4
Approach		851	19	896	2.2	0.719	10.7	LOS B	9.3	66.0	0.84	0.89	1.05	50.3
East: Fernleigh Road (E)														
4	L2	37	3	39	8.1	0.069	9.9	LOS A	0.4	2.7	0.69	0.74	0.69	50.3
5	T1	137	8	144	5.8	0.234	8.2	LOS A	1.6	11.5	0.73	0.76	0.73	51.8
6	R2	67	2	71	3.0	0.234	11.9	LOS B	1.6	11.5	0.73	0.76	0.73	50.8
6u	U	1	0	1	0.0	0.234	13.6	LOS B	1.6	11.5	0.73	0.76	0.73	52.4
Approach		242	13	255	5.4	0.234	9.5	LOS A	1.6	11.5	0.73	0.75	0.73	51.3
North: Pearson Street (N)														
7	L2	81	1	85	1.2	0.368	6.9	LOS A	2.7	19.5	0.68	0.69	0.68	51.0
8	T1	301	13	317	4.3	0.368	6.9	LOS A	2.7	19.5	0.68	0.69	0.68	52.3
9	R2	204	13	215	6.4	0.256	11.2	LOS B	1.6	11.8	0.65	0.77	0.65	49.6
9u	U	1	0	1	0.0	0.256	12.9	LOS B	1.6	11.8	0.65	0.77	0.65	49.7
Approach		587	27	618	4.6	0.368	8.4	LOS A	2.7	19.5	0.67	0.71	0.67	51.1
West: Fernleigh Road (W)														
10	L2	257	11	271	4.3	0.432	10.0	LOS A	2.7	19.5	0.79	0.94	0.88	49.4
11	T1	216	12	227	5.6	0.481	9.7	LOS A	3.3	24.2	0.81	0.96	0.93	50.9
12	R2	99	5	104	5.1	0.481	13.5	LOS B	3.3	24.2	0.81	0.96	0.93	50.6
12u	U	11	0	12	0.0	0.481	15.1	LOS B	3.3	24.2	0.81	0.96	0.93	51.4
Approach		583	28	614	4.8	0.481	10.6	LOS B	3.3	24.2	0.80	0.95	0.91	50.2
All Vehicles		2263	87	2382	3.8	0.719	10.0	LOS A	9.3	66.0	0.78	0.85	0.88	50.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Glenfield Road / Pearson Street / Fernleigh Road - AM Peak with Construction Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Glenfield Road (S)														
1	L2	122	5	128	4.1	0.741	12.0	LOS B	10.2	72.8	0.91	0.97	1.21	49.2
2	T1	651	12	685	1.8	0.741	11.8	LOS B	10.2	72.8	0.91	0.97	1.21	49.5
3	R2	77	1	81	1.3	0.122	12.0	LOS B	0.6	4.5	0.61	0.76	0.61	50.1
3u	U	2	1	2	50.0	0.122	16.2	LOS B	0.6	4.5	0.61	0.76	0.61	49.0
Approach		852	19	897	2.2	0.741	11.8	LOS B	10.2	72.8	0.88	0.95	1.15	49.5
East: Fernleigh Road (E)														
4	L2	37	3	39	8.1	0.071	10.3	LOS B	0.4	2.9	0.71	0.75	0.71	50.0
5	T1	137	8	144	5.8	0.242	8.5	LOS A	1.7	12.2	0.76	0.77	0.76	51.6
6	R2	67	2	71	3.0	0.242	12.2	LOS B	1.7	12.2	0.76	0.77	0.76	50.6
6u	U	1	0	1	0.0	0.242	14.0	LOS B	1.7	12.2	0.76	0.77	0.76	52.2
Approach		242	13	255	5.4	0.242	9.8	LOS A	1.7	12.2	0.75	0.77	0.75	51.1
North: Pearson Street (N)														
7	L2	81	1	85	1.2	0.369	6.9	LOS A	2.7	19.5	0.68	0.69	0.68	51.0
8	T1	301	13	317	4.3	0.369	6.9	LOS A	2.7	19.5	0.68	0.69	0.68	52.3
9	R2	240	16	253	6.7	0.293	11.3	LOS B	1.9	14.0	0.66	0.77	0.66	49.6
9u	U	1	0	1	0.0	0.293	12.9	LOS B	1.9	14.0	0.66	0.77	0.66	49.7
Approach		623	30	656	4.8	0.369	8.6	LOS A	2.7	19.5	0.67	0.72	0.67	51.0
West: Fernleigh Road (W)														
10	L2	257	11	271	4.3	0.436	10.0	LOS B	2.7	19.8	0.80	0.94	0.89	49.4
11	T1	216	12	227	5.6	0.485	9.8	LOS A	3.4	24.6	0.82	0.96	0.94	50.9
12	R2	99	5	104	5.1	0.485	13.5	LOS B	3.4	24.6	0.82	0.96	0.94	50.6
12u	U	11	0	12	0.0	0.485	15.2	LOS B	3.4	24.6	0.82	0.96	0.94	51.4
Approach		583	28	614	4.8	0.485	10.6	LOS B	3.4	24.6	0.81	0.95	0.92	50.2
All Vehicles		2300	90	2421	3.9	0.741	10.4	LOS B	10.2	72.8	0.79	0.87	0.92	50.3

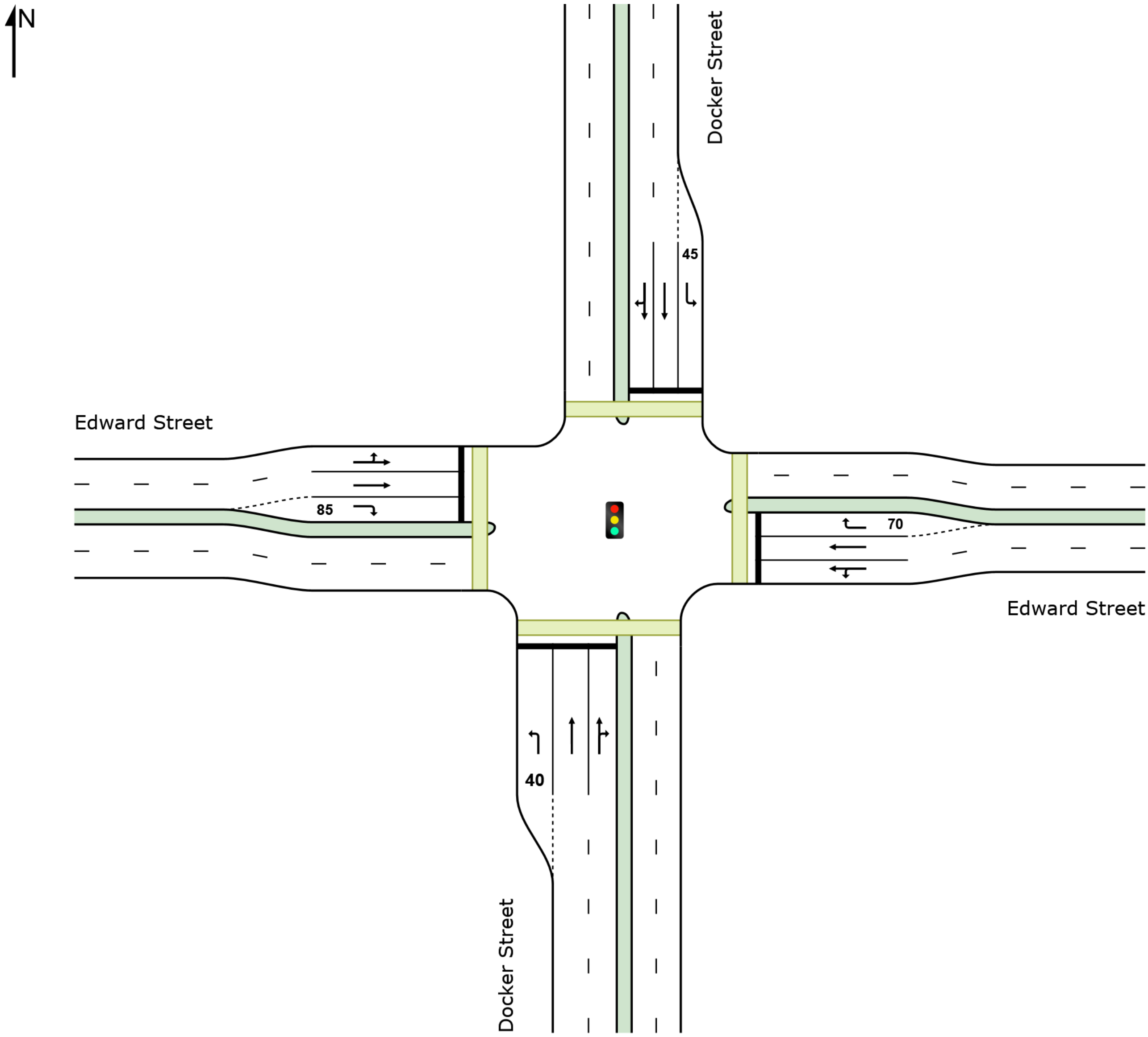
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Edward Street / Docker Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



PHASING SUMMARY

Site: [Edward Street / Docker Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

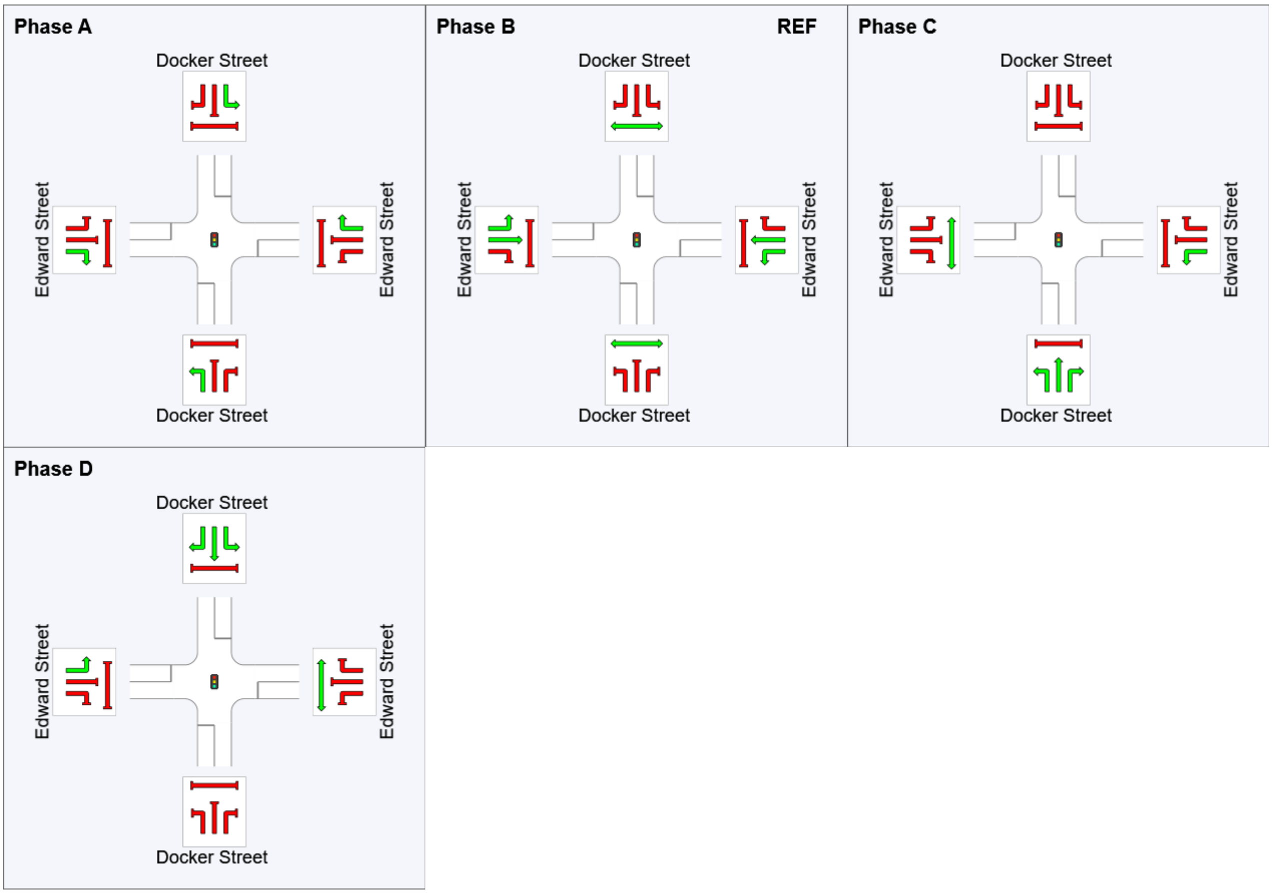
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	75	0	27	55
Green Time (sec)	9	21	22	14
Phase Time (sec)	15	27	28	20
Phase Split	17%	30%	31%	22%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

MOVEMENT SUMMARY

Site: [Edward Street / Docker Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Docker Street														
1	L2	65	3	68	4.6	0.102	16.8	LOS B	1.1	8.4	0.71	0.71	0.71	43.3
2	T1	654	7	688	1.1	* 0.924	53.0	LOS D	24.1	171.2	1.00	1.14	1.42	31.9
3	R2	177	4	186	2.3	0.924	59.2	LOS E	24.1	171.2	1.00	1.14	1.42	29.7
Approach		896	14	943	1.6	0.924	51.6	LOS D	24.1	171.2	0.98	1.10	1.37	32.1
East: Edward Street														
4	L2	107	10	113	9.3	0.719	39.7	LOS D	13.2	101.9	0.97	0.87	1.03	34.5
5	T1	473	66	498	14.0	0.719	35.9	LOS D	13.2	101.9	0.97	0.88	1.04	33.4
6	R2	94	5	99	5.3	0.556	48.7	LOS D	4.4	32.2	1.00	0.78	1.01	31.1
Approach		674	81	709	12.0	0.719	38.3	LOS D	13.2	101.9	0.98	0.86	1.03	33.2
North: Docker Street														
7	L2	112	4	118	3.6	0.202	29.5	LOS C	3.8	27.2	0.76	0.75	0.76	37.6
8	T1	284	8	299	2.8	0.893	52.2	LOS D	13.5	97.0	1.00	1.06	1.42	32.2
9	R2	206	7	217	3.4	0.893	58.2	LOS E	13.2	95.1	1.00	1.04	1.43	29.4
Approach		602	19	634	3.2	0.893	50.0	LOS D	13.5	97.0	0.96	0.99	1.30	32.0
West: Edward Street														
10	L2	226	6	238	2.7	* 0.919	55.3	LOS E	22.0	162.5	1.00	1.19	1.41	29.9
11	T1	562	60	592	10.7	* 0.919	52.6	LOS D	22.0	162.5	1.00	1.18	1.42	29.0
12	R2	152	4	160	2.6	* 0.873	57.6	LOS E	8.1	58.2	1.00	1.03	1.46	29.1
Approach		940	70	989	7.4	0.919	54.1	LOS D	22.0	164.6	1.00	1.16	1.42	29.2
All Vehicles		3112	184	3276	5.9	0.924	49.1	LOS D	24.1	171.2	0.98	1.05	1.30	31.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Docker Street												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	211.6	224.0	1.06
East: Edward Street												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.2	219.6	1.05

North: Docker Street											
P3 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.9	220.5	1.06
West: Edward Street											
P4 Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	209.6	221.4	1.06
All Pedestrians	200	211	39.3	LOS D	0.1	0.1	0.94	0.94	209.6	221.4	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: [Edward Street / Docker Street - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

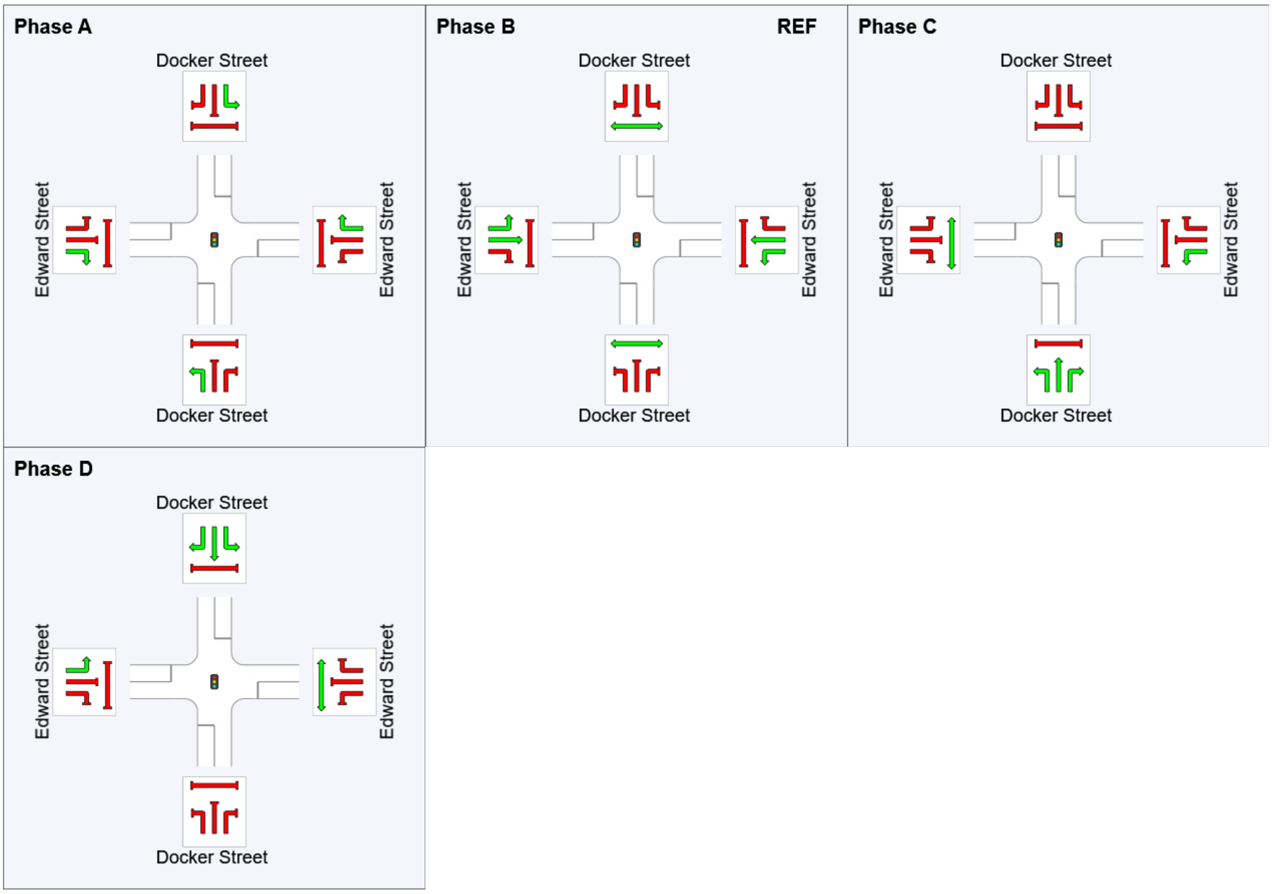
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	106	0	35	82
Green Time (sec)	18	29	41	18
Phase Time (sec)	24	35	47	24
Phase Split	18%	27%	36%	18%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: [Edward Street / Docker Street - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Docker Street														
1	L2	231	12	243	5.2	0.278	17.9	LOS B	5.5	40.4	0.66	0.75	0.66	42.7
2	T1	905	11	953	1.2	1.034	119.2	LOS F	63.8	452.4	1.00	1.37	1.67	20.1
3	R2	177	4	186	2.3	1.034	122.5	LOS F	63.8	452.4	1.00	1.34	1.64	19.5
Approach		1313	27	1382	2.1	1.034	101.8	LOS F	63.8	452.4	0.94	1.26	1.49	22.1
East: Edward Street														
4	L2	375	19	395	5.1	* 1.042	130.1	LOS F	52.5	389.9	1.00	1.28	1.71	18.3
5	T1	473	66	498	14.0	1.042	128.0	LOS F	52.5	389.9	1.00	1.43	1.76	18.0
6	R2	94	5	99	5.3	0.401	60.8	LOS E	5.9	42.8	0.96	0.78	0.96	28.2
Approach		942	90	992	9.6	1.042	122.1	LOS F	52.5	389.9	1.00	1.30	1.66	18.8
North: Docker Street														
7	L2	112	4	118	3.6	0.201	39.6	LOS D	5.4	38.7	0.76	0.76	0.76	34.1
8	T1	284	8	299	2.8	* 1.056	139.5	LOS F	27.6	198.8	1.00	1.34	1.90	17.9
9	R2	206	7	217	3.4	1.056	144.5	LOS F	27.6	198.8	1.00	1.29	1.88	17.1
Approach		602	19	634	3.2	1.056	122.6	LOS F	27.6	198.8	0.96	1.21	1.68	19.3
West: Edward Street														
10	L2	226	6	238	2.7	0.913	71.1	LOS E	27.7	204.7	1.00	1.13	1.28	26.5
11	T1	486	57	512	11.7	0.913	68.7	LOS E	27.7	204.7	1.00	1.12	1.30	25.7
12	R2	249	13	262	5.2	* 1.052	140.5	LOS F	26.7	195.4	1.00	1.29	1.87	17.3
Approach		961	76	1012	7.9	1.052	87.9	LOS F	27.7	204.7	1.00	1.17	1.44	23.0
All Vehicles		3818	212	4019	5.6	1.056	106.6	LOS F	63.8	452.4	0.97	1.24	1.55	20.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Docker Street												
P1	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	231.6	224.0	0.97
East: Edward Street												
P2	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	228.2	219.6	0.96

North: Docker Street												
P3	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	228.9	220.5	0.96
West: Edward Street												
P4	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	229.6	221.4	0.96
All Pedestrians		200	211	59.3	LOS E	0.2	0.2	0.96	0.96	229.6	221.4	0.96

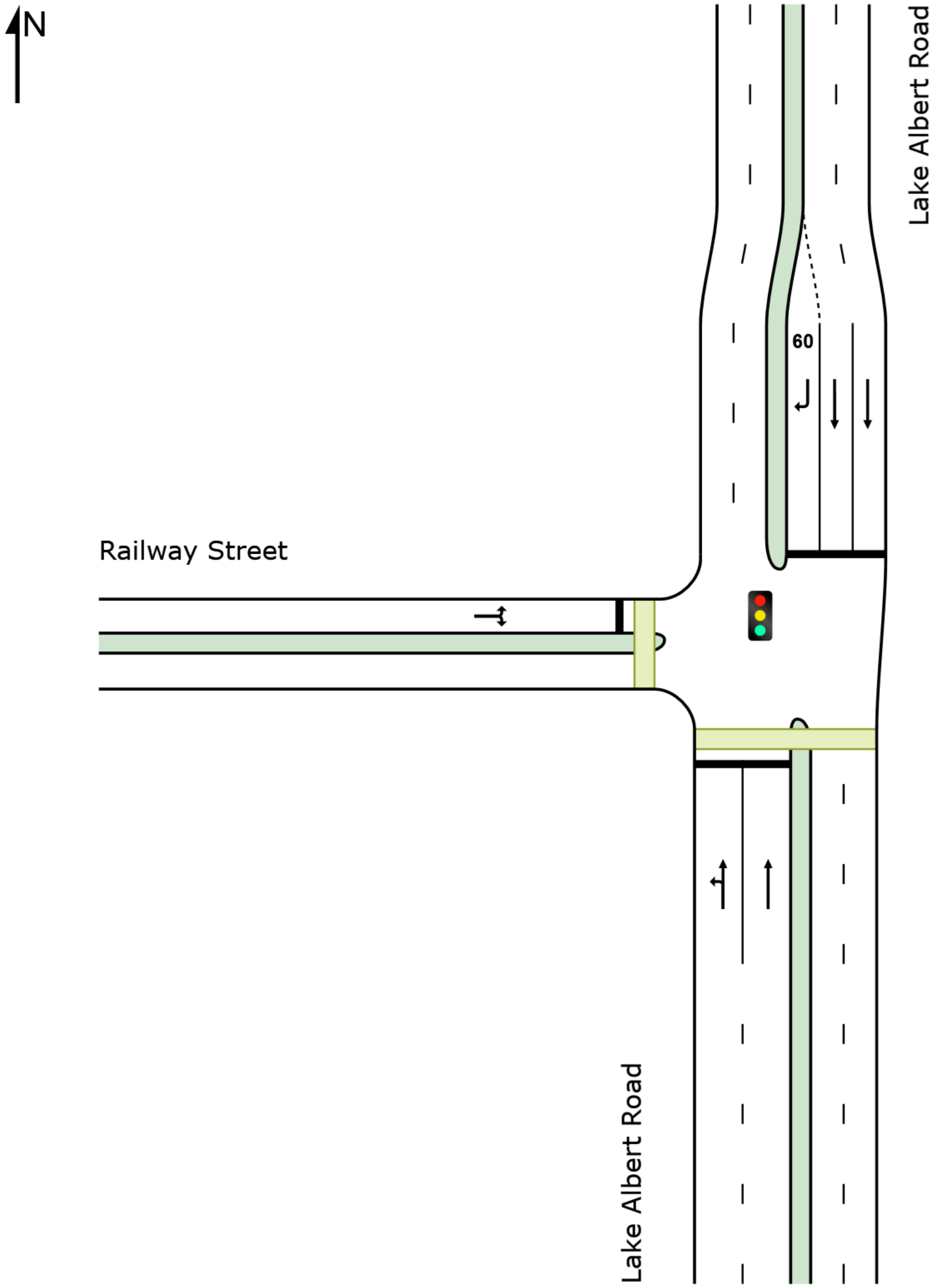
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: [Railway Street/ Lake Albert Road - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



PHASING SUMMARY

Site: [Railway Street/ Lake Albert Road - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

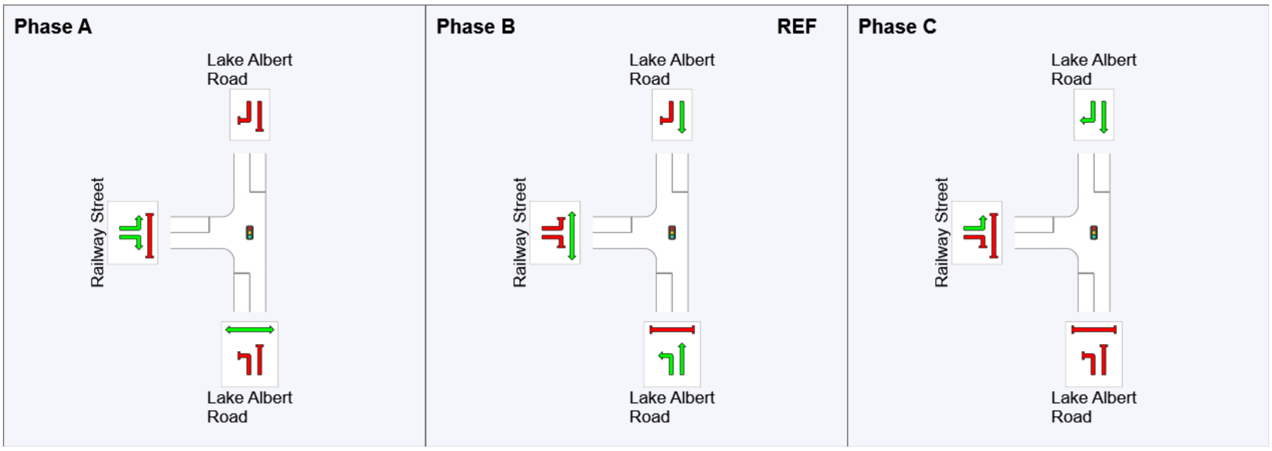
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

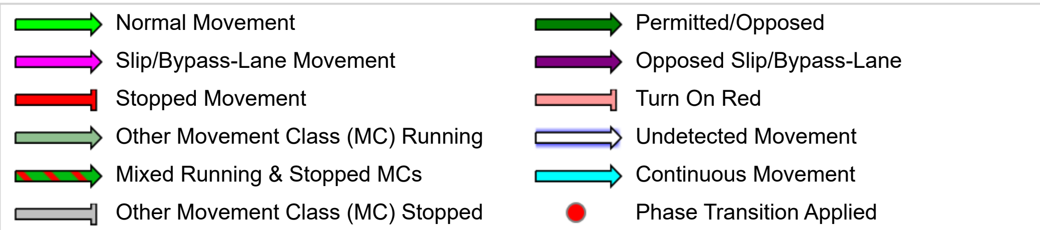
Phase	A	B	C
Phase Change Time (sec)	35	0	23
Green Time (sec)	9	17	6
Phase Time (sec)	15	23	12
Phase Split	30%	46%	24%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: [Railway Street/ Lake Albert Road - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Lake Albert Road														
1	L2	113	9	119	8.0	0.738	23.4	LOS C	12.0	86.7	0.94	0.89	1.04	42.0
2	T1	864	20	909	2.3	* 0.738	17.8	LOS B	12.2	87.4	0.94	0.88	1.04	46.1
Approach		977	29	1028	3.0	0.738	18.4	LOS B	12.2	87.4	0.94	0.88	1.04	45.6
North: Lake Albert Road														
8	T1	297	11	313	3.7	0.142	5.2	LOS A	1.8	12.6	0.48	0.40	0.48	55.3
9	R2	113	9	119	8.0	* 0.564	30.3	LOS C	3.0	22.6	0.99	0.80	1.05	37.1
Approach		410	20	432	4.9	0.564	12.1	LOS B	3.0	22.6	0.62	0.51	0.64	48.7
West: Railway Street														
10	L2	113	9	119	8.0	0.748	28.7	LOS C	6.1	46.0	0.98	0.93	1.22	37.4
12	R2	113	9	119	8.0	* 0.748	28.7	LOS C	6.1	46.0	0.98	0.93	1.22	37.4
Approach		226	18	238	8.0	0.748	28.7	LOS C	6.1	46.0	0.98	0.93	1.22	37.4
All Vehicles		1613	67	1698	4.2	0.748	18.3	LOS B	12.2	87.4	0.87	0.79	0.96	44.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lake Albert Road												
P1	Full	50	53	19.4	LOS B	0.1	0.1	0.88	0.88	188.8	220.2	1.17
West: Railway Street												
P4	Full	50	53	19.4	LOS B	0.1	0.1	0.88	0.88	181.7	211.0	1.16
All Pedestrians		100	105	19.4	LOS B	0.1	0.1	0.88	0.88	185.2	215.6	1.16

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: [Railway Street/ Lake Albert Road - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated   Cycle Time = 80 seconds (Site User-Given Cycle Time)

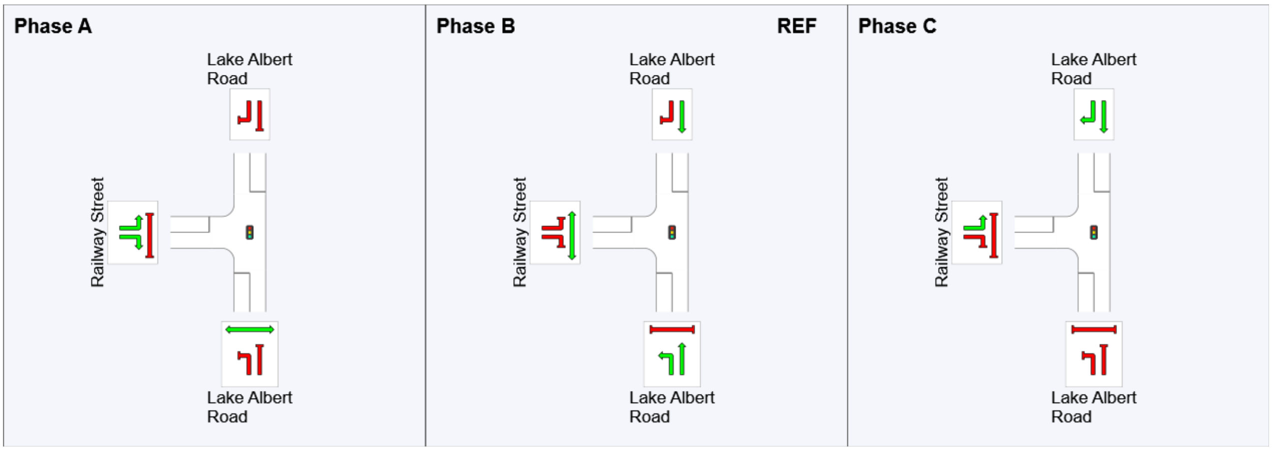
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	43	0	26
Green Time (sec)	31	20	11
Phase Time (sec)	37	26	17
Phase Split	46%	33%	21%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

MOVEMENT SUMMARY

Site: [Railway Street/ Lake Albert Road - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Lake Albert Road														
1	L2	113	9	119	8.0	1.004	84.3	LOS F	32.9	237.1	1.00	1.42	1.85	24.7
2	T1	864	20	909	2.3	* 1.004	78.5	LOS E	33.5	239.1	1.00	1.42	1.85	26.0
Approach		977	29	1028	3.0	1.004	79.1	LOS E	33.5	239.1	1.00	1.42	1.85	25.9
North: Lake Albert Road														
8	T1	297	11	313	3.7	0.177	13.5	LOS B	3.6	25.7	0.62	0.51	0.62	49.1
9	R2	204	25	215	12.3	0.914	57.6	LOS E	10.5	81.2	1.00	1.05	1.60	29.0
Approach		501	36	527	7.2	0.914	31.4	LOS C	10.5	81.2	0.77	0.73	1.02	38.3
West: Railway Street														
10	L2	560	15	589	2.7	* 1.004	82.1	LOS F	47.8	345.2	1.00	1.27	1.78	24.2
12	R2	113	9	119	8.0	1.004	82.1	LOS F	47.8	345.2	1.00	1.27	1.78	24.2
Approach		673	24	708	3.6	1.004	82.1	LOS F	47.8	345.2	1.00	1.27	1.78	24.2
All Vehicles		2151	89	2264	4.1	1.004	69.0	LOS E	47.8	345.2	0.95	1.21	1.63	27.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lake Albert Road												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	203.7	220.2	1.08
West: Railway Street												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	196.6	211.0	1.07
All Pedestrians		100	105	34.3	LOS D	0.1	0.1	0.93	0.93	200.1	215.6	1.08

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

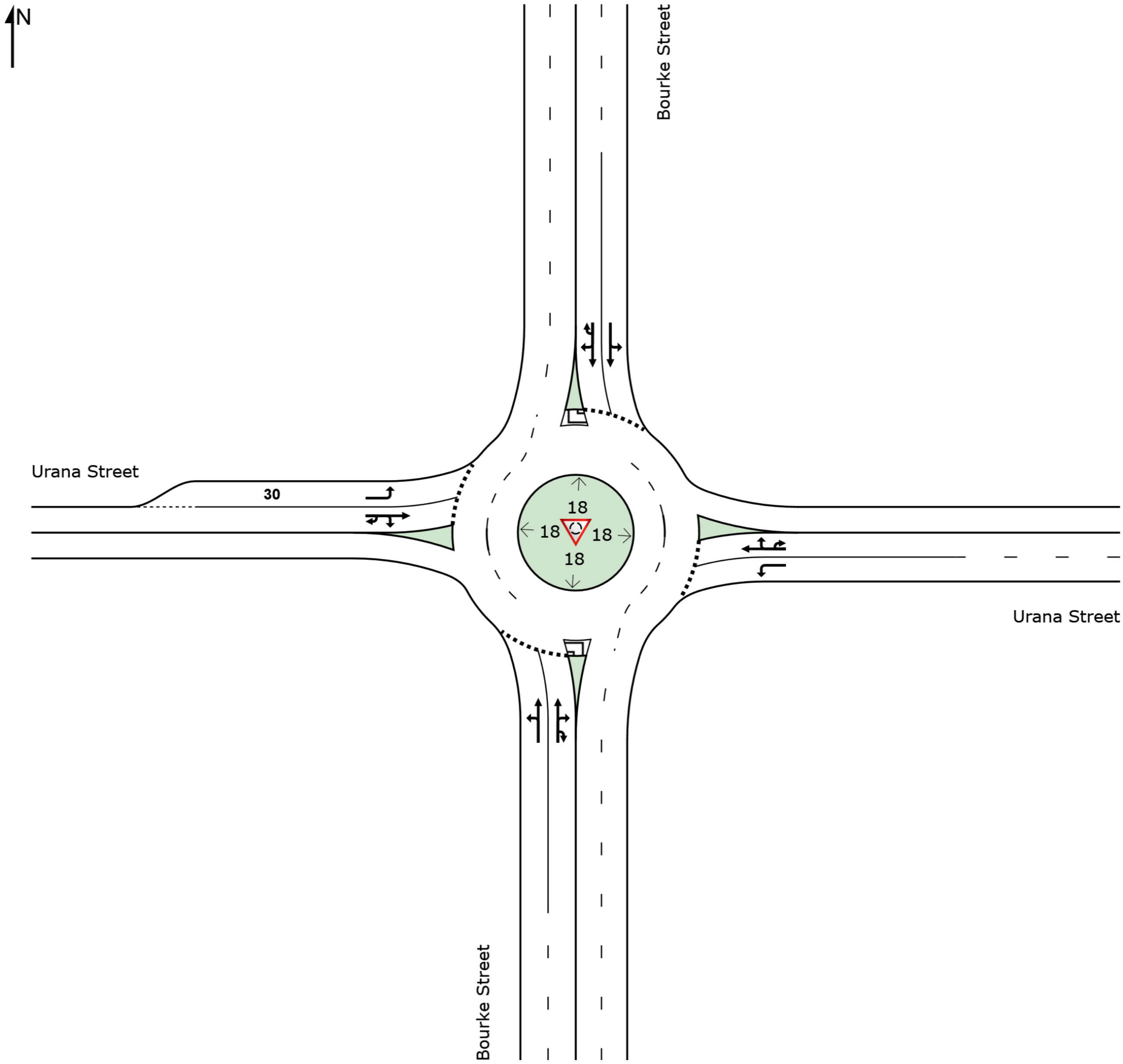
Project: \\corp.pbwan.net\ANZ\ProposalsAU\PP123xxx\PP123740_ILR_P2_RDEIS_Albu\4_WIP\Master_Doc\RFT\Traffic\Temp working for Project\95Percent\SIDRA\Traffic count intersections.sip9

SITE LAYOUT

Site: [Urana Street / Bourke Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Urana Street / Bourke Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street															
1	L2	44	2	46	4.5	0.501	8.4	LOS A	4.2	30.1	0.81	0.81	0.87	48.1
2	T1	764	16	804	2.1	0.501	8.7	LOS A	4.2	30.1	0.81	0.84	0.88	52.4
3	R2	70	1	74	1.4	0.501	13.7	LOS B	4.0	28.6	0.81	0.88	0.91	48.7
3u	U	3	0	3	0.0	0.501	15.6	LOS B	4.0	28.6	0.81	0.88	0.91	52.7
Approach		881	19	927	2.2	0.501	9.1	LOS A	4.2	30.1	0.81	0.84	0.88	51.9
East: Urana Street															
4	L2	50	1	53	2.0	0.089	6.3	LOS A	0.4	2.5	0.52	0.65	0.52	49.0
5	T1	207	5	218	2.4	0.478	5.1	LOS A	2.9	20.4	0.61	0.71	0.63	46.0
6	R2	260	2	274	0.8	0.478	9.4	LOS A	2.9	20.4	0.61	0.71	0.63	48.9
6u	U	1	0	1	0.0	0.478	12.7	LOS B	2.9	20.4	0.61	0.71	0.63	49.6
Approach		518	8	545	1.5	0.478	7.4	LOS A	2.9	20.4	0.60	0.71	0.62	47.7
North: Bourke Street															
7	L2	80	2	84	2.5	0.213	5.7	LOS A	1.4	9.7	0.52	0.57	0.52	49.3
8	T1	274	6	288	2.2	0.213	5.7	LOS A	1.4	9.7	0.53	0.60	0.53	53.7
9	R2	89	2	94	2.2	0.213	10.3	LOS B	1.3	9.3	0.54	0.65	0.54	49.4
9u	U	22	0	23	0.0	0.213	12.3	LOS B	1.3	9.3	0.54	0.65	0.54	53.5
Approach		465	10	489	2.2	0.213	6.9	LOS A	1.4	9.7	0.53	0.61	0.53	52.0
West: Urana Street															
10	L2	259	3	273	1.2	0.400	7.5	LOS A	2.3	16.0	0.79	0.91	0.86	48.2
11	T1	211	4	222	1.9	0.426	8.4	LOS A	2.3	16.6	0.79	0.91	0.90	45.6
12	R2	17	1	18	5.9	0.426	12.9	LOS B	2.3	16.6	0.79	0.91	0.90	48.3
12u	U	1	0	1	0.0	0.426	16.0	LOS B	2.3	16.6	0.79	0.91	0.90	49.3
Approach		488	8	514	1.6	0.426	8.1	LOS A	2.3	16.6	0.79	0.91	0.88	47.0
All Vehicles		2352	45	2476	1.9	0.501	8.1	LOS A	4.2	30.1	0.70	0.78	0.75	49.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Urana Street / Bourke Street - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street														
1	L2	44	2	46	4.5	1.039	108.9	LOS F	41.4	295.8	1.00	2.41	4.51	20.9
2	T1	764	16	804	2.1	1.039	110.8	LOS F	41.4	295.8	1.00	2.33	4.40	21.5
3	R2	70	1	74	1.4	1.039	118.2	LOS F	32.5	231.3	1.00	2.21	4.25	20.5
3u	U	3	0	3	0.0	1.039	120.1	LOS F	32.5	231.3	1.00	2.21	4.25	21.2
Approach		881	19	927	2.2	1.039	111.3	LOS F	41.4	295.8	1.00	2.32	4.40	21.4
East: Urana Street														
4	L2	50	1	53	2.0	0.091	6.5	LOS A	0.4	2.8	0.55	0.66	0.55	48.8
5	T1	207	5	218	2.4	0.911	16.1	LOS B	19.6	139.9	1.00	1.29	1.73	40.4
6	R2	678	16	714	2.4	0.911	20.4	LOS C	19.6	139.9	1.00	1.29	1.73	42.6
6u	U	1	0	1	0.0	0.911	23.7	LOS C	19.6	139.9	1.00	1.29	1.73	43.2
Approach		936	22	985	2.4	0.911	18.7	LOS B	19.6	139.9	0.98	1.25	1.67	42.4
North: Bourke Street														
7	L2	425	15	447	3.5	0.375	5.9	LOS A	2.8	20.0	0.60	0.63	0.60	49.3
8	T1	274	6	288	2.2	0.375	6.2	LOS A	2.8	20.0	0.61	0.66	0.61	53.0
9	R2	89	2	94	2.2	0.375	10.6	LOS B	2.6	18.9	0.62	0.66	0.62	49.6
9u	U	22	0	23	0.0	0.375	12.6	LOS B	2.6	18.9	0.62	0.66	0.62	53.8
Approach		810	23	853	2.8	0.375	6.7	LOS A	2.8	20.0	0.61	0.65	0.61	50.7
West: Urana Street														
10	L2	259	3	273	1.2	0.548	14.1	LOS B	3.8	27.1	0.92	1.07	1.22	44.3
11	T1	211	4	222	1.9	0.621	18.0	LOS B	4.2	29.8	0.91	1.10	1.33	40.8
12	R2	17	1	18	5.9	0.621	22.6	LOS C	4.2	29.8	0.91	1.10	1.33	42.9
12u	U	1	0	1	0.0	0.621	25.6	LOS C	4.2	29.8	0.91	1.10	1.33	43.7
Approach		488	8	514	1.6	0.621	16.1	LOS B	4.2	29.8	0.91	1.08	1.27	42.7
All Vehicles		3115	72	3279	2.3	1.039	41.4	LOS D	41.4	295.8	0.88	1.37	2.10	34.3

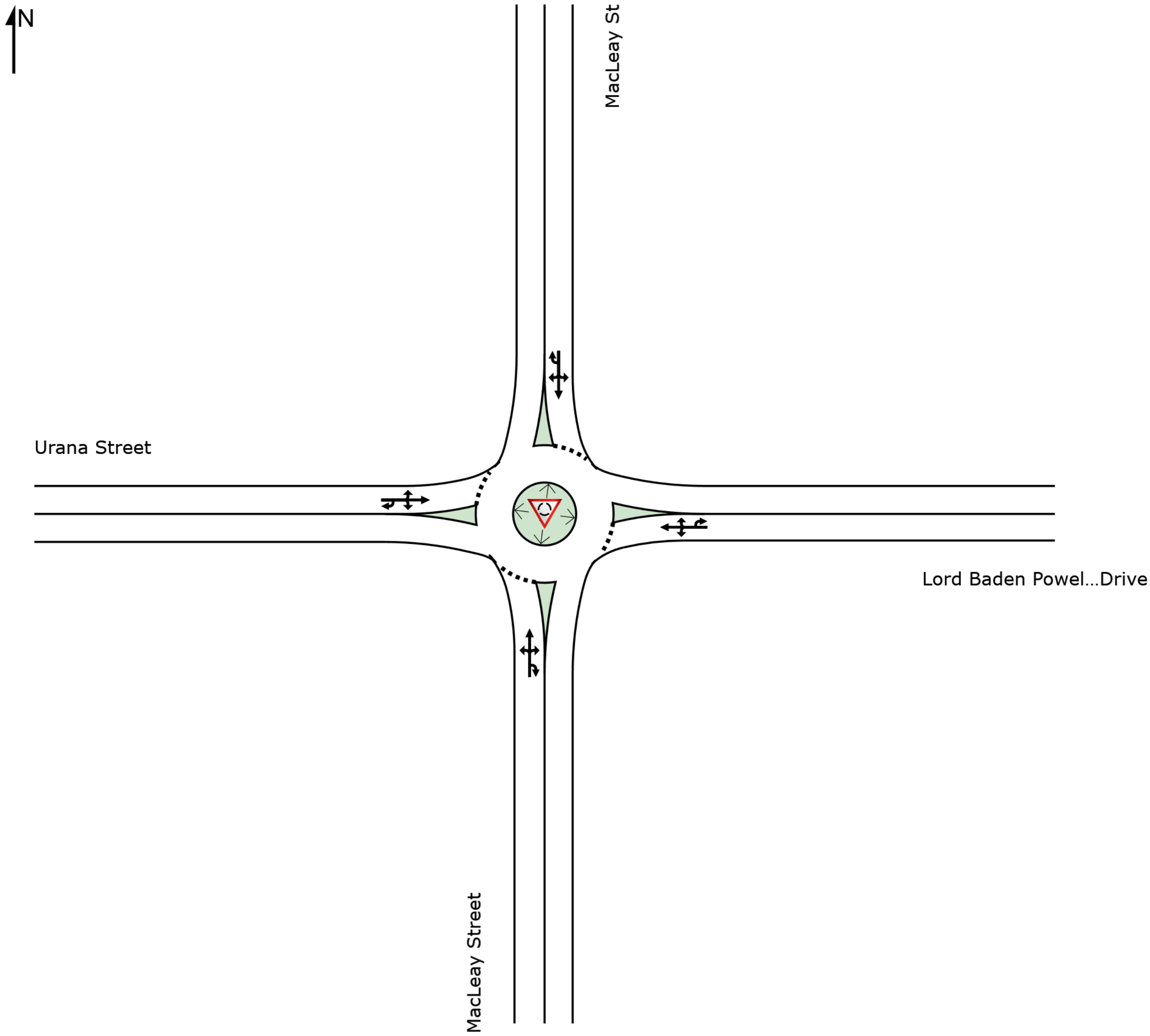
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Urana Street /MacLeay Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Urana Street /MacLeay Street - Base - AM Peak (Site Folder: Wagga Wagga)]

Site Category: Base Year
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total	HV]	DEMAND FLOWS [Total	HV]	Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh.	Dist]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: MacLeay Street														
1	L2	11	1	12	9.1	0.221	5.8	LOS A	1.2	8.8	0.39	0.56	0.39	48.8
2	T1	196	16	206	8.2	0.221	5.9	LOS A	1.2	8.8	0.39	0.56	0.39	53.2
3	R2	18	1	19	5.6	0.221	9.1	LOS A	1.2	8.8	0.39	0.56	0.39	49.5
3u	U	1	0	1	0.0	0.221	10.6	LOS B	1.2	8.8	0.39	0.56	0.39	53.7
Approach		226	18	238	8.0	0.221	6.2	LOS A	1.2	8.8	0.39	0.56	0.39	52.7
East: Lord Baden Powell Drive														
4	L2	12	0	13	0.0	0.129	4.9	LOS A	0.7	5.0	0.41	0.59	0.41	48.2
5	T1	51	1	54	2.0	0.129	4.9	LOS A	0.7	5.0	0.41	0.59	0.41	46.0
6	R2	66	1	69	1.5	0.129	8.1	LOS A	0.7	5.0	0.41	0.59	0.41	48.7
6u	U	1	0	1	0.0	0.129	10.9	LOS B	0.7	5.0	0.41	0.59	0.41	49.2
Approach		130	2	137	1.5	0.129	6.6	LOS A	0.7	5.0	0.41	0.59	0.41	47.5
North: MacLeay St														
7	L2	39	3	41	7.7	0.195	5.2	LOS A	1.1	8.4	0.27	0.53	0.27	48.9
8	T1	133	11	140	8.3	0.195	5.3	LOS A	1.1	8.4	0.27	0.53	0.27	53.3
9	R2	44	4	46	9.1	0.195	8.6	LOS A	1.1	8.4	0.27	0.53	0.27	49.6
9u	U	11	1	12	9.1	0.195	10.2	LOS B	1.1	8.4	0.27	0.53	0.27	53.4
Approach		227	19	239	8.4	0.195	6.2	LOS A	1.1	8.4	0.27	0.53	0.27	51.8
West: Urana Street														
10	L2	65	1	68	1.5	0.132	5.5	LOS A	0.7	5.0	0.49	0.58	0.49	48.8
11	T1	53	1	56	1.9	0.132	5.4	LOS A	0.7	5.0	0.49	0.58	0.49	46.5
12	R2	4	0	4	0.0	0.132	8.6	LOS A	0.7	5.0	0.49	0.58	0.49	49.4
12u	U	1	0	1	0.0	0.132	11.4	LOS B	0.7	5.0	0.49	0.58	0.49	49.9
Approach		123	2	129	1.6	0.132	5.6	LOS A	0.7	5.0	0.49	0.58	0.49	47.8
All Vehicles		706	41	743	5.8	0.221	6.2	LOS A	1.2	8.8	0.37	0.56	0.37	50.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Urana Street /MacLeay Street - AM Peak with Construction & Diversion Traffic (Site Folder: Wagga Wagga)]

Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: MacLeay Street														
1	L2	11	1	12	9.1	0.235	6.3	LOS A	1.3	9.4	0.45	0.60	0.45	48.6
2	T1	196	16	206	8.2	0.235	6.4	LOS A	1.3	9.4	0.45	0.60	0.45	52.9
3	R2	18	1	19	5.6	0.235	9.5	LOS A	1.3	9.4	0.45	0.60	0.45	49.3
3u	U	1	0	1	0.0	0.235	11.0	LOS B	1.3	9.4	0.45	0.60	0.45	53.4
Approach		226	18	238	8.0	0.235	6.6	LOS A	1.3	9.4	0.45	0.60	0.45	52.4
East: Lord Baden Powell Drive														
4	L2	12	0	13	0.0	0.137	5.3	LOS A	0.8	5.3	0.48	0.62	0.48	48.0
5	T1	51	1	54	2.0	0.137	5.4	LOS A	0.8	5.3	0.48	0.62	0.48	45.8
6	R2	66	1	69	1.5	0.137	8.5	LOS A	0.8	5.3	0.48	0.62	0.48	48.4
6u	U	1	0	1	0.0	0.137	11.3	LOS B	0.8	5.3	0.48	0.62	0.48	49.0
Approach		130	2	137	1.5	0.137	7.0	LOS A	0.8	5.3	0.48	0.62	0.48	47.3
North: MacLeay Street														
7	L2	39	3	41	7.7	0.248	5.2	LOS A	1.6	11.9	0.29	0.56	0.29	48.6
8	T1	133	11	140	8.3	0.248	5.4	LOS A	1.6	11.9	0.29	0.56	0.29	52.9
9	R2	107	12	113	11.2	0.248	8.6	LOS A	1.6	11.9	0.29	0.56	0.29	49.2
9u	U	11	1	12	9.1	0.248	10.2	LOS B	1.6	11.9	0.29	0.56	0.29	53.0
Approach		290	27	305	9.3	0.248	6.7	LOS A	1.6	11.9	0.29	0.56	0.29	50.9
West: Urana Street														
10	L2	512	7	539	1.4	0.597	7.2	LOS A	5.4	37.9	0.72	0.75	0.78	48.0
11	T1	53	1	56	1.9	0.597	7.2	LOS A	5.4	37.9	0.72	0.75	0.78	45.7
12	R2	4	0	4	0.0	0.597	10.3	LOS B	5.4	37.9	0.72	0.75	0.78	48.5
12u	U	1	0	1	0.0	0.597	13.1	LOS B	5.4	37.9	0.72	0.75	0.78	49.0
Approach		570	8	600	1.4	0.597	7.2	LOS A	5.4	37.9	0.72	0.75	0.78	47.7
All Vehicles		1216	55	1280	4.5	0.597	7.0	LOS A	5.4	37.9	0.54	0.66	0.57	49.2

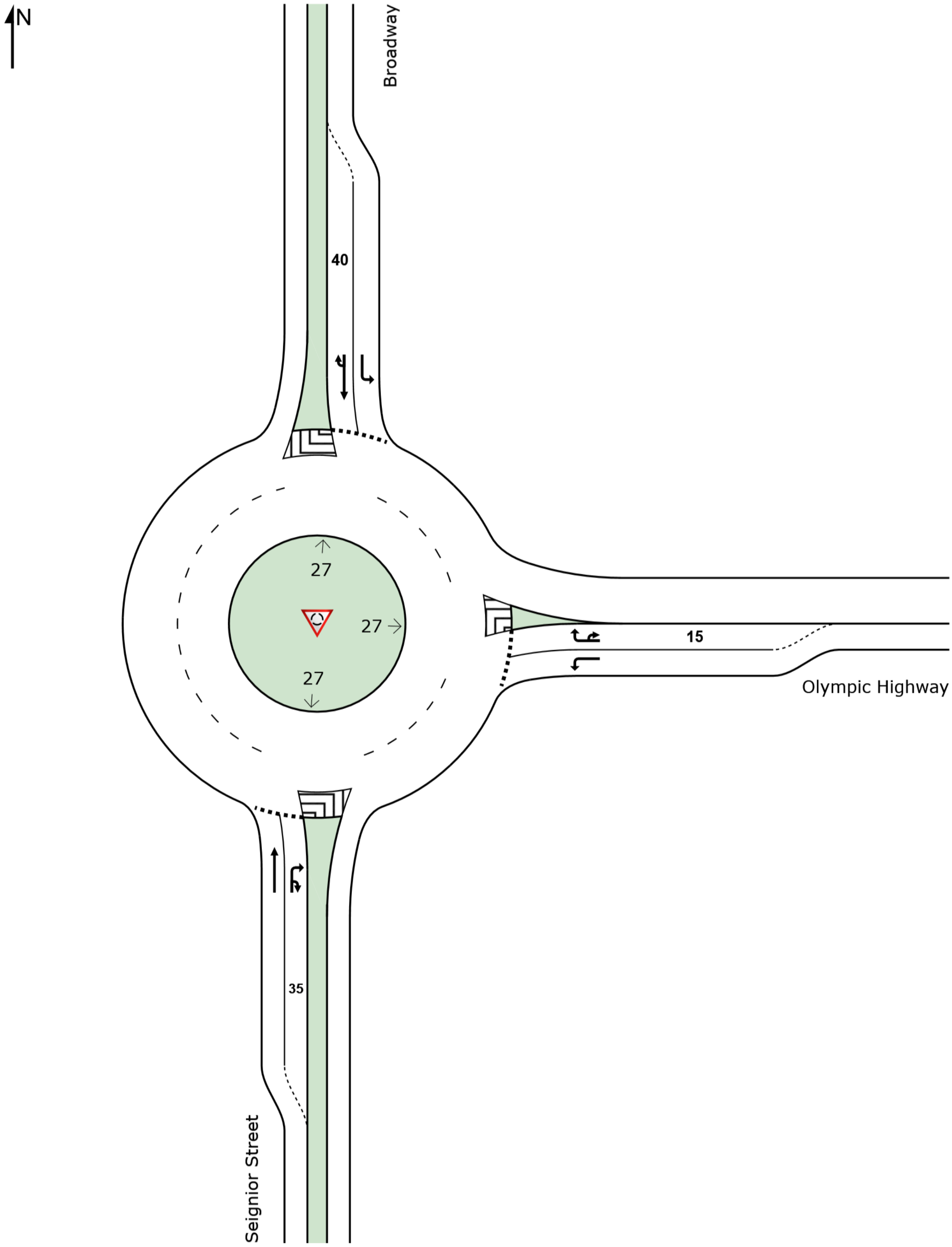
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Seignior Street / Broadway / Olympic Highway - Base - PM Peak (Site Folder: Junee)]

Peak
Site Category: Base Year
Roundabout

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



MOVEMENT SUMMARY

Site: [Seignior Street / Broadway / Olympic Highway - Base - PM Peak (Site Folder: Junee)]

Peak
Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Seignior Street														
2	T1	118	3	124	2.5	0.081	4.2	LOS A	0.5	3.3	0.30	0.39	0.30	42.7
3	R2	64	3	67	4.7	0.056	9.8	LOS A	0.3	2.2	0.32	0.60	0.32	30.6
3u	U	1	0	1	0.0	0.056	12.0	LOS B	0.3	2.2	0.32	0.60	0.32	34.6
Approach		183	6	193	3.3	0.081	6.2	LOS A	0.5	3.3	0.31	0.46	0.31	38.0
East: Olympic Highway														
4	L2	81	11	85	13.6	0.072	2.8	LOS A	0.4	2.8	0.33	0.45	0.33	42.7
6	R2	116	2	122	1.7	0.081	7.5	LOS A	0.4	3.0	0.30	0.62	0.30	33.4
6u	U	2	0	2	0.0	0.081	9.8	LOS A	0.4	3.0	0.30	0.62	0.30	27.6
Approach		199	13	209	6.5	0.081	5.6	LOS A	0.4	3.0	0.31	0.55	0.31	36.1
North: Broadway														
7	L2	130	2	137	1.5	0.097	4.1	LOS A	0.5	3.6	0.21	0.44	0.21	37.4
8	T1	151	3	159	2.0	0.102	3.9	LOS A	0.6	3.9	0.20	0.39	0.20	43.4
9u	U	9	0	9	0.0	0.102	11.6	LOS B	0.6	3.9	0.20	0.39	0.20	41.0
Approach		290	5	305	1.7	0.102	4.2	LOS A	0.6	3.9	0.21	0.41	0.21	41.1
All Vehicles		672	24	707	3.6	0.102	5.2	LOS A	0.6	3.9	0.27	0.47	0.27	38.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Seignior Street / Broadway / Olympic Highway - PM Peak with Construction & Diversion Traffic (Site Folder: Junee)]

Peak
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Seignior Street														
2	T1	118	3	124	2.5	0.098	4.4	LOS A	0.6	4.0	0.33	0.41	0.33	42.3
3	R2	183	15	193	8.2	0.129	9.7	LOS A	0.8	5.8	0.32	0.60	0.32	30.5
3u	U	1	0	1	0.0	0.129	11.9	LOS B	0.8	5.8	0.32	0.60	0.32	34.6
Approach		302	18	318	6.0	0.129	7.6	LOS A	0.8	5.8	0.32	0.52	0.32	34.8
East: Olympic Highway														
4	L2	294	23	309	7.8	0.207	2.7	LOS A	1.2	9.3	0.35	0.46	0.35	43.2
6	R2	116	2	122	1.7	0.106	7.9	LOS A	0.6	4.0	0.35	0.63	0.35	33.2
6u	U	2	0	2	0.0	0.106	10.1	LOS B	0.6	4.0	0.35	0.63	0.35	27.4
Approach		412	25	434	6.1	0.207	4.2	LOS A	1.2	9.3	0.35	0.51	0.35	39.1
North: Broadway														
7	L2	130	2	137	1.5	0.109	4.6	LOS A	0.6	4.1	0.37	0.50	0.37	35.7
8	T1	151	3	159	2.0	0.113	4.4	LOS A	0.6	4.5	0.35	0.45	0.35	41.6
9u	U	10	1	11	10.0	0.113	12.1	LOS B	0.6	4.5	0.35	0.45	0.35	38.9
Approach		291	6	306	2.1	0.113	4.7	LOS A	0.6	4.5	0.36	0.47	0.36	39.3
All Vehicles		1005	49	1058	4.9	0.207	5.4	LOS A	1.2	9.3	0.35	0.50	0.35	37.6

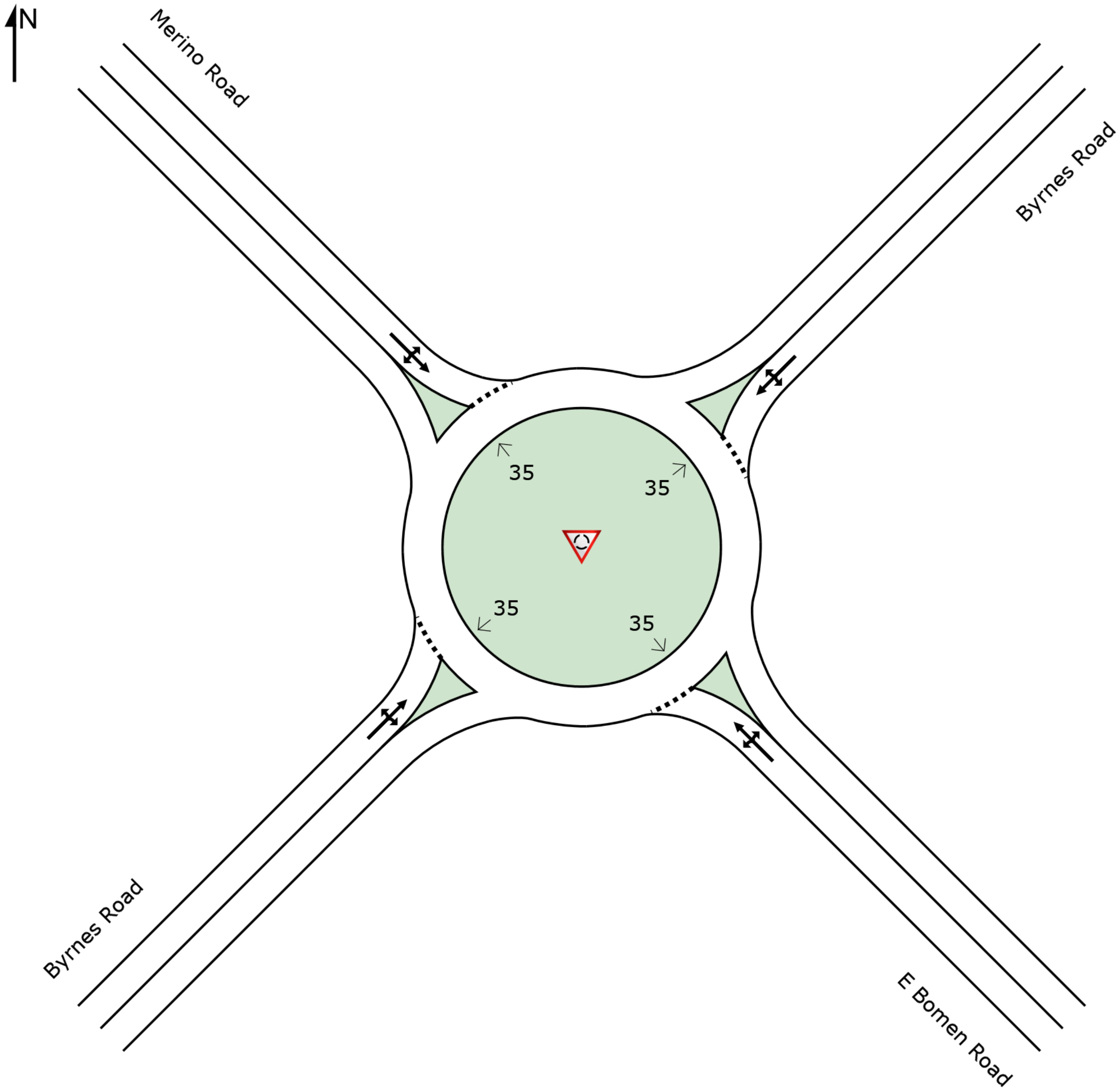
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Peak Hour Base - 2024 (Site Folder: Bomen, Wagga)]

Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: [Peak Hour Base - 2024 (Site Folder: Bomen, Wagga)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: E Bomen Road														
1	L2	8	37.0	8	37.0	0.029	4.3	LOS A	0.1	1.3	0.33	0.46	0.33	53.7
2	T1	14	37.0	15	37.0	0.029	4.2	LOS A	0.1	1.3	0.33	0.46	0.33	55.8
3	R2	8	37.0	8	37.0	0.029	10.5	LOS B	0.1	1.3	0.33	0.46	0.33	55.5
Approach		30	37.0	32	37.0	0.029	5.9	LOS A	0.1	1.3	0.33	0.46	0.33	55.1
NorthEast: Byrnes Road														
4	L2	32	31.0	34	31.0	0.124	4.2	LOS A	0.6	5.7	0.33	0.47	0.33	53.9
5	T1	72	31.0	76	31.0	0.124	4.1	LOS A	0.6	5.7	0.33	0.47	0.33	56.0
6	R2	32	31.0	34	31.0	0.124	10.4	LOS B	0.6	5.7	0.33	0.47	0.33	55.9
Approach		136	31.0	143	31.0	0.124	5.6	LOS A	0.6	5.7	0.33	0.47	0.33	55.4
NorthWest: Merino Road														
7	L2	32	37.0	34	37.0	0.113	4.2	LOS A	0.6	5.3	0.31	0.46	0.31	53.8
8	T1	58	37.0	61	37.0	0.113	4.1	LOS A	0.6	5.3	0.31	0.46	0.31	55.9
9	R2	32	37.0	34	37.0	0.113	10.4	LOS B	0.6	5.3	0.31	0.46	0.31	55.6
Approach		122	37.0	128	37.0	0.113	5.8	LOS A	0.6	5.3	0.31	0.46	0.31	55.2
SouthWest: Byrnes Road														
10	L2	32	31.0	34	31.0	0.112	3.8	LOS A	0.6	5.1	0.21	0.42	0.21	54.4
11	T1	72	31.0	76	31.0	0.112	3.6	LOS A	0.6	5.1	0.21	0.42	0.21	56.5
12	R2	32	31.0	34	31.0	0.112	9.9	LOS A	0.6	5.1	0.21	0.42	0.21	56.4
Approach		136	31.0	143	31.0	0.112	5.2	LOS A	0.6	5.1	0.21	0.42	0.21	56.0
All Vehicles		424	33.2	446	33.2	0.124	5.5	LOS A	0.6	5.7	0.29	0.45	0.29	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Peak Hour Base w/ construction - 2024 (Site Folder: Bomen, Wagga)]

Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	INPUT VOLUMES [Total	INPUT VOLUMES HV]	DEMAND FLOWS [Total	DEMAND FLOWS HV]	Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh.	95% BACK OF QUEUE Dist]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: E Bomen Road														
1	L2	8	37.0	8	37.0	0.030	4.7	LOS A	0.1	1.4	0.40	0.49	0.40	53.4
2	T1	14	37.0	15	37.0	0.030	4.6	LOS A	0.1	1.4	0.40	0.49	0.40	55.5
3	R2	8	37.0	8	37.0	0.030	10.9	LOS B	0.1	1.4	0.40	0.49	0.40	55.2
Approach		30	37.0	32	37.0	0.030	6.3	LOS A	0.1	1.4	0.40	0.49	0.40	54.8
NorthEast: Byrnes Road														
4	L2	32	31.0	34	31.0	0.133	4.7	LOS A	0.7	6.2	0.42	0.51	0.42	53.6
5	T1	72	31.0	76	31.0	0.133	4.6	LOS A	0.7	6.2	0.42	0.51	0.42	55.6
6	R2	32	31.0	34	31.0	0.133	10.9	LOS B	0.7	6.2	0.42	0.51	0.42	55.5
Approach		136	31.0	143	31.0	0.133	6.1	LOS A	0.7	6.2	0.42	0.51	0.42	55.0
NorthWest: Merino Road														
7	L2	32	37.0	34	37.0	0.173	4.3	LOS A	0.9	8.6	0.33	0.53	0.33	52.7
8	T1	58	37.0	61	37.0	0.173	4.1	LOS A	0.9	8.6	0.33	0.53	0.33	54.7
9	R2	100	37.0	105	37.0	0.173	10.5	LOS B	0.9	8.6	0.33	0.53	0.33	54.5
Approach		190	37.0	200	37.0	0.173	7.5	LOS A	0.9	8.6	0.33	0.53	0.33	54.2
SouthWest: Byrnes Road														
10	L2	40	31.0	42	31.0	0.118	3.8	LOS A	0.6	5.5	0.21	0.42	0.21	54.5
11	T1	72	31.0	76	31.0	0.118	3.6	LOS A	0.6	5.5	0.21	0.42	0.21	56.6
12	R2	32	31.0	34	31.0	0.118	9.9	LOS A	0.6	5.5	0.21	0.42	0.21	56.5
Approach		144	31.0	152	31.0	0.118	5.1	LOS A	0.6	5.5	0.21	0.42	0.21	56.0
All Vehicles		500	33.6	526	33.6	0.173	6.3	LOS A	0.9	8.6	0.32	0.49	0.32	55.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.