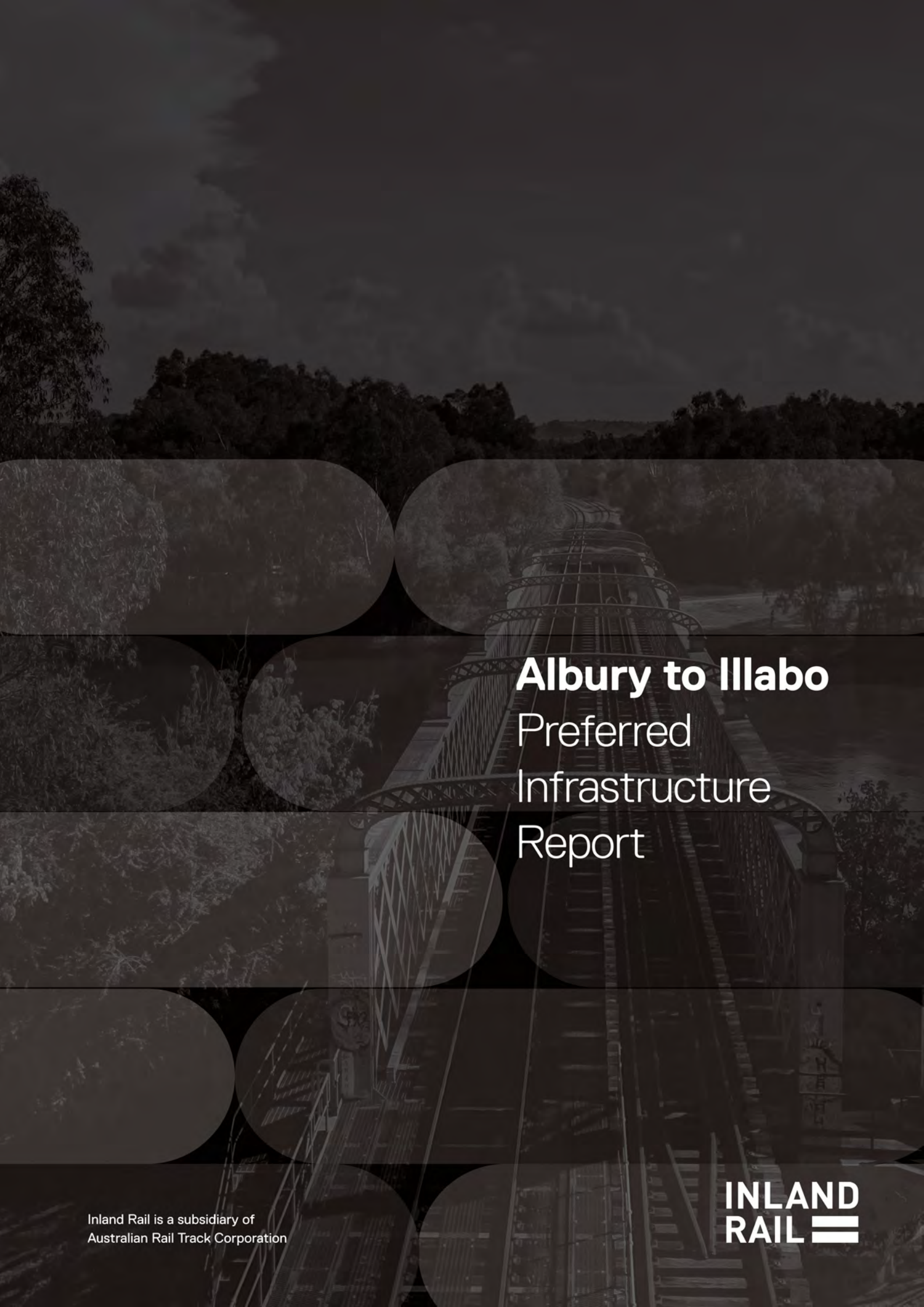

Albury to Illabo
Preferred Infrastructure Report

Inland Rail is a subsidiary of
Australian Rail Track Corporation

INLAND RAIL

COVER IMAGE
Aerial overview of the Murray River Railway Bridge facing west.

ACKNOWLEDGEMENT OF COUNTRY

Inland Rail acknowledges the Traditional Custodians of the land on which we work and, pay our respect to their Elders past, present and emerging.

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Appendices

Appendix A – Updated Proposal Description

Appendix B – Updated Mitigation Measures

Appendix C – Addendum Assessment to Technical Paper 1: Traffic and Transport

Appendix D – Revised Technical Paper 7: Operational Noise and Vibration (Rail)

Appendix E – Addendum Assessment to Technical Paper 14: Air Quality

Appendix F – Revised Technical Paper 8: Biodiversity Development Assessment Report

Appendix G – Addendum Assessment to Technical Paper 6: Noise and Vibration (Non-Rail)

Appendix H – Addendum Assessment to Technical Paper 10: Landscape and Visual Impact Assessment

Glossary

Specific terms and acronyms used throughout this report are listed and described in the table below.

Term	Acronym	Definition
Ambient Air Quality Monitoring Systems	AAQMS	
Albury to Illabo section of Inland Rail	A2I	
Annual exceedance probability	AEP	
Approval authority		The approval authority for a State significant infrastructure application or modification request. This will be the Minister for Planning and Public Spaces or the minister's delegates in the Department of Environment and Planning.
Australian Rail Track Corporation	ARTC	
*Biodiversity Conservation Act 2016 (*NSW)	BC Act	
Bund		An earthen embankment. A bund is used to control water flows or form a visual screen (often with vegetation).
Carbon monoxide	CO	
Construction environmental management plan	CEMP	
Decibels	dB	
Degree of Saturation	DOS	The ratio of traffic volume to capacity during a given flow period.
Department of Planning and Environment (NSW)	DPE	
	DDA	
Environmental Impact Statement	EIS	The Inland Rail Albury to Illabo Environmental Impact Statement (ARTC, 2022)
Environmental Planning and Assessment Act 1979	EP&A Act	
Environmental Planning and Assessment Regulation 2021.	EP&A Regulation	
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	EPBC Act	
NSW Environment Protection Authority	EPA	
The exhibited proposal		The proposal as described in the EIS.
Fibre reinforced plastic	FRP	
	$L_{Aeq(period)}$	The equivalent continuous noise level for the specified period.
	L_{Amax}	The maximum noise level during the measurement or assessment period. The L_{AFmax} or Fast is averaged over 0.125 of a second and the L_{ASmax} or Slow is averaged over 1-second.
Level of Service	LoS	A grading system used to assess the performance of transport infrastructure including roads and intersections.
Local Area Traffic Management Plans	LATM	
Local Government Area	LGA	
Kilometre	km	
Matter		An element of the environment that may be affected by an State significant infrastructure (e.g. air, amenity, biodiversity, economic, social)
micrograms per cubic metre	$\mu g/m^3$	

Term	Acronym	Definition
Minister		NSW Minister for Planning and Public Spaces
	m	metre
Mitigation		Actions or measures to reduce the impacts of the proposal
Modification		Changing the scope or terms of an SSI approval, including revoking or varying a condition of approval.
Nitrogen dioxide	NO_2	
Particulate matter (2.5)	$PM_{2.5}$	Particulate matter with an equivalent aerodynamic diameter less than or equal to 2.5 micrometres
Particulate matter (10)	PM_{10}	Particulate matter with an equivalent aerodynamic diameter less than or equal to 10 micrometres
Planning Secretary		Secretary of the Department of Planning and Environment.
Plant community type	PCT	
Preferred Infrastructure Report	PIR	This report prepared at the request of the Planning Secretary that outlines proposed changes to the proposal to minimise its environmental impact and to deal with other issues raised during the assessment of the application concerned (see the *State Significant Infrastructure Guidelines—Preparing a Preferred Infrastructure Report*)
Project Specific Noise Level	PSNL	
The proposal		Proposed enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway between Albury and Illabo for the purpose of meeting Inland Rail specifications. This includes the proposal as described in the EIS and the proposed changes described in this Preferred Infrastructure Report.
The proposal site		The areas that would be directly impacted by the enhancement works for the Albury to Illabo section of Inland Rail. It includes the location of construction worksites, operational rail infrastructure, track realignment, new bridge structures, level crossings and other ancillary infrastructure.
Quantitative Design Limit	QDL	
Rail Infrastructure Noise Guideline	RING	Rail Infrastructure Noise Guideline (NSW Environment Protection Authority, 2013)
Refinement		A minor change to the proposal that is consistent with the proposal description and impacts as described in the EIS
Secretary's Environmental Assessment Requirements	SEARs	The Planning Secretary's Environmental Assessment Requirements for the preparation of an EIS for the proposal.
State significant infrastructure		Infrastructure that is declared to be State significant infrastructure under section 5.12 of the EP&A Act.
Submission		A written response from an individual or organisation, which is submitted to the Department of Planning and Environment during the public exhibition of an EIS, amendment report, preferred infrastructure report or modification report for State significant infrastructure
Submissions report		The report prepared by ARTC to respond to the issues raised in submissions.
Sulphur dioxide	SO_2	
Vibration dose value	VDV	

Executive summary

Overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth.

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine (P2N) and Narrabri to North Star Phase 1 (N2NS P1) sections are complete.

ARTC is seeking approval to carry out enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section of the Inland Rail program (the proposal). Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

As the alignment is presently operational, the proposal does not extend to those existing sections of the alignment where no works are required.

Approval process and EIS

The proposal is declared state significant infrastructure (SSI) and critical state significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The proposal is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

An environmental impact statement (EIS) was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of the EP&A Act and the environmental assessment requirements of the Secretary of the (then) NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning and Environment (DPE)).

The EIS was placed on public exhibition by DPE for a period of 42 days, commencing on 17 August 2022 and concluding on 28 September 2022. During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by ARTC, and make a written submission to the DPE for consideration in its assessment of the proposal.

Purpose of this report

In accordance with section 5.17(6)(b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report that provides further assessment of traffic and transport, noise and vibration, and air quality impacts from the proposal. This report has also been prepared to consider changes to the exhibited proposal that have arisen as a consequence of these further assessments and related submissions.

Directed assessments

The directed assessments completed as part of the Preferred Infrastructure Report comprise:

- Traffic and transport, including:
  - further assessment of construction and operational traffic impacts and mitigation measures informed by revised traffic modelling
  - further justification for proposed rail crossing treatments, considering the impacts on traffic, road safety, emergency services, and surrounding residents and business operators
  - further consultation with road managers regarding the further traffic impact assessment, and rail crossing and bridge design details

- noise and vibration noise assessment of the full length of the rail corridor between Albury and Illabo, to determine the extent of the impacts, identify sensitive receivers at risk of impact and assess potential mitigation measures
- air quality assessment of anticipated air quality impacts of the proposal, considering receivers representative of the proposal's rural and urban environments between Albury and Illabo.

A summary of the key assessment findings from directed assessments is provided below.

Traffic and transport

The additional assessment considered the traffic impacts during construction of the proposal, from traffic generated by construction of the proposal and detours during works on road bridges and level crossings. The additional assessment also investigated potential traffic impacts during operation of the proposal due to more frequent and longer trains. Overall, the findings of the additional assessment were generally consistent with the results presented in the EIS.

Microsimulation models were developed to assess traffic impacts during the closure of Edmondson Street bridge in Wagga Wagga and Kemp Street bridge in Junee. It was found that the temporary closure of the Edmondson Street bridge and the additional construction traffic volumes would put high strains on some key intersections and cause significant delays along some typical travel routes. The highest level of impact was typically predicted to occur during the morning and afternoon peak traffic periods. Results from the microsimulation model for the temporary closure of Kemp Street bridge predicted that during peak traffic periods, intersection performance would remain unchanged, with the exception of one intersection. The assessment identified that significant queues would form at all intersections in the peak traffic periods during the closure of the level crossing in the centre of town; however, based on a review of collected data at the level crossing, it is assumed that this would only occur once in the morning and twice in the afternoon peak traffic periods.

In response, mitigation measures to improve traffic efficiency during closure of the Edmondson Street bridge and the Kemp Street bridge have been identified and modelled, including the optimisation of signal timings at key intersections, and changes in road line marking and demarcation. The implementation of mitigations would be confirmed with the relevant road authorities during detailed design and pre-construction planning.

Additional assessment of impacts to active travel during the temporary closure of pedestrian and road bridges was completed in Wagga Wagga and Junee, including pedestrian survey to confirm usage of the bridges and to identify potentially vulnerable user groups. Since the exhibition of the EIS, changes in construction scheduling for the sequencing of bridge construction works have reduced the diversion distances and improved active travel outcomes in Wagga Wagga; construction of the separate pedestrian bridge structure prior to the demolition of the Kemp Street bridge in Junee would substantially minimise the active travel impacts that were described in the EIS.

Assessment of other traffic and transport issues, including heavy vehicle turn path analysis on construction routes, level crossing safety, and social impacts resulting from level crossing closures has been completed, and mitigation measures updated as required.

Operational noise and vibration

The study area for the noise and vibration assessment has been increased from focusing on enhancement sites to cover the full length of the rail corridor between Albury and Illabo. Receivers sensitive to noise and vibration were identified within approximately 2 km either side of the rail corridor between Albury and Illabo. Additional noise monitoring was conducted along the rail corridor to measure rail noise from existing rail operations.

The approach to assessment of operational noise and vibration has changed following the increase in assessment area (i.e. assessment of full A2I alignment) and advice from the NSW Environment Protection Authority (EPA) on the application of the Rail Infrastructure Noise Guideline trigger levels. The assessment results include noise exceedances predicted to occur at 1,285 residential receivers and 28 non-residential receivers due to operation of the proposal in 2040. In addition, two receivers have been identified within the estimated offset distance for vibration. Project-specific noise levels have been introduced to guide the selection of noise mitigation measures for residential receivers that exceed the Rail Infrastructure Noise Guideline trigger levels. A hierarchy of mitigation measures are proposed.

Operational air quality

The assessment has considered potential air quality impacts of expected train operations (both passing and idling) through the completion of air quality modelling in rural and urban environments that are representative of the towns along the rail corridor between Albury and Illabo.

Emissions of sulfur dioxide, benzene and carbon monoxide from the proposal are predicted to result in concentrations well within the assessment criteria during operation. Emissions of particulate matter and nitrogen dioxide are predicted to exceed the air quality criteria at the Wagga Wagga urban case study area and the Culcairn rural case study area. These exceedances are mainly driven by elevated background concentrations, which already exceed or approach the assessment criteria. No exceedances of air quality criteria are predicted in the Junee to Illabo rural case study area.

The results of the urban and rural case studies are expected to be generally consistent in other respective urban and rural environments along the rail corridor between Albury and Illabo. Further air quality monitoring and modelling will be undertaken prior to the operation of Inland Rail to confirm existing particulate matter and nitrogen dioxide levels and to validate the findings of the assessment in this Preferred Infrastructure Report. These measures will provide a mechanism to review the contribution of railway activities to air quality and a review and resolution pathway that provides an opportunity to reduce impacts through adaptive management techniques.

Changes to the proposal

Since exhibition of the EIS, changes have been made to the proposal design in response to concerns raised by the community and in response to further development of the proposal design and the manner in which ARTC has addressed those issues. The following changes have been made to the proposal:

- The design of the pedestrian bridges has been amended and two new pedestrian bridges are proposed to be constructed adjacent to Edmondson Street road bridge and Kemp Street road bridge.
- The proposal site has changed accommodate proposed design changes, respond to stakeholder consultation and include additional construction areas.
- The construction schedule has been refined to reflect further detailed construction planning. Changes to construction of the proposal are discussed in Section 3.2.2 of this Preferred Infrastructure Report.
- Modifications to Shire and Carter Property access road level crossing (LX605) would be undertaken to accommodate the realigned track and be upgraded from a passive to an active level crossing.

Additional biodiversity, noise and vibration, social, Aboriginal cultural heritage, non-Aboriginal heritage, and landscape and visual impact assessments have been undertaken to consider changes to the proposal.

The assessments undertaken indicate that the changes would not result in a significant increase in the potential impacts of the proposal overall, and the mitigation measures identified would be effective in managing these changes.

The proposal, including changes as described in this Preferred Infrastructure Report, would continue to incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable. The majority of the potential construction-related impacts would be effectively mitigated by the implementation of best-practice construction management, including implementation of the environmental management approaches and the updated mitigation measures provided in this report.

Mitigation measures

Following consideration of the issues raised in the submissions made during exhibition of the EIS, in response to directed assessments and changes to the proposal considered in this report, mitigation measures outlined in the EIS have been updated to:

- make additional commitments to respond to issues raised in the submissions
- modify the wording in some instances so that the intent of the measure is clearer
- directly respond to the findings of further assessments and the proposal changes described in this report.

The full set of updated mitigation measures is provided in Appendix B of this report. These measures supersede the measures presented in the EIS.

Future steps

Public exhibition of the Preferred Infrastructure Report

The Preferred Infrastructure Report and Submissions Report will be made available for viewing on DPE's Major Projects website (**pp.planningportal.nsw.gov.au/major-projects**). The Preferred Infrastructure Report will be placed on public exhibition by DPE for a minimum of 14 calendar days and submissions from the public will be invited.

To support public exhibition, and provide opportunities for the community and stakeholders to ask questions and find out more information before making a submission, a range of consultation and communication tools will be used by ARTC, including:

- advertisements in the local media giving information regarding the proposal and public exhibition
- issuing of newsletters to the community (council newsletters, e-newsletter, other)
- briefings to key stakeholders, including councils
- community information sessions.

Approval process

DPE will, on behalf of the NSW Minister for Planning, review the EIS and this Preferred Infrastructure Report and the documents associated with the Response to Submissions Report. Once DPE has completed its assessment, DPE will prepare a draft Environmental Assessment Report for the Planning Secretary, which may include recommended conditions of approval in accordance with the EP&A Act.

The Planning Secretary's Environmental Assessment Report will be provided to the NSW Minister for Planning, who will then approve the proposal (with any conditions considered appropriate) or refuse to give approval to the proposal.

The Minister for Planning's determination, including any conditions of approval and the Environmental Assessment Report, will be published on the DPE Major Projects website following determination.

The detailed design would be developed with the objective of minimising potential impacts on the local and regional environment and the community. The design and construction methodology would continue to be developed with this objective in mind, taking into account the input of stakeholders and the local community, and the conditions of approval.

1. Introduction

This Preferred Infrastructure Report has been prepared for the Albury to Illabo (A2I) section of the Inland Rail program (the proposal). The Preferred Infrastructure Report addresses the direction made by the Planning Secretary in accordance with section 5.17(6)(b) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and describes and assesses the proposed amendments.

This Preferred Infrastructure Report has been prepared with regard to the *State Significant Infrastructure (SSI) Guidelines: Preparing a preferred infrastructure report* (DPE, 2022b). The report outlines changes to the proposal since the exhibition of the environmental impact statement (EIS) (the exhibited proposal) and the results of further assessment that has been completed to address the requirements of the Preferred Infrastructure Report direction. It is to be read in conjunction with the Response to Submissions Report (Submission Report) on issues raised in submissions and agency advice during the exhibition of the EIS.

1.1 Inland Rail program

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route will involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth.

Australian Rail Track Corporation Ltd (ARTC) is the proponent for Inland Rail. ARTC is fully owned by the Australian Government and was created after the Australian Government and state governments agreed in 1997 to the formation of a single entity to manage and operate the national interstate rail network. Following the release of the findings of the Independent Review of Inland Rail in April 2023 (Schott, 2023), Inland Rail Pty Ltd was established as a subsidiary of ARTC to build Inland Rail on behalf of ARTC and the Australian Government. Further information on ARTC and Inland Rail can be found at **artc.com.au** and **inlandrail.com.au**.

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine (P2N) and Narrabri to North Star Phase 1 (N2NS P1) sections are complete.

An overview of Inland Rail is shown in Figure 1-1. This Preferred Infrastructure Report relates to the A2I section of the Inland Rail program (the proposal).

FIGURE 1-1 PROPOSED ALIGNMENT FOR THE INLAND RAIL PROGRAM

1.2 The proposal

The proponent is seeking approval to carry out enhancement works to structures and sections of track along185 km of the existing operational standard-gauge railway between Albury and Illabo, to accommodate double-stacked freight trains up to 1,800 m long and 6.5 m high.

Enhancement works are needed to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works include track realignment; lowering and/or modification within the existing rail corridor; modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges); raising or replacing signal gantries; level crossing modifications; and other associated works.

As the alignment is presently operational, the proposal does not extend to those existing sections of the alignment where no works are required.

The land required for construction (the proposal site) comprises the existing railway corridor at the enhancement sites with additional areas at these locations to accommodate construction activities and ancillary facilities, which would be removed upon construction completion, along with particular infrastructure. The proposal's final land requirement would maintain the existing operational railway corridor with additions to accommodate any revised infrastructure and associated operational requirements. Clearing of the proposal site would occur as necessary to accommodate works and to maintain the safe operational area of the railway.

1.2.1 Location

The proposal is generally within the existing rail corridor (the Main South Line) extending from the town of Albury on the Victoria–NSW border to around 3 km to the north-east of Illabo. The Main South Line links Sydney and Melbourne with the A2I sections opened between 1877 and 1881.

The alignment passes through two major regional cities—Albury and Wagga Wagga in NSW—and several smaller regional towns. Works are proposed at 24 locations along the Main South Line corridor, described as 'enhancement sites'. The names and locations of these enhancement sites are identified in Figure 1-2.

Further information on the location of the proposal and the enhancement sites is available in EIS chapter 3: Location and setting.

1.2.2 Key features as exhibited

The key features of the proposal as exhibited in the EIS include:

- adjustments to approximately 44 km of track across 14 enhancement sites to accommodate the vertical and horizontal clearances according to Inland Rail specifications, comprising:
  - realignment of track within the rail corridor at 14 enhancement sites
  - lowering of track up to 1.6 m at three enhancement sites
- changes to bridges and culverts at enhancement sites to allow track realignment as follows:
  - replacement of two road bridges and adjustment to adjoining intersections
  - replacement of three pedestrian bridges
  - demolition 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.

Construction of the proposal would require:

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

No additional works would be required outside the enhancement sites identified in Figure 1-2 as they meet the clearance requirement for the Inland Rail Program.

Changes to the proposal as exhibited in the EIS are described in the section 3.2. The full description of construction and operation of the proposal as amended is provided in Appendix A.

Figure 1-2 Enhancement sites of the proposal

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:750,000
Paper size: A3
Date: 10/12/2021

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1.2.3 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. Current train services run 24-hours per day on this part of the rail network; there is no current restriction on the length of trains other than infrastructure limitations.

1.2.3.1 Train speeds and lengths

The proposal would enable the use of double-stacked trains along its entire length. Inland Rail would operate 24-hours per day and would accommodate double-stacked freight trains up to 6.5 m high and up to 1,800 m in length (see Figure 1-3).

Inland Rail freight trains would travel at speeds up to 115 kilometres per hour (km/h), which is consistent with current freight train maximum speeds. Trains may travel at speeds less than 115 km/h for operational or safety reasons, including rollingstock capability and performance, management of braking and acceleration on steep grades, and occupancy of the line by other trains.

The approval would limit Inland Rail train operations to 1,800 m, with rail infrastructure built having regard to that limitation.

FIGURE 1-3 INDICATIVE HEIGHT AND LENGTH OF A DOUBLE-STACKED INLAND RAIL FREIGHT TRAIN

1.2.3.2 Train numbers

The average number of freight train movements between Albury and Illabo varies in different sections of the line as there are several connections to other routes along with terminals at sites along the alignment. For example, north of Junee yard, the freight train numbers are slightly higher, as regional freight trains connect from the Junee to Griffith rail line onto the Main South Line. Currently, there are up to 12 freight trains per day (combined total of freight trains in both directions). There is some seasonality effect on train numbers due to agricultural commodity shipments.

A schematic diagram of Inland Rail and the interstate and regional freight rail networks is shown in Figure 1-4, showing the significant connection points.

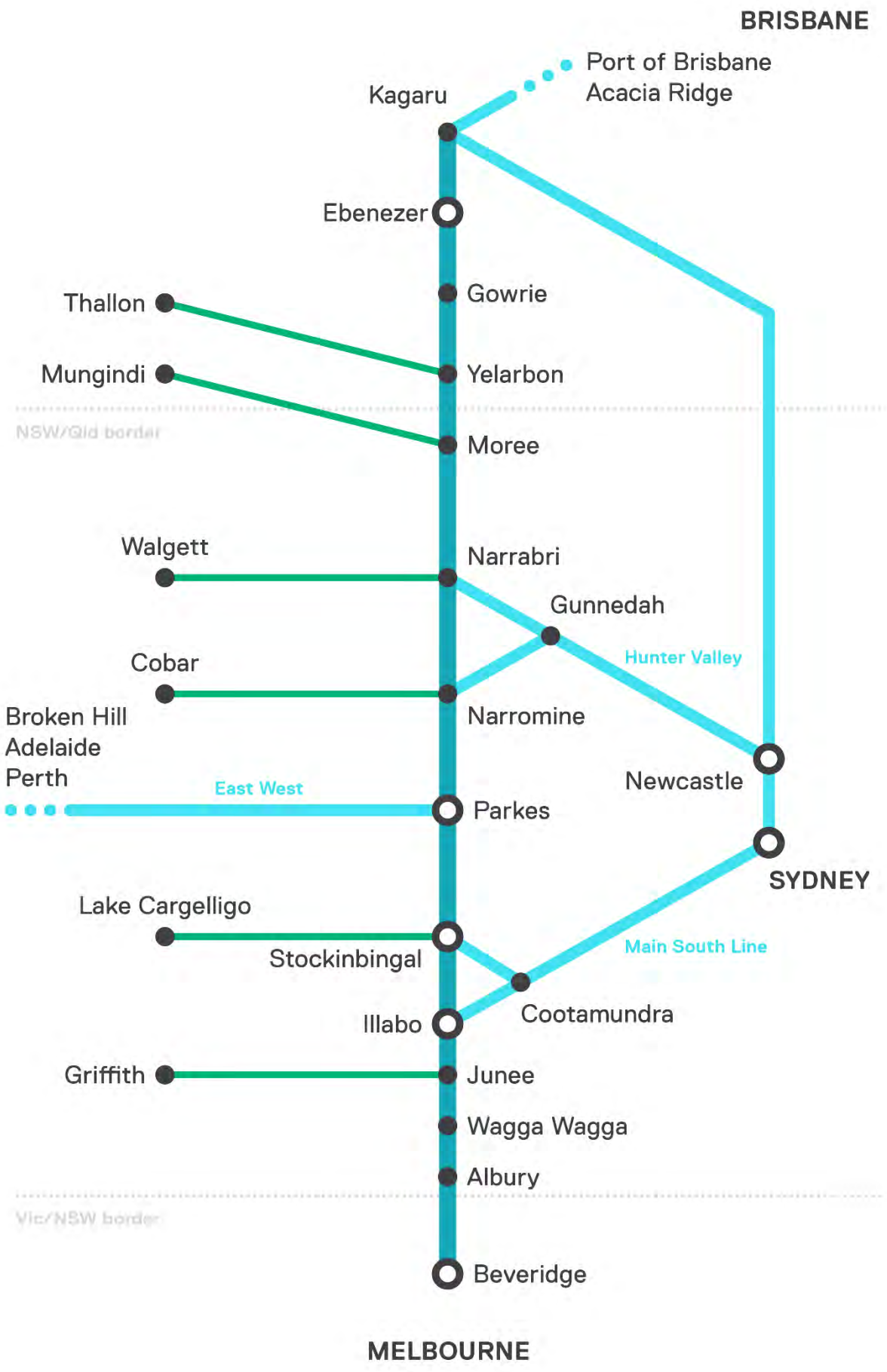

FIGURE 1-4 SCHEMATIC DIAGRAM OF INLAND RAIL, THE INTERSTATE AND REGIONAL RAIL NETWORK

Anticipated train numbers remain as reported in the EIS and have not been revised, with 2040 retained as the design year for assessment purposes. It is estimated that the operation of Inland Rail would increase freight train movements up to a total of 18 freight trains per day in the early phase of Inland Rail's operation when all projects are completed, and up to a total of 20 freight trains per day over the following years upon further take up of the service (see Table 1-1 for further information). Train numbers are not expected to immediately increase on completion of construction of the proposal, given the staged delivery of Inland Rail.

TABLE 1-1 BREAKDOWN OF TRAIN NUMBERS BY SECTION OF THE PROPOSAL

Section of the proposal	Train service	Daily train numbers		
		Current	2025	2040
Albury yard to Junee yard	Freight	12	15	18
	Passenger	4[1]	4[1]	4[1]
Junee yard to Illabo	Freight	**12**[2]	**18**[2]	**20**[2]
	Passenger	4	4	4

Note:

1. Melbourne to Albury V/Line services which terminate at Albury yard have not been included. It is assumed there is no growth in passenger services.
2. Bold font represents maximum freight train number in each year.

1.2.3.3 Maintenance

ARTC would continue to maintain the line during operations. Maintenance would typically involve minor 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 schedules are not proposed to change as a result of the proposal. Approval is not sought for such operational maintenance activities, as other planning and environmental approval controls apply, and these activities would continue in accordance with the existing Environment Protection Licence that applies to the rail corridor (EPL 3142).

1.2.4 Timing

In response to the Independent Review of Inland Rail, the Australian Government has prioritised completing the sections of Inland Rail between Beveridge in Victoria and Narromine in New South Wales by 2027. In line with Government's response to the review, ARTC is now taking a staged approach to Inland Rail, with a focus south of Parkes on construction and delivery to progressively unlock the benefits of Inland Rail ahead of end-to-end completion. North of Parkes, attention is on obtaining approvals, securing the route and refining cost and delivery arrangements ahead of commitments for construction.

As described in the EIS, construction of the proposal was planned to start in early 2024 and take about 16 months. Since exhibition of the EIS the construction schedule has changed as described in section 3.2.3. Subject to approval, detailed design and construction planning for the proposal would commence shortly after approval, in mid-2024. Due to the nature of the works, construction of some elements would also commence shortly after approval (notably the removal of structures to provide the necessary clearance for the double-stacked trains where replacement of these structures is not required). Construction is expected to take about 30 months for completion by the end of 2026, with enhancement sites progressively commissioned on completion of construction. Rail operations would continue throughout construction.

1.3 Approval and assessment requirements

The proposal is declared state significant infrastructure (SSI) and critical state significant infrastructure (CSSI) under Division 5.2 of the EP&A Act. The proposal is permissible without development consent and is subject to approval by the NSW Minister for Planning under Division 5.2, Part 5 of the EP&A Act.

An EIS was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of Division 5.2 of the EP&A Act. The EIS addressed the Secretary's environmental assessment requirements (SEARs) for the proposal, which were issued by the (then) Department of Planning, Industry and Environment on 14 October 2020. In 2022, the department changed its name to the Department of Planning and Environment (DPE).

The EIS was placed on public exhibition and made publicly available on the Planning Portal website by DPE between 17 August 2022 to 28 September 2022 (available at: **pp.planningportal.nsw.gov.au/major-projects/projects/inland-rail-albury-illabo**). During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by

ARTC, and make a written submission to the DPE for consideration in its assessment of the proposal. The submissions received have been described and responses provided in the Submissions Report.

All approvals as described in chapter 4 and Appendix C of the EIS remain relevant.

1.4 Preferred infrastructure direction

In accordance with section 5.17(6)(b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report in addition to a Submissions Report, which provides further assessment of traffic and transport, noise and vibration, and air quality impacts from the proposal. This report has also been prepared to consider the changes to the exhibited proposal.

1.5 Changes to the exhibited proposal

Since exhibition of the EIS, changes have been made to the proposal design in response to concerns raised by the community and in response to further development of the proposal design. Changes to the exhibited proposal are summarised in Table 1-2. These changes are detailed in chapter 3 and an updated proposal description is provided in Appendix A.

TABLE 1-2 SUMMARY OF CHANGES TO THE PROPOSAL DESCRIBED IN THE EXHIBITED EIS AND THE PROPOSED CHANGES

Proposal element	Summary of the exhibited proposal	Summary of the proposed changes
Pedestrian bridges and pedestrian access on road bridges	Replacement of existing pedestrian bridges over the rail corridor with new structures that provide *Disability Discrimination Act 1992* (Cth) (DDA) compliant access, including at: ▸ Albury Station pedestrian bridge ▸ Cassidy Parade pedestrian bridge ▸ Wagga Wagga Station pedestrian bridge. Replacement of existing road bridges over the rail corridor with integrated shared paths that did not provide DDA-compliant access, including at: ▸ Edmondson Street bridge ▸ Kemp Street bridge.	To address stakeholder feedback, including the need for accessible pedestrian access on the road bridges, the designs at Edmondson Street and Kemp Street bridges have been amended to be compliant with requirements for disability access and improved connectivity to the surrounding pedestrian networks. Both the Edmondson Street and Kemp Street bridges now provide separated pedestrian bridge structures. Updated designs of pedestrian bridges have also been provided, including an update of the Albury Station pedestrian bridge in Albury and the Cassidy Parade pedestrian bridge in Wagga Wagga, to improve connectivity and meet the proposal objectives, as described in Section 3.2.1.
Correction at Riverina Highway bridge	A collision protection wall was included along the eastern boundary of the rail corridor in Albury near The Scots School in addition to those proposed at the Riverina Highway bridge where the track would be lowered.	The design does not require a collision protection wall at the eastern boundary of the rail corridor and a wall is not proposed.
Additional bund at Pearson Street bridge	There is a risk of localised flooding upstream of the railway corridor in Wagga Wagga affecting the railway at the Pearson Street bridge due to the track lowering at this location. To mitigate this risk, a 0.5 m high bund had been proposed on the south-eastern cutting of the rail corridor in the EIS.	At the request of Wagga Wagga City Council, a second bund is now proposed on the north-eastern cutting of the rail corridor and would generally have consistent dimensions with, and be parallel to, the southern bund.
Shire and Carter Property access road (LX605)	This level crossing would be modified to accommodate the realigned track and be upgraded from a passive to an active level crossing. The existing level crossing has a non-compliant sight distance and has a short-stacking issue for a 26 m B-Double design vehicle. To eliminate these existing issues, the exhibited EIS proposed additional storage lanes and a concrete island to be established on the level crossing approach from the Olympic Highway to limit movements to be left-in and left-out only.	Following receipt of stakeholder feedback on this level crossing, the design solution has been revised to address the existing non-compliance. To accommodate a level crossing at this location that does not impact on the Olympic Highway, the track would be realigned. The new track would be realigned by up to 16 m from the current level crossing location. The design of the level crossing would be modified to accommodate the realigned track and upgraded from a passive to an active level crossing as previously proposed in the exhibited EIS.

Proposal element	Summary of the exhibited proposal	Summary of the proposed changes
Construction schedule	Subject to planning approval and consultation with the construction contractor (once appointed), construction is planned to commence in early 2024 and will be completed by mid-2025. The staging of works is generally focused around 60-hour rail possessions, which typically occur twice a year. The duration of works at each enhancement site would vary according to the required construction activities. Enhancement sites would be progressively commissioned and rehabilitated as works are completed.	The construction schedule has been refined to reflect further detailed construction planning that has occurred since the exhibition of the EIS, and changes to the proposal discussed in this report. Subject to approval, detailed design and construction planning for the proposal would now commence shortly after, in mid-2024 and is expected to take about 30 months for completion by the end of 2026, with enhancement sites progressively commissioned on completion of construction. It is noted that this report and the Submissions Report have retained the same assessment years as used in the EIS, being 2020 as the existing scenario, 2025 as the opening year and 2040 as the peak of Inland Rail operations, in order to maintain a consistent reference point.
Proposal site	The area that would be directly impacted by the enhancement works for the Albury to Illabo section of Inland Rail. It includes the location of construction worksites; land needed temporarily to build the infrastructure; operational rail infrastructure; track realignment; new bridge structures; level crossings and other ancillary infrastructure.	The proposal site has been changed since exhibition of the EIS to accommodate proposed design changes, respond to stakeholder consultation and include additional construction areas. The land requirements of the proposal site have been refined through further design and construction planning. Consequently, the area needed for the proposal site has been revised. An outline of design refinements and changes to the proposal site are provided in Section 3.2.2.1.

1.6 Structure of this report

This Preferred Infrastructure Report has been prepared having regard to the *State Significant Infrastructure Guidelines* (DPE, 2022a), including the form and content requirements for a preferred infrastructure report as outlined in the *State Significant Infrastructure guidelines—preparing a preferred infrastructure report* (DPE, 2022b), shown in Table 1-3 .

TABLE 1-3 REPORT STRUCTURE

Guideline requirement	Where addressed in this report
Introduction to the proposal and the assessment that has been carried out to date	Chapter 1: Introduction
Description of the strategic context of the proposal	Chapter 2: Strategic context
Description of the additional assessment undertaken and the proposed changes to the proposal	Chapter 3: Description of directed additional assessments and changes to the proposal
Summary of the statutory context of the proposal	Chapter 4: Statutory context
Summary of the approach to engagement and engagement activities undertaken since exhibition of the EIS	Chapter 5: Engagement
Summary of the additional assessment undertaken for the proposal	Chapter 6: Directed assessments of the proposal
Summary of the assessment undertaken for the proposed changes to the proposal	Chapter 7: Assessment of changes to the proposal
Updated justification of the proposal and conclusion	Chapter 8: Justification of preferred infrastructure

Guideline requirement	Where addressed in this report
Appendices to support the report	▸ Appendix A – Updated Proposal Description ▸ Appendix B – Updated Mitigation Measures ▸ Appendix C – Addendum Assessment to Technical Paper 1: Traffic and Transport ▸ Appendix D – Revised Technical Paper 7: Operational Noise and Vibration (Rail) ▸ Appendix E – Addendum Assessment to Technical Paper 14: Air Quality ▸ Appendix F – Revised Technical Paper 8 - Biodiversity Development Assessment Report ▸ Appendix G – Addendum Assessment to Technical Paper 6: Noise and Vibration (Non-Rail) ▸ Appendix H – Addendum Assessment to Technical Paper 10: Landscape and Visual Impact Assessment

2. Strategic context

Inland Rail is an approximate 1,600 km freight rail network that will connect Melbourne and Brisbane via regional Victoria, NSW and Queensland. It is a fast freight line that will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australia's growth.

Generating regional opportunities during construction and beyond, Inland Rail will better link businesses, manufacturers and producers to national and global markets. Delivering Inland Rail will help keep pace with the increasing freight demands of Australia's growing population. Shifting more goods onto rail means faster, more reliable freight; safer, less congested roads; and fewer emissions.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise our economy.

The strategic context of, and need for, the proposal is described in chapter 2 of the EIS. The strategic context of Inland Rail is influenced by the outcomes of a number of strategic plans for transport, development and freight that have been prepared at the national, state and regional levels.

The objectives of the Inland Rail Program are to:

- provide a rail link between Melbourne and Brisbane that is interoperable with train operations to Perth, Adelaide, and other locations on the standard-gauge rail network, to serve future rail freight demand, and stimulate growth for inter-capital and regional/bulk rail freight
- increase productivity that will benefit consumers through lower freight transport costs, provide a step-change improvement in rail service quality in the Melbourne to Brisbane corridor and deliver a freight rail service that is competitive with road freight
- improve road safety, ease congestion, and reduce environmental impacts by moving freight from road to rail
- bypass bottlenecks within the existing metropolitan rail networks and free up train paths for other services along the coastal route
- act as an enabler for regional economic development along the Inland Rail corridor.

The objectives of the proposal are to:

- provide rail infrastructure that meets the Inland Rail specifications, to enable trains using the Inland Rail corridor to travel between Albury to Illabo, connecting with other sections of Inland Rail to the north and south
- minimise the potential for environmental and community impacts, by maximising use of the existing rail corridor.

The proposal, as part of Inland Rail, is needed to respond to the growth in demand for freight transport and address existing freight capacity and infrastructure issues. The proposal is a critical component of Inland Rail and is required to enable Inland Rail to operate.

The proposal, as part of Inland Rail, is needed to respond to the growth in demand for freight transport and address existing freight capacity and infrastructure issues. The proposed changes to the proposal since exhibition of the EIS are consistent with the strategic context of the proposal and the Inland Rail Program.

3. Description of directed additional assessments and changes to the proposal

Since exhibition of the EIS, the proposal has undergone additional assessment and development of the proposal design in response to issues raised by the community and stakeholders. This chapter describes the additional assessment undertaken as directed by DPE and the proposed changes to the exhibited proposal.

3.1 Description of directed additional assessments

Additional assessments completed in response to submissions, and as further directed by DPE, focus on the potential impacts of the proposal associated with traffic and transport, noise and vibration, and air quality as described in Table 3-1. Refer to Appendices C to E for the detailed assessment reports.

TABLE 3-1 SUMMARY OF ADDITIONAL ASSESSMENTS

Aspect	Summary of additional assessment
Traffic and transport	▸ Further assessment of construction and operational traffic impacts and mitigation measures informed by revised traffic modelling ▸ Further justification for proposed rail crossing treatments, considering the impacts on traffic, road safety, emergency services, and surrounding residents and business operators ▸ Further design details of the Edmondson Street bridge, Kemp Street bridge and pedestrian bridges ▸ Evidence of consultation with road managers regarding the further traffic impact assessment and rail crossing and bridge design details
Noise and vibration (operation)	▸ A supplementary rail operational noise assessment of the full length of the rail corridor between Albury and Illabo, to determine the extent of the impacts and identify sensitive receivers at risk of impact and assess potential mitigation measures
Air quality	▸ A quantitative assessment of anticipated air quality impacts of the proposal, considering receivers representative of the proposal's rural and urban environments, and including any necessary mitigation measures

3.2 Description of changes to the proposal

Since exhibition of the EIS, changes have been made to the proposal in the process of refining the design and in response to concerns raised by the community and stakeholders. The proposed changes described in this chapter are based on the current level of design development that has occurred to date. Detailed design would include further engineering, construction planning and detailed assessment work, and would be subject to further input from key stakeholders. The updated proposal description incorporating the proposed changes is provided in Appendix A, and is summarised below.

3.2.1 Design of the proposal

3.2.1.1 Road and pedestrian bridges in Albury, Wagga Wagga, Junee and surrounds

Changes to pedestrian bridges, including updated designs and additional infrastructure to provide improved accessibility, have been designed with consideration of the following standards:

- Australian Standard AS5100 series—Bridge Design
- Australian Standard AS1170 series—Structural Design Actions
- Australian Standard AS1428.1—Design for access and mobility
- Australian Standard AS7646—Railway Structures.

The design of some of the pedestrian bridges has been amended and a new, separate pedestrian bridge structure is proposed to be constructed adjacent to the Edmondson Street road bridge and the Kemp Street road bridge. All of the pedestrian bridges provided DDA-compliant pedestrian access.

A summary of the proposed changes to the pedestrian bridges is provided in Table 3-2, followed by artists' impressions of the bridges.

TABLE 3-2 DESCRIPTION OF CHANGES TO THE DESIGN OF BRIDGES

Precinct	Enhancement site	Proposed changes
Albury	Albury Station pedestrian bridge (refer to Figure 3-1)	▸ Location: There is no change in location of the deck and spans across the rail corridor as described in the EIS, but the main span has been extended towards the station building side to provide increased clearance from the rail corridor to the bridge's western abutment. The ramp arrangement on the western side of the bridge next to the station building side has also changed to include ramps further offset from the rail corridor. ▸ Connectivity: No change in connectivity for pedestrians, as described in the EIS. An additional six informal staff parking spaces at the northern end of Albury Station would be removed due to the change in the ramp design. This would make a total of eight impacted informal staff parking spaces as two were identified as impacted in the EIS. ▸ Height: No change in maximum height of the bridge as described in the EIS. ▸ Design: No significant changes in design compared to the pedestrian bridge replacement in the exhibited EIS. The ramps would still provide DDA-compliant grades, and anti-throw screens would be provided in line with relevant safety standards where required. ▸ Appearance: The pedestrian bridge would be of similar shape, form and material to the pedestrian bridge replacement in the exhibited EIS, and would still be taller and more visually prominent than the existing bridge.
Wagga Wagga	Cassidy Parade pedestrian bridge (refer Figure 3-2)	▸ Location: To align with the proposed cycle path network in the *Wagga Wagga Active Travel Plan* (Wagga Wagga City Council, 2022), the direction of the ramp on the southern side of the rail corridor has been changed. The ramp on Cassidy Parade now connects with Norman Street rather than Kildare Street. The bridge deck across the rail corridor has been repositioned to the east by approximately 50 m to improve the ramp grade. ▸ Connectivity: Stair access to the pedestrian bridge would remain onto Kildare Street as described in the EIS; however, the ramp is now proposed to be accessed from Norman Street. ▸ Height: No change in maximum height of the bridge as described in the EIS. ▸ Design: No significant changes to the design. Ramps would provide DDA-compliant grades and anti-throw screens, in line with relevant safety standards, would be provided where required. ▸ Appearance: The pedestrian bridge would be of similar shape, form and material to the pedestrian bridge replacement in the exhibited EIS, and would still be taller and more visually prominent than the existing bridge.
	Edmondson Street road bridge and pedestrian bridge (refer to Figure 3-3)	▸ Location: A new, separate pedestrian bridge structure is proposed on the eastern side of the Edmondson Street bridge to provide DDA-compliant access for pedestrians. The new road bridge would continue to include a pedestrian footpath on the western side of the road. ▸ Connectivity: The pedestrian bridge would connect to the existing footpath network to the north and south of the bridge. ▸ Height: The new pedestrian bridge would be approximately 11 m tall at its highest point. There is no change to the maximum height of Edmondson Street bridge as described in the EIS. ▸ Design: No significant change to the road bridge design, noting the pedestrian path on the eastern side would be removed as it is no longer required, given access would be provided by the separate pedestrian bridge structure. Ramps with switch backs would provide DDA-compliant grades on the pedestrian bridge and anti-throw screens, in line with relevant safety standards, would be provided where required. ▸ Appearance: There is no change to the appearance of the road bridge itself, with the exception of the removed footpath on the eastern side. The appearance of the pedestrian bridge would be similar to the road bridge, to assist in integrating them both into the surrounding environment.

Precinct	Enhancement site	Proposed changes
	Wagga Wagga Station pedestrian bridge (refer to Figure 3-4)	▸ No changes have been made to this pedestrian bridge from the design in the EIS. Further detail on anti-throw screens, in line with relevant safety standards, has been provided.
Junee	Kemp Street road bridge and pedestrian bridge (refer to Figure 3-5)	▸ Location: The pedestrian footpath along the northern side of the road bridge has been removed and a new, separate pedestrian bridge is now proposed directly north of the Kemp Street bridge to provide DDA-compliant access for pedestrians. ▸ Connectivity: On the western side of the new pedestrian bridge, a ramp would provide connection to the existing footpath network in the open space area between Seignior Street and the rail corridor. The pedestrian access on the eastern side of the bridge would no longer provide connection to Ducker Street. Instead, a ramp is proposed adjacent to the rail corridor on Edgar Street to a tie-in point at Hill Street. ▸ Height: The new pedestrian bridge would be approximately 11 m tall at its highest point. No increase in maximum height of Kemp Street bridge as described in the EIS. ▸ Design: No significant change to the road bridge design. Due to the separate pedestrian bridge, the integrated pedestrian path on the bridge has been removed in agreement with Junee Shire Council. The pedestrian bridge design would be consistent with the style of the road bridge. Ramps would have DDA-compliant grades and anti-throw screens, in line with relevant safety standards, would be provided where required. ▸ Appearance: There is no change to the appearance of the road bridge itself, with the exception of the footpath being removed. The appearance of the pedestrian bridge would be similar to the road bridge to assist in integrating them both into the surrounding environment.

FIGURE 3-1 ALBURY STATION PEDESTRIAN BRIDGE (FACING SOUTH-EAST)

FIGURE 3-2 CASSIDY PARADE PEDESTRIAN BRIDGE (FACING NORTH-EAST)

FIGURE 3-3 EDMONDSON STREET PEDESTRIAN BRIDGE (FACING SOUTH-WEST)

FIGURE 3-4 WAGGA WAGGA STATION PEDESTRIAN BRIDGE (FACING SOUTH-EAST)

FIGURE 3-5 KEMP STREET BRIDGE (FACING SOUTH)

3.2.1.2 Correction at the Riverina Highway bridge enhancement site

Figure 7-8 in chapter 7 of the EIS incorrectly included a collision protection wall along the eastern boundary of the rail corridor near The Scots School in addition to those proposed at the Riverina Highway bridge where the track would be lowered. The design does not require a collision protection wall at the eastern boundary of the rail corridor and a wall is not proposed. Figure 3-6 provides an update of the design at the Riverina Highway bridge.

3.2.1.3 Additional bund at the Pearson Street bridge enhancement site

There is a risk of localised flooding upstream of the railway corridor affecting the railway at the Pearson Street bridge enhancement site due to the track lowering at this location. To mitigate this risk, a 0.5 m high bund had been proposed on the south-eastern cutting of the rail corridor in the EIS. The EIS Technical Paper 11: Hydrology, flooding and water quality of the EIS noted the purpose of the bund was to prevent overtopping of the rail alignment and that it would provide a one per cent Annual Exceedance Probability (1% AEP) flood immunity to the proposed lowered track. At the request of Wagga Wagga City Council, a second bund is now proposed on the north-eastern cutting of the rail corridor and would generally have consistent dimensions with, and be parallel to, the southern bund.

As the bund on the southern side provides flood protection to the rail corridor and to land downstream of this location, the addition of a bund on the northern side would not affect flood behaviour beyond the proposal site. No change in the flood behaviour is expected that would be non-compliant with the Quantitative Design Limits (QDLs) proposed for the proposal. The design would be further developed during detailed design in consultation with Wagga Wagga City Council.

3.2.1.4 Change to level crossing LX605 at the Junee to Illabo clearances enhancement site

The design solution for the level crossing on the Shire and Carter Property access road (LX605), as presented in the EIS, focused on addressing the existing compliance issue, through activation of the crossing and mitigation of the short-stacking issue between the crossing and the Olympic Highway. The design solution proposed changes to the Olympic Highway by prohibiting right-hand turns with a concrete median barrier and installing storage lanes adjacent to the Olympic Highway.

In response to concerns raised in submissions and agency advice, the design solution has been amended to address existing non-compliances by realigning approximately 1,300 m of the track, including the level crossing, by up to 16 m south from the current level crossing location. This design solution maintains the ability for vehicles to perform both left- and right-hand turns into and out of the level crossing, does not decrease the safety and functionality of the road network and does not require alterations to the highway infrastructure.

To accommodate the realigned track, the rail corridor boundary would be adjusted and approximately 0.5 hectares (ha) of the Crown road adjacent to the rail corridor would need to be acquired. Subject to detailed design and property agreements, it is not anticipated that the land requirement of the Crown road would sever the road or limit the ongoing use of the Crown land.

The level crossing would still be upgraded from a passive to an active level crossing as previously proposed in the exhibited EIS.

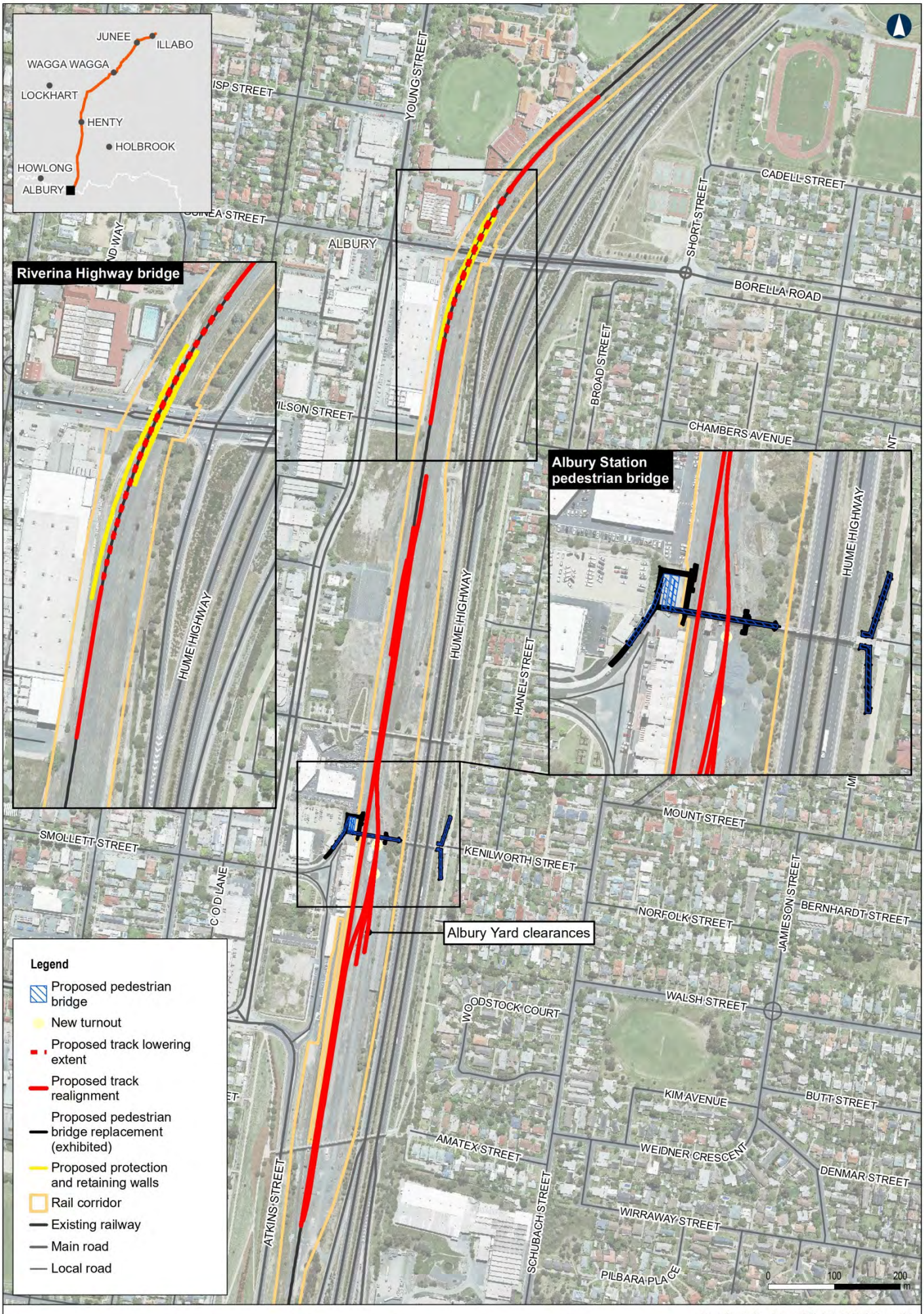

Figure 3-6 Key features of Albury Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:7,500
Paper size: A4
Date: 27/10/2023

210_EAP_F0306_AlburyYard_KeyFeatures_r1v7.mxd

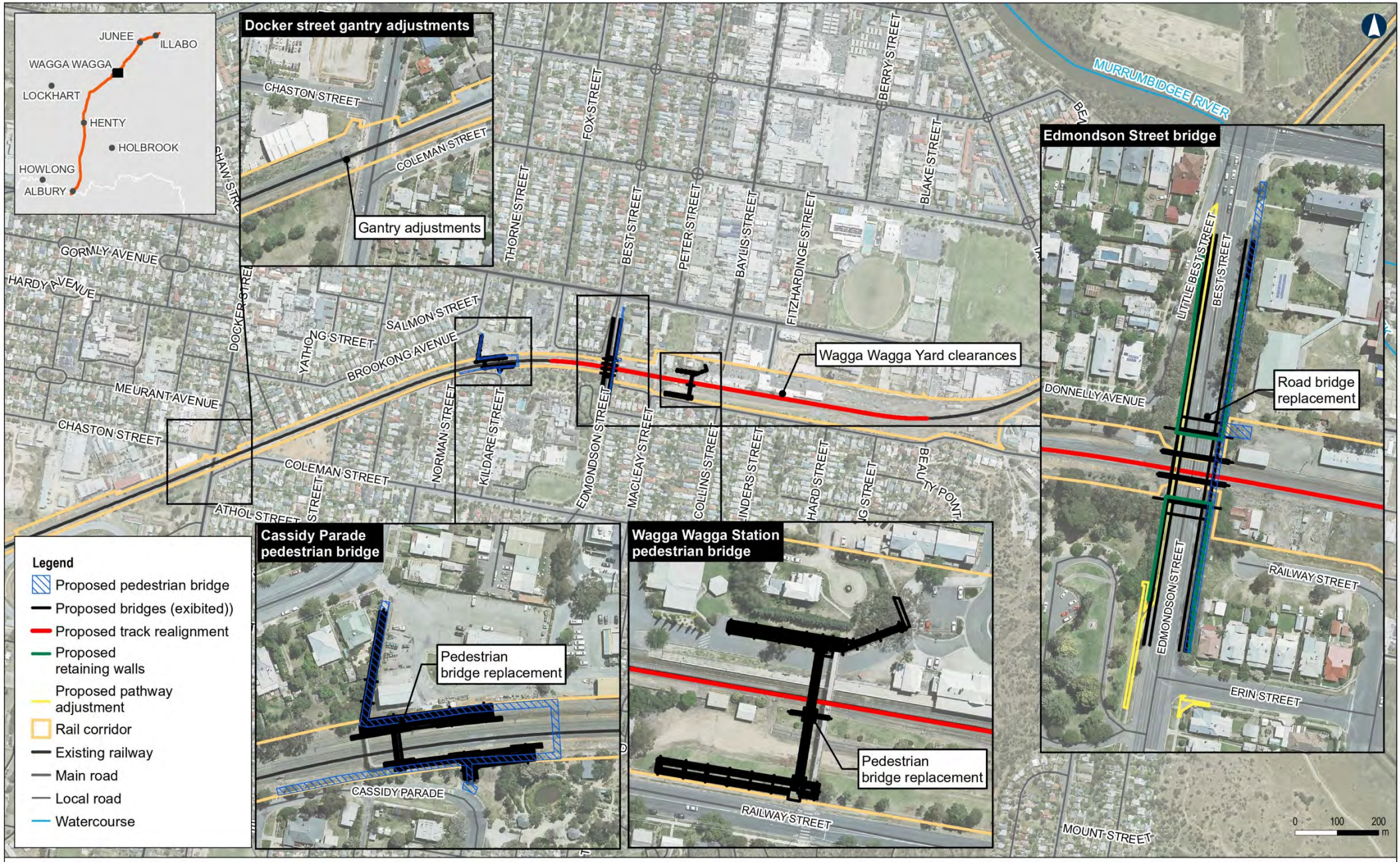

Figure 3-7 Key features of Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:2,500
Paper size: A4
Date: 27/10/2023

210_EAP_F0307_WaggaWagga_KeyFeatures_r1v7.mxd

Figure 3-8 Key features of Junee Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:3,000
Paper size: A4
Date: 27/10/2023

210_EAP_F0308_Junee_KeyFeatures_r1v6.mxd

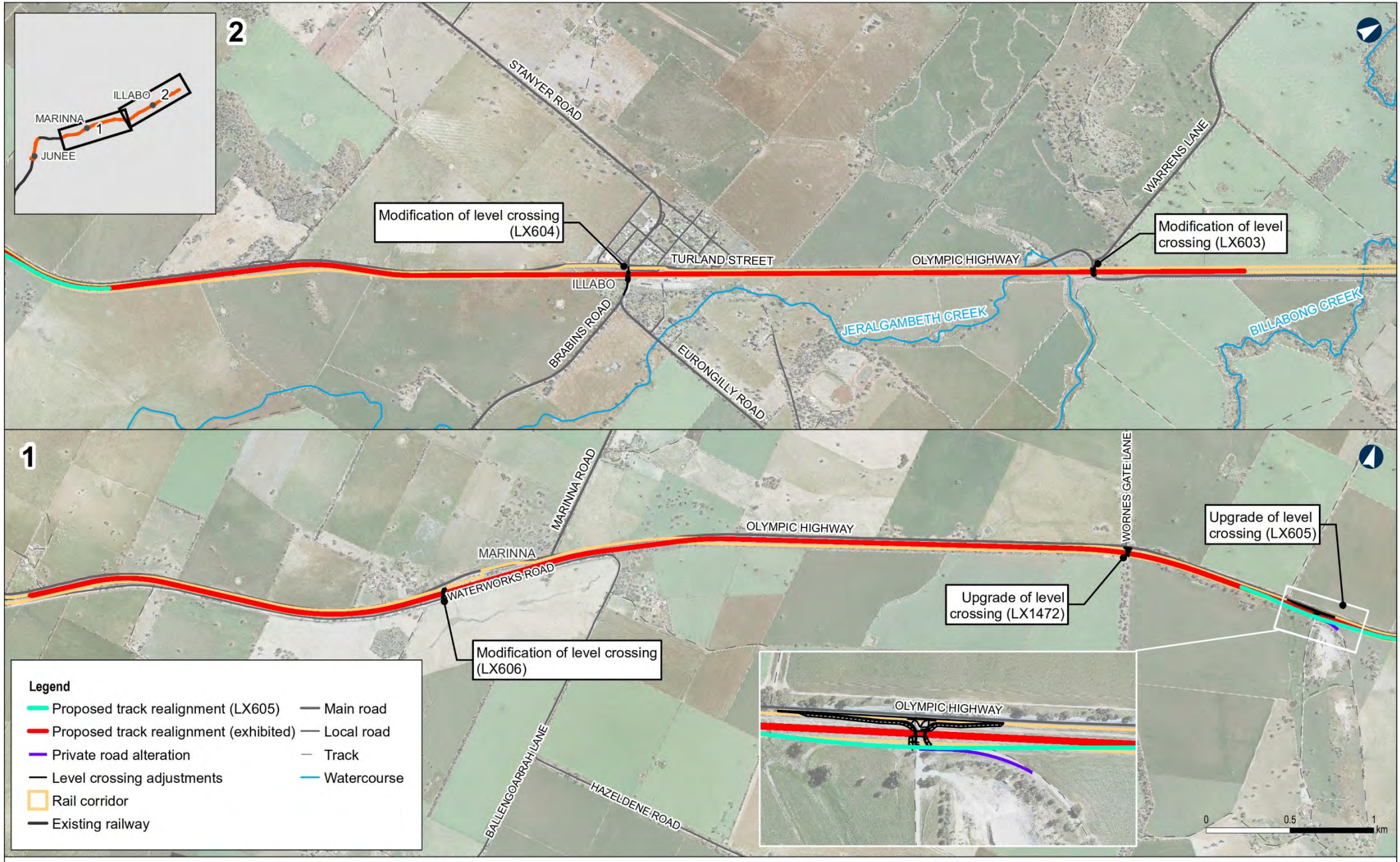

Figure 3-9 Key features of Junee to Illabo clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:30,000
Paper size: A4
Date: 27/10/2023

210_EAP_F0309_J2I_KeyFeatures_r1v7.mxd

3.2.2 Construction of the proposal

3.2.2.1 Changes to the proposal site

The proposal site has been changed since exhibition of the EIS to accommodate proposed design changes, respond to stakeholder consultation and include additional construction areas. Table 3-3 provides a summary of the proposed changes.

TABLE 3-3 SUMMARY OF THE PROPOSED CHANGES TO THE PROPOSAL SITE

Precinct	Enhancement site	Description of change to the proposal site
Wagga Wagga	Pearson Street bridge (refer to Figure 3-10)	Part of the Wagga Show Campground was identified for use as a temporary construction compound. Wagga Wagga Showground Society has subsequently identified the need to use this area during construction. In response, in consultation with the Wagga Wagga Showground Society, the proposal site has been refined to relocate the temporary construction compound to the south-west of the property, between the existing rail corridor and Urana Street. Site access would remain at the existing entry point at Urana Street.
	Cassidy Parade pedestrian bridge (refer to Figure 3-11)	To accommodate the changes in pedestrian bridge design (refer to section 3.2.1.1) the proposal site has been extended further west within the rail corridor and the Cassidy Parade road reserve. To improve access for construction of the ramp off Brookong Avenue, an additional construction area has also been identified in the Telstra depot property on Brookong Avenue. No change to site access points is proposed.
	Edmondson Street bridge (refer to Figure 3-11)	The proposal site has been extended by about 10 m on the north-eastern side of Edmondson Street bridge to accommodate the new pedestrian bridge (refer to section 3.2.1.1). The proposal site now meets the southern boundary of South Wagga Public School. No change to site access points is proposed.
	Wagga Wagga Station pedestrian bridge Wagga Wagga Yard clearances (refer to Figure 3-11)	Th proposal site has been extended in two locations to facilitate construction. It has been extended within the car park of Multicultural Council of Wagga Wagga Centre to the north of the rail corridor and a small increase to the south of the rail corridor has been included to bring the proposal site to the edge of the Railway Street road. No change to site access points is proposed.
Junee	Harefield Yard clearances (refer to Figure 3-12)	The proposal site has been refined to remove the access through the intermodal as it is no longer required for construction. No change to site access points is proposed.
	Kemp Street bridge Junee Yard clearances (refer to Figure 3-13)	The proposal site has been extended along the rail corridor on the north eastern side of Kemp Street bridge to accommodate the new pedestrian bridge (refer to section 3.2.1.1). A small 10 m extension into the Hill Street road reserve has also been included to tie-in with the footpath network. No change to site access points are proposed.
	Junee to Illabo clearances (refer to Figure 3-14)	The proposal site has widened to accommodate the proposed changes to LX605 (refer to section 3.2.1.4). This includes an additional permanent land requirement of a section of Crown land. No change to site access points are proposed.

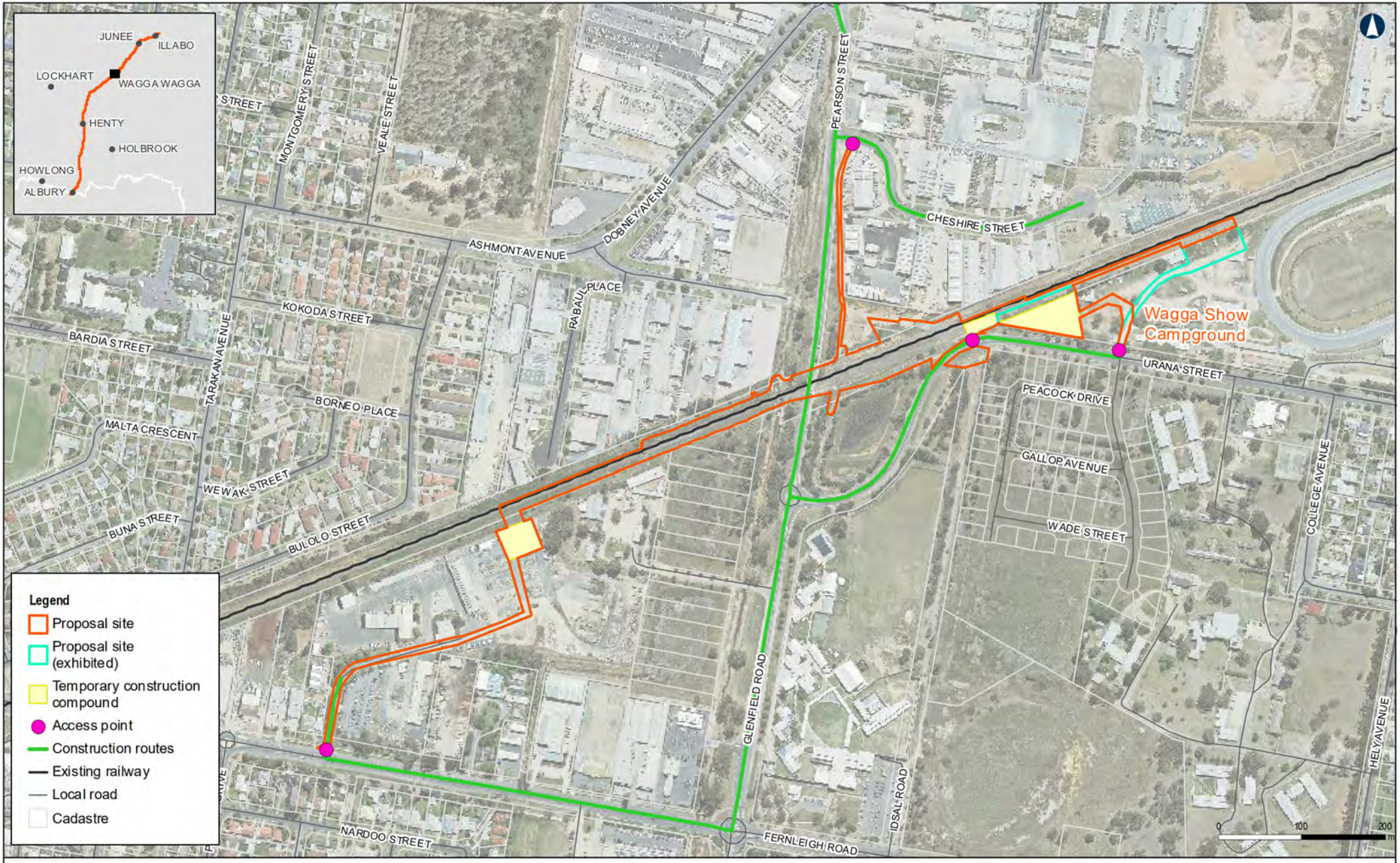

Figure 3-10 Revised Construction layout of enhancement site

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
Paper size: A4
Date: 18/10/2023

210_EAP_F0310_ConstructionLayoutofPearsonSteetBridgeEnhancementSite_r1v1.mxd

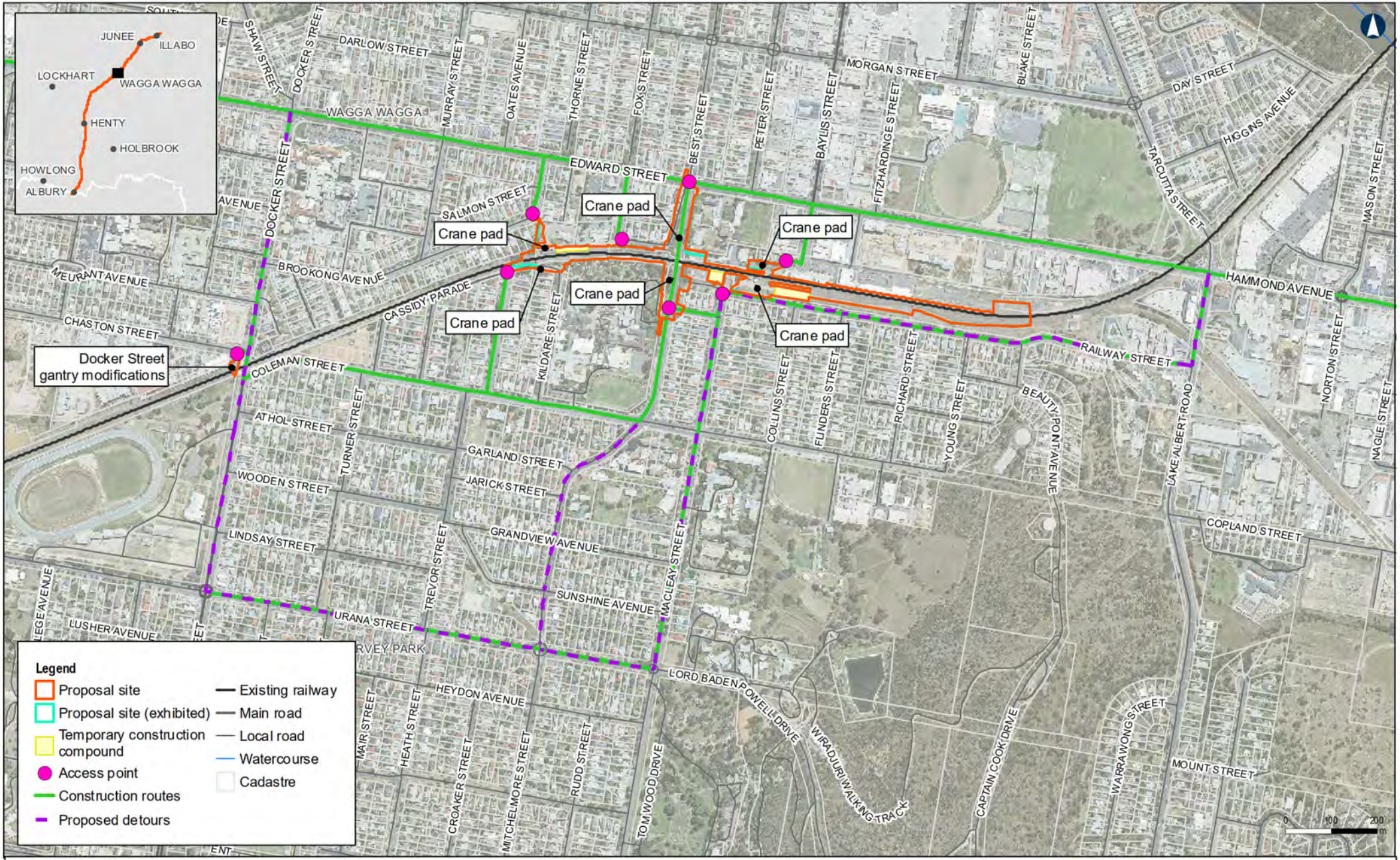

Figure 3-11 Revised Construction layout of Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:11,000
Paper size: A4
Date: 18/10/2023

210_EAP_F0311_RevisedConstructionLayoutofWaggaWaggaStationandSurrounds_r1v1.mxd

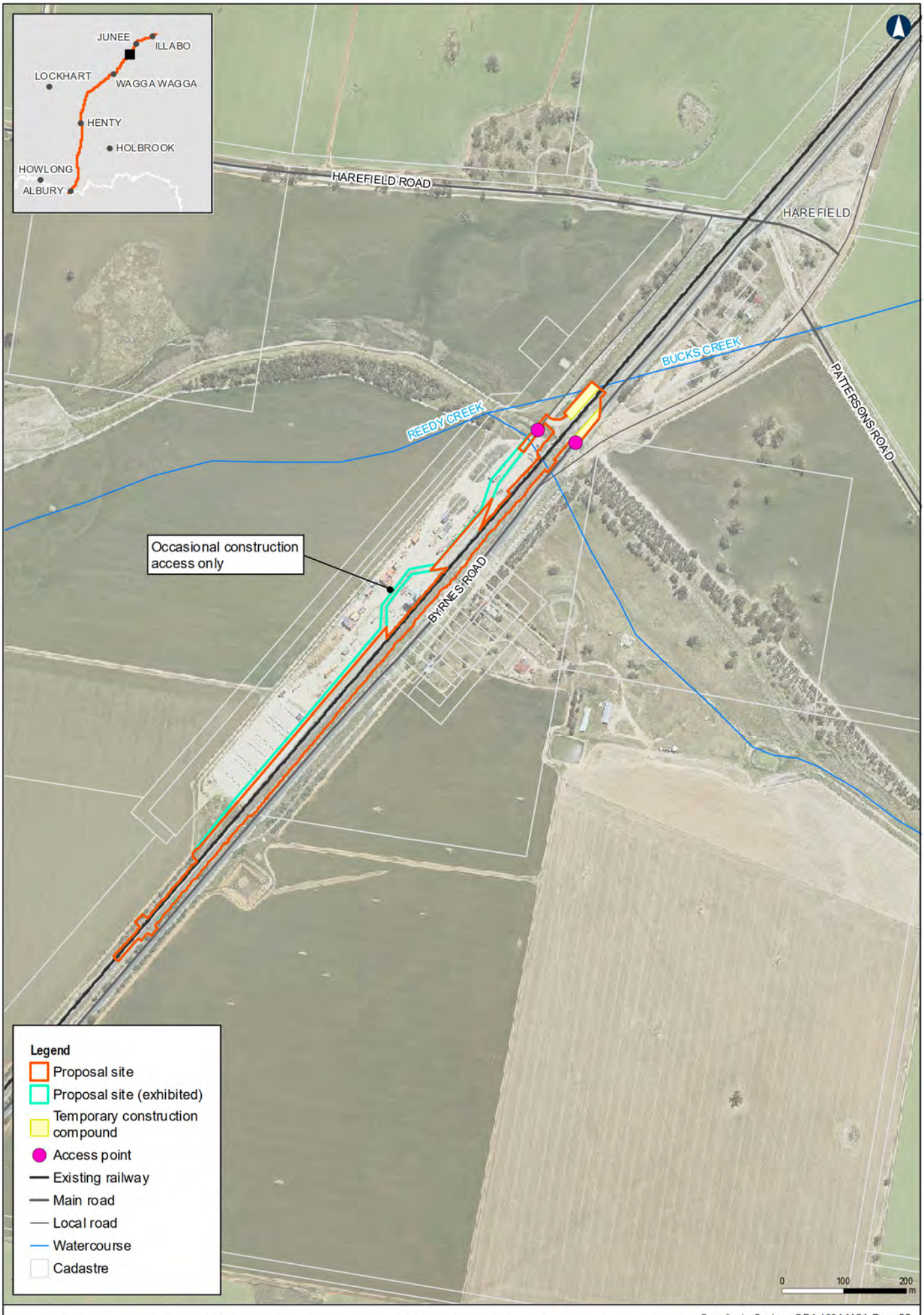

Figure 3-12 Revised Construction layout of Harefield Yard clearances

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,000
Paper size: A4
Date: 18/10/2023

Data Sources: ARTC, NSWSS

210_EAP_F0312_RevisedConstructionLayoutofHarefieldYardClearances_r1v1.mxd

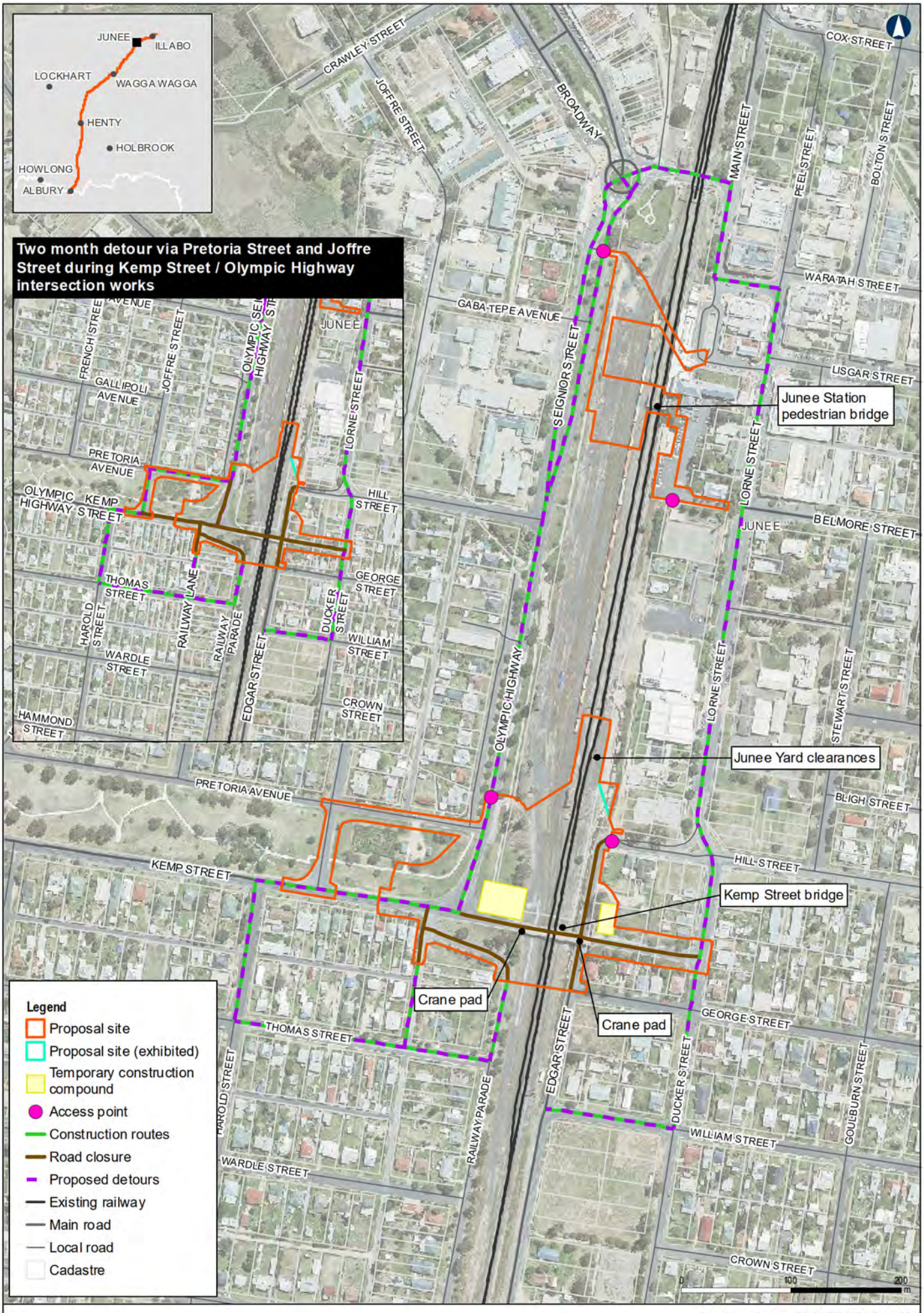

Figure 3-13 Revised Construction layout of Junee Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,500
Paper size: A4
Date: 18/10/2023

210_EAP_F0313_RevisedConstructionLayoutoJuneeStationandSurrounds_r1v1.mxd

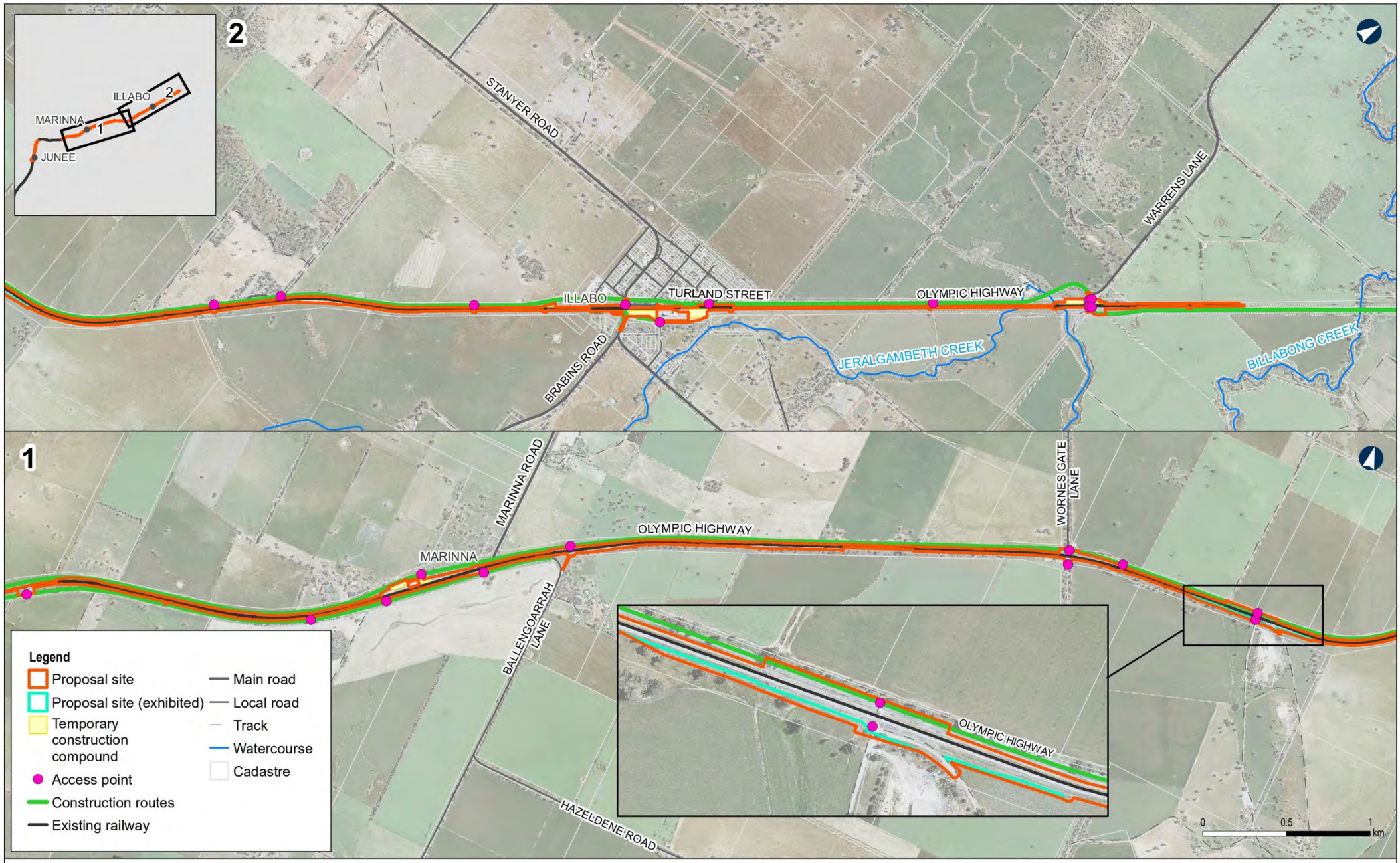

Figure 3-14 Revised Construction layout of Junee to Illabo clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,500
Paper size: A4
Date: 27/10/2023

210_EAP_F0314_RevisedConstructionLayoutofJuneetoIllaboClearances_r1v1.mxd

3.2.2.2 Changes to the construction schedule and staging

The construction schedule has been refined to reflect further detailed construction planning that has occurred since the exhibition of the EIS. Subject to approval, detailed design and construction planning for the proposal would now commence shortly after, in mid-2024. Due to the nature of the works, construction of some elements would also commence shortly after approval (notably the removal of minor structures such as gantries to provide the necessary clearance for the double-stacked trains where replacement of these structures is not required). Construction is expected to take about 30 months (rather than 16 months as described in the EIS) for completion by the end of 2026, with enhancement sites progressively commissioned on completion of construction.

Construction durations are shown in Table 3-4. The changes outlined result from a range of factors, such as specialised resource planning, revised staging of bridge closures and scheduling construction around 60-hour rail possessions, as well as changes to the proposal made as part of this Preferred Infrastructure Report. Some enhancement sites were identified to require additional planned March or September 60-hour rail possessions. The required construction durations are generally focused around the 60-hour rail possessions and there would not necessarily be active construction work occurring throughout the entire duration of construction at each enhancement site.

TABLE 3-4 PROPOSED CHANGE TO CONSTRUCTION PROGRAM

Precinct	Enhancement site	Indicative construction duration in EIS (months)	Revised construction duration (months)	Difference (months)
Albury	Murray River bridge	12	9	-3
	Albury Station pedestrian bridge	6	13	+7
	Albury Yard clearances	3	6	+3
	Riverina Highway bridge	16	11	-5
	Billy Hughes bridge	16	20	+4
	Table Top Yard clearances	1	2	+1
Greater Hume–Lockhart	Culcairn pedestrian bridge	3	1	-2
	Culcairn Yard clearances	3	8	+5
	Henty Yard clearances	3	13	+10
	Yerong Creek Yard clearances	3	3	0
	The Rock Yard clearances	1	2	+1
Wagga Wagga	Uranquinty Yard clearances	2	15	+13
	Pearson Street bridge	16	20	+4
	Cassidy Parade pedestrian bridge	6	24	+18
	Edmondson Street Road bridge	11	14	+3
	Wagga Wagga Station pedestrian bridge	6	9	+3
	Wagga Wagga Yard clearances	3	6	+3
	Bomen Yard clearances	2	6	+4

Precinct	Enhancement site	Indicative construction duration in EIS (months)	Revised construction duration (months)	Difference (months)
Junee	Harefield Yard clearances	2	7	+5
	Kemp Street bridge	10	18	+8
	Junee Station pedestrian bridge	1	1	0
	Junee Yard clearances	2	10	+8
	Olympic Highway underbridge	3	10	+7
	Junee to Illabo clearances	10	23	+13

Temporary detours

The duration and staging of bridge closures during construction has also changed as a result of further construction planning (refer to Table 3-5). The staging of the bridge closures in Wagga Wagga has been revised in response to concerns raised by the community and stakeholders. No change to detour durations for level crossing closures during construction are proposed.

TABLE 3-5 CHANGES TO TEMPORARY DETOUR ARRANGEMENTS AS A RESULT OF BRIDGE CLOSURES

Precinct	Enhancement site	Closure duration in the EIS (months)	Revised closure duration (months)	Proposed change summary
Albury	Albury Station pedestrian bridge	6	8	The Albury Station pedestrian bridge would be closed for an additional two months, due to the need to complete some construction activities during a 60-hour rail possession when train services are suspended. No change in detour routes from the EIS are proposed, given the alternate crossing points are a relatively short distance of only 170 m to the north or 450 m to the south of the Albury Station pedestrian bridge.
Wagga Wagga	Cassidy Parade pedestrian bridge	8	6	Although the overall construction duration of Cassidy Parade pedestrian bridge has increased to two years, the bridge closure would not be in place for the whole period. The early stages of construction would involve enabling works and construction of sections of the proposed bridge that can be built prior to removal of the existing bridge. This would allow the existing bridge to remain open for longer and minimise the duration of the pedestrian detour at this location during construction. Closure of the Cassidy Parade pedestrian bridge is also now planned to occur at the same time as the Wagga Wagga Station pedestrian bridge after Edmondson Street bridge is completed. Pedestrians would now primarily be diverted to Edmondson Street to the east rather than Wagga Wagga Station pedestrian bridge, which is located further away.

Precinct	Enhancement site	Closure duration in the EIS (months)	Revised closure duration (months)	Proposed change summary
	Edmondson Street bridge	9	11	To minimise detour distances between pedestrian rail corridor crossings, Edmondson Street road bridge and pedestrian bridge would be constructed first and then Cassidy Parade pedestrian bridge and Wagga Wagga Station pedestrian bridge would be constructed concurrently. Subject to final construction planning and requirements for rail possessions, there may be a short period of time where Edmondson Street bridge is closed at the same time as one of the other two bridges. Pedestrians would be diverted to the Cassidy Parade pedestrian bridge to the west and Wagga Wagga Station pedestrian bridge to the east. No change to vehicular detours is proposed.
	Wagga Wagga Station pedestrian bridge	6	7	No change to the pedestrian detour is proposed. As described in the EIS, pedestrians would be diverted to the new Edmondson Street bridge over the rail corridor while works are carried out on Wagga Wagga Station pedestrian bridge.
Junee	Kemp Street bridge	8	12	Pedestrian detour disruptions would be minimised, as every endeavour would be made to ensure the new pedestrian bridge proposed would be finalised prior to closure of the Kemp Street bridge. There may be short periods of time where both the Kemp Street bridge and the new pedestrian bridge are closed, during construction. No change to vehicular detours is proposed.

3.2.3 Operation of the proposal

As a result of changes in the construction schedule as outlined in section 3.2.2.2, the proposal is expected to be operational by late 2026.

It is noted that this Preferred Infrastructure Report and the Submissions Report have retained the same assessment years as used in the EIS, being 2020 as the existing scenario, 2025 as the opening year and 2040 as the peak of Inland Rail operations, in order to maintain a consistent reference point. There is no predicted change in train numbers on the existing rail line between Albury and Illabo prior to the commencement of operation of Inland Rail upon the completion of all projects. As such, changing the opening year would not result in a material change to assessment outcomes.

As noted in section 1.2.4, ARTC is now taking a staged approach to Inland Rail, with a focus on construction of the sections of Inland Rail between Beveridge in Victoria and Narromine in NSW by 2027, to progressively unlock the benefits of Inland Rail ahead of end-to-end completion. North of Parkes, attention is on obtaining approvals, securing the route, and refining cost and delivery arrangements ahead of commitments for construction.

4. Statutory context

The (then) NSW Minister for Planning and Public Spaces declared the proposal to be CSSI in 2021. The proposal is listed in Schedule 5, Clause 7 of the State Environmental Planning Policy (Planning Systems) 2021 and is subject to approval by the NSW Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.

The statutory context of the proposal is described in chapter 4 of the EIS. The proposed changes to the exhibited proposal do not change the statutory context of the proposal. No additional approvals are required for the proposal.

5. Engagement

5.1 Approach

ARTC's values commit the organisation to active engagement with stakeholders and the community. For the Inland Rail program, effective communication and stakeholder engagement are fundamental to minimising the potential for social and environmental impacts as far as possible. ARTC believes that identifying, engaging and effectively communicating with stakeholders is critical to the successful delivery of Inland Rail.

ARTC's approach to consultation for the proposal is described in chapter 5 of the EIS. The consultation activities undertaken prior to exhibition of the EIS are described in Appendix C of the EIS. Engagement activities have been carried out for the proposal since 2017 and are ongoing.

The following sections describe the engagement undertaken after public exhibition of the EIS related to the preparation of this Preferred Infrastructure Report. Engagement specific to submissions received on the EIS and general engagement activities are documented in the Submissions Report.

5.1.1 Additional assessments

Engagement with relevant regulatory authorities and other stakeholders has been ongoing on the scope of additional assessments and mitigation identified for the proposal. An outline of the engagement that has occurred for each additional assessment is provided in Table 5-1.

TABLE 5-1 ENGAGEMENT UNDERTAKEN FOR ADDITIONAL ASSESSMENTS COMPLETED FOR THE PROPOSAL

Preferred Infrastructure Report topic	Description
Traffic and transport	**Methodology and modelling** As part of the development of the microsimulation traffic models for Wagga Wagga and Junee, ARTC provided iterative reports to Transport for NSW and DPE for feedback. As Wagga Wagga City Council had expressed interest in the development of the Wagga Wagga microsimulation model, the relevant assessments were also provided for feedback. Feedback received from Transport for NSW on the overall methodology of the microsimulation model for Wagga Wagga highlighted the importance of validating and calibrating the model with Origin–Destination (OD) survey of existing travel patterns in the area. ARTC is planning to carry out OD survey and would use the data to validate the assumptions in the model, and refine the model if required. The outcomes would be confirmed in the future submissions report prepared following exhibition of this Preferred Infrastructure Report. **Emergency services** ARTC consulted with emergency services stakeholders and agencies on flooding and traffic impacts. Members of the Junee Local Emergency Management Committee, Riverina Murray Regional Emergency Management Committee NSW Police, NSW Rural Fire Service, NSW Ambulance, NSW State Emergency Service and Fire and Rescue NSW were invited to an Emergency Services briefing held online on 12 October 2023. One representative from NSW Ambulance, NSW Police and NSW Rural Fire Service attended the meeting. The briefing included topics on construction issues such as traffic impacts during the closure of Edmondson and Kemp Street bridges and operational issues such as further clarification of train numbers, and impacts to emergency service operation due to increased and more frequent level crossing closures. NSW Rural Fire Service queried potential traffic impacts at the Bourke Street/Docker Street level crossing when the Edmondson Street bridge is closed. NSW Ambulance expressed interest in further engagement with ARTC regarding the impacts to traffic during the closure of the Edmondson Street bridge and potential impacts to ambulance operations. ARTC will continue engaging with emergency services as the proposal progresses through detailed design and construction planning. **Design of Edmondson Street bridge, Kemp Street bridge, and pedestrian bridges** ARTC consulted Transport for NSW, DPE and relevant local councils on the proposed changes to bridge designs in Albury, Wagga Wagga and Junee. A summary of the feedback received during this consultation, and changes implemented in response, is provided in section 5.1.2.1.

Preferred Infrastructure Report topic	Description
Noise and vibration	To support the development of the additional assessment, ARTC carried out noise monitoring of freight trains using the existing rail infrastructure on the A2I section of track in January and February 2023. ARTC developed the scope of the noise monitoring, including monitor locations, in consultation with DPE in December 2022.
Air quality	The development of the assessment scope, including the use of a case study approach to represent air quality impacts in rural and urban environments for the additional assessment was subject to consultation with DPE in January 2023.

5.1.2 Changes to the proposal

Changes to the proposal were developed in consultation with relevant stakeholders. A summary of engagement completed for changes to the proposal is provided in the following sections.

5.1.2.1 Pedestrian bridges

ARTC consulted Transport for NSW, DPE and relevant local councils on the proposed changes to bridge designs in Albury, Wagga Wagga and Junee. Pedestrian bridge designs and visualisations were provided to relevant stakeholders for feedback as outlined below:

- The proposed changes to Wagga Wagga Station and Edmondson Street pedestrian bridges were sent to DPE, Transport for NSW and Wagga Wagga City Council on 14 August 2023. Feedback was received from Wagga Wagga City Council on 25 September 2023 and Transport for NSW on 1 September 2023.
- The proposed changes to Cassidy Parade pedestrian bridge were sent to DPE, Transport for NSW and Wagga Council on 12 September 2023. Feedback was received from Wagga Wagga City Council on 25 September 2023 and Transport for NSW on 29 September 2023.
- Albury Station pedestrian bridge were sent to DPE, Transport for NSW and Albury City Council on 6 September 2023. Transport for NSW provided feedback on 22 September 2023.
- Two pedestrian bridge design options for Junee were provided to Junee Shire Council for comment on 18 September 2023. On 20 September, Junee Shire Council provided feedback and noted a preference for the proposed pedestrian bridge design presented in this report.

Feedback received on pedestrian bridges design is summarised in Table 5-2. Overall, the feedback received on the pedestrian bridge designs were generally engineering and design related that would be resolved during the next stage of design development, being the detailed design. Impacts associated with relevant council assets will be managed through interface agreements, which detail the arrangements for managing design outcomes and the effects of construction on the relevant council's infrastructure and assets. Through these agreements, and ongoing discussions and detailed design reviews, ARTC will continue to resolve feedback received by relevant councils and other stakeholders.

TABLE 5-2 SUMMARY OF STAKEHOLDER AND AGENCY FEEDBACK ON PEDESTRIAN BRIDGES DESIGNS

Agency/stakeholder	Feedback
Transport for NSW	▸ Noted land ownership and consultation expectations including consideration of Transport for NSW and Transport Asset Holding Entity of NSW owned land at Albury Station and at Edmondson Street bridge. ▸ Provided feedback and guidance on the pedestrian bridge design ▸ Requested ongoing consultation during detailed design
Wagga Wagga City Council	▸ Provided design comments on the new pedestrian bridge at Edmondson Street bridge
Junee Shire Council	▸ Noted a preference for the pedestrian bridge option north of Kemp Street bridge ▸ Provided design feedback and guidance on the pedestrian bridge design ▸ Requested consultation on further design changes to the pedestrian bridge

5.1.2.2 Change to level crossing LX605

The design solution for level crossing LX605, as presented in the exhibited proposal, focused on addressing the existing compliance issue, through activation of the crossing and mitigation of the short-stacking issue between the crossing and the Olympic Highway. The previous design solution proposed changes to the Olympic Highway by prohibiting right-hand turns with a concrete median barrier and installing storage lanes adjacent to the Olympic Highway. Feedback received in stakeholder submissions and agency advice received during the exhibition of the EIS is summarised in Table 5-3.

TABLE 5-3 SUMMARY OF STAKEHOLDER AND AGENCY FEEDBACK ON LX605 DESIGN

Agency/stakeholder	Key feedback
Transport for NSW	▸ Required that works do not decrease safety and functionality of the road network ▸ Requested more information on the turn-around facilities for trucks that can no longer turn right
Junee Shire Council	▸ Considered the solution to introduce road safety hazards ▸ Stated that intersections with the Olympic Highway should allow all turning traffic ▸ Recommended the continued use of level crossing LX605 for access to quarry
NSW Farmer's Federation	▸ Considered the solution to introduce road safety hazards ▸ Objected to the impacts to users ▸ Questioned the differences in treatment between crossings
Landowner	▸ Considered the solution to have been developed with a lack of consultation ▸ Considered the solution to introduce road safety hazards ▸ Objected to detour times associated with left turn only option ▸ Recommended extra lanes on highway to allow right turns and cited other level crossing examples ▸ Questioned the differences in treatment between crossings

Inland Rail developed a Briefing Paper in April 2023 to provide an overview of alternative design options at LX605 and present a preferred option as outlined in section 3.2.1.4 to directly impacted stakeholders including Transport for NSW, Junee Shire Council and the Landowner for feedback. The main objectives sought by the redesign of this level crossing were to:

- address the existing short stacking issue whilst providing space for a 26 m B Double design vehicle to access
- provide access to the Junee Shire Council quarry (Lot 1 DP 965172) and provide access to the property at 1272 Olympic Highway, Illabo (multiple lots) for the landowner
- maintain the existing safety and functionality of the Olympic Highway (a state-controlled road).

A briefing was held with Junee Shire Council and the landowner on 11 May 2023 who confirmed they were generally supportive of the preferred option. Feedback received from Transport for NSW on 19 May 2023 confirmed in-principle support for the preferred option and addressing short-stacking issues; however, requested further information and a strategic design of the preferred option. Consultation would continue to be carried out during the detailed design stage.

5.2 Ongoing engagement

Ongoing consultation with the community and key stakeholders will be held in the lead up to, and during, construction (should the proposal be approved), with the following objectives:

- landowners, community and stakeholders have a high level of awareness of all processes and advanced notice of activities associated with the proposal
- accurate and accessible information is made available
- a timely response is given to issues and concerns raised by the community
- feedback from the community is encouraged
- opportunities for input are provided.

The Inland Rail community engagement hotline and email address will continue to be available during construction, along with a 24-hour construction response line. Targeted consultation methods, such as letters, notifications, signage and face-to-face communications, will continue to occur. The Inland Rail websites and social media platforms will also include updates on the progress of the proposal.

The following communication tools and activities will continue to be used during the construction phase:

- development of a communication management plan detailing a complaint-handling process
- Inland Rail community engagement hotline and email address
- updates to the Inland Rail websites
- updates on social media platforms
- targeted consultation and notifications, such as letters, notifications and face-to-face communication
- construction signage.

A complaints management system would also be implemented prior to the commencement of construction. It would be maintained throughout the construction period and for a minimum of 12 months after construction finishes.

6. Directed assessments of the proposal

6.1 Traffic and transport

This section provides a summary of the additional traffic and transport assessments undertaken for the proposal in response to DPE direction and concerns made by the community and stakeholders. The additional assessment addresses the traffic impacts during construction of the proposal, from traffic generated by construction of the proposal and detours during works on road bridges and level crossings. The additional assessment also investigates potential traffic impacts during operation of the proposal due to more frequent and longer trains. A full copy of the addendum assessment is provided in Appendix C.

6.1.1 Approach overview

The additional assessment of traffic and transport includes a number of topics, for which individual approaches have been developed. These include:

- for construction:
  - microsimulation traffic model for Junee and Wagga Wagga, where the proposal would require temporary road closures and traffic diversions during construction
  - updated assessments of intersection and road links at other enhancement sites
  - assessment of construction routes, and heavy vehicle turn paths at intersections
  - assessment of impacts to active transport due to temporary bridge closures
  - identifying a range of mitigation measures as required.
- for operation:
  - assessment of level crossing safety and community severance caused by level crossing closures
  - traffic modelling of the operation of the level crossings in Wagga Wagga and Culcairn, where impacts to the performance of the road network were predicted in the EIS
  - identification and analysis of mitigation treatments to reduce potential negative impacts.
- More detail on the approach for each assessment is provided in the following sections.

6.1.1.1 Traffic and pedestrian surveys

Traffic and pedestrian data was collected in June 2023 to support the additional traffic and transport assessments. The data collection included:

- vehicle surveys at intersections in Albury, Wagga Wagga, Culcairn, Henty, Uranquinty, Yerong Creek and Junee
- automatic traffic count (tubes) in Wagga Wagga, Albury, The Rock and Junee
- vehicle travel time surveys in Wagga Wagga
- pedestrian counts in Wagga Wagga (Cassidy Parade pedestrian bridge, Wagga Wagga Station pedestrian bridge and Edmondson Street bridge) and Junee (Kemp Street bridge).
- The data was used as a basis to determine future background traffic volumes by applying annual growth rates. Traffic growth in Wagga Wagga was determined through the Wagga Wagga Strategic Transport Model provided by Wagga Wagga City Council (refer to section 6.1.2.1). Traffic growth rates outside Wagga Wagga were determined through analysis of traffic data from between 2010 and 2018 from Traffic Volume Viewer (Transport for NSW, 2021a) and consultation with Transport for NSW, Junee Shire Council and Albury City Council (refer to Technical Paper 1 of the EIS for further detail).

6.1.1.2 Assessment criteria

The criteria applied to the traffic assessment is described in this section.

Intersection Level of Service

The assessment of intersection performance has been performed in relation to the Level of Service (LoS) criteria set out in the *Guide to Traffic Generating Developments* (Road Traffic Authority (RTA), 2002). Table 6-1 provides the LoS criteria for signalised, signed and roundabout intersections.

TABLE 6-1 LOS CRITERIA FOR INTERSECTIONS (RTA, 2002)

LoS	Average delay (seconds per vehicle)	Description at traffic signals and roundabouts	Description at give way and stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	Greater than 70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Road link Level of Service

The assessment of the road network performance between intersections (referred to as road links) has been performed in relation to the LoS described in Table 6-2.

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

TABLE 6-2 LOS DESCRIPTION FOR ROAD LINKS

LoS	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 LoS 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.

Environmental capacity thresholds

Environmental capacity is the volume of moving vehicles that can be accommodated in a street or area considering the need to maintain environmental standards. Environmental capacity thresholds are provided in the *Guide to Traffic Generating Developments* (RTA, 2002) and include two threshold levels; one for the desirable maximum (the environmental goal) and one for the absolute maximum (maximum). The environmental capacity thresholds are presented in Table 6-3.

The environmental capacity thresholds apply to local roads and collector roads connecting to arterial or sub-arterial roads, and distributing traffic from those roads onto local roads. Local and collector roads are classified to be roads that:

- have predominantly residential land use
- currently carry less than 300 vehicles per hour for local roads or 500 vehicles per hour for collector roads
- have a maximum speed limit of 60 km/hr
- have a maximum of one line-marked lane per direction.

TABLE 6-3 ENVIRONMENTAL CAPACITY THRESHOLDS (ROAD TRAFFIC AUTHORITY, 2002).

Road class	Road type	Maximum speed (km/hr)	Maximum peak hour volume (vehicles per hour)
Local	Access way	25	100
	Street	40	200 (Environmental goal)
		40	300 (Maximum)
Collector	Street	50	300 (Environmental goal)
			500 (Maximum)

6.1.2 Construction assessment

6.1.2.1 Traffic impacts during Edmondson Street bridge replacement

Based on the traffic survey data collected and the estimated construction traffic volumes, the traffic impact assessment was undertaken in Wagga Wagga using a microsimulation model. Microsimulation modelling is the most detailed level of traffic modelling that simulates traffic operations at a vehicle level.

Approach

The assessment involved:

- determining future traffic growth based on the Wagga Wagga Strategic Transport Model provided by Wagga Wagga City Council
- developing the Wagga Wagga network model using AIMSUN software
- calibrating the model using the data collected from traffic surveys (June 2023)
- assessing traffic performance in the model during:
  - base conditions
  - peak construction traffic volumes and traffic detours during replacement of the Edmondson Street bridge
- assessing travel times (for the routes shown in Figure 6-1), traffic volumes and network performance using density maps generated by the model to identify where excessive delays and queues are occurring in the modelled area
- assessing model results against relevant criteria (refer to section 6.1.1.2) including:
  - intersection LoS based vehicle delays
  - environmental capacity thresholds
- identifying a range of mitigation measures as required and modelling them where practicable
- modelling potential mitigation measure scenarios.

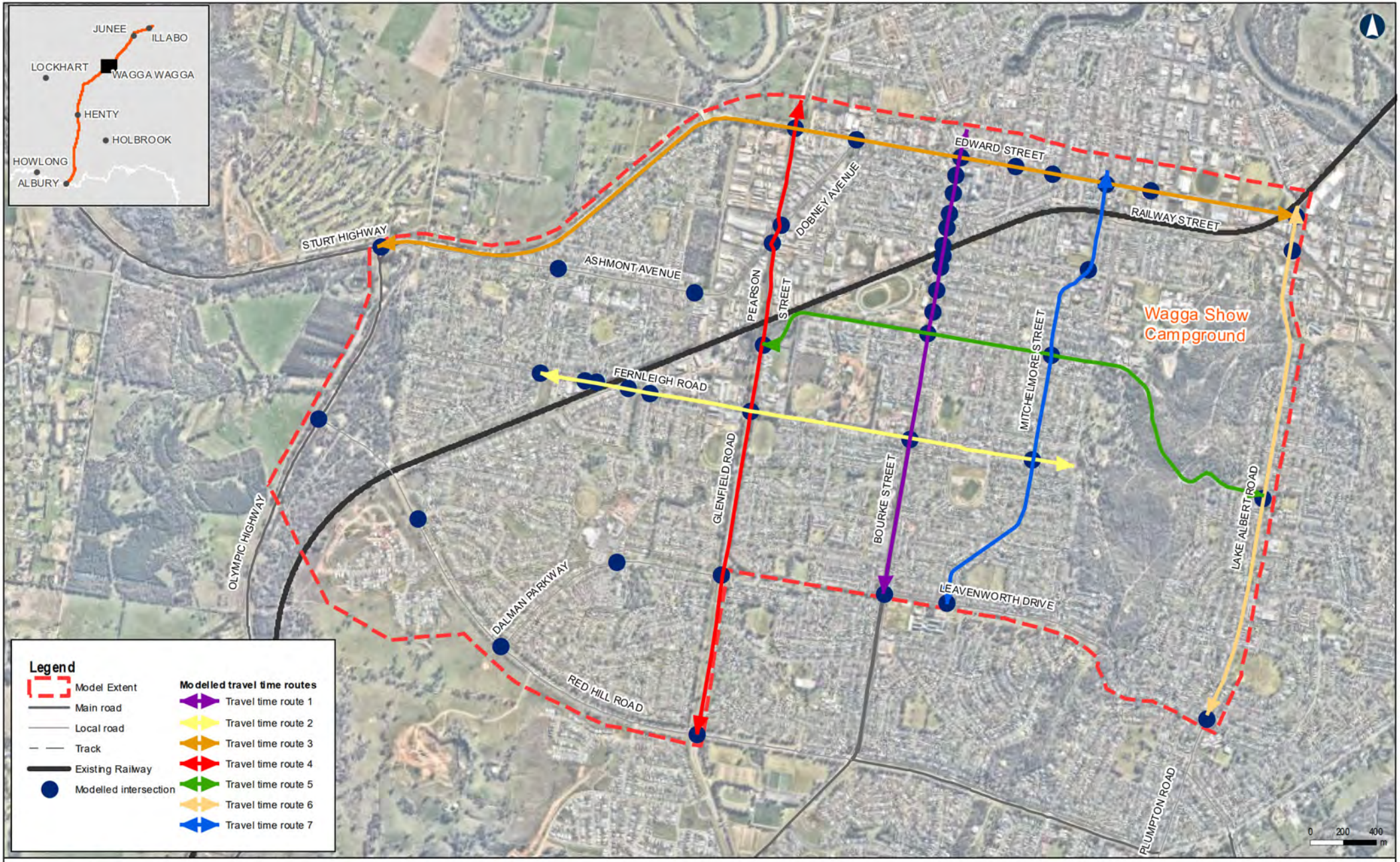

Figure 6-1 Modelled area for construction in Wagga Wagga

Data Sources: ARTC, NSWSS, Nearmap

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:30,000
Paper size: A4
Date: 16/10/2023

210_EAP_F601_ModelledAreaForConstructionInWaggaWagga_r1v2.mxd

Assessment

During the replacement of the Edmondson Street bridge, motorists would be diverted to other rail corridor crossings including Docker Street and Edward Street. The proposal would also generate construction traffic during construction.

The temporary closure of the Edmondson Street bridge and the additional construction traffic volumes would put high strains on the intersections of Docker Street and Lake Albert Road with the Sturt Highway, as well as Railway Street with Lake Albert Road, as diverted traffic from the temporary bridge closure cause increases on some of the approaches to these intersections. These pressures are most prevalent in the morning and afternoon peak traffic periods.

Table 6-4 and Table 6-5 present the intersections where the delay is predicted to increase by more than 20 per cent in the morning and afternoon peak traffic periods, respectively. All results, including during the midday peak, are included in Appendix C.

TABLE 6-4 INTERSECTIONS IN WAGGA WAGGA WHERE THE AVERAGE DELAY IS INCREASED BY MORE THAN 20 PER CENT DURING THE MORNING PEAK

Intersection	Base			Construction		
	Volume (vehicles)	Delay (sec)	LoS	Volume (vehicles)	Delay (sec)	LoS
Sturt Highway / Murray Street	1,551	11	A	1,937	14	A
Sturt Highway / Pearson Street	3,320	6	A	3,447	13	A
Sturt Highway / Docker Street	2,907	62	E	3,257	256	F
Sturt Highway / Best Street	2,659	18	B	2,275	46	D
Bourke Street / Coleman Street	1,785	25	B	2,234	123	F
Bourke Street / Urana Street	1,996	4	A	2,345	72	E
Pearson Street / Dobney Avenue (South)	1,905	5	A	2,201	7	A
Glenfield Road / Fernleigh Road	2,166	4	A	2,281	5	A
Fernleigh Road / Bulolo Street	844	10	A	880	13	A
Urana Street / Pearson Street	1,705	4	A	1,999	7	A
Sturt Highway / Dobney Avenue	2,022	6	A	2,041	96	F
Docker Street / Gormly Avenue	1,251	4	A	1,580	183	F
Docker Street / Hardy Avenue	1,251	6	A	1,616	93	F
Docker Street / Brookong Avenue	1,467	7	A	2,028	60	E
Docker Street / Meurant Avenue	1,529	16	B	2,067	52	D
Docker Street / Chaston Street	1,788	10	A	2,235	47	D
Lake Albert Road / Railway Street	1,601	80	F	1,605	272	F
Bourke Street / Athol Street	1,627	12	A	1,906	112	F
Bourke Street / Wooden Street	1,618	15	B	1,862	75	F
Sturt Highway / Brookong Ave	1,604	9	A	2,133	22	B

TABLE 6-5 INTERSECTIONS IN WAGGA WAGGA WHERE THE AVERAGE DELAY IS INCREASED BY MORE THAN 20 PER CENT DURING THE AFTERNOON PEAK

Intersection	Base			Construction		
	Volume (vehicles)	Delay (sec)	LoS	Volume (vehicles)	Delay (sec)	LoS
Sturt Highway / Pearson Street	3,038	5	A	3,187	6	A
Sturt Highway / Docker Street	3,263	104	F	3,467	157	F
Sturt Highway / Best Street	2,917	30	C	2,275	107	F
Bourke Street / Coleman Street	1,573	13	A	1,979	25	B
Pearson Street / Dobney Avenue (South)	2,087	4	A	2,311	5	A
Urana Street / Pearson Street	1,885	7	A	2,090	18	B
Docker Street / Gormly Avenue	1,481	3	A	1,592	69	E
Docker Street / Hardy Avenue	1,509	14	A	1,653	139	F
Docker Street / Brookong Avenue	1,659	7	A	1,872	11	A
Docker Street / Chaston Street	1,808	7	A	2,053	11	A
Lake Albert Road / Railway Street	1,602	42	C	1,752	131	F
Sturt Highway / Brookong Ave	1,856	8	A	2,222	23	B

Most travel times along the assessed travel routes (see Figure 6-1) only moderately increase or decrease as a result of the changed traffic conditions during construction; however, there are significant delays predicted at five of the routes, particularly during the morning peak as shown in Table 6-6.

Environmental capacity thresholds are predicted to be exceeded during construction at 13 roads during the morning peak and at 12 roads during the afternoon peak. The full list of roads is provided in Appendix C.

TABLE 6-6 NETWORK TRAVEL TIMES IN WAGGA WAGGA WITHOUT (BASE) AND WITH CONSTRUCTION TRAFFIC

Route	Direction	Morning peak (minutes)			Afternoon peak (minutes)		
		Base	Construction	Difference (%)	Base	Construction	Difference (%)
Route 1—Bourke Street	Northbound	5:37	15:16	+171.9	5:09	7:21	+42.9
	Southbound	4:14	3:55	-7.7	4:03	3:35	-11.3
Route 2—Fernleigh Road	Eastbound	5:49	5:39	-2.8	5:22	5:15	-2.12
	Westbound	5:38	5:41	+0.9	5:35	5:26	-2.9
Route 3—Sturt Highway	Eastbound	10:11	16:58	+66.6	11:30	12:11	+6.0
	Westbound	15:05	21:01	+39.4	16:38	17:27	+4.9
Route 4—Glenfield Road	Northbound	5:27	5:36	+2.7	5:21	5:25	+1.3
	Southbound	5:13	5:31	+6.0	5:20	5:25	+1.4
Route 5—Urana Street	Eastbound	5:08	6:57	+35.2	5:08	4:59	-2.7
	Westbound	5:04	5:12	+2.4	5:08	5:13	+1.6

Route	Direction	Morning peak (minutes)			Afternoon peak (minutes)		
		Base	Construction	Difference (%)	Base	Construction	Difference (%)
Route 6—Lake Albert Road	Northbound	8:39	16:29	+90.5	8:17	10:24	+25.5
	Southbound	5:26	4:55	-9.6	5:32	5:14	-5.2
Route 7—Mitchelmore St	Northbound	4:28	4:04	-9.0	4:18	4:01	-6.6
	Southbound	5:12	6:11	+18.6	5:21	8:45	+63.3

Assessment with traffic mitigation

To alleviate some of the traffic impacts from construction, mitigation measures have been identified and tested in the model. A review of intersection performance, and key constraints, was completed to identify feasible mitigation, which could be implemented in consultation with the relevant road authorities. It is noted that major intersection upgrades, such as road widening or creation of additional capacity, was not considered appropriate for the mitigation of temporary impacts during construction of the proposal.

The mitigation identified and modelled in the assessment included:

- optimising signal timings at the following key intersections:
  - Sturt Highway / Docker Street
  - Sturt Highway / Best Street
  - Sturt Highway / Lake Albert Road
  - Railway Street / Lake Albert Road.
- lengthening and demarcation of the left-turn lane on Railway Street at Lake Albert Road (western approach turn).

A summary of the mitigation and traffic performance is provided in Table 6-7. It is noted that intersection performance is also driven by the broader network, and mitigation has down-stream impacts in the network, which may worsen results at adjacent intersections. Detailed results, including all measures of traffic performance, are provided in Appendix C.

The results above show that there are improvements to network travel time for both morning and afternoon peak. Morning peak sees the biggest improvement with the optimised signal timings modelled. Afternoon peak network travel times could be potentially further reduced, with further signal optimisation during the construction period. Intersections where delay is predicted to worsen greater than 20 per cent with the proposal are generally predicted to worsen greater than 20 per cent with the identified mitigation.

In addition to the specific mitigations modelled in the assessment, other potential mitigations will be further considered during detailed design and construction planning for the proposal. These potential mitigations include but are not limited to:

- Local Area Traffic Management Plans (LATM)
- turn restrictions at selected locations
- removal of on-street parking / creating clearways at particular times.
- improved lane delineations.

These mitigation measures would be implemented in combination with the existing mitigation measures detailed in EIS chapter 27 to minimise traffic impacts in Wagga Wagga during construction. As part of the overarching construction environmental management plan, a specific traffic and transport management sub-plan will be developed to detail processes and responsibilities to minimise traffic, and access delays and disruptions. Consultation with the relevant road managers will be undertaken during preparation of the traffic and transport management sub-plan and throughout construction.

TABLE 6-7 SUMMARY OF MITIGATION AND INTERSECTION PERFORMANCE DURING CLOSURE OF EDMONDSON STREET BRIDGE

Mitigation	Summary of intersection performance
Signal optimisation—Sturt Highway / Docker Street	▸ In the morning peak, delay is reduced from 256 seconds to 179 seconds; however, LoS is maintained at F. In comparison, the base case is 62 seconds and LoS at E. ▸ In the afternoon, delay is not improved, and is slightly worsened from 157 seconds to 180 seconds, and LoS maintained at F. In comparison, the base case is 104 seconds and LoS at F.
Signal optimisation—Sturt Highway / Best Street	▸ In the morning peak, delay is reduced from 46 seconds to 26 seconds, resulting in an LoS of B with mitigation. In comparison, the base case is 18 seconds and LoS at B. ▸ In the afternoon, delay is reduced from 107 seconds to 33 seconds, resulting in an improved LoS of C with mitigation. In comparison, the base case is 30 seconds and LoS at C.
Signal optimisation—Sturt Highway / Lake Albert Road	▸ In the morning peak, delay is not improved, and is slightly worsened from 92 seconds to 119 seconds, and LoS maintained at F. In comparison, the base case is 87 seconds and LoS at F. ▸ In the afternoon, delay is not improved, and is slightly worsened from 78 seconds to 138 seconds, and LoS maintained at F. In comparison, the base case is 77 seconds and LoS at F.
Signal optimisation and lengthening and demarcation of the left turn lane on Railway Street at Lake Albert Road (western approach turn).	▸ In the morning peak, delay is reduced from 272 seconds to 82 seconds; however, LoS is maintained at F. In comparison, the base case is 80 seconds and LoS at F. ▸ In the afternoon, delay is reduced from 131 seconds to 79 seconds; however, LoS is maintained at F. In comparison, the base case is 42 seconds and LoS at C.

6.1.2.2 Traffic impacts during Kemp Street bridge replacement

Based on the traffic count data collected and the estimated construction traffic volumes, additional traffic impact assessment was undertaken in Junee using a microsimulation model.

Approach

The assessment involved:

- developing a traffic model using VISSIM software and calibrating the model using the data collected from traffic surveys (June 2023) (for the area shown in Figure 6-2)
- modelling the network and intersections performances with peak construction traffic volumes and diverted traffic volumes using microsimulation traffic modelling software (VISSIM)
- analysing modelling results in relation to travel times (for the routes shown in Figure 6-2), traffic volumes and queue lengths
- assessing modelling results against intersection LoS (refer to section 6.1.1.2)
- identifying a range of mitigation measures as required and modelling them where practicable.

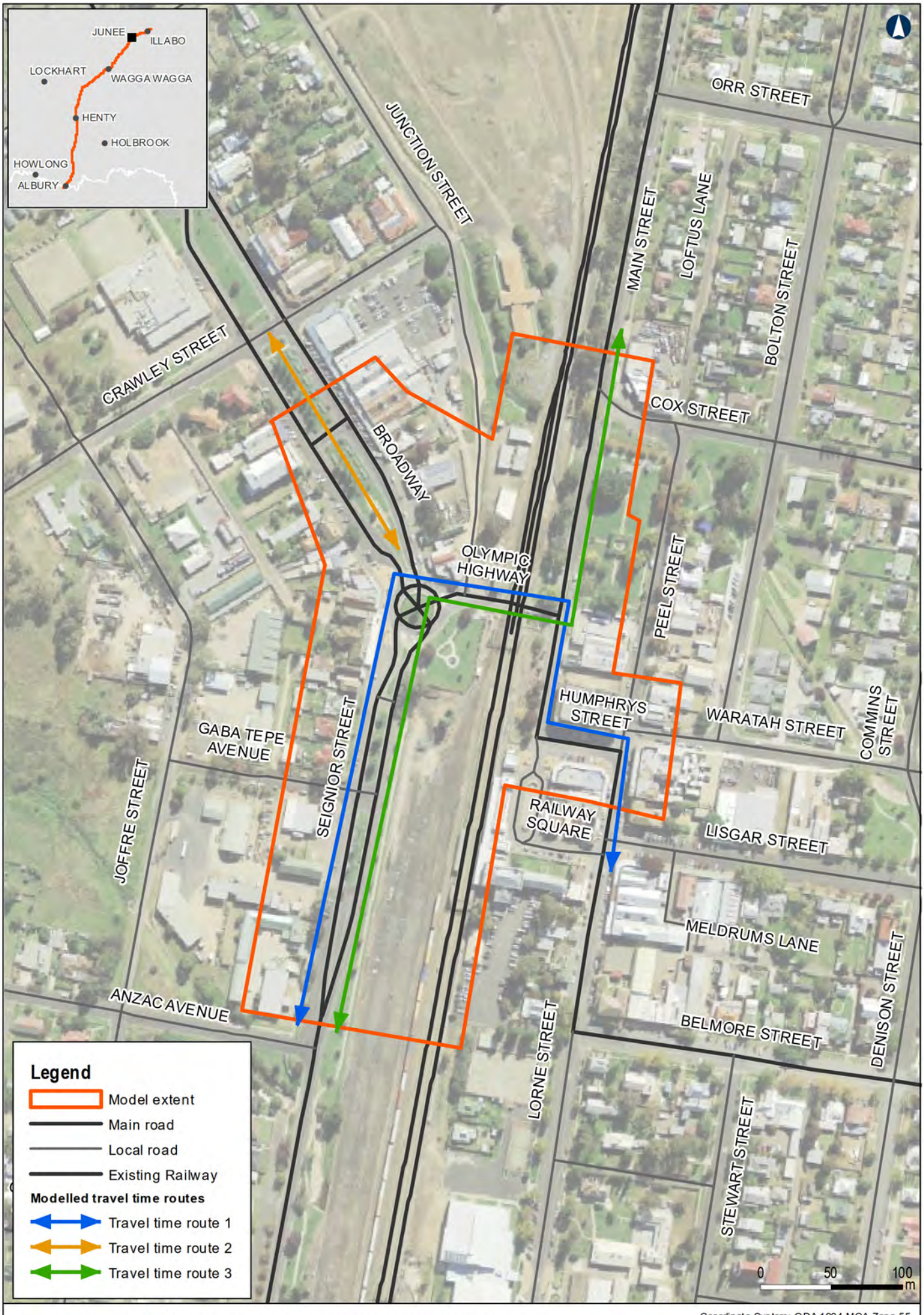

Figure 6-2 Modelled area for construction in Junee

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:3,500
Paper size: A3
Date: 16/10/2023

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Assessment

Traffic in the Junee precinct would be impacted by construction traffic along construction routes and detours as a result of the replacement of Kemp Street bridge. The proposed traffic detour route during the bridge closure, as detailed in EIS chapters 8 and 9, includes the following diversions:

- Kemp Street bridge traffic diverted via Seignior Street, Lorne Street, Ducker Street, Hill Street, George Street and Edgar Street for 12 months
- traffic on Seignior Street would be diverted via Joffre Street and Pretoria Avenue for two months during construction of the Seignior Street and Kemp Street intersection
- local access to Railway Lane and Railway Parade would be via Harold Street and Thomas Street for two months.

During peak traffic periods, each intersection was predicted to either remain unchanged at LoS A or LoS B except for one intersection. At the roundabout between Olympic Highway and Broadway Street, the additional traffic as a result of the detour combined with morning traffic would reduce intersection performance from a LoS A to a LoS B (see Table 6-8).

Significant queues are predicted to form at all intersections only during level crossing closures in peak traffic periods. Based on data collected from train services in June 2023, it was assumed that one level crossing closure would occur in the morning peak and two would occur in the afternoon peak. In the morning peak hour, the maximum queue length is predicted to increase by 57 m at both the north approach of Olympic Highway and Broadway Street and the east approach of the level crossing. In the midday peak, the maximum queue length is predicted to increase by 31 m on the east approach of the level crossing. In the afternoon peak, the maximum queue length is predicted to increase by 89 m on the south approach of Olympic Highway and Main Street.

TABLE 6-8 INTERSECTION IN JUNEE WHERE THE LOS IS REDUCED DURING THE MORNING PEAK BASED ON THE WORSE APPROACH DELAY VALUE

Intersection	Base			Construction		
	Volume (vehicles)	Delay (sec)	LoS	Volume (vehicles)	Delay (sec)	LoS
Olympic Highway / Broadway Street	528	6	A	856	15.6	B

In the morning peak hour, there are minimal changes to average travel time, with the highest increase predicted to be 13 seconds. In the afternoon peak hour, larger increases to average travel time are noted, with the highest increase predicted to be 49 seconds for vehicles heading southbound through Junee on the Olympic Highway (see Route 3 in Table 6-9).

TABLE 6-9 NETWORK TRAVEL TIMES IN JUNEE WITHOUT (BASE) AND WITH CONSTRUCTION TRAFFIC

Route	Direction	Morning peak (seconds)			Afternoon peak (seconds)		
		Base	Construction	Difference (%)	Base	Construction	Difference (%)
Route 1	Northbound	79	84	+6.3	101	118	+16.8
	Southbound	68	69	+1.5	74	73	-1.4
Route 2	Northbound	15	15	0	15	15	0
	Southbound	18	25	+38.9	26	39	+50.0
Route 3	Northbound	69	72	+4.3	90	85	-5.6
	Southbound	68	81	+19.1	97	146	+50.5

Assessment with traffic mitigation

To alleviate some of the traffic impacts during construction, mitigation measures have been identified and tested in the model. A review of intersection performance, and key constraints, was completed to identify feasible mitigation that could be implemented in consultation with the relevant road authorities. It is noted that major intersection upgrades, such as road widening or creation of additional capacity, were not considered appropriate for the mitigation of temporary impacts during construction of the proposal.

The mitigation measures identified and modelled in the assessment included:

- adding keep-clear markings on the circulating lanes of the Olympic Highway / Broadway roundabout to prevent queueing through the roundabout (from the level crossing during closures) restricting the ability of southbound traffic
- extending the existing right-turn lane on the south approach of the Olympic Highway / Broadway roundabout
- adding keep-clear markings in the intersection of Olympic Highway / Main Street to prevent queueing restricting the ability of northbound traffic (Main Street to Olympic Highway) to traverse the intersection. Extension of the length of the solid white line marking has been included in the model to channel vehicles into the appropriate turn lane earlier.

Potential mitigation measures were modelled to determine whether they were feasible and likely to be effective. The above potential mitigation measures were found to provide relatively minor changes to performance outcomes. In addition to the above identified mitigation measures ARTC will also investigate the potential to re-position the centreline where Main Street turns into Humphreys Street, to extend the length of left-turn stacking in Main Street.

The mitigation measures detailed in chapter 27 of the exhibited EIS were not modelled; however, they have the potential of reducing both background and construction traffic through the study area. These include:

- signage and warnings in the vicinity of the enhancement sites to provide early warning for road users of disruptions due to construction activities and road closures .
- potential upgrades to the intersection of Olympic Highway / Main Street to improve intersection performance
- scheduling (where possible) of peak construction trips outside of background peak hours.
- The traffic and transport management sub-plans, as part of the overarching construction environmental management plan, will include measures to minimise traffic and access delays and disruptions during construction. Opportunities to further minimise traffic impacts will be investigated during construction planning and incorporated in the plan.

6.1.2.3 Intersection performance (SIDRA modelling) and road link performance

Additional assessment of intersections and road network performance along construction routes was undertaken for all enhancement sites using SIDRA modelling and link assessment. Intersection and road network performance in Wagga Wagga and intersection performance in Junee have been assessed separately using a microsimulation models (refer to sections 6.1.2.1 and 6.1.2.2, respectively).

Approach

The assessment of involved:

- assessing intersection performance, including:
  - identifying the signalised and roundabout intersections along construction routes and detours where the assessment in the EIS used traffic count data collected prior to January 2020
  - modelling intersection performance with peak construction traffic volumes using traffic modelling software (SIDRA Intersection 9.0)
  - modelling intersections located near adjacent intersections, including level crossings, with peak construction traffic volumes using modelling software (SIDRA Network)
  - assessing the model predictions to determine the LoS (refer to section 6.1.1.2), average vehicle delay, degree of saturation and queue length
- assessing road link (sections of road between intersections) performance including:
  - identifying the road links along construction routes and detours where:

    the assessment in the EIS used traffic count data collected prior to January 2020

    background traffic volumes are estimated to exceed 300 vehicles per hour in any peak or 5,000 vehicles per day (two-way)

    diverted or construction traffic is expected to exceed 10 per cent of background peak hour one-way traffic volumes.
  - identifying the road links along construction routes and detours that met the above criteria
  - using link assessment spreadsheets comprising base traffic volumes and applying construction traffic volumes during peak periods
  - determining the LoS during construction for road links using the number of vehicles per hour (refer to section 6.1.1.2)

- determining the performance of residential roads in relation to the environmental capacity thresholds (refer to section 6.1.1.2)
- identifying a range of mitigation measures as required.

Assessment

Based on the modelling outcomes, the impact of peak construction traffic volumes typically results in minor changes in average delays, degree of saturation and queue lengths during morning and afternoon peak hour traffic along construction, and detour routes around enhancement sites (excluding those in Junee in Wagga Wagga).

A majority of the intersections modelled are predicted to remain at the same LoS. Only two intersections in Albury are predicted to have a reduced LoS (see Table 6-10). At the intersection of Hume Highway (West) and Borella Road, the additional construction traffic changes intersection operational outcomes from LoS C to LoS D meaning that the intersection performance changes from satisfactory to near capacity.

TABLE 6-10 INTERSECTIONS IN ALBURY WHERE THE LOS IS REDUCED DURING THE MORNING PEAK

Intersection	Base			Construction		
	Queue length (m)	Delay (sec)	LoS	Queue length (m)	Delay (sec)	LoS
Borella Road / Schubach Street / Short Street	16.2 (East—Borella Road)	14.5	A	16.8 (East—Borella Road)	14.5	B
Hume Highway (West) / Borella Road	146.8 (West—Borella Road)	34.2	C	169.1 (West—Borella Road)	46.8	D

The link assessments indicate that generally the addition of construction traffic has minimal impact to the LoS for the links that were assessed.

The LoS remains the same during peak traffic periods along the construction routes for the enhancement sites in the Albury precinct, except for one location. The largest increase in traffic during construction is predicted at Young Street, with an increase of 78 vehicles during both the morning and afternoon peak periods, resulting in the LoS reducing from LoS A to LoS B; however, Schubach Street would continue to operate in a satisfactory manner.

The LoS remains the same during peak traffic periods along the construction routes for the enhancement sites in the Greater Hume–Lockhart and Wagga precincts (considering enhancements sites outside Wagga Wagga). The largest increases in traffic in each precinct would be:

- along Railway Parade in Henty and Cox Street in Yerong Creek, with traffic at both roads predicted to increase by 28 vehicles during morning and afternoon peaks
- along Morgan Street in Uranquinty, with traffic at both roads predicted to increase by 35 vehicles during morning and afternoon peaks.
- In the Junee precinct, the LoS is predicted to reduce from LoS A to LoS B at:
- Ducker Street during the morning and afternoon peak
- Humphrys Street during the morning peak
- Main Street during the morning and afternoon peak
- Lorne Street during the morning and afternoon peak
- Olympic Highway / Seignior Street during the morning and afternoon peak.

In the Junee precinct, the largest increase in traffic during the morning peak is predicted at Olympic Highway / Seignior Street (eastbound direction), with an increase of 170 vehicles. During the afternoon peak, the largest increase is at Humphrys Street (in the westbound direction) and Main Street (in the northbound direction), with an increase of 147 vehicles.

The environmental thresholds for residential roads along the construction routes and detours were generally achieved during the peak construction period; however, the performance standard at 10 roads is predicted to change as a result of peak construction traffic. Performance in relation to the environmental threshold is predicted to change at the roads presented in Table 6-11.

Previously proposed mitigation measures detailed in chapter 27 of the EIS are aimed at managing existing and construction vehicle movements. 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. This mitigation is sufficient to address impacts from changes to

traffic impacts around enhancement sites outside Junee and Wagga Wagga that have occurred as a result of the additional construction and/or diversion traffic.

TABLE 6-11 ROAD WHERE PERFORMANCE IN RELATION TO THE ENVIRONMENTAL CAPACITY THRESHOLDS IS PREDICTED TO REDUCE

Precinct	Road	Environmental capacity during morning peak		Environmental capacity during afternoon peak	
		Base	Construction	Base	Construction
Albury	Schubach Street	Environmental goal met	Maximum met	Maximum met	Maximum met
Junee	Edgar Street	Environmental goal met	Maximum met	Environmental goal met	Maximum exceeded
	Humphrys Street	Environmental goal met	Maximum met	Environmental goal met	Maximum exceeded
	Main Street	Environmental goal met	Maximum met	Environmental goal met	Maximum exceeded
	Hill Street	Environmental goal met	Maximum met	Environmental goal met	Maximum met
	Joffre Street	Environmental goal met	Maximum exceeded	Maximum met	Maximum exceeded
	Ducker Street	Environmental goal met	Maximum exceeded	Environmental goal met	Maximum exceeded
	William Street	Environmental goal met	Maximum exceeded	Environmental goal met	Maximum exceeded
	Pretoria Avenue	Environmental goal met	Maximum exceeded	Environmental goal met	Maximum exceeded
	Lorne Street	Maximum met	Maximum exceeded	Maximum met	Maximum exceeded

6.1.2.4 Heavy vehicle turn-path analysis

Analysis of heavy vehicle turn paths at intersections along the construction routes was undertaken to determine their compliance and identify potential treatment options if necessary.

Approach

The analysis involved:

- identifying intersections along the construction routes that would not currently be used by heavy vehicles (articulated trucks)
- assessing intersections that were evaluated as currently not being used by articulated trucks was conducted using the procedure for undertaking turning paths from Austroads *Design Vehicles and Turning Path Templates Guide* (2023)
- simulating turn paths of 19 m articulated trucks (truck and dog type vehicles) using AutoTURN software within Civil 3D by placing vehicle travel lines along the intersection manoeuvres requiring an impact assessment
- assigning a ‘compliance rating’ to each intersection assessed, of either:
  - pass: the truck manoeuvre can be completed with no physical intersection impacts or impacts to standard intersection operation
  - conditional pass: the truck manoeuvre can be completed with no physical intersection impacts but would impact standard intersection operation
  - fail: not able to complete the manoeuvre without physical intersection impacts and standard intersection operation is highly desirable (e.g. at a highway intersection)
- identifying potential treatment options (mitigations) where intersections were not considered to pass, including:
  - minimum treatment, which would initially involve checking whether the manoeuvre can be undertaken in a manner that is not standard to the intended intersection operation and then determining whether it is an acceptable risk. Examples of non-standard manoeuvre include allowing all traffic to clear the intersection before undertaking the manoeuvre or crossing over semi-mountable kerbs
  - alternate route, which would involve identifying alternative route options that would allow adequate access to the relevant enhancement site

- alternate construction vehicle type, which would involve use of smaller construction vehicle that can successfully use the intersection.
- traffic control, which would involve operating the intersection under traffic control conditions
- pavement widening, which would involve widening pavement at the intersection to accommodate the manoeuvres.

Impacts

The turn-path analysis identified six intersections along the construction routes where 19 m long articulated heavy vehicles cannot successfully manoeuvre in either one or both directions and therefore failed the turn-path requirements. The intersections that fail turn-path analysis and the potential treatment options are described in Table 6-12.

Fourteen intersections conditionally pass as they are partially compliant with the turn path and would require ground truthing to confirm they can be safely used. Subject to confirming the compliance of these intersections, treatment options would be identified.

Potential treatment options would be considered further during the development of the detailed design and in detailed construction planning. The traffic and transport management Sub-plan, prepared as part of the construction environmental management plan, would include measures to manage heavy vehicle movements including confirming the status and approach to all intersections in the run path assessment.

TABLE 6-12 INTERSECTIONS THAT FAIL TURN-PATH ANALYSIS AND THE POTENTIAL TREATMENT OPTIONS

Precinct	Enhancement site	Intersecting roads	Direction	Potential treatment options
Albury	Murray River bridge	Abercorn St, Kiewa St	Northbound	Alternate construction vehicle type Alternate route (potential to use Kiewa Street or Townsend Street for smaller vehicles) Traffic control Pavement widening
	Table Top Yard clearances	Hume Hwy, Tynan Rd	Southbound	Alternate construction vehicle type Alternate route (potential to access the western end of Tynan Road via Gregory Road) Traffic control Pavement widening
Wagga Wagga	Edmondson Street bridge	Urana St, MacLeay St	Northbound Southbound	Alternate construction vehicle type Alternate route (potential to use Lake Albert Road and Railway Street) Pavement widening
	Wagga Wagga Station Yard clearances	Station Place, Edward St (West)	Northbound	Alternate construction vehicle type Alternate route (potential to use Lake Albert Road and Railway Street) Traffic control Pavement widening
Junee	Kemp Street bridge	Olympic Highway, Railway Lane	Northbound	Alternate construction vehicle type Alternate route (potential to use Harold Street and Thomas Street) Traffic control Pavement widening (note this intersection would be modified as part of the proposal)

Precinct	Enhancement site	Intersecting roads	Direction	Potential treatment options
		Pretoria Ave, Seignior St (North)	Northbound	Alternate construction vehicle type Alternate route (potential to use Joffre Street and Anzac Parade) Traffic control Pavement widening (note this intersection would be modified as part of the proposal)

6.1.2.5 Impacts to active transport due to pedestrian bridge closures

Additional assessment of impacts to pedestrian and cyclists as a result of detours during bridge construction were undertaken for:

- Cassidy Parade bridge in Wagga Wagga
- Edmondson Street bridge in Wagga Wagga
- Wagga Wagga Station pedestrian bridge in Wagga Wagga (also known as Mother's Bridge)
- Kemp Street bridge in Junee.

Assessment of impacts during closure of Albury Station pedestrian bridge was not necessary as alternative crossing points exist in proximity to the station bridge.

Approach

The assessment involved:

- analysing the pedestrian and cyclist survey data collected (refer to section 6.1.1.1)
- reviewing the distance and accessibility of identified diversion routes
- identifying additional mitigation measures as required.

Assessment

During the construction of pedestrian and road bridges, pedestrians and cyclists would be diverted to the nearest rail corridor crossings. The number of pedestrians anticipated to be diverted during construction varies depending on the location. A survey was undertaken between 7 am and 6 pm on 8 June 2023, which counted pedestrians and cyclists using the bridges to cross the rail corridor (refer to Table 6-13).

At each of the three bridges in Wagga Wagga and Kemp Street in Junee, the peak pedestrian periods coincided with the hour leading up to school start (8 am–9 am) and the hour after school finishes (2.45 pm–3.45 pm). Children made up a majority of the pedestrians using each bridge.

Cassidy Parade pedestrian bridge is located near three schools south of the rail corridor, including Kildare Catholic College, Wagga Wagga High School and The Bidgee School. The majority of pedestrians were observed to travel southbound over the bridge (towards the schools) in the morning and northbound over the bridge (away from the schools) in the afternoon.

Edmondson Street bridge is located in the vicinity of four schools. South Wagga Public School is located north of the rail corridor. Kildare Catholic College, The Bidgee School and Wagga Wagga High School are located south of the rail corridor. The highest pedestrian traffic period across the bridge was observed during the after school peak hour, with a total of 100 pedestrians travelling northbound (97 children and 3 adults). All observed pedestrians used the footpath on the western side of the Edmondson Street bridge as the eastern footpath was closed in late 2022 due to structural damage to the bridge.

Wagga Wagga Station pedestrian bridge was overall the most trafficked of the three bridges surveyed in Wagga Wagga. It is located closer to the town centre, which is on the northern side of the rail corridor, and it is in the vicinity of three schools (South Wagga Public School, Kildare Catholic College, Wagga Wagga High School). The highest pedestrian traffic period across the bridge was observed during the hour after school finishes, with a total of 117 travelling northbound (102 children and 15 adults).

TABLE 6-13 ACTIVE TRANSPORT SURVEY SUMMARY FROM 8 JUNE 2023

		Two-way counts between 7 am and 6 pm					
Precinct	**Bridge**	**Adults**	**Children**	**Mobility impaired**	**Pedestrian with pram**	**Cyclists**	**Total**
Wagga Wagga	Cassidy Parade pedestrian bridge	38	56	0	0	6	100
	Edmondson Street bridge	39	192	0	0	1	232
	Wagga Station pedestrian bridge	135	261	1	5	6	408
Junee	Kemp Street Bridge	35	17	0	0	4	56

Temporary pedestrian and cyclist detours would be required while works are carried out on Cassidy Parade pedestrian bridge, Edmondson Street bridge and Wagga Wagga Station pedestrian bridge. Of the schools within a reasonable distance for children to travel to school via active transport, potential impacts to active transport are expected to be minor and short term, as detours have been identified to maintain connectivity and public transport services are available. Further analysis of the impact to each school identified within walking distance is provide in Appendix C.

As described in section 3.2.2.2, the proposed staging of the closure of the bridges in Wagga Wagga has been revised since exhibition of the EIS. Bridge construction sequencing would commence with Edmondson Street, followed by the Cassidy Parade and Wagga Wagga Station pedestrian bridges (see Figure 6-3). Construction planning and delivery would apply best endeavours to ensure closure of the Cassidy Parade and Wagga Wagga Station pedestrian bridges would commence following the availability of pedestrian movement across either the Edmondson Street road or pedestrian bridge; however, as construction timing is driven in part by rail possessions, there may be a short period of time where Edmondson Street bridge is closed at the same time as one of the other two bridges.

During the closures of the Cassidy Parade and Wagga Wagga Station pedestrian bridges, pedestrians would now primarily be diverted to Edmondson Street, which minimises diversion distances.

Disruption to active transport has also changed at Junee since exhibition of the EIS. A separate pedestrian bridge is proposed directly north of Kemp Street bridge and ARTC would apply best endeavours to ensure this is constructed prior to closure of the Kemp Street bridge. During the Kemp Street bridge closure period, there may be short periods where cross-rail pedestrian and cyclist movements would be diverted to the alternative rail crossing on Olympic Highway, located 700 m north due to construction activities associated with the road bridge.

Potential impacts would be minimised through detailed construction planning, which will seek to reduce the duration of closure of the bridges and the associated length of disruption to active transport. Further, as part of the community health and wellbeing plan, the construction contractor would assess the provision of transportation services for school users whose accessibility to services would be constrained as a result of road and pedestrian bridge closures.

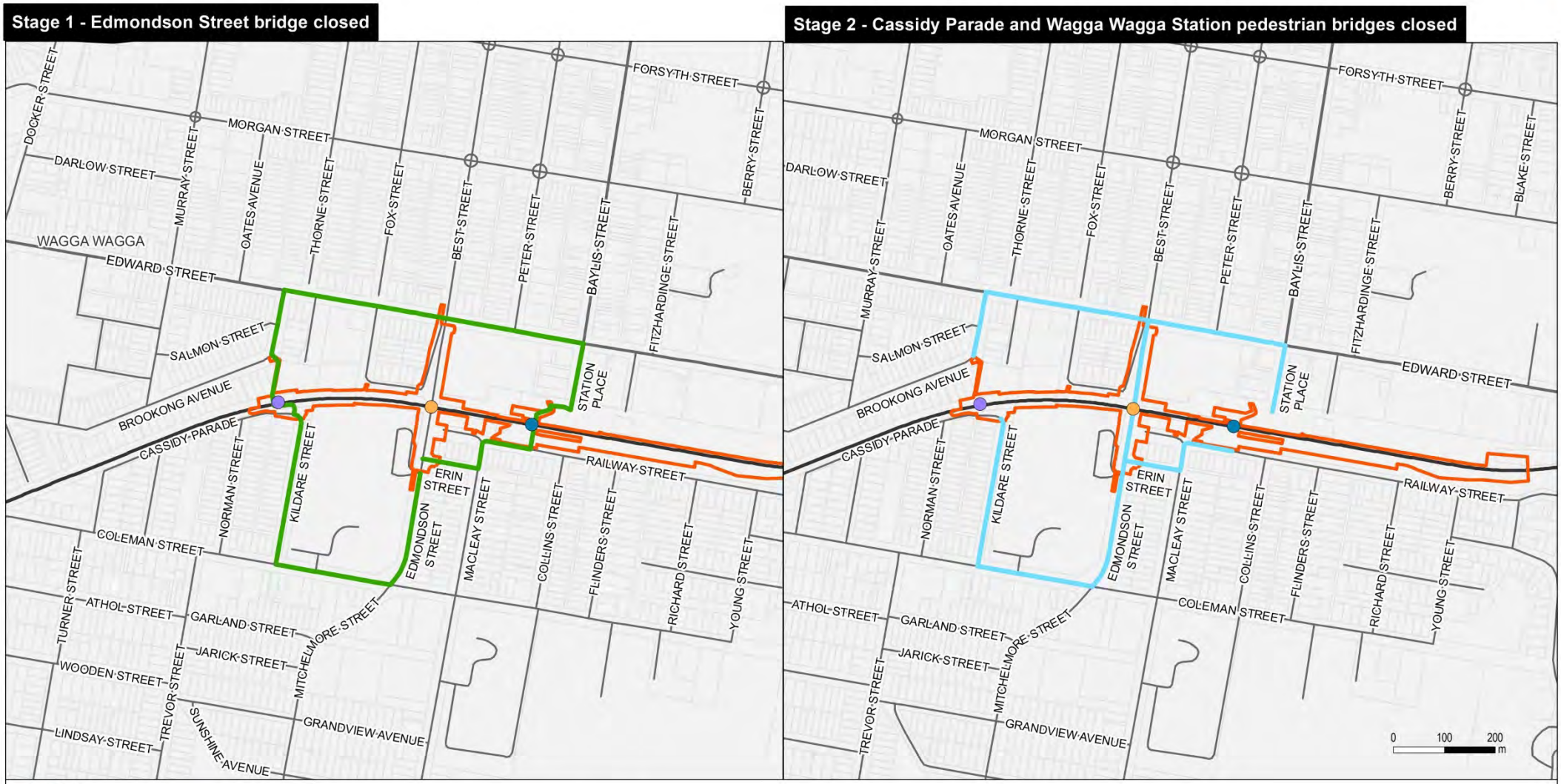

Figure 6-3 Pedestrian detours and staging at Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:11,000
Paper size: A4
Date: 27/10/2023

210_EAP_F603_PedestriandetoursandstagingatWaggaWaggaStationandsurrounds_r1v1.mxd

6.1.3 Operational assessment

6.1.3.1 Approach to determining inputs to the assessment

Train speeds

Section 1.2.3.1 outlines that Inland Rail freight trains would travel at speeds up to 115 km/h, which is consistent with current freight train maximum speeds. Train speeds would not change as a result of the proposal; consequently, observed speeds of current operations provide a realistic basis for assessment of project impacts.

Submissions received on the EIS raised concerns regarding the accuracy of train speeds used in the traffic assessment, including the application of a typical train speed of 80 km/h to determine level crossing closure times. The rail network is a live environment and train operating companies provide requirements for their services, including type, number of services, axle loads, train lengths, days of service and preferred times of entry to and exit from the network. While there are posted speeds along the rail corridor that represent the theoretical maximum speed a train is permitted to travel, it is difficult to specify a typical speed for each train service due to the large number of variables that influence the speed of a train.

For the reasons outlined above, an assumed train speed is no longer being adopted as a key input into the operational assessment.

Train lengths

As outlined in section 1.2.3.1, the proposal would enable the operation of double-stacked freight trains up to 1,800 m in length between Albury and Illabo.

Existing rail infrastructure, including signalling systems and yard extents, limit trains to 1,800 m in length under standard operating conditions.

Consequently, freight trains up to 1,800 m in length currently operate between Albury and Illabo; however, based on network data, most existing freight trains are generally about 1,200 m in length. As noted, Inland Rail services would run at a maximum of 1,800 m in length due to the network capabilities. The length of other presently operating services is not expected to change but, if lengthened, would not exceed 1,800 m in standard operating conditions.

Accordingly, traffic assessments have used 1,800 m as the train length in order to establish a conservative assessment.

Level crossing closure durations

For this assessment, instead of determining the level crossing closures time on an assumed speed of the train, they were determined through a review of recorded level crossing closure time data for June 2023 for level crossings relevant to the proposal. This measured data represents the typical level crossing closure time at each crossing under standard operating conditions, encompassing both a range of train lengths and variability of train speed. It is noted that assessing a worst-case scenario or using the maximum recorded level crossing closure duration would not represent typical operations and would not provide an appropriate basis to identify mitigation measures, should they be required.

For all assessments undertaken within the analysis detailed in Appendix C, observed average weekday level crossing closure durations and frequencies have been adopted for short-term analysis horizons, or as the basis for extrapolation of future-years' level crossing closure durations and frequencies.

The average weekday daytime observed closure durations range from 1:04 to 2:05 minutes and the observed 95th percentile closure durations (24-hour) range from 2:08 to 4:32 minutes.

- For future-year (operation) analysis, the average level crossing activation durations have been increased by a factor of 1.5 to allow for running of longer trains (on average) as part of Inland Rail for 2025 and 2040. This factor has been applied based on an estimated 50 per cent increase of train lengths (i.e. 1,200 m to 1,800 m lengths) travelling at existing speeds. This is considered to be a conservative estimate as:
- it assumes an increase in length of all trains in the future (including passenger services, which are not expected to change due to the proposal)
- it is factored against the total observed closure duration, which includes the following allocations expected to remain constant:
  - 30-second pre-train warning flashing lights and boom gate closure period
  - 10-second flashing lights and boom gate closure period after the train has passed.

6.1.3.2 Traffic impacts in Wagga Wagga

An additional traffic impact assessment was undertaken in Wagga Wagga using a microsimulation model based on the traffic count data collected and the estimated level crossing closure time during operation. This assessment considers traffic volumes and network performance in 2025 and 2040 in a 'base case' scenario without the effects of Inland Rail, and an 'operational case' scenario in the same years applying Inland Rail train volumes and assumed frequencies.

Approach

The additional assessment involved:

- identifying traffic demands for 2025 and 2040, using the Wagga Wagga Strategic Transport Model provided by Wagga Wagga City Council to determine traffic growth
- development of the traffic model using AIMSUN software; calibration and validation of the model using the data collected from traffic surveys (8 June 2023)
- modelling intersection performance with the longer and more frequent level crossing closure times
- analysing modelling results in relation to travel times, traffic volumes and network performance using density maps generated by the model to identify where excessive delays and queues are occurring
- assessing modelling results against relevant criteria (refer to section 6.1.1.2), including:
  - intersection LoS-based vehicle delays
  - environmental capacity thresholds
- identifying a range of mitigation measures as required.

Assessment

The longer and more frequent level crossing closures at Docker Street and Fernleigh Road would result in extended waiting times at these level crossings and associated traffic impacts at nearby intersections. The predicted impacts are greater in 2040 than 2025 due to the increased growth in background traffic volumes and the additional train services proposed. To allow for an increased proportion of trains of 1,800 m in length during operation of the proposal, a factor was also applied to conservatively allow for an increase in the average closure time at a level crossing.

When compared to their respective base models, average travel times at the Docker Street level crossing will increase at a maximum of 11.5 per cent in the 2025 operational model (in the northbound direction during the morning peak) and 17.8 per cent in the 2040 operation model (in the northbound direction during the afternoon peak). The Fernleigh Road level crossing shows moderate impacts in the operational models when compared to the 2025 and 2040 base models, with the highest increase in travel times occurring in the northbound direction in 2040 by 7 per cent.

The Fernleigh Road level crossing shows moderate impacts with the highest increase in travel times in the northbound direction in 2040 by 7 per cent. The predicted delay to travel times across these level crossings as a result of operation of the proposal is presented in Table 6-14. The LoS criteria has not been applied to level crossings as it does not provide an accurate reflection of performance due to the infrequency of closures compared to signalised intersections.

TABLE 6-14 IMPACTS TO TRAVEL TIMES AT LEVEL CROSSINGS IN WAGGA WAGGA DURING OPERATION OF THE PROPOSAL

			2025			2040		
Peak period	Level crossing	Direction	Max delay time (sec)	Max queue length (m)	Change in avg travel time (sec)	Max delay time (sec)	Max queue length (m)	Change in avg travel time (sec)
Morning	Fernleigh Road	Westbound	240.0	163	+3.0	247.2	150	+6.4
		Eastbound	252.8	110	+1.8	224.4	88	+4.5
	Docker Street	Northbound	310.4	417	+8.0	387.6	436	+8.0
		Southbound	297.2	105	+6.0	285.2	162	+8.8
Afternoon	Fernleigh Road	Westbound	168.8	85	+1.4	170.0	47	+2.9
		Eastbound	155.6	66	+0.9	157.2	92	+3.1

Peak period	Level crossing	Direction	2025 Max delay time (sec)	2025 Max queue length (m)	2025 Change in avg travel time (sec)	2040 Max delay time (sec)	2040 Max queue length (m)	2040 Change in avg travel time (sec)
	Docker Street	Northbound	179.6	157	+2.6	766.0	185	+15.1
		Southbound	141.2	97	+1.0	158.0	64	+2.5

The impacts of the longer and more frequent level crossing closures in 2025 and 2040 are limited to some worsening performance of intersections on Docker Street close to the level crossing. These include intersections north of the level crossing: Docker Street / Chaston Street and Docker Street / Brookong Avenue, and south of the level crossing: Bourke Street / Coleman Street, Bourke Street / Athol Street, and Bourke Street / Wooden Street). Table 6-15 and Table 6-16 present the intersections where the delay is predicted to increase by more than 20 per cent in the morning and afternoon peak traffic periods, respectively.

The environmental thresholds for residential roads in Wagga Wagga were generally achieved during the peak traffic periods; however, the performance standard is predicted to change as a result of the proposal at eight roads in 2025 and 12 roads in 2040. This includes three roads in 2025 where the maximum environmental capacity is predicted to be exceeded in the morning. In 2040, the maximum environmental capacity is predicted to be exceeded by two local roads (Marshall Street and Emblen Street) and two collector roads (Yentoo Drive and Northcott Parade) during the morning and/or afternoon peak with the proposal. The full list of roads is provided in Appendix C.

TABLE 6-15 INTERSECTIONS IN WAGGA WAGGA WHERE THE DELAY IS PREDICTED TO INCREASE BY MORE THAN 20 PER CENT DURING THE MORNING PEAK IN 2025 AND 2040

Intersection	2025 base LoS	2025 operation LoS	2025 operation Delay change (%)	2040 Base LoS	2040 operation LoS	2040 operation Delay change (%)
Bourke Street / Coleman Street	C	D	+56	B	D	>100
Pearson Street / Dobney Avenue (North)	A	A	+3	A	B	+46
Pearson Street / Dobney Avenue (South)	A	A	-2	A	A	+91
Fernleigh Road / Bulolo Street	A	A	+20	A	B	+39
Fernleigh Road / Barrima Drive	A	A	+16	B	B	+26
Docker Street / Meurant Avenue	A	B	+31	B	C	+21
Docker Street / Chaston Street	B	B	+13	B	D	+79
Bourke Street / Athol Street	B	B	+80	C	C	>100
Bourke Street / Wooden Street	B	B	+25	B	B	+17

TABLE 6-16 INTERSECTIONS IN WAGGA WAGGA WHERE THE DELAY IS PREDICTED TO INCREASE BY MORE THAN 20 PER CENT DURING THE AFTERNOON PEAK IN 2025 AND 2040

		2025 operation			2040 operation	
Intersection	2025 base LoS	LoS	Delay change (%)	2040 Base LoS	LoS	Delay change (%)
Bourke Street / Coleman Street	A	A	+9	B	B	+42
Bourke Street / Leavenworth Drive	A	B	+4	B	B	-10
Urana Street / Pearson Street	A	A	+33	B	C	+38
Docker Street / Chaston Street	A	A	+50	A	B	+13
Fernleigh Road / Bulolo Street	A	A	+23	B	B	+1

6.1.3.3 Traffic impacts at Culcairn (Balfour Street and Railway Parade)

Additional traffic impact assessment was undertaken in Culcairn based on the traffic count data collected and the estimated level crossing closure time during operation. The following intersections were assessed:

- Balfour Street / Railway Parade
- Balfour Street / Railway Crossing
- Balfour Street / Melville Street.

Approach

The assessment involved:

- modelling intersection performance with level crossing closures for 2025 and 2040 using traffic modelling software (SIDRA Intersection 9.0)
- assessing the results to report on the LoS (refer to section 6.1.1.2), average vehicle delay, degree of saturation and queue length
- identifying mitigation measures as required.

Assessment

Based on the modelling outcomes, the impact of longer and more frequent level crossing closures typically results in minor changes in average delays, degree of saturation and queue lengths during the morning and afternoon peak hour at the intersections in Culcairn. The predicted impacts are greater in 2040 than 2025 due to the additional train services proposed and the increased growth in background traffic volumes.

Each intersection was predicted to remain at LoS A in 2025 and 2040 with the exception of one intersection, which is predicted to reduce to LoS B in 2040 (see Table 6-17). The average delay at the signalised intersection at Balfour Street and Railway Crossing is predicted to increase but the LoS would remain acceptable with spare capacity. Due to the relatively minor impacts to traffic flows and acceptable LoS, no further mitigation is proposed to address operational level crossing impacts in Culcairn.

TABLE 6-17 THE INTERSECTION IN CULCAIRN WHERE THE LOS IS REDUCED DURING THE AFTERNOON PEAK IN 2040

Intersection	Base			Operation		
	Queue length (m)	Delay (sec)	LoS	Queue length (m)	Delay (sec)	LoS
Balfour Street / Railway Crossing	49.0 (East—Balfour Street)	3.5	A	49.0 (East—Balfour Street)	15.6	B

6.1.3.4 Social impacts associated with level crossing closures

The social impacts during operation of the proposal were assessed with a focus on the longer and more frequent closures at level crossings. Further detail is provided in Appendix C. The potential impacts considered include:

- severance due to the longer and more frequent level crossing closures
- local community impacts such as disruption to access to educational, health and emergency services
- local workforce and socio-economic impacts such as disruption to access to employment.

Approach

The level crossings considered in this assessment were those within the scope of the proposal (refer to Table A-7 of Appendix C) as well as three level crossings of key interest, being the Bourke Street and Fernleigh Road level crossings in Wagga Wagga and the Balfour Street level crossing in Culcairn.

The analysis of social impacts involved:

- identifying baseline conditions including services, businesses and amenity in the surrounds of each level crossing, as well as key demographic data
- reviewing the traffic assessment outcomes for operation of the proposal
- assessing potential severance, local community, workforce and socio-economic impacts by considering baseline conditions and the increase in frequency of closures at each level crossing, and increase in average closure time due the proposal
- assigning social impacts a significance rating in accordance with *Social Impact Assessment Guideline for State Significant Projects* (DPE, 2023b) considering the:
  - magnitude based on four impact characteristics that demonstrate the material effect of the impact (extent, duration, severity, sensitivity and level of concern or importance)
  - likelihood of occurrence
  - significance of the potential impact, evaluated through magnitude and likelihood (see Table 6-18)
- identifying a range of mitigation measures as required.

TABLE 6-18 SOCIAL IMPACT SIGNIFICANCE MATRIX

		Magnitude				
		1 Minimal	2 Minor	3 Moderate	4 Major	5 Transformational
Likelihood	A Almost certain	Low	Medium	High	Very high	Very high
	B Likely	Low	Medium	High	High	Very high
	C Possibly	Low	Medium	Medium	High	High
	D Unlikely	Low	Low	Medium	Medium	High
	E Very unlikely	Low	Low	Low	Medium	Medium

Assessment

Severance

Community severance comprises the effects of transport infrastructure or motorised traffic as a physical or psychological barrier separating one built-up area from another area or space, affecting mobility and accessibility (Anciaes et al., 2016). The railway acts as an edge, or boundary between two areas, and can be visually prominent, continuous in form and impenetrable to cross movement (Lynch, 1962). Crossings, and predominantly the at-grade level crossings, provide a key linkage between the areas separated by the railway. During consultation for the EIS, concerns were raised around exacerbation of social severance due to the increase of trains and their characteristics (ARTC, 2021).

Most towns and localities in the study area are divided by the railway and Olympic Highway, creating a physical barrier for residents to get from one side of the town to another. While the proposal does not change the functionality or operational arrangements of any of the level crossings, there will be an increase in frequency and duration of level crossings closures due to increased train movements, which will eventuate following full operation of the Inland Rail Program. Table 6-19 presents the ratings for community severance impacts in localities where level crossings are a significant cross-railway travel route.

TABLE 6-19 RATINGS FOR COMMUNITY SEVERANCE IMPACTS

Location	Social impact assessment of severance
Culcairn	While there are community places at two sides of the railway, community members noted that severance is already experienced, and expressed concerns about the exacerbation of this issue; therefore, it is **possible** that the residents experience mild changes to community severance, resulting in **minor magnitude** of the impact. As such, the community severance impact is expected to be **Medium**.
Henty	Given that the western part of Henty has the most services, it is **possible** that the residents of the eastern part might experience **minor** change to community severance due to increased frequency of level crossing closure. As such, the community severance impact is expected to be **Medium**.
Yerong Creek	Given that the western part has a disproportionally low number of services, it is **possible** that residents living there might experience **minor** change to community severance due to increased frequency of level crossing closure. As such, the community severance impact is expected to be **Medium**.
Uranquinty	Most facilities are equally distributed across two sides of the railway; therefore, it is unlikely that any change in community severance can be observed.
Wagga Wagga	The distribution of the infrastructure where residents can meet and interact is almost equal between both sides of the city close to Docker Street level crossing and Fernleigh Road level crossing. Most events take place in the centre of the town, which is located to the north of the railway and potentially leading to the need to cross the railway at Docker Street level crossing for the residents living in the south (noting that there are also other grade and level crossings available to get to the city centre). In addition, the community has already raised concerns about severance. It is **possible** that increased frequency of the level crossing closures and increased travel time across the level crossings might lead to noticeable inconvenience for the residents living in the southern part close to Docker Street and Fernleigh Road level crossings, resulting in **moderate** magnitude of the impact. As such, the community severance impact is expected to be **Medium**.
Illabo	Considering that both the schools and residential area are in the same side of the town, no impact related to accessibility to educational services is anticipated. Students from further afield are likely to use car or bus transport to school, which minimises the effects of a level crossing activation on severance.

Local community impacts—accessibility

Accessibility to educational, health and emergency services might change due to the changes in the frequency of level crossing closures and waiting time from the proposal. The impact to accessibility varies along the rail corridor depending on the location of residential areas and educational, health and emergency facilities in relation to the level crossings. Low impacts to accessibility from the proposal are generally expected along the rail corridor. Medium impacts on emergency service access are anticipated in Wagga Wagga and Junee due to the location of the hospitals in these towns.

As outlined in section 5.1.1, ARTC held a briefing with emergency services on 12 October 2023 on flooding and traffic impacts. Issues raised by emergency services during the briefing related to the closure of Edmondson Street bridge and associated impacts on traffic and level crossings. Mitigation measure TT3 (now TT4) has been updated to include consultation with emergency services and the Local Emergency Management to provide further information on train movements and level crossing closures to assist emergency services in their emergency response and travel planning in the operational stage.

TABLE 6-20 RATINGS FOR COMMUNITY ACCESSIBILITY IMPACTS

Location	Educational services	Health services	Emergency services
Culcairn	Low	Low	Low
Henty	Low	Low	Low
Yerong Creek	Low	None	None
Uranquinty	Low	None	Low
Wagga Wagga	Low	Low	Medium
Illabo	None	None	None

The mitigation measures detailed in chapter 27 of the EIS address social impacts of level crossings through the following mitigation measure SI12:

- Development of an operations communication and engagement plan that builds community awareness of the rail line's operational characteristics, including information on level crossing operations, likely daily train movements and ARTC's ongoing role after construction. Special attention should be given to informing educational, medical and emergency facilities (mitigation measure SI12).
- Continued engagement with the community about potential ways for people to be informed about the time of day in which trains may be passing through a level crossing, to facilitate access and movement around the town.

The proposed measures will support the mitigation of the social impacts caused by the longer and more frequent level crossings closures. No further mitigations are proposed.

6.1.3.5 Safety assessment of level crossings at locations with high traffic volumes

Further assessment of level crossings subject to high traffic volumes were conducted, including the level crossings on Docker Street, Fernleigh Road in Wagga Wagga and on Olympic Highway (Balfour Street) in Culcairn. It is noted that these level crossings are not part of the proposal scope.

Approach

The assessment involved:

- undertaking a historic near-miss crash assessment, including reviewing notifiable occurrences for Docker Street, Fernleigh Road and Balfour Street level crossings including collisions or near misses between either a vehicle or a pedestrian at a level crossing
- undertaking a review of each level crossing against ARTC's policy for level crossings and *Establishing a Railway Crossing Safety Management Plan* (RTA, 2011)
- undertaking a review of the compliance of short stacking and sight distances at each level crossing with *AS 1742.7 Manual of Uniform traffic control devices* (Standards Australia, 2016) and *Austroads Guides to Road Design* (Austroads, 2021)
- identifying mitigation measures as required.

Assessment

Historic near-miss crash assessment

Under Rail Safety National Law, rail transport operators are required to report to the Office of the National Rail Safety Regulator (ONRSR) all notifiable occurrences that occur on, or in relation to, their railway premises or railway operations. A notifiable occurrence means an accident or incident associated with railway operations. Notifiable occurrences include collisions or near misses between either a vehicle or a pedestrian at a level crossing.

In summary, over the period from July 2014 to March 2022, there were no vehicle or pedestrian collisions reported at these level crossings (no fatalities or injuries). A total of 13 of the 17 near misses were with pedestrians, with the majority of these being reported at the Fernleigh Road level crossing.

Level crossing policy

Regarding general level crossing policy, ARTC's objective is to manage the risk at level crossings So Far As Is Reasonably Practicable (SFAIRP) in accordance with Rail Safety National Law and good practice. Existing level crossings are assessed and managed in accordance with the attributes of their configuration, with targeted improvement initiatives over time. New or upgraded level crossings are designed to meet the current Australian Standard *AS 1742.7 Manual of uniform traffic control devices*.

Under Rail Safety National Law at public crossings, road and rail infrastructure managers must seek to enter into an Interface Agreement to manage risks to safety at crossings. ARTC actively seeks to enter into Interface Agreements with other rail, road and bridge structure managers, and has signed interface agreements for level crossings within the proposal site with Transport for NSW, Greater Hume Council, Lockhart Shire Council, Wagga Wagga City Council and Junee Shire Council, and ARTC is progressing the Albury City Council Interface Agreement.

The interface agreements document the agreed risk management process of all parties in the agreements and railway crossing safety management plans are identified as TfNSW-specific, in that it is part of Transport for NSW's risk management process. Regardless, ARTC has included the new mitigation measure TT26, which outlines that a public level crossing treatment report will be prepared to document the assessment and design process that has been undertaken for level crossings within the proposal scope. The report will be developed in consultation with Transport for NSW and the relevant councils. The report will provide an assessment of road risks consistent with the guideline *Establishing a Railway Crossing Safety Management Plan* (RTA, 2011). Justification will be provided where no works are proposed to existing public level crossings within the proposal scope.

Compliance with standards

All three crossings are controlled by flashing lights and boom barriers, which is the highest form of level crossing control in the Australian Standard *AS 1742.7 Manual of Uniform traffic control devices*. All three level crossings are compliant for both sight distances and short stacking. Safety risks at existing level crossings that are outside of the scope of the proposal are managed under the existing arrangements between ARTC and the relevant road manager and, as such, no additional mitigation is proposed to address safety at these level crossings.

6.1.4 Changed or additional mitigation measures

The approach to mitigation of traffic and transport remains generally the same as provided in chapter 27 of the EIS and Technical Paper 1: Transport and Traffic; however, as a result of the additional assessments undertaken, revised and additional mitigation measures have been identified to address identified impacts (refer to Table 6-21). Revisions to the measures are indicated with deleted text crossed out and new text additions are in blue and underlined. These mitigation measures have been added to the full list of updated mitigation measures in Appendix C.

TABLE 6-21 ADDITIONAL TRANSPORT AND TRAFFIC MITIGATION MEASURES

Phase	Ref	Impact/issue	Mitigation measure
Detailed design/ pre-construction	TT1	Road operations	Early consultation will be undertaken with road authorities (local councils and Transport for NSW (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 additional mitigation measures to improve traffic efficiency during construction, such as temporary changes to signal phasing at intersections along the traffic diversion routes ~~in Wagga Wagga during the Edmondson Road bridge closure~~ ▸ consideration of other projects, in addition to aspects of the proposal that may require changes to the road network.

Phase	Ref	Impact/issue	Mitigation measure
Detailed design/ pre-construction	TT2	Road operations	Subject to agreement with the relevant road authority, mitigation measures to improve traffic efficiency during construction in Wagga Wagga will include, but not be limited to: ▸ signal optimisation at: ▸ Sturt Highway (including intersections with Docker Street, Best Street, Lake Albert Road) ▸ the intersection of Railway Street and Lake Albert Road ▸ signal optimisation will also be further investigated at other intersections where significant congestion is predicted ▸ road markings (lengthen and demarcate left turn lane on Railway Street at Lake Albert Road western approach (remove existing on street parking). Subject to agreement with the relevant road authority, mitigation measures to improve traffic efficiency during construction in Junee will include, but not be limited to: ▸ formalisation of keep clear markings on circulating lanes at the Olympic Highway / Broadway roundabout to prevent queueing through the roundabout ▸ extending the existing right turn lane on the south approach of the Olympic Highway / Broadway roundabout ▸ keep clear markings at the intersection of Olympic Highway / Main Street. ARTC will also investigate the potential to re-position the centre line where Main Street turns into Humphreys Street, to extend the length of left turn stacking in Main Street. In addition to the specific mitigations detailed above, other potential mitigations will be further considered during the Construction Planning and Detailed Design phases. These potential mitigations include, but are not limited to: ▸ Local Area Traffic Management Plans (LATM) ▸ turn restrictions at selected locations ▸ removal of on-street parking / creating clearways at particular times ▸ improved lane delineations.

Phase	Ref	Impact/issue	Mitigation measure
Detailed design/ pre-construction	TT4 ~~TT3~~	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.~~ Consultation will be undertaken with emergency services and the Local Emergency Management Committee regarding construction related impacts 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. ▸ advise of temporary disruption to access on the Murray River ▸ provide further information on temporary road closures and disruption to access to assist emergency services in their emergency response and travel planning Consultation will be undertaken with emergency services and the Local Emergency Management Committee regarding operational impacts to provide further information on train movements and level crossing closures to assist emergency services in their emergency response and travel planning.
Pre-construction/ construction	TT12 ~~TT8~~	Active transport connectivity	~~Construction staging will be planned to account for continued active transport connectivity during construction.~~ Construction staging will be planned to account for continued active transport connectivity during construction, including exploring opportunities to reduce the duration of concurrent bridge closures, in consultation with impacted stakeholders. The order of construction will be confirmed during detailed design, but could include: ▸ opening of the Edmondson Street pedestrian bridge, prior to closure of the Cassidy Parade pedestrian bridge and Wagga Wagga Station pedestrian bridge ▸ opening of the Junee pedestrian bridge, prior to the closure of Kemp Street bridge.
Operation	TT26	Access	A public level crossing treatment report will be prepared to document the assessment and design process that has been undertaken for level crossings within the proposal scope. The report will be developed in consultation with Transport for NSW and the relevant councils. The report will provide an assessment of road risks consistent with the guideline *Establishing a Railway Crossing Safety Management Plan* (Roads and Traffic Authority, 2011). Justification will be provided where no works are proposed to existing public level crossings within the proposal scope.

6.2 Operational rail noise and vibration

This section provides a summary of the updated operational noise and vibration assessment for the proposal. A full copy of the assessment is provided in Appendix D. This assessment was undertaken in response to DPE direction and considers the full length of the rail corridor between Albury and Illabo.

6.2.1 Approach

The study area for the noise and vibration assessment has been increased from focusing on enhancement sites to cover the full length of the rail corridor between Albury and Illabo. This was expanded from the EIS to include the areas potentially impacted by noise and vibration from operation of the proposal outside of corridor enhancement sites. Receivers sensitive to noise and vibration were identified within approximately 2 km either side of the rail corridor between Albury and Illabo.

Additional noise monitoring along the rail corridor to measure rail noise from existing rail operations (refer to section 6.2.2.2) was also undertaken to support the updated assessment.

6.2.1.1 Assessment criteria

The NSW Rail Infrastructure Noise Guideline has been used to assess (airborne) noise from the railway operations on the proposal. Noise from railways and railway infrastructure covered under the Rail Infrastructure Noise Guideline includes:

- train movements during the daytime and night-time, which includes noise from the propulsion of the rollingstock and wheel-rail noise associated with trains running on the tracks
- the influence of specific track features, such as bridges, tight-radius curves, turnouts and crossings
- level crossing bells/alarms at road intersections and the use of train horns as safety and warning devices.
- The assessment adopts the assessment criteria contained in the Rail Infrastructure Noise Guideline for redevelopment projects (i.e. those where an operating railway currently exists). The assessment criteria referred to are:
- L_{Aeq}, which is the equivalent continuous noise level, providing a representation of the cumulative level of noise exposure over a defined period
- L_{Amax}, which is the maximum noise level during the measurement or assessment period.

The assessment criteria are the same as described in chapter 15 of the EIS and EIS Technical Paper 7: Operational Noise and Vibration (Rail); however, the interpretation of the criteria has been varied following advice from the NSW EPA. Refer to Appendix D for further information on the assessment criteria used in this assessment for airborne noise, ground-borne noise and ground-borne vibration.

6.2.2 Existing environment

6.2.2.1 Sensitive receivers

Sensitive receivers, as described in the Rail Infrastructure Noise Guideline, are those that may be sensitive to noise and vibration levels, which includes residential dwellings, educational institutions, childcare centres, medical facilities and places of worship. Approximately 28,969 buildings within 2 km of the rail corridor between Albury and Illabo were identified as being potential noise- and vibration-sensitive receivers, with the majority being identified as residential properties. The types of sensitive receivers are shown in Table 6-22.

TABLE 6-22 SENSITIVE RECEIVERS IN THE STUDY AREA

Receiver type	Number of receivers with 2 km of the rail corridor
Residential[1]	28,343
Schools, educational institutions and child-care centres	380
Place of worship	82
Medical facility	41
Outdoor recreation—active	101
Outdoor recreation—passive	22

Note 1: Total count for residential includes aged care facilities and hotels.

Adjacent heritage structures are also considered as vibration-sensitive receivers due to the potential for cosmetic damage. The following state heritage- listed items were identified along the rail corridor:

- Albury Rail bridge over the Murray River
- Albury Railway Yard precinct
- Gerogery Railway Station group
- Culcairn Railway Yard precinct
- Henty Railway Yard precinct
- The Rock Station and Yard group

- Bomen Railway Yard precinct
- Wagga Wagga Railway Yard precinct
- Junee Railway Yard precinct.

6.2.2.2 Noise monitoring

Additional noise monitoring was undertaken in January and February 2023 at representative locations within the study area between Albury and Illabo, to measure operational rail noise from existing operations. Measurements were completed over a period of around seven days at each location and include all representative train pass-bys that were not influenced by other noise sources. The monitoring locations and measured rail noise levels are described in Table 6-23 and Figure 6-4.

TABLE 6-23 TRAIN PASS-BY MEASUREMENT LOCATION

ID	Location	Monitoring dates	Distance to track centreline (m)	Measured train movements (dB)		
				Day time[2] $L_{Aeq,15h}$	Night time[3] $L_{Aeq,9h}$	L_{Amax}
L01	Albury	31 January to 7 February 2023	12	59	62	93
L02	Table Top (Perrymans Lane)	14 November to 22 November 2018	17.5	60	63	96
L03	Henty	14 November to 22 November 2018	17	58	62	94
L04[1]	Henty	31 January to 7 February 2023	20	-	-	-
L05	Uranquinty	31 January to 7 February 2023	49	51	56	86
L06	Wagga Crossing	31 January to 7 February 2023	10	62	64	94
L07	Wagga Yard	31 January to 7 February 2023	20	55	58	89
L08	Junee	31 January to 7 February 2023	10	59	63	97
L09	Wantiool	29 November to 7 December 2018	12.5	61	63	97
L10	Illabo	1 February to 7 February 2023	12	63	67	98

1 Due to equipment failure, this location has been excluded.
2 Equivalent continuous sound level over a 15-hour time period.
3 Equivalent continuous sound level over a 9-hour time period.

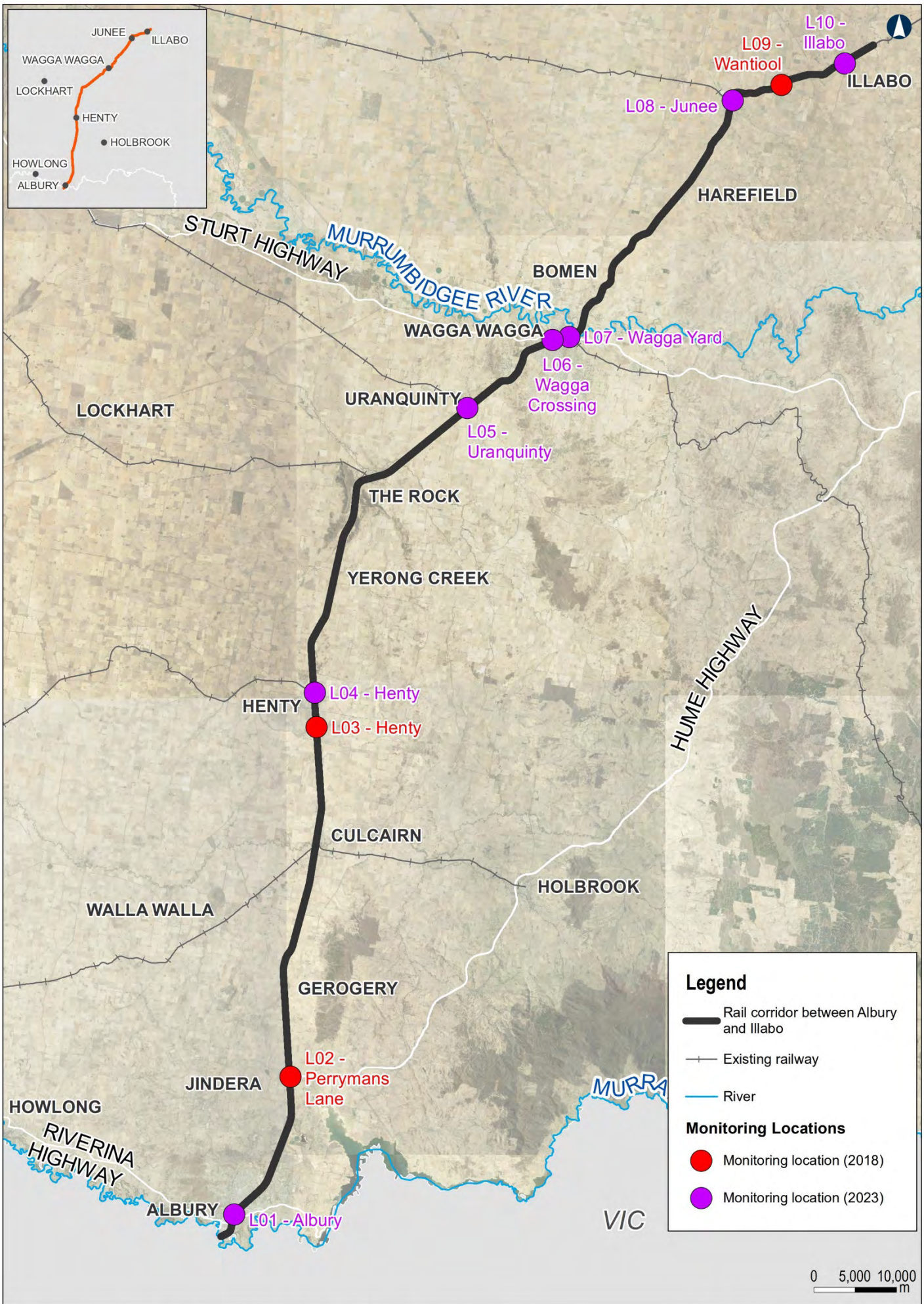

Figure 6-4 Modelled area for construction in Junee

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:600,000
Paper size: A3
Date: 27/10/2023

210_EAP_F604_NoiseMonitoringLocations_r1v2.mxd

6.2.3 Assessment

- Within the rail corridor between Albury and Illabo, the operation of trains would be similar to the current situation; however, operation of the proposal could contribute to noise and vibration impacts due to the following:
- increased number of train movements
- increased number of idling events
- increased operation of level crossings, including warning bells and use of train horns.
- The proposal train numbers, length and speed are described in section 1.2.3.

6.2.3.1 Airborne noise

Train movement

Airborne noise from operation of the proposal would primarily change due to an increased frequency of train movements along the existing operational rail corridor. Currently, there are up to 12 freight trains per day (combined total of freight trains in both directions) between Albury and Illabo. It is estimated that the operation of Inland Rail would increase freight train movements up to a total of 18 freight trains per day in the early phase of Inland Rail's operation when all projects are completed, and up to a total of 20 freight trains per day over the following years, upon further take up of the service.

Noise levels are predicted to not exceed the airborne rail noise criteria at the majority of the sensitive receivers in the study area with multiple receivers predicted to exceed each criteria (daytime L_{Aeq}, night-time L_{Aeq} and L_{Amax}). The highest noise level increases predicted at receivers are shown in Table 6-24. Maps showing the location of these receivers is provided in Appendix D.

The daytime L_{Aeq} criteria is predicted to be exceeded at 138 residential receivers in 2025, and 190 residential receivers in 2040. The night-time L_{Aeq} criteria is predicted to be exceeded at 60 residential receivers in 2025 and 92 residences in 2040. While L_{Amax} noise levels are not predicted to change as a result of the proposal, existing rail noise levels combined with proposal-related L_{Aeq} increases generate exceedances of the Rail Infrastructure Noise Guideline triggers at 1,219 residences in 2025 and 1,285 residences in 2040.

TABLE 6-24 SUMMARY OF PREDICTED OPERATION RAIL NOISE LEVELS AT RESIDENTIAL RECEIVERS (YEAR 2040)

Area	Worst-case predicted noise level (dBA)—residential receivers									
	Existing			With proposal 2040			Noise level increase			Number of triggered residential receivers
	$L_{Aeq(15hr)}$	$L_{Aeq(9hr)}$	L_{Amax}	$L_{Aeq(15hr)}$	$L_{Aeq(9hr)}$	L_{Amax}	$L_{Aeq(15hr)}$	$L_{Aeq(9hr)}$	L_{Amax}	
Albury	61	62	91	65	63	91	3.8	1.0	0.0	20
Table Top	56	58	92	59	57	92	3.2	-0.3	0.0	11
Gerogery	67	69	102	71	70	102	4.3	0.9	0.0	13
Culcairn	65	67	95	69	68	95	4.3	1.1	0.0	99
Henty	66	67	98	70	68	98	4.3	1.2	0.0	91
Yerong Creek	61	63	95	66	65	95	5.3	2.9	0.0	26
The Rock	67	69	101	71	69	101	3.6	0.2	0.1	62
Uranquinty	62	64	94	67	66	94	5.3	2.4	0.0	151
Wagga Wagga	73	75	107	77	75	107	4.1	0.4	0.0	662
Harefield	62	64	93	66	64	93	3.9	0.5	0.0	5
Junee	59	61	95	64	62	95	4.3	0.5	0.0	129
Illabo	63	64	97	66	65	97	4.7	1.3	0.0	16
Total										1,285

The airborne rail noise criteria is also predicted to be exceeded for both 2025 and 2040 at 28 non-residential sensitive receivers (refer to Table 6-25). It should be noted that the Rail Infrastructure Noise Guideline trigger levels for non-residential receivers are internal noise levels and are therefore subject to the quality of the building façade. Façade testing of non-residential receivers will be undertaken to confirm eligibility for noise mitigation.

TABLE 6-25 NON-RESIDENTIAL RECEIVERS PREDICTED TO TRIGGER PROPOSAL NOISE CRITERIA (YEAR 2025 AND 2040)

Location	Triggered non-residential receivers
Albury	▸ The Scots School Albury
Gerogery	▸ Gerogery Public School ▸ Gerogery Church
Culcairn	▸ Culcairn Public School ▸ Balfour St Church, Culcairn ▸ Greater Southern Area Health Service
Henty	▸ Henty Uniting Church ▸ Henty Presbyterian Church ▸ Riverlife Church, Henty ▸ Henty Hospital and Health Service
Yerong Creek	▸ Yerong Creek Public School ▸ Cole St Church, Yerong Creek
Uranquinty	▸ Uranquinty Preschool ▸ Uranquinty Public School ▸ St Patrick's Catholic Church ▸ Seventh Day Adventist Reform ▸ St James Uniting Church, Uranquinty ▸ St Cuthbert's Anglican Church Quintessential Chapel
Wagga Wagga	▸ Kildare Catholic College ▸ ErinEarth Centre ▸ South Wagga Public School ▸ Goodstart Early Learning Wagga Wagga – Station Place ▸ St John's Anglican Church ▸ Calvary Riverina Hospital
Junee	▸ Goodstart Early Learning Junee ▸ Junee Preschool ▸ Junee Baptist Church
Illabo	▸ Illabo Public School

Level crossings

While the level crossings and train horns are a potential source of noise, and have been included in the model, the daytime and night-time noise emissions from railway noise levels at most sensitive receivers were determined by the train movements on the main line track. The noise from the level crossings, however, particularly the train horns, have the potential to be audible at sensitive receivers and recommendations have been provided in the updated operational noise and vibration (rail) assessment (see Appendix D) to assist the management of noise associated with the level crossings.

Idling trains at crossing loops

At crossing loops, the trains come to a complete stop off the main line track and idle until the train is signalled to return to the main line track. Noise sources from crossing loops include short noise events, such as train wagons bunching and stretching while coming to a stop, or noise from train engines idling.

The noise levels from trains idling on crossing loops are predicted to not exceed Rail Infrastructure Noise Guideline criteria and are lower than the noise levels from train movements on the main alignment. Because the crossing loops are within proximity of the main line track, noise from crossing loops is not expected to be the primary influence on the overall daytime and night-time predicted noise levels at the sensitive receivers.

6.2.3.2 Ground-borne noise

Based on the proposal train speeds and types, ground-borne noise levels at distances greater than 50 m from the track are expected to comply with the assessment criteria. There are 174 sensitive receivers located within 50 m of the rail corridor between Albury and Illabo; however, as airborne noise levels during train pass-by are predicted to be the dominant noise contribution at these locations, the Rail Infrastructure Noise Guideline methodology does not require further consideration of ground-borne noise for these receivers.

6.2.3.3 Vibration

The vibration dose value (VDV) levels from operation of the proposal were estimated based on daily train movements for the 2040 design year and the forecast train speeds. The screening assessment in Table 6-26 shows that the human comfort vibration criteria are predicted to be met for most sensitive buildings adjacent to the proposal. Two receivers have been identified within the estimated offset distance. These two receivers are also within the estimated offset distance for existing train operations and may therefore already be subject to existing VDV levels above the preferred criteria for residential receivers. Vibration levels at these receivers will be validated during detailed design.

The additional vibration impacts associated with the proposal are minimal. The ground vibration levels would also be well within vibration levels for damage to building contents, structural and cosmetic damage to buildings, including heritage buildings and structures.

TABLE 6-26 SCREENING ASSESSMENT OF VIBRATION LEVELS ALONG THE RAIL CORRIDOR

	Estimated offset to meet vibration criteria, subject to detailed review		
Rail corridor section	**Daytime (0.2 m/s$^{1.75}$)**	**Night-time (0.13 m/s$^{1.75}$)**	**Receivers within the offset distance**
Victorian border to Albury Railway Yard	12 m	15 m	None
Albury to Junee	10 m	13 m	Two receivers, including: ▸ one receiver 13 m from the track in Gerogery (ID 19774) ▸ one receiver 6 m from the track in Wagga Wagga (ID 214630)
Junee Railway Yard to Illabo	12 m	15 m	None

At all heritage sites identified near the proposal site, such as heritage-listed stations and platform structures, the distance from the structure to the nearest track is not proposed to change significantly. Therefore, vibration levels at heritage-listed structures are not predicted to significantly change from the existing levels currently experienced. Operation of the proposal is not predicted to change the risk of cosmetic damage to these buildings and structures.

6.2.4 Changed approach to operational rail noise mitigation

The approach to mitigation of operational noise and vibration has changed following the increase in assessment area (i.e. assessment of full A2I alignment) and advice from the NSW EPA on the interpretation of the Rail Infrastructure Noise Guideline trigger levels.

ARTC is applying the following strategy for the proposal as the basis for selecting reasonable and feasible noise mitigation for operational rail noise impacts:

- Project-specific noise levels have been developed to guide the selection of noise mitigation measures for residential receivers that exceed the Rail Infrastructure Noise Guideline criteria.
- Source controls (i.e. infrastructure and rollingstock measures) have been investigated first, in line with Rail Infrastructure Noise Guideline hierarchy of controls.
- Noise barriers have been considered where groups of triggered sensitive receivers with noise levels above the project-specific noise levels are apparent. For isolated sensitive receivers, such as single dwellings in rural areas, noise barriers have not been considered.
- The noise mitigation for isolated sensitive receivers is expected to include:
- at-property architectural treatments to the building (such as increased glazing or facade upgrades) to control rail noise inside building; and/or,
- upgrades to the receiver property boundary fencing to improve screening of rail noise.

Project-specific noise levels do not apply to the internal noise criteria for non-residential receivers (refer to table 3 in the Rail Infrastructure Noise Guideline). Mitigation for these receivers will be determined on a case-by-case basis dependent on the outcomes of detailed design and façade testing. An explanation of the project-specific noise levels and the resulting mitigation measures is included in the updated operational noise and vibration (rail) assessment (Appendix D) in section 9 and Appendix F.

The updated operational noise and vibration (rail) assessment (Appendix D) includes conceptual mitigation measures based on the reference design and this is summarised below in section 6.2.4.1 to section 6.2.4.3. Consistent with the EIS, the extent of mitigation or the type of mitigation identified for individual receivers will not be finalised until detailed design, in consultation with the community, and as documented in the operational noise and vibration review.

A full list of potential mitigation measures for each triggered residential receiver is provided in Appendix F of the updated operational noise and vibration (rail) assessment.

6.2.4.1 Source controls

At-source controls are the most efficient and effective mitigation option to reduce operational rail noise on A2I. Three at-source mitigation options are now included in the updated operational rail noise and vibration (rail) assessment (Appendix D):

- installation of exhaust silencers on legacy locomotives operating on A2I via the Locomotive Noise Control Program (refer to Appendix G of the Updated Rail Assessment)
- review of mitigation options for open transom and steel rail bridges
- use of soft-tone level crossing bells and/or turning level crossing bells off at night (where safety is not compromised).

These measures will be further refined as the program progresses and, if identified as feasible and reasonable, will be detailed in the operational noise and vibration review for implementation.

6.2.4.2 Noise barriers

Twelve conceptual noise barriers have been identified to address exceedances of the project-specific noise levels at Culcairn, Henty, The Rock, Uranquinty, Wagga Wagga and Junee where receivers are grouped on the same side of the track and the barrier was feasible and effective. A barrier height of 4 m was able to mitigate the predicted exceedances of the project-specific noise levels at most locations; however, a height of 5 m for barriers ‘Wagga 1’ and ‘Junee 1’ was determined to perform the best at mitigating the predicted exceedances of the project-specific noise levels (refer to Table 6-27).

For the predicted 2040 (design year) railway noise levels, the number of exceedances of the assessment criteria with and without a noise barrier, for various barrier heights, are summarised in Table 6-27 for residential and non-residential receivers (referred to as ‘other sensitive’). The updated operational noise and vibration (rail) assessment (see Appendix D) includes the locations and predicted noise reductions at receivers associated with these barriers.

Noise barriers would need to be solid structures constructed from material such as autoclaved aerated concrete or pre-cast concrete. Should noise barriers be deemed required in the operational noise and vibration review, the final location and extent of noise barriers would be determined by ARTC in consultation with the impacted sensitive receivers.

TABLE 6-27 NUMBER OF EXCEEDANCES OF PROJECT SPECIFIC NOISE LEVELS WITH AND WITHOUT BARRIERS

		2040—no mitigation		2040—with barrier	
Noise barrier	Height (m)	Residential	Other Sensitive	Residential	Other Sensitive
Culcairn 1	4	8	0	2	0
Culcairn 2	4	15	0	2	0
Henty 1	4	16	4	2	2
The Rock 1	4	15	0	5	0
Uranquinty 1	4	31	1	10	1
Uranquinty 2	4	10	0	0	0
Wagga 1	5	44	0	9	0
Wagga 2	4	12	0	0	0
Wagga 3	4	30	0	7	0
Wagga 4	4	11	0	6	0
Wagga 5	4	33	0	2	0
Junee 1	5	31	1	2	1
Sub Total		256	6	47	4
Total		262		51	

6.2.4.3 At-property treatments

Isolated properties (where a noise barrier is not considered feasible or effective) exceeding the project-specific noise levels or those with residual impacts (following reductions associated with a noise barrier) have been identified for at-property treatments. An at-property treatment is a receiver control to reduce internal noise levels, and may include façade upgrades and/or localised screening or upgraded boundary fences. The locations of at-property treatments are summarised in Table 6-28. A full list of proposed mitigation measures for each receiver that exceeds the Rail Infrastructure Noise Guideline criteria is detailed in Appendix F of the updated operational noise and vibration (rail) assessment (see Appendix D).

TABLE 6-28 ADDITIONAL NOISE AND VIBRATION MITIGATION MEASURES

Area	At-property treatments[1]	At-property treatments (residual)
Albury	1	0
Table Top	2	0
Gerogery	5	0
Culcairn	16	4
Henty	20	2
Yerong Creek	13	0
The Rock	9	5
Wagga Wagga	105	24
Harefield	3	0

Area	At-property treatments[1]	At-property treatments (residual)
Junee	21	2
Illabo	7	0
Uranquinty	24	10
Total	226	47

1. Primary treatment where a noise barrier not considered feasible or effective

6.2.5 Changed or additional mitigation measures

Mitigation measures NV3 and NV4 remain valid despite the updated approach to mitigation of operational noise, and no additional operational rail noise mitigation measures are proposed. The reference to the Inland Rail Noise and Vibration Strategy has been removed from NV4 as the approach to operational rail noise mitigation has been revised, refer to section 6.2.4.

One additional mitigation measure for operational vibration is proposed in Table 6-28 and the full list of updated mitigation measures is provided in Appendix B.

TABLE 6-29 ADDITIONAL OPERATIONAL RAIL NOISE AND VIBRATION MITIGATION MEASURES

Phase	Ref	Impact/issue	Mitigation measure
Detailed design	NV4	Minimising the potential for operational noise impacts	Feasible and reasonable mitigation measures will be identified where exceedances of operational noise and vibration triggers are identified in accordance with the NSW Rail Infrastructure Noise Guideline and the project-specific noise levels, considering at-source, pathway and receiver treatments. Measures will be identified in accordance with the outcome of the operational noise and vibration review ~~and the Inland Rail Noise and Vibration Strategy~~. Where at-property noise treatments are identified as the preferred mitigation option, these will be developed in consultation with individual property owners.
Detailed design/ pre-construction	NV11	Operational vibration	Prior to the preparation of the operational noise and vibration review, ARTC will carry out vibration monitoring to confirm compliance with vibration criteria.

6.3 Operational air quality

This section provides a summary of the additional air quality assessment of the proposal. A full copy of the addendum assessment is provided in Appendix E. This assessment was undertaken in response to DPE direction, and concerns from the community and stakeholders regarding the approach to operational air quality impact assessment in the EIS. In particular, that the assessment undertaken in the EIS was not sufficiently quantitative, had only considered idling trains at Junee and had not considered potential operational impacts along the full length of the rail corridor between Albury and Illabo.

6.3.1 Approach

Due to the spatial extent of the proposal, a case study approach has been undertaken, and assesses expected train operations in an urban setting and a rural setting to represent the urban areas and rural areas along the rail corridor between Albury and Illabo. For both the urban and rural case studies, the study area considers potential air quality impacts within 200 m of the rail corridor. The assessment has considered potential air quality impacts of expected train operations (both passing and idling) through the completion of air quality modelling in rural and urban environments that are representative of the towns along the rail corridor between Albury and Illabo.

The additional assessment adopted a quantitative methodology, including conducting air dispersion modelling, to supplement the qualitative assessment carried out in Technical Paper 14: Air Quality. The key tasks for the additional assessment of air quality involved:

- establishing case study areas representative of the wider study area. The three case study areas are:
  - Wagga Wagga case study area (urban), including modelling of trains passing through Wagga Wagga and idling trains near the Wagga Wagga station
  - Junee to Illabo case study area (rural), including modelling of passing trains only
  - Culcairn case study area (rural), including modelling of passing trains and idling trains around the Culcairn crossing loop
- reviewing the existing environment within the study area, including existing air quality monitoring data
- developing a diesel locomotive emissions inventory for each case study scenario
- dispersion modelling of each case study scenario using CALMET and CALPUFF
- processing of dispersion modelling outputs
- interpreting dispersion modelling results including comparison against relevant air quality assessment criteria (see section 6.3.1.1)
- identifying additional mitigation as required.

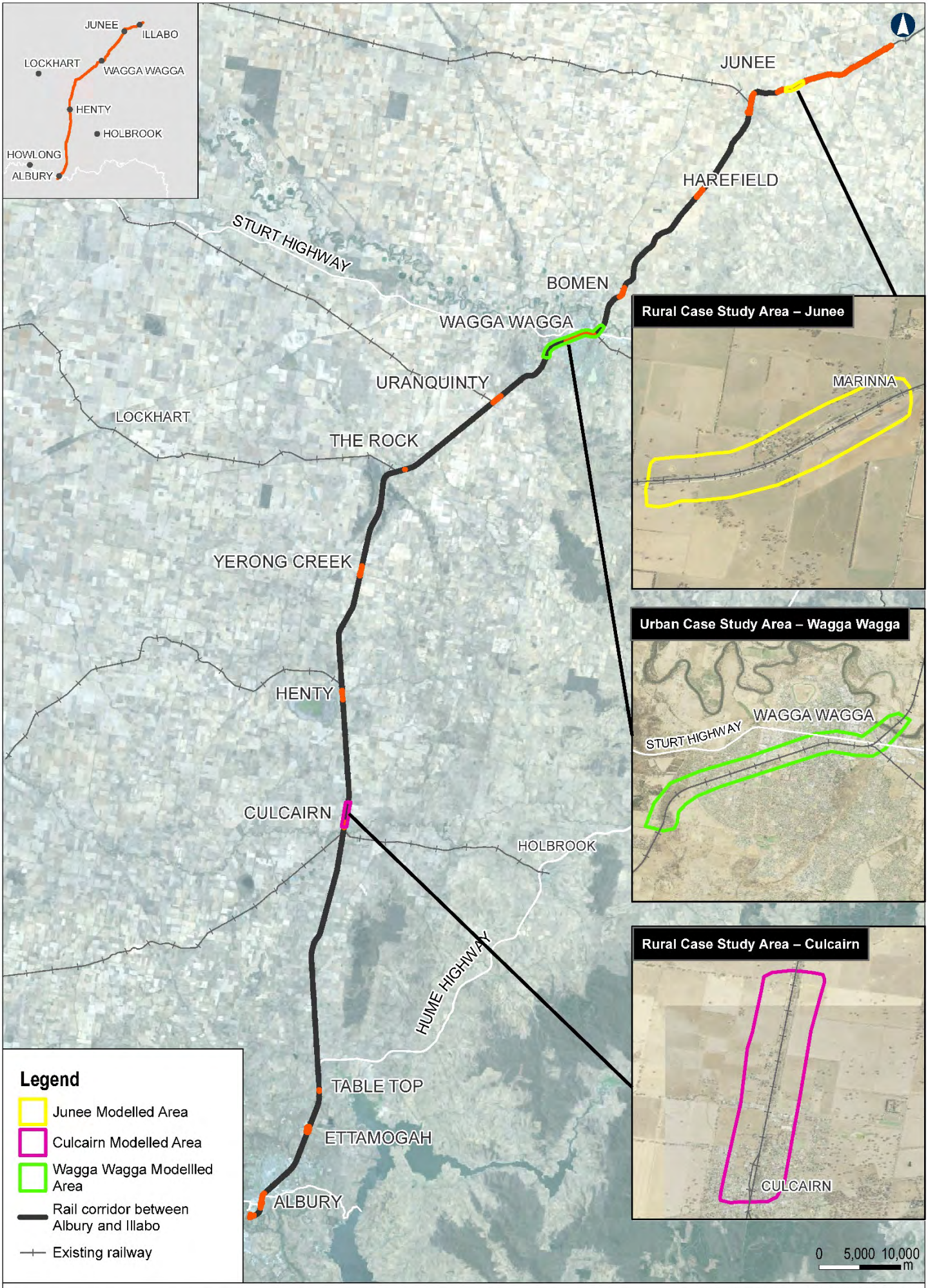

Figure 6-5 Case study areas for the air quality assessment

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:600,000
Paper size: A3
Date: 30/10/2023

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6.3.1.1 Assessment criteria

The *Approved Methods for Modelling and Assessment of Air Quality in NSW 2022* (Approved Methods) prescribes the methods for modelling and assessing air emission sources in NSW (NSW EPA, 2022).

The assessment criteria for the pollutants relevant to this assessment, as specified by the Approved Methods, are presented in Table 6-30. Pollutant levels are defined in terms of micrograms per cubic metre (µg/m^3) over a specified period.

TABLE 6-30 NSW ASSESSMENT CRITERIA FOR AIR QUALITY POLLUTANTS (NSW EPA, 2022)

Pollutant	Averaging period	Maximum concentration criteria (µg/m^3)
Particulate matter with an equivalent aerodynamic diameter less than or equal to 2.5 micrometres ($PM_{2.5}$)	24 hours	25
	Annual	8
Particulate matter with an equivalent aerodynamic diameter less than or equal to 10 micrometres (PM_{10})	24 hours	50
	Annual	25
Carbon monoxide (CO)	15 minutes	100,000
	1 hour	30,000
	8 hours	10,000
Nitrogen dioxide (NO_2)	1 hour	164
	Annual	31
Sulphur dioxide (SO_2)	1 hour	286
	24 hours	57
Benzene	1 hour	29

6.3.1.2 Sensitive receivers

Sensitive receivers are locations where people are likely to work or reside; this may include a dwelling, school, hospital, office or recreational areas. Sensitive receivers are scattered along the rail corridor on farming properties, in rural towns, and in the urban areas of Albury, Wagga Wagga and Junee. Three case study areas were identified to represent the urban and rural environments between Albury and Illabo (refer to Figure 6-5).

6.3.1.3 Climate and meteorology

Meteorological conditions are important for determining the direction and rate at which emissions from a source would disperse. Data from weather stations near the proposal were used to characterise the local climate using the most recent long-term datasets. Albury Airport automatic weather station and Wagga Wagga Airport Aeronautical Meteorological Observing were identified as the nearest weather stations to the proposal.

The data indicates that the proposal site experiences warm, dry summers, with average maximum temperatures around 33 degrees Celsius (℃). Months in winter are the coldest with an average minimum temperature of around 3℃. Months through summer and autumn were measured to be the driest, with the lowest average monthly rainfall recorded in summer (around 42 millimetres (mm)) at Albury and in April (around 38 mm) in Wagga Wagga.

Overall, wind speeds are highest during summer (around 3 m/s recorded at Albury, and 4.1 m/s recorded at Wagga Wagga), and lowest in winter (around 2 m/s, and 3 m/s at Albury and Wagga, respectively). The most frequent wind condition at Albury is south-easterly followed by westerly. At Wagga Wagga, the most frequent wind direction is easterly followed by east north-easterly.

6.3.1.4 Existing air quality

The air quality in the case study areas is influenced by the following emission sources:

- local industry primarily in Wagga Wagga (such as petrol and gas supply and storage, paper manufacturing, meat processing and landfill facilities)
- traffic using the local- and state-managed road networks
- railway operation using the existing rail corridor
- domestic solid and liquid fuel burning
- dust from paved and unpaved roads
- natural sources such as dust storms and bushfires
- agricultural and farming activities.

- Local air quality in the case study areas was characterised using ambient air quality data collected at the nearest and/or most representative ambient air quality monitoring stations (AAQMS) operated by relevant regulatory authorities in NSW and the Australian Capital Territory (ACT). Ambient air quality data was used from the following AAQMS:
- Wagga Wagga North: PM_{10} and $PM_{2.5}$ levels for the urban case study area
- Florey (ACT): NO_2 and CO levels for the urban case study area and CO for rural case study areas
- Bargo: SO_2 for both the urban and rural case study areas
- Merriwa: NO_2, PM_{10} and $PM_{2.5}$ for rural case study areas.
- As the background concentrations monitored in years 2019 and 2020 were likely affected by significant bushfire activity during that time, the maximum concentrations measured in 2021 were used in this assessment. It has been assumed that the background benzene concentrations around the case study areas are negligible as no regional-scale benzene emitters have been identified in proximity to the proposal.
- The background air quality identified for each case study is presented in Table 6-31. Two pollutant levels for $PM_{2.5}$ and PM_{10} in the Wagga Wagga case study area (highlighted bold) were identified to exceed the assessment criteria.

TABLE 6-31 BACKGROUND AIR QUALITY DATA FOR THE CASE STUDY AREAS

Pollutant	Averaging period (µg/m^3)	Urban case study area (Wagga Wagga)	Rural case study area (Junee and Culcairn)
$PM_{2.5}$	24 hour	**25.5**	14.7
	Annual	6.3	4.2
PM_{10}	24 hour	**69.1**	35.4
	Annual	17.7	11.6
NO_2	1 hour	70	66
	Annual	8	6
SO_2	1 hour	25.7	25.7
	24 hour	5.7	5.7
Benzene	1 hour	0	0
Carbon monoxide	1 hour	3,124	3,124
	8 hour	1,499	1,499

6.3.2 Assessment

Air pollutants generated by diesel locomotives (trains) are primarily the products of combustion released via the exhaust. The air pollutants that have the highest potential for impact on sensitive receivers are PM_{10}, $PM_{2.5}$, NO_2, CO, SO_2 and benzene.

The air pollutant concentrations were predicted for future operational years of the proposal (2025 and 2040) and the existing operations (2020) were estimated for comparison. Emissions of SO_2, benzene and CO from the proposal are predicted to result in concentrations well within the assessment criteria during operation. Emissions of PM_{10}, $PM_{2.5}$, NO_2, are predicted to exceed the air quality criteria at the Wagga Wagga urban case study area and the Culcairn rural case study area. Table 6-32 presents the predicted exceedances for each pollutant at the sensitive receiver with the highest exposure to train emissions. No exceedances of air quality criteria are predicted in the Junee to Illabo case study area.

The 24-hour PM_{10} and $PM_{2.5}$ concentrations (for all operational years), are predicted to exceed the assessment criteria for passing trains, idling trains, and the combination of passing and idling trains at Wagga Wagga Urban case study area. These exceedances are mainly driven by elevated background concentrations, which already exceed or approach the assessment criteria. The NO_2 concentrations are predicted to exceed the assessment criteria during idling (1-hour) and combined idling and train passing (1-hour and annual) at the Wagga Wagga Urban case study area and the Culcairn Rural case study area. Train passing is also predicted to result in 1-hour NO_2 exceedance for the year 2040 in the Culcairn Rural case study area.

TABLE 6-32 PREDICTED AIR QUALITY CRITERIA EXCEEDANCE AT THE WORST IMPACTED RECEIVER

					Predicted cumulative concentration (train contribution)		
Case study area	**Scenario**	**Pollutant**	**Criteria (µg/m3)**	**Background concentration (µg/m^3)**	**2020 (µg/m^3)**	**2025 (µg/m^3)**	**2040 (µg/m^3)**
Wagga Wagga (urban)	Passing train	$PM_{2.5}$ 24-hour	25	25.5	25.8 (0.3)	25.9 (0.4)	26.0 (0.5)
		PM_{10} 24-hour	50	69.1	69.1 (0.4)	69.5 (0.4)	69.5 (0.5)
	Idling train	$PM_{2.5}$ 24-hour	25	25.5	27.2 (1.7)	27.8 (2.3)	28.4 (2.9)
		PM_{10} 24-hour	50	69.1	70.9 (1.8)	71.5 (2.4)	72.1 (3.0)
		NO_2 1-hour	164	70	328 (258)	328 (258)	328 (258)
	Passing train and idling train	$PM_{2.5}$ 24-hour	25	25.5	27.5 (2.0)	28.1 (2.6)	28.7 (3.2)
		PM_{10} 24-hour	50	69.1	71.1 (2.0)	71.8 (2.7)	72.4 (3.3)
		NO_2 1-hour	164	70	348 (278)	348 (278)	368 (298)
		NO_2 annual	31	8	35 (27)	38 (30)	44 (36)
Culcairn (rural)	Passing train	NO_2 1-hour	164	66	-	-	177 (111)
	Idling train	NO_2 1-hour	164	66	343 (277)	343 (277)	343 (277)
	Passing train and idling train	NO_2 1-hour	164	66	372 (306)	372 (306)	400 (334)
		NO_2 annual	31	6	-	33 (27)	39 (33)

- No exceedance is predicted

While exceedances are modelled to occur along the rail corridor, the maintenance and operation of trains is the responsibility of the train operators. During operation of the proposal, it is expected that existing trains that have reached their operational life would be retired from use and replaced by new models that would be required to comply with the latest air emission limits, as specified in EPLs required for train operators' under the *Protection of the Environment Operations Act 1997* (NSW). These EPLs require new trains to comply with stricter noise and air emission limits, while existing trains are covered by legacy operational controls.

The operation of inland Rail will necessitate changes to operational patterns on the rail network, which provides an opportunity to further consider sequencing of train movements and utilisation of crossing loops in close proximity to sensitive receivers, to reduce air quality impacts.

New mitigation measure AQ2 commits to management of operational air quality impacts in accordance with ARTC's existing EPL (EPL #3142) and its standard operating procedures, including those within the ARTC Environmental Management System (EMS). ARTC's standard operating procedures, EMS and EPL #3142 provide a structured framework for the consideration, evaluation, management, regulatory compliance and reporting of environmental issues associated with ARTC's activities. The benefit of implementing ARTC's EMS for the operation of the proposal is that it ensures a coordinated approach to environmental management across the national and NSW freight network. This facilitates improved management of environmental risks, and ensures that ARTC maintains compliance with the various environmental laws, statutes, regulations, policies, management plans, licenses and other approvals that apply to its activities. The operation of the proposal would be consistent with the existing operating line and, as such, any environmental issues and impacts that occur during operation can be effectively managed under ARTC's EMS. The community can also report any concerns to the ARTC Enviroline on 1300 550 402, which operates 24 hours a day.

Prior to the operation of Inland Rail, in accordance with new mitigation measure AQ3, ARTC will carry out an additional Air Quality Monitoring Program at a representative train idling location to measure existing levels of PM_{10}, $PM_{2.5}$ and NO_2. The monitoring results will be compared against relevant air quality criteria. Where exceedances of the relevant air quality criteria occur, further investigation of the likely cause will be undertaken, including but not limited to analysis of the contribution of existing train operations or another source of pollution such as a regional bushfire or agricultural activities. Where analysis indicates exceedances related to existing train operations, a review of relevant operating procedures will be undertaken including consultation with the train operating companies to explore options to reduce train operation's contribution.

Following the completion of AQ3 and prior to operation of Inland Rail, air quality modelling will be undertaken to validate the Preferred Infrastructure Report assessment utilising data collected during the Air Quality Monitoring Program. Where exceedances of the relevant air quality criteria are predicted as a result of planned Inland Rail operations (i.e. Inland Rail trains and consequential alterations to other train services), a review of relevant operating procedures will be undertaken, including consultation with the train operating companies to explore options to reduce train operation's contribution.

The results of the urban and rural case studies are expected to be generally consistent in other respective urban and rural environments along the rail corridor between Albury and Illabo. Table 6-33 summarises the indicative maximum distance for potential exceedances, at each of the potential idling locations along the alignment. Distances are based on the distance from the train at which exceedance of NO_2 criteria may occur. Confirmation of potential exceedances would occur through the completion of AQ3.

TABLE 6-33 INDICATIVE EXCEEDANCE DISTANCE FOR IDLING LOCATIONS

Representative case study scenario	Indicative distance for exceedance (m)	Idling locations between Albury and Illabo
Urban—Idling train	70	• Albury • Wagga Wagga • Junee
Urban—Idling and passing train	120	
Rural—Idling train	100	• Gerogery • Culcairn • Henty • Yerong Creek • The Rock • Uranquinty • Bomen • Harefield
Rural—Idling and passing train	150	

6.3.3 Changed or additional mitigation measures

Additional mitigation measures that would be implemented to address potential operational impacts on air quality are listed in Table 6-34. The full list of updated mitigation measures is provided in Appendix B.

TABLE 6-34 ADDITIONAL AIR QUALITY MITIGATION MEASURES

Stage	Ref	Impact/issue	Mitigation measure
Operation	AQ2	Operational air quality	ARTC will manage operational air quality impacts in accordance with ARTC's existing EPL (EPL #3142) and its' standard operating procedures including those within the ARTC Environmental Management System (EMS).
Operation	AQ3	Operational air quality	Prior to the operation of Inland Rail, ARTC will carry out an additional Air Quality Monitoring Program at a representative train idling location to measure existing levels of PM_{10}, $PM_{2.5}$ and NO_2. The monitoring results will be compared against relevant air quality criteria. Where exceedances of the relevant air quality criteria occur, further investigation of the likely cause will be undertaken, including but not limited to analysis of the contribution of existing train operations or another source of pollution such as a regional bushfire or agricultural activities. Where analysis indicates exceedances related to existing train operations, a review of relevant operating procedures will be undertaken including consultation with the train operating companies to explore options to reduce train operation's contribution.
Operation	AQ4	Operational air quality	Prior to operation of Inland Rail and following the completion of AQ3, air quality modelling will be undertaken to validate the Preferred Infrastructure Report assessment utilising data collected during the Air Quality Monitoring Program. Where exceedances of the relevant air quality criteria are predicted as a result of planned Inland Rail operations (i.e. Inland Rail trains and consequential alterations to other train services), a review of relevant operating procedures will be undertaken including consultation with the train operating companies to explore options to reduce train operation's contribution.

7. Assessment of changes to the proposal

The changes to the proposal, including changes made in response to additional assessment completed as part of the Preferred Infrastructure Report direction, were assessed and further mitigation identified where necessary.

7.1 Environmental impact screening

Consideration of each environmental issue assessed as part of the EIS was conducted to determine the potential for change to the impacts as a result of the proposed changes (described in section 3.2) and, therefore, whether further assessment of the potential impacts is required. A screening assessment of the potential change in impacts is provided in Table 7-1.

Where further assessment was identified for an issue, more detail is provided in section 7.2. The full list of mitigation measures is provided in Appendix B.

TABLE 7-1 ENVIRONMENTAL IMPACT SCREENING

Environmental aspect	Comparison of potential impacts of preferred infrastructure against the exhibited proposal	Further detailed assessment required?
Traffic and transport	The proposed changes to the design and the construction method would result in minor changes to access and parking during construction and operation of the proposal. Further assessment of impacts to parking is required. The construction volumes and routes described in the EIS would not be changed as a result of the proposed changes. No further assessment of construction impacts is proposed.	Yes
Aboriginal heritage	As proposed changes to the design and construction footprint would result in changes to the proposal site, consideration of potential impacts to Aboriginal heritage is required.	Yes
Non-Aboriginal heritage	The proposed changes to pedestrian bridges and changes to the proposal site would involve work in and adjacent to state and local heritage curtilages. Additional assessment of potential non-Aboriginal heritage impacts of the proposed changes is required.	Yes
Land use and property	The proposed changes would result in changes to the proposal site to accommodate design changes, respond to stakeholder feedback and include additional construction areas. The change to the proposal site and resultant additional land requirements are generally to properties that were identified in Appendix G of the EIS. The exception is at LX605 in the Junee to Illabo clearances enhancement site. The proposed changes at LX605 would result in additional temporary leasing for construction areas and acquisition of Crown land; however, the additional land use impacts are minor and are consistent with the land use and property impacts assessed in the EIS. As discussed in Section 7.2.1.1, the land requirement of the Crown road is not anticipated to sever the road or limit the ongoing use of the Crown land. The existing mitigation measures would manage the impacts of the proposed changes. No further assessment is required for land use and property impacts.	No
Social	Additional land and property would be temporarily impacted, and construction duration extended, which may change the impacts assessed for the proposal.	Yes

Environmental aspect	Comparison of potential impacts of preferred infrastructure against the exhibited proposal	Further detailed assessment required?
Economic	The proposed changes would result in minimal economic changes from what was described in the EIS. No further assessment is proposed.	No
Noise and vibration	Noise and vibration impacts during construction are anticipated to increase as a result of the proposed changes to the design and construction footprint. No changes to operation of the proposal are proposed, therefore no further assessment of operation noise and vibration is required.	Yes
Biodiversity	Due to the changes to the proposal site, additional native vegetation would be impacted by the proposal. Further assessment is required.	Yes
Landscape and visual amenity	The proposed changes would result in changes to landscape and visual impact due to new and revised pedestrian bridge designs. Further assessment is required.	Yes
Hydrology, flooding and water quality	The potential impacts to hydrology, flooding and water quality are consistent with those described in the EIS. The proposal would not extend into additional flood-prone land. At the request of Wagga Wagga City Council, a second bund on the north-eastern cutting of the rail corridor is now proposed at Pearson Street bridge in Wagga Wagga. As the bund on the southern side of the rail corridor provides flood protection to the rail corridor and to land downstream of this location, the addition of a bund on the northern side would not affect flood behaviour beyond the proposal site. No change in the flood behaviour is expected that would be non-compliant with the QDLs applied to the proposal. The design would be further developed during detailed design in consultation with Wagga Wagga City Council. Further assessment is not required.	No
Groundwater	The proposed changes are unlikely to result in interception of groundwater and no groundwater take is proposed. The potential impacts to groundwater are consistent with those identified in the EIS.	No
Soils and contamination	Minor changes to the proposal site are proposed in Wagga Wagga, Harefield, Junee, and between Junee and Illabo. The new areas would not intersect additional areas of potential contamination. Changes to the proposal site would not result in any change to the outcomes of the contamination assessment provided in the EIS. Further assessment is not required.	No

Environmental aspect	Comparison of potential impacts of preferred infrastructure against the exhibited proposal	Further detailed assessment required?
Air quality	Construction-related air quality impacts are anticipated to increase as a result of the proposed changes. The proposed changes would involve additional exhaust emissions from construction plant and equipment, and an increase in dust emissions from additional earthworks. However, construction impacts are likely to be similar in nature to those assessed for the exhibited proposal. Existing mitigation measures in place are suitable to reduce construction air quality impacts associated with the proposed changes. The operational air quality impacts are unlikely to change as result of the proposed changes. Operational air quality impacts have been further assessed in section 6.3. No further assessment of air quality impacts is required.	No
Waste and resource management	The proposed changes would require use of additional resources and would generate additional waste. As the type of materials and waste generated by the proposed changes would be consistent with the exhibited proposal, the existing mitigation measures are considered suitable to manage potential resource use and waste generation impacts during construction.	No
Hazards	The potential hazards associated with the proposed changes would be consistent with those assessed for the exhibited proposal.	No
Climate change risk adaptation and greenhouse gases	The potential climate change impacts from the proposed changes would generally be consistent with those assessed in the EIS. Greenhouse gas emissions would marginally increase from the construction of the additional proposed infrastructure included in the proposed changes, such as the new pedestrian bridges in Wagga Wagga and Junee. No further assessment is proposed.	No
Cumulative impacts	As impacts have changed and there is potential for new projects to be proposed in the vicinity of the proposal since the completion of the EIS for the proposal, the cumulative impact assessment has been updated.	Yes

7.2 Assessment of changes to the proposal

The same assessment approaches that were applied for the EIS have been used to conduct the assessments in this section. The new and revised mitigation measures identified as a result of the assessment of proposed changes or through the Response to Submissions are included in the full list of updated mitigation measures in Appendix B.

7.2.1 Traffic and transport

This section summarises the assessment of the traffic and transport impacts as a result of the proposed changes.

7.2.1.1 Assessment

The proposed changes involve changes to the construction schedule with increased duration of construction identified at most enhancement sites. The proposed changes would result in an extension of the presence of construction traffic; however, the estimated peak construction traffic volumes are not proposed to change. Further assessment of construction traffic impacts is assessed in section 6.1.2.

The proposed design changes to the western ramp of Albury Station pedestrian bridge result in a loss of six informal staff parking spaces at the northern end of Albury Station. The total number of impacted informal staff parking spaces is now eight as the EIS had identified that two parking spaces would not be reinstated as a result of the new DDA-compliant ramp. This would reduce available parking for staff at Albury Station. In accordance with existing mitigation measure TT25 (previously TT19), ARTC will continue engagement with Transport for NSW through subsequent design stages to investigate opportunities to ameliorate residual impacts to parking.

The proposed changes include the realignment of the level crossing (LX605) at Junee and Illabo clearances enhancement site. This design solution resolves the existing short-stacking issue and now maintains the ability for vehicles to perform both left- and right-hand turns into and out of the level crossing, does not decrease the safety and functionality of the road network and does not require alterations to the highway infrastructure.

To accommodate the realigned track, the rail corridor boundary would be adjusted and approximately 0.5 h of the Crown road adjacent to the rail corridor would need to be acquired. Subject to detailed design and property agreements, it is not anticipated that the land requirement of the Crown road would sever the road or limit the ongoing use of the Crown land.

On the southern side of the level crossing there are two farm access roads. The eastern farm access road is anticipated to be permanently impacted due to the realignment of the track and associated adjustment to the rail corridor boundary. However, the western farm access road would be retained and opportunities would be investigated during detailed design to retain the eastern access road to the property. Relevant stakeholders, including the landowner who uses the farm access track, were consulted during the development of the design change at LX605. As outlined in section 5.1.2.2, the relevant stakeholders were generally supportive or provided in-principle support of the design change. Consultation would continue to be carried out during the detailed design stage, and in accordance with new mitigation measure TT27, opportunities would be investigated during detailed design to retain the eastern farm access road to the property.

7.2.1.2 Changed or additional mitigation

Revisions and addition to the mitigation measures have been identified to reflect the proposed changes to traffic and transport impacts (refer to Table 7-2). Revisions to the measures are indicated with deleted text crossed out and new text additions are in blue and underlined.

TABLE 7-2 PROPOSED REVISED AND ADDITIONAL MITIGATION MEASURES FOR TRAFFIC AND TRANSPORT IMPACTS

Phase	Ref	Impact/issue	Mitigation measure
Operation	TT25 ~~TT19~~	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 enhancement site and Wagga Wagga Station pedestrian bridge enhancement site. At the Albury Station pedestrian bridge enhancement site, eight ~~two~~ parking spaces will not be re-instated after construction. These parking spaces will make way for a new DDA-compliant ramp. Engagement with Transport for NSW 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 three parking spaces under the ramp would be investigated during detailed design.
Detailed design/pre-construction	TT27	Access	As part of the track realignment at level crossing LX605, opportunities would be investigated during detailed design to retain the eastern farm access road to the property.

7.2.2 Biodiversity

This section summarises the assessment of the biodiversity impacts as a result of the proposed changes. Refer to the Revised Technical Paper 8: Biodiversity Development Assessment Report, which is provided in Appendix F for further information.

7.2.2.1 Assessment

The potential biodiversity impacts of the proposed changes are generally consistent with those assessed for the exhibited proposal. The proposed changes would result in increase in the area of the proposal site and additional clearing of approximately 0.13 ha of native vegetation (see Table 7-3). In total, the proposal would impact 4.57 ha of native vegetation, comprising 4.53 ha of plant community type (PCT) 277 and 0.04 ha of PCT 5.

The additional native vegetation cleared would include the threatened ecological community (TEC) White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland. The proposal would impact on a total of 2.84 ha of this TEC as listed under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and 0.50 ha of this TEC as listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

The proposal site has been designed to avoid and minimise impacts on native vegetation with most of the proposal site being located in rail corridor within non-native miscellaneous ecosystem areas. The additional clearing primarily is the result of a localised change to the track realignment at level crossing (LX605)(refer to section 3.2.1.4 for further information). The proposal, including the proposed changes, is unlikely to result in serious, irreversible or significant impacts on these communities due to the small area of these communities to be removed and existing fragmentation of vegetation in the area.

No additional threatened flora or fauna species have been identified as likely to be impacted by the proposed changes. The proposed changes do not cross new waterways and therefore no additional impact to aquatic ecosystems are anticipated. The indirect impacts of the proposed changes are consistent with those assessed for the exhibited proposal, as described in chapter 16 of the EIS.

As outlined in Appendix F, the proposal, including the proposed changes, is unlikely to lead to a significant impact on any threatened species or ecological community listed under the EPBC Act. A referral under the EPBC Act is not required.

TABLE 7-3 DIRECT IMPACTS ON NATIVE VEGETATION

	TEC			Extent of impact (hectares)		
PCT	BC Act (NSW)	EPBC Act (Cth)	Vegetation zone	Exhibited proposal	Proposed changes	Total
PCT 5—River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion	N/A	N/A	Poor condition	0.05	-0.1	0.04
PCT 277—Blakely's Red Gum —Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	N/A	N/A	Poor condition	1.29	0.14	1.43
	Yes	Yes	Moderate condition	0.50	0	0.50
		N/A	Derived native grasslands	2.34	0	2.34
	N/A	N/A	Native plantings	0.26	0	0.26
			Total	**4.44**	**0.13**	**4.57**

7.2.2.2 Changed or additional mitigation

Mitigation measures identified in the EIS chapter 27 are sufficient to address the identified potential biodiversity impacts of the proposed changes. Biodiversity impacts would be managed in accordance with the biodiversity management sub-plan, which would be prepared prior to construction and implemented as part of the construction environmental management plan; therefore, additional mitigation measures to manage the potential biodiversity impacts from the proposed changes are not required.

7.2.3 Non-Aboriginal heritage

This section summarises the assessment of the non-Aboriginal heritage impacts as a result of the proposed changes based on a comparison of the assessment included in EIS Technical Paper 3: Non-Aboriginal heritage, by GML Heritage.

7.2.3.1 Assessment

A summary of the proposed changes and assessment on non-Aboriginal heritage impacts is provided in Table 7-4.

TABLE 7-4 SUMMARY OF PROPOSED CHANGES AND ASSESSMENT OF NON-ABORIGINAL HERITAGE

Precinct	Change	Assessment summary
Albury	Albury Station pedestrian bridge design	At the Albury Station pedestrian bridge and Albury Yard clearances enhancement sites, the EIS assessment concluded the following impact to heritage items as a result of the pedestrian bridge replacement and the track slews (including associated work) in Albury Yard: ▸ Albury Railway Station and Yard Group (listed under the State Heritage Register (SHR) – item 01073, Albury Local Environmental Plan 2010 and the ARTC and Transport for NSW section 170 registers)—moderate impact ▸ Railway Conservation Area (listed under the Albury Local Environmental Plan 2010)—moderate impact. The new pedestrian bridge would not change the location of the deck, and spans across the rail corridor as described in the EIS, but the main span has been extended towards the station building side to increase the horizontal clearance from the rail corridor to the bridge's western abutment. The addendum landscape and visual assessment (refer to section 7.2.7) concluded that the visual impact from the proposal would remain consistent with that assessed in the EIS. No additional visual impacts to heritage items are anticipated. No changes to the proposal site are required at this location. Further consideration of the bridge design will be completed as part of the urban design and landscape plan during detailed design.
Wagga Wagga	Pearson Street bridge proposal site	At the Pearson Street bridge enhancement site, the EIS assessment concluded that the use of a portion of the showground for a temporary construction compound would have negligible impact on the Wagga Wagga Showground, 'Kyeamba Smith' Hall, and grandstand (listed under the Wagga Wagga Local Environmental Plan 2010). In response to consultation with the Wagga Wagga Showground Society, the proposal site has been refined to relocate the temporary construction compound to the south-west of the property, between the existing rail corridor and Urana Street. Site access would remain at the existing entry point at Urana Street. The EIS assessment noted the proposal would be located in a portion of the showground, and there were no proposed works to the structures associated with the Wagga Wagga Showground, 'Kyeamba Smith' Hall, and grandstand. The proposed changes are consistent with the EIS assessment.
Wagga Wagga	Cassidy Parade pedestrian bridge design	At the Cassidy Parade pedestrian bridge enhancement site, the EIS assessment concluded there would be a major impact to the Cassidy Parade and Brookong Avenue footbridge (listed under the ARTC section 170 register) as it would be demolished. A minor impact was predicted to the Wagga Wagga Conservation Area (listed under the Wagga Wagga Local Environmental Plan 2010) as a result of this bridge demolition, in addition to other work occurring at nearby enhancement sites. Changes to the proposal include an updated design of the pedestrian bridge. The direction of the ramp on the southern side of the rail corridor has been changed. The ramp on Cassidy Parade now connects with Norman Street, rather than Kildare Street. The bridge deck across the rail corridor has been repositioned to the east by approximately 50 m to improve the ramp grade. The addendum landscape and visual assessment (refer to section 7.2.7) concluded that the landscape impacts from the proposed changes would increase to a moderate impact (from minor in the EIS). The visual impact from the proposal would remain consistent with that assessed in the EIS. No significant additional visual impacts to heritage items are anticipated. Changes to the proposal site include an extension further west within the Cassidy Parade road reserve, within the Wagga Wagga Conservation Area. The proposal site included in the EIS included direct impact to this conservation area; as such, this change is considered minor and not significant to the assessment conclusions. Other changes to the proposal site are minor and do not result in additional impact to heritage items. Further consideration of the bridge design will be completed as part of the urban design and landscape plan during detailed design.

Precinct	Change	Assessment summary
Wagga Wagga	Edmondson Street road bridge and pedestrian bridge design	As a result of the Edmondson Street road bridge replacement and associated works, the EIS assessment concluded the following impact to registered and unregistered (potential) heritage items: ▸ Edmondson Street bridge (the bridge itself was identified as an unregistered, potential heritage item and part of the Wagga Wagga Conservation Area, listed under the Wagga Wagga Wagga Local Environmental Plan 2010)—major impact due to demolition of the bridge ▸ Wagga Wagga Conservation Area (listed under the Wagga Wagga Local Environmental Plan 2010)—minor impact as a result of this bridge demolition, in addition to other work occurring at nearby enhancement sites ▸ Mount Erin Convent, Chapel, High School, and Grounds (listed under the Wagga Wagga Local Environmental Plan 2010) —minor impact ▸ Wagga Wagga Railway Station and Yard Group (listed under the SHR – item 01279, Wagga Wagga Local Environmental Plan 2010 and the ARTC and Transport for NSW section 170 registers)—minor impact. Changes to the proposal include a new, separate pedestrian bridge structure is proposed on the eastern side of the Edmondson Street bridge. The addendum landscape and visual assessment (refer to section 7.2.7) concluded that the landscape impacts from the proposed changes would increase to a moderate impact (from minor in the EIS). The visual impact from the proposal would remain consistent with that assessed in the EIS. No significant additional visual impacts to heritage items are anticipated. Changes to the proposal site include an extension of about 10 m on the north eastern side of Edmondson Street bridge to accommodate the new pedestrian bridge, within the Wagga Wagga Conservation Area. The proposal site included in the EIS included direct impact to this conservation area; as such, this change is considered minor and not significant to the assessment conclusions. Further consideration of the bridge design will be completed as part of the urban design and landscape plan during detailed design.
Wagga Wagga	Wagga Wagga Station pedestrian bridge design	No changes have been made to this pedestrian bridge from the design in the EIS. Changes to the proposal site include minor extensions in two locations to facilitate construction within the Wagga Wagga Conservation Area (listed under the Wagga Wagga Local Environmental Plan 2010). The proposal site included in the EIS included direct impact to this conservation area; as such, this change is considered minor and not significant to the assessment conclusions. Further consideration of the bridge design will be completed as part of the urban design and landscape plan during detailed design.
Junee	Harefield Yard clearances proposal site	No registered and unregistered (potential) heritage items were identified relevant to this enhancement site.
Junee	Kemp Street road bridge and pedestrian bridge design	The EIS assessment concluded the following impact to registered and unregistered (potential) heritage items: ▸ Kemp Street bridge (the bridge itself was identified as an unregistered, potential heritage item)—major impact due to demolition of the bridge ▸ Junee Railway Station, Yard, and Locomotive Depot (listed under the SHR - item 01173, Junee Local Environmental Plan 2012 and the ARTC and Transport for NSW section 170 registers)—moderate impact ▸ Junee Railway Station Moveable Relics (listed under the SHR - item 01172)—negligible impact ▸ Junee Heritage Conservation Area (listed under the Junee Local Environmental Plan 2012)—negligible impact. Changes to the proposal would result in a new pedestrian bridge directly north of Kemp Street bridge. The proposal site has been amended to accommodate the new structure. The addendum landscape and visual assessment (refer to section 7.2.7) concluded that the landscape and visual impact from the proposal would remain consistent with that assessed in the EIS. No significant additional visual impacts to heritage items are anticipated. Changes to the proposal site includes an additional area to the north of Hill Street, which intrudes into the Junee Heritage Conservation Area. The proposal site included in the EIS included direct impact to this conservation area; as such, this change is considered minor and not significant to the assessment conclusions. Further consideration of the bridge design will be completed as part of the urban design and landscape plan during detailed design.

Precinct	Change	Assessment summary
Junee	Junee to Illabo clearances proposal site	No registered and unregistered (potential) heritage items were identified relevant to this enhancement site.

7.2.3.1 Assessment changed or additional mitigation

As the proposed changes would result in minimal change to the non-Aboriginal heritage assessment in the EIS, the mitigation measures identified in the EIS chapter 27 are sufficient to address the identified potential impacts.

7.2.4 Aboriginal heritage

This section summarises the assessment of the Aboriginal heritage impacts as a result of the proposed changes.

7.2.4.1 Assessment

The changes to the proposal site were reviewed by a heritage specialist (GML Heritage) considering the findings of EIS Technical Paper 2: Aboriginal Cultural Heritage Assessment Report. The study area for the Aboriginal cultural heritage assessment included the proposal site and the surrounding landscape of the proposal site to provide environmental and cultural value context. The changes to the proposal site as exhibited in the EIS are within the study area for the Aboriginal cultural heritage assessment report.

The changes to the proposal site are in locations within or adjacent to the rail corridor, which are not considered significant to Aboriginal heritage and are in areas that have been substantially disturbed and were assessed as having no archaeological potential in the EIS Technical Paper 2: Aboriginal Cultural Heritage Assessment Report.

7.2.4.2 Changed or additional mitigation

Potential impacts to Aboriginal heritage would be managed in accordance with the mitigation measures identified in the EIS chapter 27 and the heritage management sub-plan, which would be prepared prior to construction and implemented as part of the construction environmental management plan; therefore, additional mitigation measures are not proposed.

7.2.5 Social

The potential social impacts as a result of the proposal as exhibited were assessed within EIS Technical Paper 4: Social. This section summarises the assessment of the social impacts as a result of the proposed changes.

7.2.5.1 Assessment

Changes to the proposal which may result in additional social impacts include changes to the proposal site and construction schedule.

The proposal site has been changed since the exhibition of the EIS and includes additional land to accommodate proposed design changes, respond to stakeholder consultation and include additional construction areas. Refer to section 3.2.2.1 for further information.

Social impacts from additional land required for the proposal would predominantly relate to land use and property, and amenity impacts; however as noted in Section 7.1, additional land use impacts are minor and are consistent with the land use and property impacts assessed in the EIS. With regard to amenity impact, the assessment of construction noise and vibration in section 7.2.6 concluded that additional impacts resulting from the proposed changes are minor, and mitigation measures identified in Appendix B are sufficient to address the identified potential noise and vibration impacts of the proposed changes. Based on these conclusions, no significant social impacts from additional land required for the proposed changes are anticipated.

Since the exhibition of the EIS, the construction schedule has changed due to a range of factors, such as specialised resource planning, revised staging of bridge closures and scheduling construction around 60-hour rail possessions, as well as changes to the proposal made as part of this Preferred Infrastructure Report. Whilst some changes, such as staging of bridge closures, would reduce social impacts from reducing diversion distances, the increase in duration of construction at most enhancement sites can result in higher levels of impact due to the longer exposure to construction impacts such as amenity, access and safety.

Further consideration of the proposed changes to the construction schedule and potential social impacts is provided below. Changes to the proposal were reviewed against the social impact ratings assigned in EIS Technical Paper 4: Social. The changes in the construction schedule are most relevant to the impact categories of way of life (mobility and accommodation), and health and wellbeing (amenity, safety and hazards).

Albury, Greater Hume-Lockhart and Junee precincts

Although the start to finish work duration may be increased at some enhancement sites, work periods would be interspersed with periods of down time where minimal work would be undertaken. The increased duration of

construction work is not anticipated to result in additional impact to the way of life (mobility and accommodation). The extended duration of construction time would not result in significant changes to the quantum of work (possession time, number of workers, operation of heavy vehicles). This means that the period of intrusive, loud, and labour-intense work is expected be consistent, and additional significant social impacts to health and wellbeing (amenity, safety and hazards) are not anticipated. The proposed changes would result in an extension of the presence of construction traffic; however, the estimated peak construction traffic volumes are not proposed to change.

Based on the consideration provided above, changes to the proposal construction schedule would not result in changes to the social impact ratings assigned in EIS Technical Paper 4: Social and no additional mitigation measures are required.

Wagga Wagga precinct

The impacts associated with way of life (mobility and accommodation) were assessed as Very High for the Wagga Wagga precinct in EIS Technical Paper 4: Social. In addition, the proposed measures are sufficient to mitigate these impacts. Whilst the changes to the construction schedule may result in some change to the level of impacts, the conclusion of a Very High level of impact would remain, therefore, no re-assessment for these impacts is required.

The extended construction time at the Cassidy Parade pedestrian bridge (an additional 18 months) would include periods of reduced activity, and peak construction during scheduled possession periods; as such, the quantum of work resulting in no change associated with noise levels for the residents living in proximity. Therefore, amenity impacts on health and wellbeing are considered to be generally consistent, and significant impacts from the extended duration are not anticipated.

The construction of the Edmondson pedestrian bridge (11 months) coincides with the construction of the road bridge. Whilst additional construction activity would be required for the new pedestrian bridge, assessment of construction noise and vibration in section 7.2.6 concluded that additional impacts resulting from the proposed changes are minor. No significant change to traffic diversions or noise levels would occur. In addition, the measures related to adjusting bus routes, proposed in the EIS, are also expected to be sufficient; therefore, social impacts such as amenity impacts on health and well-being, and safety risks to pedestrians would be generally consistent with those assessed in the EIS.

The proposed changes would result in an extension of the presence of construction traffic; however, the estimated peak construction traffic volumes are not proposed to change. The revised pedestrian bridge construction sequencing would limit social impacts that may otherwise arise from reductions in connectivity (refer to section 6.1.2.5 and mitigation measure TT4).

Based on the consideration provided above, changes to the proposal construction schedule would not result in changes to the social impact ratings assigned in EIS Technical Paper 4: Social and no additional mitigation measures are required.

7.2.5.2 Changed or additional mitigation

Mitigation measures identified in the EIS chapter 27 are sufficient to address the identified potential social impacts of the proposed changes. Social impacts would be managed in accordance with the Social Impact Management Plan, which would be prepared prior to construction and implemented as part of the construction environmental management plan; therefore, additional mitigation measures are not proposed.

7.2.6 Noise and vibration

This section summarises the assessment of the noise and vibration impacts as a result of the proposed changes. The Addendum Assessment to Technical Paper 6: Noise and Vibration (Non-rail) is provided in Appendix G.

7.2.6.1 Assessment

The proposed changes would result in changes to the (non-rail) noise and vibration impacts during construction, particularly due to changes to the proposal site and extension of the construction program. Operational rail noise impacts have been assessed in section 6.2.

Noise

To predict likely changes in construction noise impacts where there are changes to the proposal site, the extent of change and the relative location of the nearest noise sensitive receivers has been considered. Where the proposed change is minor (defined as moving less than approximately 30 m closer to any receiver), a basic distance calculation has been used to estimate likely changes in construction noise.

Where the changes to the proposal site are greater, the noise impacts have been modelled by updating the noise model prepared for the EIS and detailed results presented. As such, noise modelling has been undertaken to consider updated noise impacts at the Pearson Street bridge enhancement site in Wagga Wagga, where the changes results in the proposal site being up to 50 m closer to the nearest noise sensitive receivers.

The proposal site changes have resulted in minor changes to the predicted number of impacted residential receivers during construction works (refer to Table 7-5). At the Pearson Street bridge enhancement site, a reduction in the number of potentially impacted receivers has been predicted due to the changes to the proposal site; however, there is a minor increase in the number of moderately affected receivers. At the Cassidy Parade pedestrian bridge enhancement site, the change in the proposal design and site mean that some nearest receivers may be louder than originally predicted. In both locations, despite the increased impacts, the proposed mitigation measures are sufficient to ensure that no additional receivers are highly impacted as a result of the proposed changes.

Changes to the duration of construction activities would not affect the predicted noise levels; however, may increase (or decrease) the duration of exposure to some work stages.

TABLE 7-5 NOISE IMPACTS DUE TO THE PROPOSED CHANGES

Precinct	Enhancement site with proposal site change	Assessment summary
Wagga Wagga	Pearson Street bridge	The number of highly affected residential receivers is predicted to increase during unmitigated construction works that occur in the vicinity of the proposed change of the compound location in Wagga Show Campground. However, there would be a reduction in the overall number of receivers that would be subject to noise exceedances to the west of the enhancement site.
	Cassidy Parade pedestrian bridge	Due to the extension of the proposal site along Cassidy Parade, noise levels at the receiver closest to the proposed change may be exposed to construction noise approximately 8 decibels (dB) louder than originally predicted. Change in the location of bridge construction activities such as pilling would occur. While this would change the assessment of this scenario, it is noted that the noise scenario with the highest sound level at these locations was associated with earthworks. This scenario was modelled for the entire proposal site, therefore the change in location of the bridge construction activities would not change the worst-case impacts predicated at surrounding receivers. The proposal site would also extend into the Telstra Depot facility of Brookong Avenue north of the rail corridor. Due the location and proximity of the change, no changes to noise levels as assessed in the EIS are predicted.
	Edmondson Street bridge	Due to the small increase in the extent of the proposal site (an extension of 10 m), noise levels at the most impacted receivers are unlikely to change and the number of receivers predicted to be impacted is not predicted to change. Change in the location of bridge construction activities such as pilling would occur. While this would change the assessment of this scenario, it is noted that the noise scenario with the highest sound level at these locations was associated with earthworks. This scenario was modelled for the entire proposal site; therefore, the change in location of the bridge construction activities would not change the worst-case impacts predicated at surrounding receivers.
	Wagga Wagga Station pedestrian bridge Wagga Wagga Yard clearances	The proposed changes to the proposal site do not the change the proximity to sensitive receivers. There are no new or modified structures; therefore, no changes to noise levels assessed in the EIS are predicted.
Junee	Harefield Yard clearances	Due to the low number of receivers in the area and the proposed reduction in the proposal site, no change to the noise levels as assessed in the EIS is predicted.

Precinct	Enhancement site with proposal site change	Assessment summary
	Kemp Street bridge Junee Yard clearances	Due to the small increase in the extent of the proposal site within the rail corridor of about 10 m towards Junee Skate Park, noise levels at the most impacted receivers are unlikely to change and the number of receivers predicted to be impacted is not predicted to change. Change in the location of bridge construction activities such as pilling would occur. While this would change the assessment of this scenario, it is noted that the noise scenario with the highest sound level at these locations was associated with earthworks. This scenario was modelled for the entire proposal site; therefore, the change in location of the bridge construction activities would not change the worst-case impacts predicated at surrounding receivers.
	Junee to Illabo clearances	Due to the low number of receivers in the area and the minor proposed change to the proposal site relevant to the distance of these receivers, no change to the noise levels as assessed in the EIS is predicted.

Vibration

The proximity of vibration-generating works has the potential to change due to the proposed changes to the proposal site. The predicted receivers within the safe working distances for ground vibration (excluding start up and shutdown) were reviewed with the proposed changes, and the following changes were identified:

- At Pearson Street bridge enhancement site in Wagga Wagga, the number of receivers potentially subject to human comfort effects decreases from 53 to 50.
- At Cassidy Parade bridge enhancement site in Wagga Wagga, the number of receivers potentially subject to human comfort effects increases from 58 to 65.
- At Kemp Street bridge enhancement site in Junee, the number of receivers potentially subject to human comfort effects increases from 82 to 84 and the number of receivers potentially subject to cosmetic damage increase from 15 to 18.

The vibration-generating construction works at each enhancement site would be temporary and the level of vibration would only occur for relatively short periods of time. Existing mitigation measures for construction-phase vibration impacts remain applicable.

7.2.6.2 Changed or additional mitigation

The additional noise impacts identified for the proposed changes are minor and consistent in nature to those identified in the EIS. Mitigation measures identified in the EIS chapter 27 are sufficient to address the identified potential noise and vibration impacts of the proposed changes. The approach to mitigation to address construction noise and vibration impacts has been developed in accordance with the ARTC Inland Rail Construction Noise and Vibration Framework (CNVF) and the requirements of the ICNG. The existing mitigation measures as identified in Appendix B are considered to be adequate to manage impacts of noise and vibration identified for the proposed changes.

7.2.7 Landscape and visual

This section summarises the assessment of the landscape and visual amenity impacts as a result of the proposed changes. The Addendum Assessment to Technical Paper 10: Landscape and Visual Impact Assessment is provided in Appendix H.

7.2.7.1 Assessment

The construction methodology and duration varies to a small extent due to the proposed changes; however, the construction phase landscape and visual impacts ratings would generally remain the same as assessed in the EIS. The one exception is increased impact in Junee with views from the Junee Skate Park area looking on increased construction activity due to the new pedestrian bridge.

In the operational phase, the main features of the proposed changes with the potential for landscape and visual impacts are the design changes to four bridges in Albury, Wagga Wagga and Junee (refer to section 3.2.1.1). The landscape and visual impact rating for each bridge have been reassessed considering the landscape character areas and viewpoints as identified in the EIS chapter 17.

The operational visual and landscape impacts from the proposed changes is described below.

Albury Station pedestrian bridge

Changes to the pedestrian bridge design are focused around the ramp arrangement on the western side of the rail corridor directly north of Albury Station. The key visual changes are:

- The new ramp arrangement connecting the pedestrian bridge with the station precinct would be more visually bulky due to the additional switchbacks and overlapping throw screens.
- The length of the ramp connecting the bridge to the entry to the station would be shortened, reducing the prominence of the bridge in views from Railway Place.
- The bridge would continue to be a visually heavy structure due to the anti-throw screens, density of switchback ramps and concrete bridge deck.
- The stairs and ramps would be set back from the façade and maintain the set back from the northern end of the station; however, they would continue to present a more visually complex form that competes visually with views to the main station building from this location.

The Albury Station pedestrian bridge is located in the Albury Station heritage precinct, which, as a landscape character area, has a regional sensitivity. The magnitude of impact from the pedestrian bridge with the proposed changes remains moderate; therefore, the level of impact to the landscape, moderate adverse, remains the same as identified in the EIS.

Based on the location of the proposed changes on the western side of the rail corridor, viewpoints from Albury Station and from Harold Mair Bridge to the north were considered and the level of impact is anticipated to remain the same as identified in the EIS. The view from the Albury Station has a local sensitivity and the magnitude of change from the pedestrian bridge would remain moderate, resulting in a moderate adverse impact. The view from the Harold Mair bridge has a regional sensitivity and the magnitude of change from the pedestrian bridge would remain high-moderate adverse, resulting in a high-moderate adverse impact. The impact to views of Albury Station at night would also remain negligible as assessed in the EIS.

Cassidy Parade pedestrian bridge

The ramp arrangement of the Cassidy Parade pedestrian bridge on the southern side of the rail corridor has changed and the span across the tracks has shifted about 50 m east. The key visual changes are:

- A majority of the pedestrian bridge would be out of view from Cassidy Parade with the bridge crossing located further east.
- A new ramp and stair arrangement would extend west along the railway corridor generally parallel to Cassidy Parade.
- The stairs would continue to be visible in the centre of the view from Cassidy Parade
- The stairs and ramp would continue to sit below the leafy backdrop of leafy residential development.
- The rail corridor and trains would be more visible crossing where the trees along the rail corridor and within the Kildare Street Playground would have been removed.

The Cassidy Parade pedestrian bridge is located in the Cassidy Parade and Brookong Avenue residential area, which, as a landscape character area, has a local sensitivity. The magnitude of impact from the new pedestrian bridge would increase from a low, as assessed in the EIS, to moderate; therefore, the level of impact to the landscape would increase to moderate adverse impact due to the visual changes above.

As the proposed changes to Cassidy Parade pedestrian bridge are mainly visible from the southern side of the rail corridor, an additional viewpoint from Cassidy Parade was considered. The view has a local sensitivity and the magnitude of change from the pedestrian bridge would remain moderate, resulting in a moderate adverse impact. The views from residences on Brookong Avenue at night would improve as a result of the proposed changes moving the bridge crossing further east, reducing the impact from moderate–minor adverse to a minor adverse.

Edmondson Street bridge

A new pedestrian bridge is proposed to be constructed adjacent to Edmondson Street road bridge to the east. The key visual changes are:

- the footprint of bridge infrastructure would increase with the creation of a separate pedestrian bridge
- a separate pedestrian bridge would be visible along the eastern side of the road bridge, rising more gently than the road bridge and with switch back ramps to the north of the rail corridor
- there would be additional trees removed to accommodate the switch back ramps, which would further reduce the shade cover and amenity for the adjacent streets and school.

The new pedestrian bridge is located in the Edmondson Street bridge landscape, which as a landscape character area has a local sensitivity. The magnitude of impact from the new pedestrian bridge would increase from a low, as

assessed in the EIS, to moderate; therefore, the level of impact to the landscape would increase to moderate adverse due to the visual changes described above.

As the proposed changes to Edmondson Street bridge are mainly visible from the northern side of the rail corridor, the viewpoint from Best Street was considered. The view has a local sensitivity and the magnitude of change from the pedestrian bridge would remain moderate, resulting in a moderate adverse impact as identified in the EIS. The impact to views around Edmondson Street bridge at night would also remain low to moderate as assessed in the EIS.

Kemp Street bridge

A new pedestrian bridge is proposed to be constructed directly north of Kemp Street bridge. The key visual changes are:

- the footprint of bridge infrastructure would increase with the creation of a separate pedestrian bridge
- the amenity of the park areas adjoining the new pedestrian bridge, within Endeavour Park, would be further divided by the separate curving pedestrian ramp
- the new route would connect pedestrians more directly to the Junee Recreation and Aquatic Centre and the centre of town
- with the reconfiguration of Kemp Street, there may be a slight overall reduction in the area of open space within Endeavour Park and along the rail corridor.

The new bridge is located in the Kemp Street and south Junee area, which, as a landscape character area, has a local sensitivity. The magnitude of impact from the new pedestrian bridge remains high; therefore, the level of impact to the landscape, high-moderate adverse, remains the same as identified in the EIS.

Based on the location of the proposed changes to the north of Kemp Street, existing viewpoints from Kemp Street to the west of the rail corridor and from the Junee Station platform to the north were considered. The view from the Kemp Street has a local sensitivity and the magnitude of change from the new pedestrian bridge would remain high, resulting in a high–moderate adverse impact. The view from Junee Station has a local sensitivity and the magnitude of change from the new pedestrian bridge would remain high–moderate adverse, resulting in a high–moderate adverse impact. The impact to views of Kemp Street and south Junee at night would also remain moderate–minor adverse, as assessed in the EIS.

One new viewpoint was also considered from the Junee Skate Park north east of Kemp Street bridge (see Figure 7-1). The new Kemp Street bridge would be a much larger feature in this view, being about 3 m taller than the existing bridge, with anti-throw screens, concrete piers and longer bridge approaches extending either side of the rail corridor. A new separate pedestrian bridge would be seen in front of the bridge, including ramps connecting the bridge with the skate park to the east of the rail corridor and Endeavour Park to the west. The view has a local sensitivity and the magnitude of change from the new pedestrian bridge would be moderate, resulting in a moderate adverse impact.

FIGURE 7-1 VIEW SOUTH FROM JUNEE SKATE PARK

7.2.7.2 Changed or additional mitigation

The landscape and visual impacts during construction identified for the proposed changes are minor and consistent in nature to those identified in the EIS and therefore would be managed by existing mitigation measures identified in EIS chapter 27. New and revised mitigation measures have been identified for the design as a result of the proposed changes to minimise visual impacts (refer to Table 7-6). Revisions to the measures are indicated with deleted text crossed out and new text additions are in blue and underlined.

TABLE 7-6 PROPOSED ADDITIONAL MITIGATION MEASURES FOR LANDSCAPE AND VISUAL IMPACTS

Phase	Ref	Impact/issue	Mitigation measure
Detailed design / pre-construction	LV2	Landscape and visual impact	An urban design and landscape plan would be prepared to provide a consistent approach to design, landscaping and landform rehabilitation. The urban design and landscape plan would include: ▸ vegetation screening in strategic locations to minimise impacts from new structures and rail operations, including around bridges and locations where the proposal would be visible from sensitive receivers, where the presence of screening does not impact safe rail operations ▸ integration of batter slopes into the surrounding landscape as far as practicable and inclusion of appropriate slope stabilisation measures to ensure successful rehabilitation and slope stability ▸ appropriate treatment of cuttings to minimise the need for shotcrete, and use of appropriate urban design finishes where shotcrete is unavoidable ▸ appropriate species that respond to the existing landscape character setting and environmental conditions ▸ design guidelines to minimise the visual impacts of infrastructure, with consideration of the existing landscape and visual context ▸ Detailed design would be undertaken in accordance with the urban design objectives developed for the design, and the urban design and landscape plan. ▸ The urban design and landscape plan, including the urban design objectives, will be prepared in consultation with Transport for NSW and relevant local councils.

Phase	Ref	Impact/issue	Mitigation measure
Detailed design / pre-construction	LV3	Landscape and visual impact	▸ The final urban design treatments and landscaping at Kildare Street park (Wagga Wagga) and Endeavour Park (Junee) will be identified in consultation with the relevant council and informed by community consultation. This includes park embellishments where possible. ▸ Where possible, these improvements will provide screening of rail corridor and enhance local landscape character. ▸ Due to its proximity to the Olympic Highway, urban design treatments and landscaping at Endeavour Park (Junee) will be identified in consultation with Transport for NSW.
Detailed design / pre-construction	LV4	Landscape and visual impact	▸ Detailed design of the new road and pedestrian bridges will have regard to *Bridge aesthetics: design guideline to improve the appearance of bridges in NSW* (Transport for NSW, 2019), *Beyond the Pavement* (Transport for NSW, 2020), and be completed in consultation with Transport for NSW and relevant local councils. Where a bridge or its setting is of heritage value, detailed design will consider relevant heritage interpretation recommendations, and the involvement of a suitably qualified heritage specialist and urban designer/architect.
Detailed design / pre-construction	LV12	Landscape and visual impact	The use of throw screens will be limited to the extent necessary to minimise visual clutter and the visual mass of bridges.
Detailed design / pre-construction	LV13	Landscape and visual impact	The urban design and landscape plan will include consideration of screening vegetation along Kemp Street between Ducker Street and Byrnes Road to screen views from adjoining residences where practicable.

7.2.8 Cumulative

The potential for cumulative impacts resulting from the interaction of the proposal with other projects, either existing or proposed, in the surrounding area is considered low. The assessment of potential cumulative impacts has been undertaken in accordance with the SEARs and considers the potential for impacts, taking into account other projects.

A review of potentially relevant projects was completed based on searches of the DPE's Major Projects register, NSW Southern Regional Planning Panel planning register and Transport for NSW projects. The projects identified were screened in relation to their potential for cumulative impacts with the proposal, based on their nature, size and proximity to the proposal site. The construction and operation timeframes of other projects were also considered during screening.

No new State significant infrastructure or State significant development projects with available EISs have been identified in the same local government areas as the proposal. Two new modifications with environmental assessments available have been identified for projects assessed in the EIS. Screening of these modifications is summarised in Table 7-7.

The duration of construction has extended; however, the projects identified to overlap with the proposal remain generally the same as identified in EIS chapter 26. Due to the minor increase in native vegetation removed for the proposal as a result of the proposed changes, the cumulative biodiversity impacts marginally increase; however the cumulative impacts remain low.

The cumulative impacts as identified in the EIS Chapter 26 are consistent with the cumulative impacts of the proposal with the proposed changes. Potential cumulative impacts for the proposal would be managed in accordance with the mitigation measures in Appendix B.

TABLE 7-7 NEW PROPOSED MODIFICATIONS SINCE EIS EXHIBITION IN PROXIMITY TO THE PROPOSAL

Project	Description	Location with respect to the proposal site	Status	Summary of cumulative assessment of modifications
Jindera Solar Farm	A large-scale solar project with the following proposed modifications: ▸ Electrical connection be constructed as an underground transmission line ▸ An increase of inverter stations ▸ Increase the peak vehicle movements per day, from 242 to 292 movements per day.	About 10 km north-west of Table Top Yard clearances	Proposed	Construction of Jindera Solar Farm is predicted to overlap with the beginning of construction of the proposal as identified in the EIS. The construction traffic is predicted to increase however due to the location of the proposed modification in relation to the proposal and magnitude of increase traffic volume, cumulative traffic impacts are not predicted to change. No additional biodiversity impacts are identified for the modification (NGH Pty Ltd, 2023).
Gregadoo Solar Farm	A large-scale solar project with the following proposed modifications: ▸ increased capacity ▸ increase the number of inverters.	About 12 km east of Uranquinty Yard clearances	Approved	Due to the minor nature of the modification, no changes to cumulative impacts are predicted to change as a result. No additional biodiversity impacts were identified for the modification (Premise, 2023).

8. Justification of preferred infrastructure

8.1 Strategic need

The proposal, and Inland Rail more broadly, is supported and influenced by several strategic plans for transport infrastructure and regional development that have been prepared at the national, state and regional levels. The vision, objectives and development of Inland Rail and the proposal have been developed to be consistent with the key national and state strategies, policies and plans.

The proposal, as part of Inland Rail, is needed to respond to the growth in demand for freight transport and address existing freight capacity and infrastructure issues. The proposed changes to the proposal since exhibition of the EIS are consistent with the strategic context of the proposal and the Inland Rail program as described in EIS chapter 2: Strategic context and need.

8.2 Biophysical, economic and social considerations

A proposal of this scale would inevitably have some impacts on the environment, local community and economy, particularly during construction. Additional assessment of traffic impacts during construction and operation, and noise and air quality impacts during operation for the length of the corridor was completed as detailed in this report. The impact of the proposed changes to the proposal since exhibition of the EIS were also assessed in this report. Mitigation measures have been updated in response to the additional assessment and proposed changes to minimise impacts on the community and the environment as result of the proposal. The full list of updated mitigation measures is provided in

The key biophysical potential impacts to the biophysical environment are identified to occur generally during construction. The proposal would remove 4.57 ha of native vegetation, and biodiversity offsets would be finalised and implemented to address the residual impacts of the proposal on biodiversity values. Other temporary biophysical impacts to watercourses, groundwater and air quality would occur during construction. Construction of the proposal would also result in noise impacts to sensitive receivers, particularly during out-of-hours works, and traffic impacts particularly during closure of road bridges in Wagga Wagga and Junee. Other amenity impacts during construction include dust and visual impacts. The majority of the potential construction-related impacts would be effectively mitigated by implementing best-practice construction management measures.

The proposal would have direct and indirect impacts to multiple non-Aboriginal heritage-listed items, resulting in minor-to-moderate impacts to heritage except where bridges would be demolished—being the pedestrian bridges at three state heritage-listed stations, one section 170 heritage-listed pedestrian bridge and two road bridges that have been identified as unregistered potential heritage items. The demolition of the bridges, which have been identified as either having their own individual heritage values or contributing to the heritage value of the landscape in which they are situated, would result in a major collective impact on railway heritage values. Additional opportunities to minimise heritage impacts through design or construction planning would be explored during detailed design, and heritage interpretation and management plans would be prepared. Where the avoidance of heritage items and archaeological sites is not possible, detailed recording and the investigation of re-purposing of salvaged materials would be undertaken prior to construction.

Operational impacts primarily consist of noise, air quality and traffic impacts as result of larger and more frequent trains along the rail corridor and visual landscape as a result of new and more prominent bridges across the rail corridor. High–moderate visual impacts are predicted at viewpoints near Albury Station pedestrian bridge and Edmondson Street bridge as the new bridges at these locations would be taller and more visually prominent.

The more significant impacts to the community are predicted to be from noise and traffic. During construction, noise impacts would be greatest during out-of-hours work on the rail corridor. These impacts would be managed through implementation of the Construction Noise and Vibration Management Plan (CNVP). During operation of the proposal, noise exceedances are predicted to occur at 1,285 residential receivers and 28 non-residential receivers in 2040. Project-specific noise levels have been introduced to guide the selection of noise mitigation measures for residential receivers that exceed the noise criteria, with the Rail Infrastructure Noise Guideline triggers applied to non-residential sensitive receivers on a case-by-case basis. Mitigation measures include at-source controls such as exhaust silencers on trains, noise barriers and at-property treatments such as façade upgrades. Final mitigation measures and timing of implementation would be confirmed in the operational noise and vibration review.

Traffic impacts during construction of the proposal are predominantly associated with traffic delays from diversions during road bridge closures in Wagga Wagga and Junee. Assessment completed for this Preferred Infrastructure Report has identified a number of additional mitigation measures to improve operation of the road network during this period. During operation, impacts from the proposal occur at level crossings, where increased frequency of level crossing closures and increased average duration of a level crossing combined with projected growth in traffic volumes on the road network results in traffic delays. Impacts at level crossings are anticipated to occur in Wagga Wagga and Junee due to relatively high volumes of traffic at these locations during peak periods. Traffic volumes at other level crossings are generally low, and significant delays during operation of the proposal are not anticipated.

Mitigation and management measures to minimise any outstanding impacts of the proposal are identified in this document. These measures, and the proposed approach to environmental management during construction and operation, are summarised in Appendix B of this report.

The following benefits to the community and local economies as a result of this proposal have been identified:

- Construction of the proposal would employ around 770 workers during the construction period, of which around 10 per cent are expected to be sourced from local communities. A local and Indigenous industry participation plan will be implemented during construction.
- Construction of the proposal would create opportunities for the supply of materials and services in the regional study area.
- Improved accessibility across the rail corridor in Albury, Wagga Wagga and Junee through the provision of five new DDA-compliant pedestrian bridges.
- Enhancement of the rail corridor between Albury and Illabo would enable Inland Rail to operate, and support operation of, intermodals and freight-related industries.

The changes to the proposal, as described in this report, were identified in response to community and stakeholder submissions. The proposed changes improve the outcomes of the proposal by:

- minimising pedestrian detour distances for pedestrians during closure of bridges in Wagga Wagga during construction
- minimising pedestrian disruption in Junee by completing construction of a new pedestrian bridge prior to closure of Kemp Street bridge
- providing DDA-compliant pedestrian access at Edmondson Street bridge and Kemp Street bridge via separate, pedestrian bridge structures
- providing a design at LX605 between Junee and Illabo that better meets the needs of relevant stakeholders.

Total domestic freight volumes are expected to grow by more than 20 per cent between 2018 and 2040. Inland Rail will enhance our national freight and supply chain capabilities, connect existing freight routes through rail, roads and ports, and support Australia's growth. It will better link businesses, manufacturers and producers to national and global markets and generate opportunities for industries and regions during construction and beyond. Two-thirds of the freight that will be carried on Inland Rail by 2050 will be for domestic use—including food, white goods, medical supplies, and industrial equipment.

Inland Rail will address the growing freight task by helping to move freight off the congested road network and moving interstate freight off the congested Sydney suburban rail network. It provides a reliable road-competitive solution to the freight task and enables the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight challenge.

8.3 Ecologically sustainable development

The EP&A Act adopts the definition of ecologically sustainable development contained in the *Protection of the Environment Administration Act 1991* (NSW). The following sections provides justification for the proposal, having regard to the principles of ecologically sustainable development defined by clause 193 of the EP&A Regulation.

8.3.1 Precautionary principle

The precautionary principle is defined as:

> *'…if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*

- careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
- an assessment of the risk-weighted consequence of various options'.

A range of environmental investigations have been undertaken during the development of the proposal and the environmental assessment process (including an environmental risk analysis), to ensure that potential impacts are understood with a high degree of certainty. The environmental assessment process has been informed by the environmental risk analysis provided in EIS Appendix E: Environmental Risk Assessment. The assessment of the potential impacts of the proposal is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies and have considered relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to construction and operational arrangements, and the modelling used.

Lack of full scientific certainty has not been used as a reason to postpone or avoid identification and adoption of design or management measures to avoid or minimise environmental degradation. For example:

- Where potential suitable habitat for species credit species is present, the species are assumed present and appropriate offsets have been calculated.
- Where building conditions of sensitive receivers are unknown or final construction methodology is to be determined, the most conservative assumptions have been used in the noise modelling to predict noise levels during construction and operation.
- Monitoring and further investigation have been proposed to verify assessment findings, including groundwater, air quality, noise and vibration monitoring and survey for hazardous materials in the proposal site.

The proposal has been designed to avoid or minimise the potential environmental impacts. The design of the proposal was informed by an options evaluation process, which considered a range of environmental factors alongside engineering and operational requirements, and has responded to the findings of the assessments undertaken. Mitigation and management measures have been proposed to minimise potential impacts where impacts have not been avoided, and these management measures would be implemented during construction and operation. While not all environmental impacts have been avoided, no threat of serious or irreversible damage to the environment arising from the proposal has been identified.

8.3.2 Principle of inter-generational equity

The principle of inter-generational equity is defined as *'…the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations*.'

As outlined in EIS chapter 2: Strategic context and need, the delivery of Inland Rail will deliver social and economic benefits due to improved freight transport. The proposal would, as part of Inland Rail, benefit future generations by providing a safer, more efficient means of freight transport.

Construction of a long, linear infrastructure project, such as the proposal, has the potential for some degree of environmental and social disturbance. These disturbances include the clearing of vegetation, some disturbance to private properties during construction, construction noise, impact on heritage sites, and other localised impacts; however, the potential for environmental and social disturbance as a result of construction has to be balanced against the long-term benefits of the Inland Rail overall. The proposal optimises the use of an existing operational rail corridor and avoids the establishment of a greenfield rail corridor for the Inland Rail program, which would result in greater environmental impacts and changes to land use.

8.3.3 Conservation of biological diversity and ecological integrity

The principle of conservation of biological diversity and ecological integrity is defined as *'…conservation of biological diversity and ecological integrity should be a fundamental consideration'.*

Ecological studies have been undertaken to identify potential adverse impacts on biodiversity. Approaches to avoid and minimise impacts to terrestrial and aquatic biodiversity have been incorporated into the proposal during the options assessment and reference design development. The use of an existing operational rail corridor has minimised impacts to biodiversity, including further severance of habitats and vegetation corridors that a new transport corridor would create. Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as much as possible. For example, installation of a glider pole on each side of the rail corridor would be further investigated to enhance habitat connection between patches of remnant vegetation for Squirrel Glider at the Billy Hughes bridge enhancement site north of Albury.

A biodiversity assessment was undertaken in accordance with the *Biodiversity Assessment Method* (DPIE, 2020) to identify potential adverse impacts on biodiversity. The proposal would result in the clearing of vegetation to facilitate construction. The proposal site has been refined to minimise this impact as much as possible, and conserve native vegetation and fauna habitat as far as practicable, while endeavouring to balance the potential for land use impacts. Mitigation measures are proposed to minimise and manage the significance of the impact on native vegetation and flora and fauna. Biodiversity offsets would be implemented to address the impacts that cannot be avoided.

8.3.4 Improved valuation, pricing, and incentive mechanisms

The principle of improved valuation and pricing of environmental resources is defined as *'…that environmental factors should be included in the valuation of assets and services'.*

The assessment has identified the environmental and other consequences of the proposal, and identified mitigation measures, where appropriate, to manage potential impacts. If approved, the construction and operation of the proposal would be in accordance with relevant legislation, the conditions of approval, and the construction environmental management plan and the operational environmental management framework. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the proposal; this signifies that environmental resources have been included in the valuation of assets and services in the design and assessment of the proposal.

The value of environmental resources is also inherently considered in the development of a design that avoids and minimises impacts.

The reference design for the proposal has been developed with an objective of minimising potential impacts on the surrounding environment. The extra cost of designs, proposal elements, management measures and impact offset or mitigation packages, selected to avoid and minimise environmental and/or social impacts, are included in the total estimated proposal cost.

8.4 Concluding statement

The proposal is needed to support the development of Inland Rail. The proposal, as part of Inland Rail, is needed to respond to the growth in demand for freight transport, and address existing freight capacity and infrastructure issues.

A proposal of this scale would inevitably have some impacts on the local environment and community; however, the proposal would incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable. The majority of the potential construction-related impacts would be effectively mitigated by the implementation of best-practice construction management, including the implementation of the environmental management approaches described in EIS chapter 27 and the mitigation measures detailed in Appendix B of this report. The potential remains for residual impacts, particularly as a result of construction noise at enhancement sites, the loss of some heritage fabric along the existing rail line, the traffic detours at Wagga Wagga and Junee, and changes to open space at Junee. Approaches to further reduce these impacts would be explored with key stakeholders during detailed design, and subject to further communication and engagement with potentially affected receivers during construction.

The biodiversity offsets would be finalised and implemented to address the residual impacts of the proposal on biodiversity values, according to the requirements for Division 5.2 projects under the EP&A Act.

To manage the potential impacts identified by the EIS and this report, and in some cases reduce them completely, a range of mitigation measures would be implemented during construction and operation of the proposal. A full list of the mitigation measures that would be implemented is provided in Appendix B of this report. The environmental performance of the proposal would be managed by the implementation of the Construction and Operational Environmental Management Frameworks. These frameworks would also ensure compliance with relevant legislation and any conditions of approval.

The management measures in the construction environmental management plan would be monitored during construction to confirm their effectiveness and whether any additional measures are required. Environmental site monitoring would also be undertaken to confirm proposal impacts and existing environmental values in accordance with monitoring commitments made in the EIS and this report. An auditing program would also be included in the construction environmental management plan, and be defined by this report, the EIS and the conditions of the approval.

The residual impacts of the proposal are outweighed by the long-term benefits, including:

- enabling Inland Rail to operate by making it possible for double-stacked freight trains to operate between Albury and Illabo
- providing improved accessibility across the rail corridor in Albury, Wagga Wagga and Junee through the provision of new DDA-compliant pedestrian bridges and the inclusion of shared paths on the replacement road bridge in Wagga Wagga
- job creation during construction and flow-on benefits to the local economies around the enhancement sites.

The proposal, as part of Inland Rail, is needed to respond to the growth in demand for freight transport, and to address existing freight capacity and infrastructure issues. Inland Rail would provide the following key benefits:

- boost the Australian economy
- job creation
- provide better access to and from our regional markets
- offer better transit time and reliability for freight transport
- improve road safety by removing more trucks from the road network.

The design and the construction methodology would continue to be developed with the objective of further minimising potential impacts, considering the input of stakeholders and the community. The potential residual construction and operational impacts of the proposal are considered manageable with the implementation of the proposed mitigation and management measures.

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Appendix A Updated Proposal Description

A.1 Proposal features and operation

This chapter provides a description of the features of the proposal (as amended) and how it would operate. The proposed approach to construction is described in Section A.6.

The proposal involves the operation of double-stacked freight trains between Albury and just north east of Illabo, which requires enhancement works to structures and sections of track at 24 enhancement sites along 185 kilometres (km) of existing operational standard-gauge track. As the alignment is presently operational, the proposal does not extend to those existing sections where no works are required.

The enhancement sites are grouped into four precincts which align with the LGAs: Albury, Greater Hume–Lockhart, Wagga Wagga and Junee. A summary of the proposal is in Table A-1.

The proposal described in this chapter is based on the current level of design development that has occurred to date. Detailed design would include further engineering, construction planning and detailed assessment work, and would be subject to further input from key stakeholders and the community. A description of how the design for the proposal was developed is in EIS Chapter 6: Alternatives and proposal options.

TABLE A-1 PROPOSAL FEATURES SUMMARY TABLE

Element	Summary of the proposal	Reference
Description	Enhancement works to track and structures at 24 sites along the existing rail corridor between Albury and Illabo, NSW, to achieve the required clearances to accommodate freight trains of up to 1,800 metres (m) long and 6.5 m high.	
Operational footprint	Within the rail corridor, road reserve and an open area in Junee.	▸ Figure A-27 to Figure A-40
Track work	▸ Adjustments to 44 km of track comprising: ▸ Track realignment at 14 enhancement sites ▸ Track lowering under bridges at three enhancement sites.	▸ Section A.2.1 ▸ Figure A-1 and Figure A-2
Bridge structures	▸ Modification of four rail bridges ▸ Replacement of two road bridges, with pedestrian access provided by new separate pedestrian bridges ▸ Replacement of three pedestrian bridges ▸ Removal of two pedestrian bridges.	▸ Section A.2.2 ▸ Figure A-3 and Figure A-11
Local road network	▸ Intersection works to integrate replacement road bridges at Wagga Wagga and Junee ▸ Adjustment of nine level crossings	▸ Section A.2.2 ▸ Section A.3.1 ▸ Figure A-12 to Figure A-25
Drainage infrastructure	▸ Modifications and replacement of culverts and other track or roadside drainage ▸ New pumping station and stormwater storage tank at Riverina Highway bridge.	▸ Section A.2.1
Ancillary facilities	Road infrastructure, access tracks, signalling including gantry works, signage, fencing and landscaping.	▸ Section A.3
Commencement of operations	The proposal is anticipated to commence in late 2026.	▸ Section A.6.1
Operational workforce	Supported by the existing ARTC workforce.	▸ Section A.6.3

A summary of the key features proposed at each enhancement site are provided in Table A-2. Associated works, including culverts and signalling (e.g. ground signals, gantries and overhead cabling), would occur where track realignments occur as required.

TABLE A-2 KEY FEATURES AT EACH ENHANCEMENT SITE

Enhancement sites	Key features
Albury precinct	
Murray River bridge	▸ Rail bridge alterations
Albury Station pedestrian bridge	▸ Pedestrian bridge replacement (of spans over the rail corridor) and construction of ramps on the eastern approach at Kenilworth Street to the Transport for NSW owned bridge over the Hume Highway.
Albury Yard clearances	▸ Track realignment
Riverina Highway bridge	▸ Track lowering and realignment
Billy Hughes bridge	▸ Track lowering and realignment
Table Top Yard clearances	▸ Gantry removal
Greater Hume—Lockhart precinct	
Culcairn pedestrian bridge	▸ Pedestrian bridge removal
Culcairn Yard clearances	▸ Track realignment
Henty Yard clearances	▸ Track realignment ▸ Level crossing modifications
Yerong Creek Yard clearances	▸ Track realignment
The Rock Yard clearances	▸ Gantry modification
Wagga Wagga precinct	
Uranquinty Yard clearances	▸ Track realignment ▸ Rail bridge alterations ▸ Level crossing modifications
Pearson Street bridge	▸ Track lowering and realignment
Cassidy Parade pedestrian bridge	▸ Pedestrian bridge replacement
Edmondson Street bridge	▸ Road bridge replacement, including new pedestrian bridge
Wagga Wagga Station pedestrian bridge	▸ Pedestrian bridge replacement
Wagga Wagga Yard clearances (including Docker Street gantry)	▸ Track realignment
Bomen Yard clearances	▸ Track realignment ▸ Level crossing modifications
Junee precinct	
Harefield Yard clearances	▸ Track realignment ▸ Rail bridge alterations
Kemp Street bridge	▸ Road bridge replacement, including new pedestrian bridge
Junee Station pedestrian bridge	▸ Pedestrian bridge removal
Junee Yard clearances	▸ Track realignment

Enhancement sites	Key features
Olympic Highway underbridge	▸ Track realignment ▸ Rail bridge alterations
Junee to Illabo clearances	▸ Track realignment ▸ Level crossing modifications, including the upgrade of two level crossings.

A.2 Key features

The key design features of the proposal are described in the following sections and the locations of these features are shown in Figure A-12 to Figure A-25.

A.2.1 Track infrastructure

Track realignment, lowering or removal

Track lowering is proposed at three enhancement sites and track realignment (slew) is proposed at 14 enhancement sites, across the four precincts, to achieve the required clearances for double-stacked trains. The extent of track lowering and realignment is outlined Table A-3.

Horizontal realignment of the track is proposed at enhancement sites to provide clearances from other tracks and structures such as station platforms, retaining walls and bridge supports (refer Figure A-1). Horizontal realignment would be required to the main line, loop lines or, in more limited circumstances, sidings. Minor increases in vertical alignment of the track occur at a number of enhancement sites to match levels and improve track geometry. These alterations are localised and may not completely coincide with the extent of horizontal realignments. Increases in vertical alignment are generally between 50–75 mm.

Track lowering is proposed at enhancement sites where bridges over the rail corridor do not provide sufficient vertical clearance and replacing or modifying the bridge is not feasible (refer to Figure A-2). New independent collision protection and retaining walls are required each side of the track to maintain the stability of the reinforced soil walls and the bridge structure. Concrete protection walls established under the bridge would be up to 4 m high and retaining walls would be up to 2 m high.

Sections of redundant track are proposed to be removed at several enhancement sites including Albury Yard clearances, Henty Yard clearances, Wagga Wagga Yard clearances and Olympic Highway underbridge.

TABLE A-3 PROPOSED TRACK WORKS AT ENHANCEMENT SITES

Enhancement sites	Track	Length (approximate)	Maximum extent of horizontal realignment (approximate)	Maximum depth of lowering (approximate)
Albury Precinct				
Albury Yard clearances	Main line	1,070 m	0.40 m	N/A
	Loop line	1,145 m	18.5 m	N/A
	Loop line (platform)	140 m	0.3 5 m	N/A
	Siding	40 m	0.55 m	N/A
Riverina Highway bridge	Main line	570 m	0.15 m	1 m
Billy Hughes bridge	Main line	730 m	2.15 m	1.40 m
	Siding (Arrival Road)	170 m	0.65 m	N/A
Lockhart–Greater Hume Precinct				
Culcairn Yard clearances	Loop line	460 m	0.15 m	N/A
Henty Yard clearances	Main line	550 m	0.60 m	N/A

Enhancement sites	Track	Length (approximate)	Maximum extent of horizontal realignment (approximate)	Maximum depth of lowering (approximate)
Yerong Creek Yard clearances	Main line	1,190 m	0.70 m	N/A
Wagga Wagga Precinct				
Uranquinty Yard clearances	Main line	1,185 m	0.55 m	N/A
Pearson Street bridge	Main line	500 m	0.05 m	1.6 m
Wagga Wagga Yard clearances	Main line	920 m	0.65 m	N/A
Bomen Yard clearances	Main line	1,160 m	0.85 m	N/A
	Loop line	310 m	0.45 m	N/A
Junee Precinct				
Harefield Yard clearances	Loop line	1,030 m	0.45 m	N/A
	Siding (stock)	140 m	0.45 m	N/A
Junee Yard clearances	Siding (up)	160 m	0.35 m	N/A
Olympic Highway underbridge	Main line (down)	330 m	0.15 m	N/A
		700 m	0.15 m	N/A
	Main line (up)	655 m	0.20 m	N/A
		425 m	1.45 m	N/A
Junee to Illabo clearances[1]	Main line (down)	15,440 m	0.65 m	N/A N/A
	Main line (up)	15,440 m	0.35 m	N/A N/A

Note 1 – It is noted that due to modification of LX605, a section of 1,000 m of both the main line (up and down) would be realigned horizontally up to 16.0 m. This length is included in and not additional to the 15,440 m

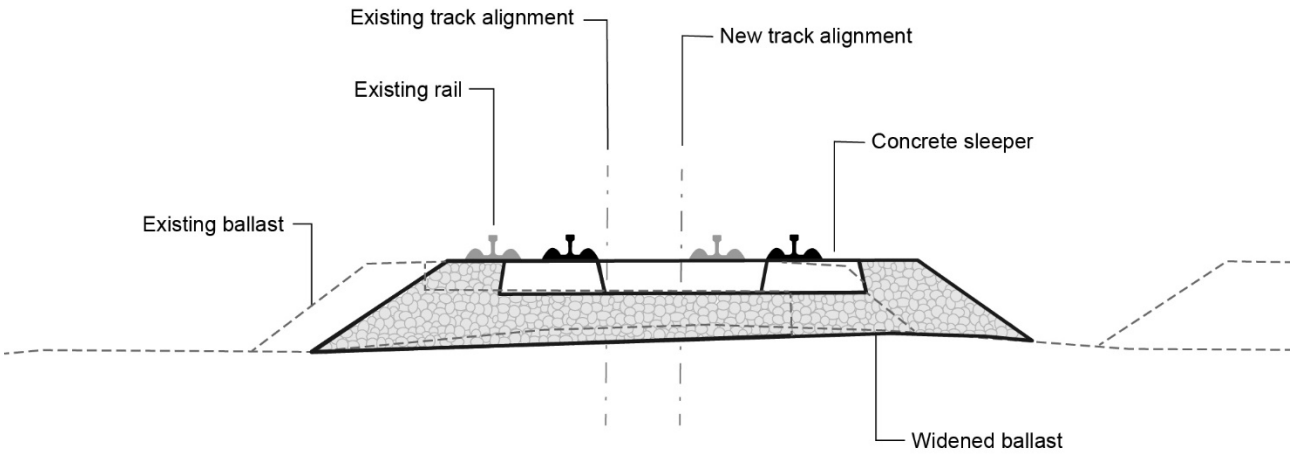


FIGURE A-1 INDICATIVE TRACK REALIGNMENT

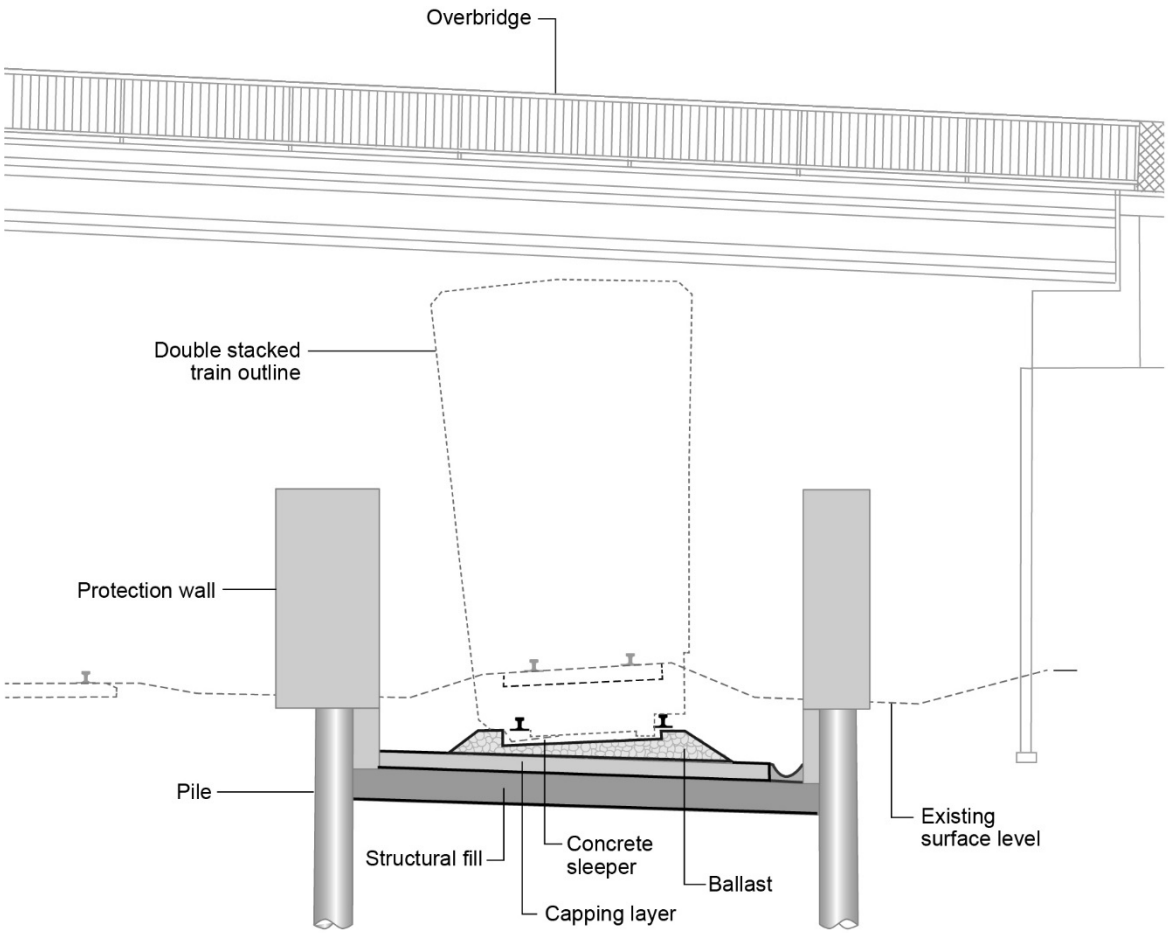


FIGURE A-2 INDICATIVE TRACK LOWERING

Turnouts and cross overs

Turnouts and cross overs are mechanical components of rail that enable a train to be guided from one track to another. Work proposed relating to these components include:

- Albury Yard clearances—replacement of three turnouts and removal of one turnout
- Billy Hughes bridge—approximately 0.6 m realignment of the existing turnout for the Arrival Road siding at Ettamogah
- Henty Yard clearances—removal of a turnout
- Olympic Highway underbridge—one new turnout immediately north of the underbridge and replacement of one crossover at the southern extent of the track realignment
- Junee to Illabo clearances—removal of one cross over.

Track drainage

New or modified drainage required at enhancement sites would be carried out to ensure existing or improved drainage outcomes are maintained as far as practicable. Track drainage infrastructure would primarily be within the rail corridor and would connect to council stormwater infrastructure, where necessary.

Drainage works associated with proposed track works consist of cess drains adjacent to the track, culvert extensions or replacements, intersecting stormwater pipes and gutters. Scour protection would be provided in cess drains and at the outlets of new drainage structures such as rip raps.

Existing track drainage within the enhancement sites would be adjusted to suit the new or revised track levels and address any drainage issues. Modified and new drainage infrastructure would be designed to avoid increasing flooding impacts or improve flood impacts as far as practicable (refer to EIS chapter 18: Hydrology, flooding and water quality).

Overland flows from the regional flooding would need to be managed within the Riverina Highway bridge enhancement site. The lowered track under the Riverina Highway bridge would be managed using cess drains to transfer water to the track low point. Flows would then be transferred to the combined concrete pumping station and storage tank. The pumping station, tank storage and rising main would be located on the south-western side of the

lowered track and would discharge to the existing stormwater network at Wilson Street. Under the current arrangement, external overland flows from The Scots School, adjacent to the rail corridor, discharges to Wilson Street. The overland flow would be intercepted and managed separately to the lowered track drainage and discharged to Wilson Street via an overland flow channel.

At Billy Hughes bridge and Pearson Street bridge, water captured within the lowered track section would be managed by ballast pits to capture water at the new low point on the track, which would then be transferred via gravity through pipes to existing drainage lines. A 0.5-m high flood bund would also be provided at Pearson Street bridge, at the top of the south-eastern cutting, to prevent overtopping of the track. At the request of Wagga Wagga City Council, a second bund is proposed on the north-eastern cutting of the rail corridor and would generally have consistent dimensions with and be parallel to the southern bund.

A.2.2 Bridges

Replacement, removal or modification is proposed to 11 existing bridges in the rail corridor as described in the following section.

Rail bridge alterations

Four existing rail bridges would be modified to achieve the required vertical or horizontal clearances. These are summarised in Table A-4.

TABLE A-4 RAIL BRIDGES

Enhancement site	Proposed rail bridge alterations
Albury precinct	
Murray River bridge	The Murray River bridge would be modified to achieve the required clearances. The existing top chord (portal frame) bracing over the bridge does not provide sufficient vertical clearance for the proposed double-stacked freight trains. The top chord is proposed to be raised by approximately 2.1 m and this structural component would be subject to condition assessment (inspected for defects, general wear and tear and load rated). If the condition assessments prove satisfactory, i.e. that there are none or few repairable defects, the existing top chord members shall be refurbished and repositioned in the structure, atop new stanchions which would provide the necessary vertical clearances. If the assessed component(s) is deemed unfit for refurbishment, it shall be reinstated in accordance with the heritage style of the existing bridge. The replacement members installed would be in the same style, colour and of similar materials refer to Figure A-3). In addition to these works, a permanent walkway to facilitate inspection and maintenance activities would also be established through the centre of the bridge, between the dual tracks, and would not impact either track.
Wagga Wagga precinct	
Uranquinty Yard clearances	This rail bridge over Sandy Creek is a two-span bridge that carries two tracks (main line and loop line) over Sandy Creek. Th bridge is proposed to be modified to accommodate the realignment of the main line track by approximately 0.3 m (refer to Figure A-18). The modification involves shifting the main line track and the metal structure supporting it across the bridge. New precast bearing blocks on the bridge priers would be installed to support the changed track locations. Minor widening on the embankment would occur on the northern side of Sandy Creek.
Junee precinct	
Harefield Yard clearances	The rail bridge over Reedy Creek is a two-span bridge that carries two tracks (main line and stock siding line) (refer to Figure A-22). The alteration involves shifting the stock siding line track on the bridge to align with the track on either side. The fence on the bridge alongside the siding would be replaced to achieve the required clearances. Strengthening works along the bridge may also be required to ensure the bridge is suitable to accommodate double-stacked trains.
Olympic Highway underbridge	The rail underbridge over Olympic Highway in Junee is proposed to be modified to accommodate the track realignment. Parts of the bridge structure supporting the upline track would be replaced and/or strengthened to accommodate the realigned position (refer to Figure A-24). The down-line track would become redundant but may remain in place on the bridge. Investigations would be carried out during detailed design to determine if both up and down mains can remain operational using a signalling solution.

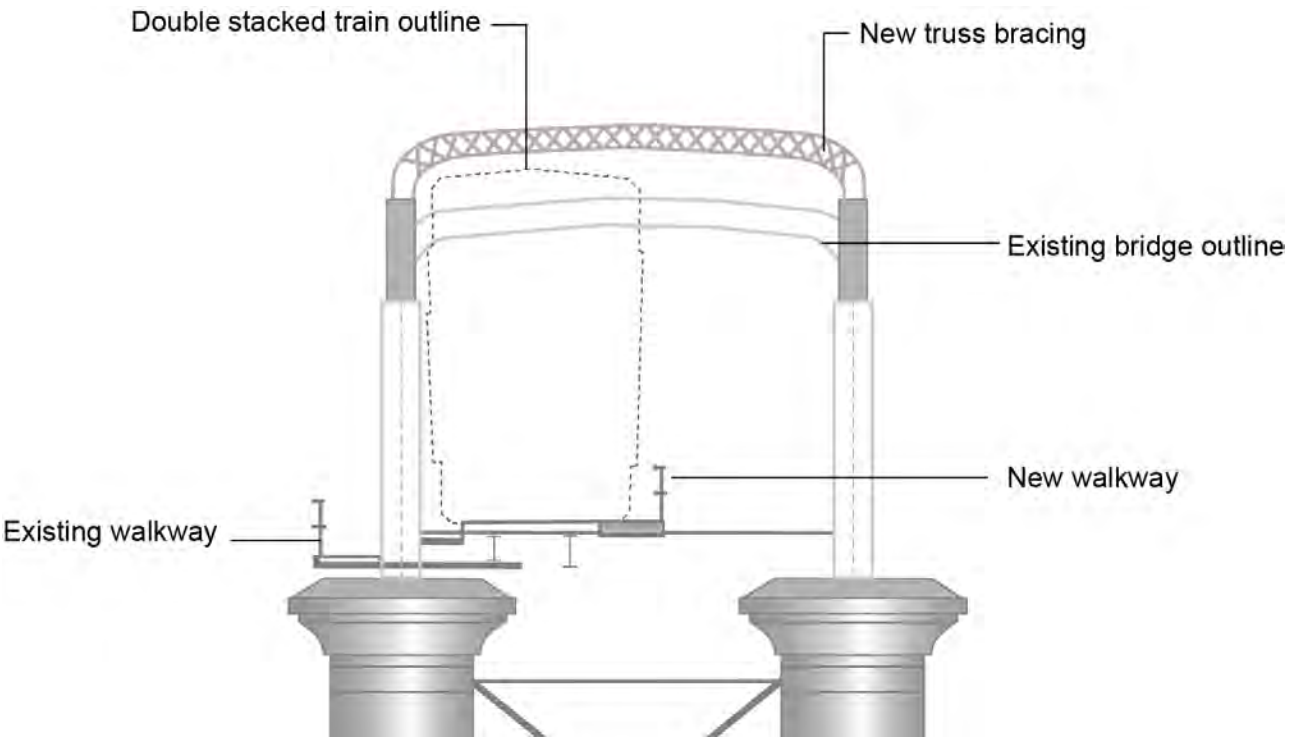


FIGURE A-3 THE MURRAY RIVER BRIDGE (AS PROPOSED)

Road bridges

New road bridges would be required as part of the proposal to accommodate the required clearances at Wagga Wagga and Junee (refer to Table A-5). Track lowering at the Riverina Highway bridge, Albury, and at Billy Hughes bridge, Ettamogah, would not require modifications to the bridge structures.

TABLE A-5 REPLACEMENT ROAD BRIDGES AND NEW PEDESTRIAN BRIDGES

Bridge	Summary
Wagga Wagga precinct	
Edmondson Street bridge	Edmondson Street bridge is a two-span overbridge that carries four lanes of traffic with pedestrian paths on each side over two tracks. The bridge is owned by Wagga Wagga City Council. As of late 2022, southbound lanes including the pedestrian pavement are partially closed due to slumping and structural concerns. The existing posted speed limit is 50 km/hr, with a 40 km/hr school zone applying at relevant times. The bridge would be replaced with a raised single span over the two tracks resulting in removal of the pier in the middle of the rail corridor. The new bridge span would be taller by approximately 2.8 m and would maintain four traffic lanes with shared paths on both sides of the bridge. The bridge design would include an approach span on each side of the main span to enable safe access to the tracks and bridge structure for maintenance, and retaining walls of 10 m in height on each side of the rail corridor to support the northern and southern roadworks approaches to the new bridge (refer to Figure A-4 and Figure A-6). Shared paths for pedestrians and cyclists would be provided on both sides of Edmondson Street bridge. The eastern shared path would be separated from the main structure as a standalone pedestrian bridge structure and would provide Disability Discrimination Act (DDA) compliant access. Pedestrian fencing is to be provided between the roadway and the integrated shared path over the western side of the bridge. Tie-in works would be required to integrate the replacement road bridge and new pedestrian bridge with the existing road and pathway networks, including pavement, line-marking and road drainage. These works would extend to the Edmondson Street intersection with Edward Street and Little Best Street to the north of the bridge and the intersection to the south with Erin Street (refer to Figure A-20). The bridge would be designed to a speed limit of 50 km/hr, with a matching posted speed limit. Throw screens and street furniture (e.g. lighting) would be provided to both bridges as appropriate.
Junee precinct	
Kemp Street bridge	Kemp Street bridge is a six-span bridge that carries two lanes of traffic and a pedestrian path across the railway corridor and Edgar Street in Junee. The bridge is owned by Junee Shire Council. The existing posted speed limit is 50 km/hr. The bridge would be replaced with a three-span road bridge including new piers and abutments along its existing alignment (refer to Figure A-5 and Figure A-7). The location of the two piers has been identified to maximise horizontal clearances from the track. The height of the bridge would be approximately 11 m from rail level at its tallest point, including handrails, which is approximately 2.6 m taller than the existing bridge. The bridge design would include retaining walls of approximately 9 m height on the eastern and western approaches. The replacement road bridge would have two lanes for traffic only; no pedestrian pathway would be provided on the road bridge. The bridge would have a posted speed limit of 50 km/hr. A shared path would be provided as a separate pedestrian bridge structure along the northern side. This new bridge would have a similar height to the replacement road bridge in order to provide necessary track clearances. It would provide DDA-compliant access that would connect into the existing road and pedestrian network (refer to Figure A-23). The current staircase to Edgar Street would not be reinstated, and all future pedestrian/active travel movements would be diverted to the new bridge. Modifications to intersections and associated pedestrian paths would be adjusted to accommodate the new bridge structure. Throw screens and street furniture (e.g. lighting) would be provided to both bridges as appropriate.

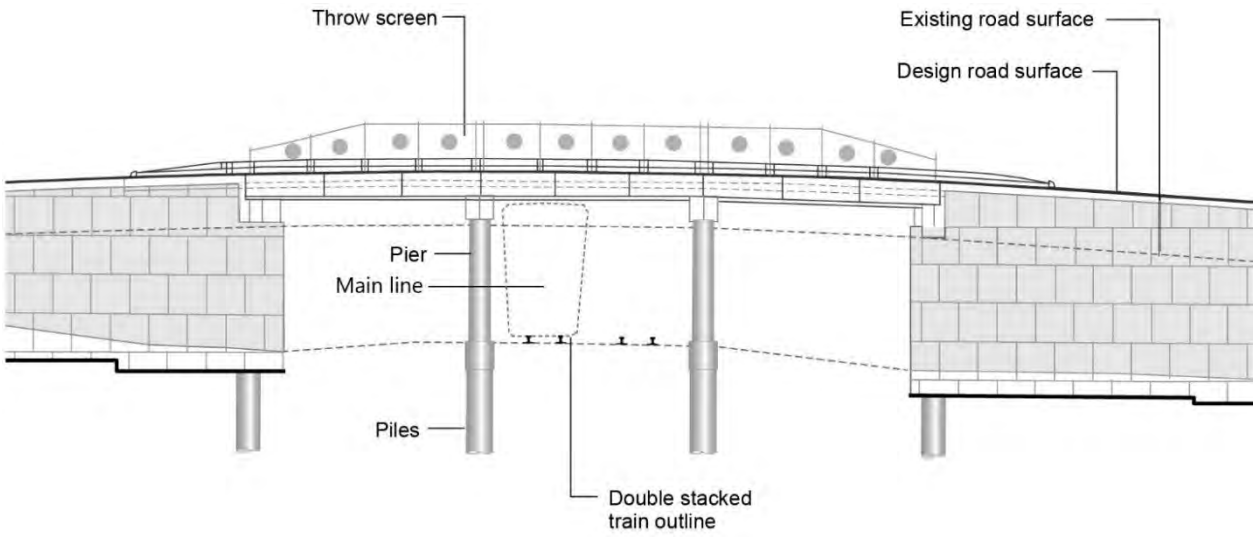


FIGURE A-4 INDICATIVE EDMONDSON STREET BRIDGE

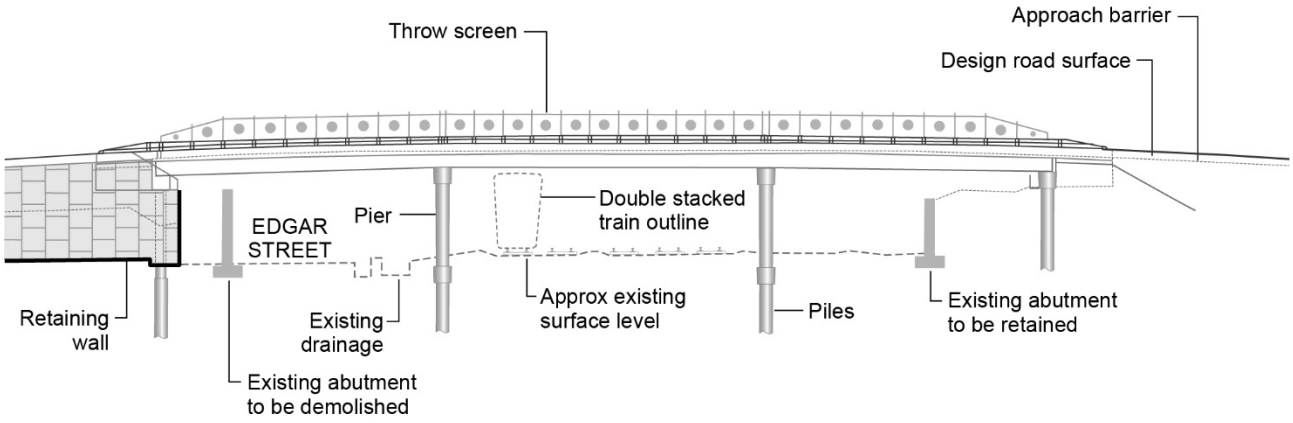


FIGURE A-5 INDICATIVE KEMP STREET BRIDGE

FIGURE A-6 VISUALISATION OF EDMONDSON STREET BRIDGE (FACING SOUTH WEST)

FIGURE A-7 VISUALISATION OF KEMP STREET BRIDGE (FACING SOUTH)

Pedestrian bridges

Three pedestrian bridges over the rail corridor would be replaced and two closed pedestrian bridges would be removed. Further detail is in Table A-6. The new pedestrian bridges are DDA-compliant bridges designed for use by pedestrians and cyclists. The three new bridges would have ramps and stairs to ensure accessibility and throw screens, and handrails would be installed for safety purposes. An indicative image of the pedestrian bridge design is shown in Figure A-8.

TABLE A-6 PEDESTRIAN BRIDGES—REMOVAL AND/OR REPLACEMENT

Enhancement site	Summary
Albury precinct	
Albury Station pedestrian bridge	The section of Albury Station pedestrian bridge over the rail corridor would be demolished and replaced with a new pedestrian bridge. This new section of the bridge would be a steel truss span, which would tie in with the design of the eastern section of the bridge over the Hume Highway. The new bridge section would be approximately 11 m tall at its highest point. Stairs and a ramp would be provided at the western side of the pedestrian bridge to tie in with existing footpaths and station roads including adjustments to the pedestrian crossing on Railway Place. There will be at least 7 spaces retained and there is opportunity for more spaces to be retained based on optimising the design during detailed design. The Albury Station pedestrian bridge connects to the Transport for NSW owned and maintained section over the Hume Highway. A new DDA-compliant ramp would also be established on the eastern end of this section connecting to Kenilworth Street (refer to Figure A-9 and Figure A-13).
Greater Hume—Lockhart precinct	
Culcairn pedestrian bridge	The redundant pedestrian bridge south of Culcairn Station on Balfour Street is no longer accessible and would be removed (refer to Figure A-15). Footpaths would be resurfaced to minimise trip hazards and the pedestrian fence would be adjusted at the level crossing. The opportunity and feasibility to re-purpose the Culcairn pedestrian bridge would be investigated and negotiated in consultation with Greater Hume Shire Council. Any legislative approvals and rehabilitation of the structure associated with retention and ongoing use of these facilities would be the responsibility of the party who takes ownership.
Wagga Wagga precinct	
Cassidy Parade pedestrian bridge	The existing Cassidy Parade pedestrian bridge would be demolished and replaced with a single-span truss bridge with a composite fibre reinforced plastic (FRP) deck. The new pedestrian bridge would be approximately 11 m tall at its highest point. Ramps and stairs would connect to existing roads and footpaths (refer to Figure A-10 and Figure A-20). Minor adjustments to footpaths would be required at Cassidy Parade.
Wagga Wagga Station pedestrian bridge	The existing pedestrian bridge (also known as Mothers bridge) that connects Railway Street to Station Place at Wagga Wagga Station would be removed and replaced with a single-span truss pedestrian bridge with a composite FRP deck. The new pedestrian bridge would be approximately 11 m tall at its highest point. New ramps and stairs would connect to existing footpaths and the pedestrian crossing on Station Place (refer to Figure A-11 and Figure A-20). 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.
Junee precinct	
Junee Station pedestrian bridge	The Junee Station pedestrian bridge, which connects the main station platform to a disused platform on the western side of the track, would be removed (refer to Figure A-23). The pedestrian bridge is no longer in public use. The main platform would be resurfaced to minimise trip hazards. The opportunity and feasibility to re-purpose the Junee pedestrian bridge would be investigated and negotiated in consultation with Junee Shire Council. Any legislative approvals and rehabilitation of the structure associated with retention and ongoing use of these facilities would be the responsibility of the party who takes ownership.

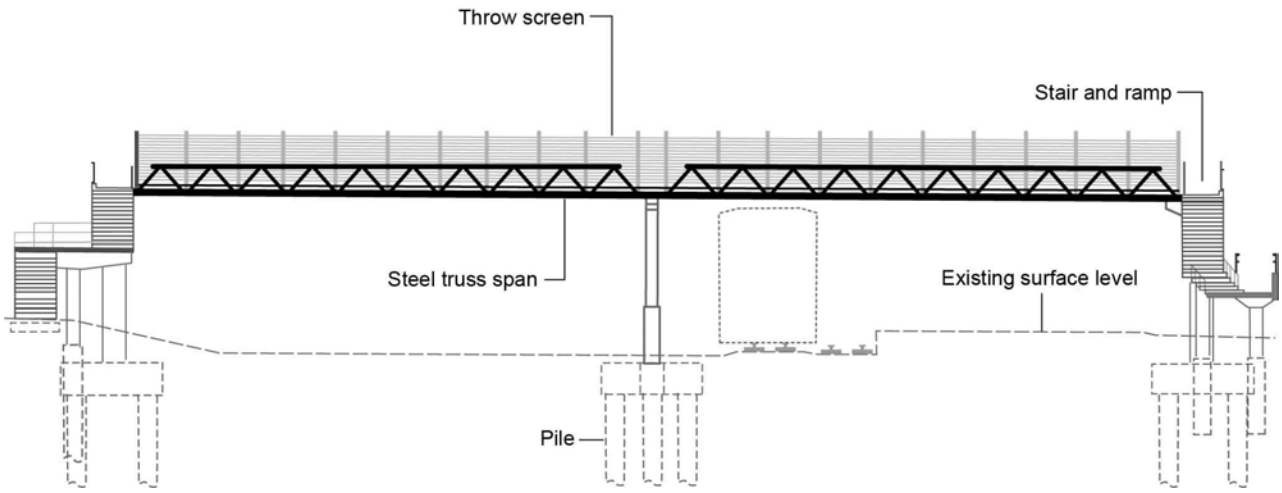


FIGURE A-8 INDICATIVE PEDESTRIAN BRIDGE

FIGURE A-9 VISUALISATION OF ALBURY STATION PEDESTRIAN BRIDGE (FACING SOUTH EAST)

FIGURE A-10 VISUALISATION OF CASSIDY PARADE PEDESTRIAN BRIDGE (FACING NORTH EAST)

FIGURE A-11 VISUALISTAION OF WAGGA WAGGA STATION PEDESTRIAN BRIDGE (FACING SOUTH EAST)

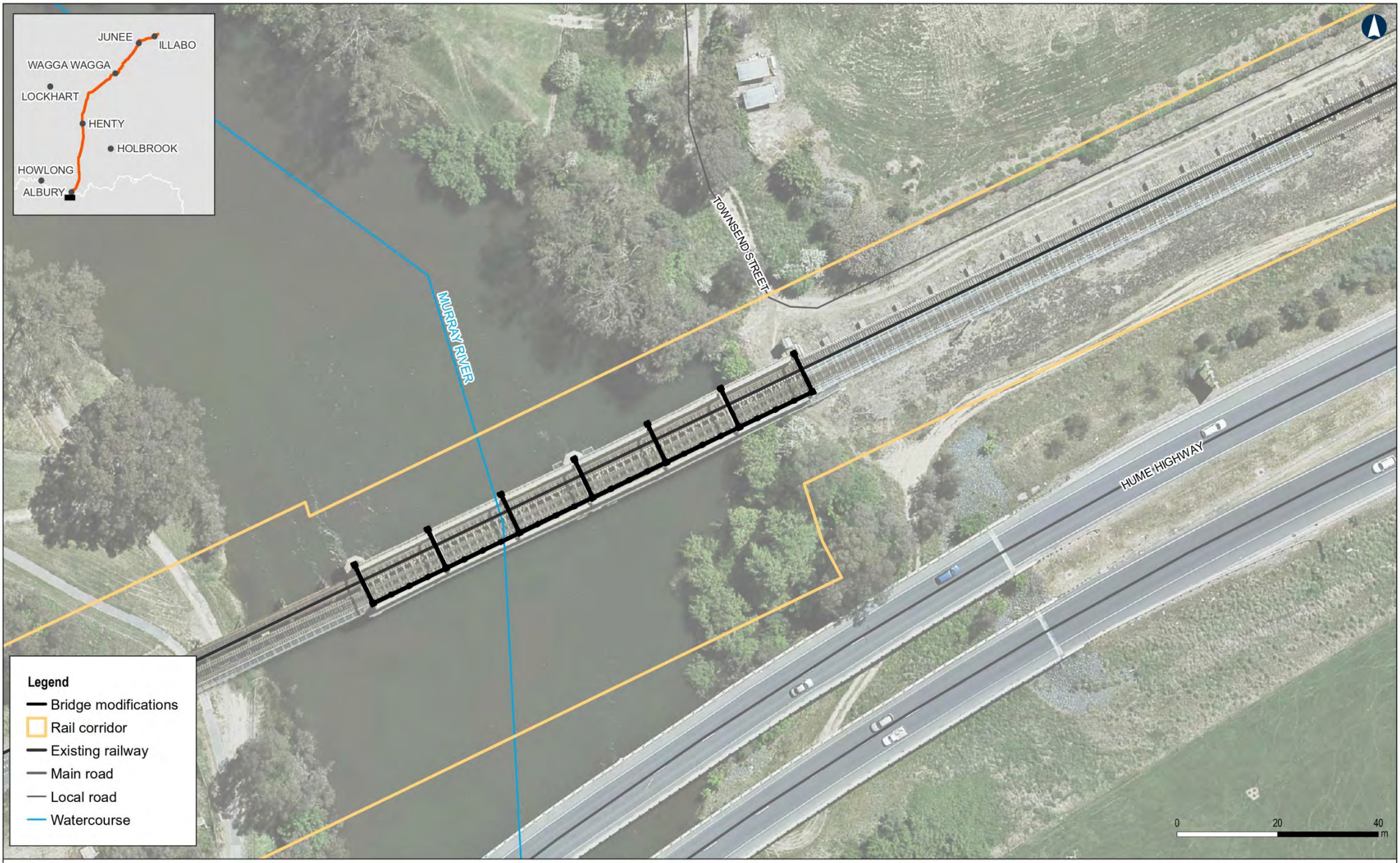


Figure A-12 Key features of Murray River bridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:1,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA12_KeyfeaturesofMurrayRiverbridge_r1v2.mxd

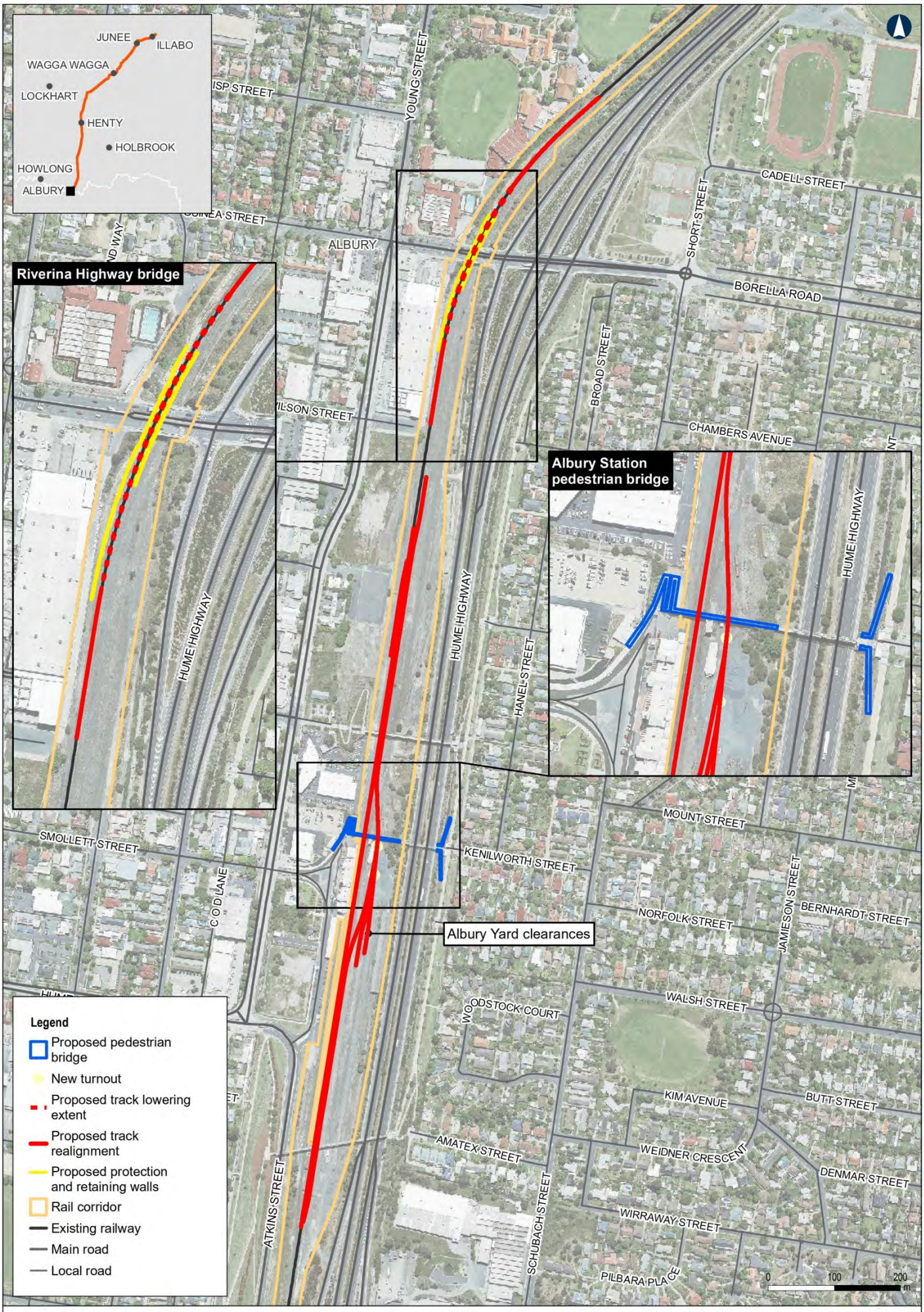
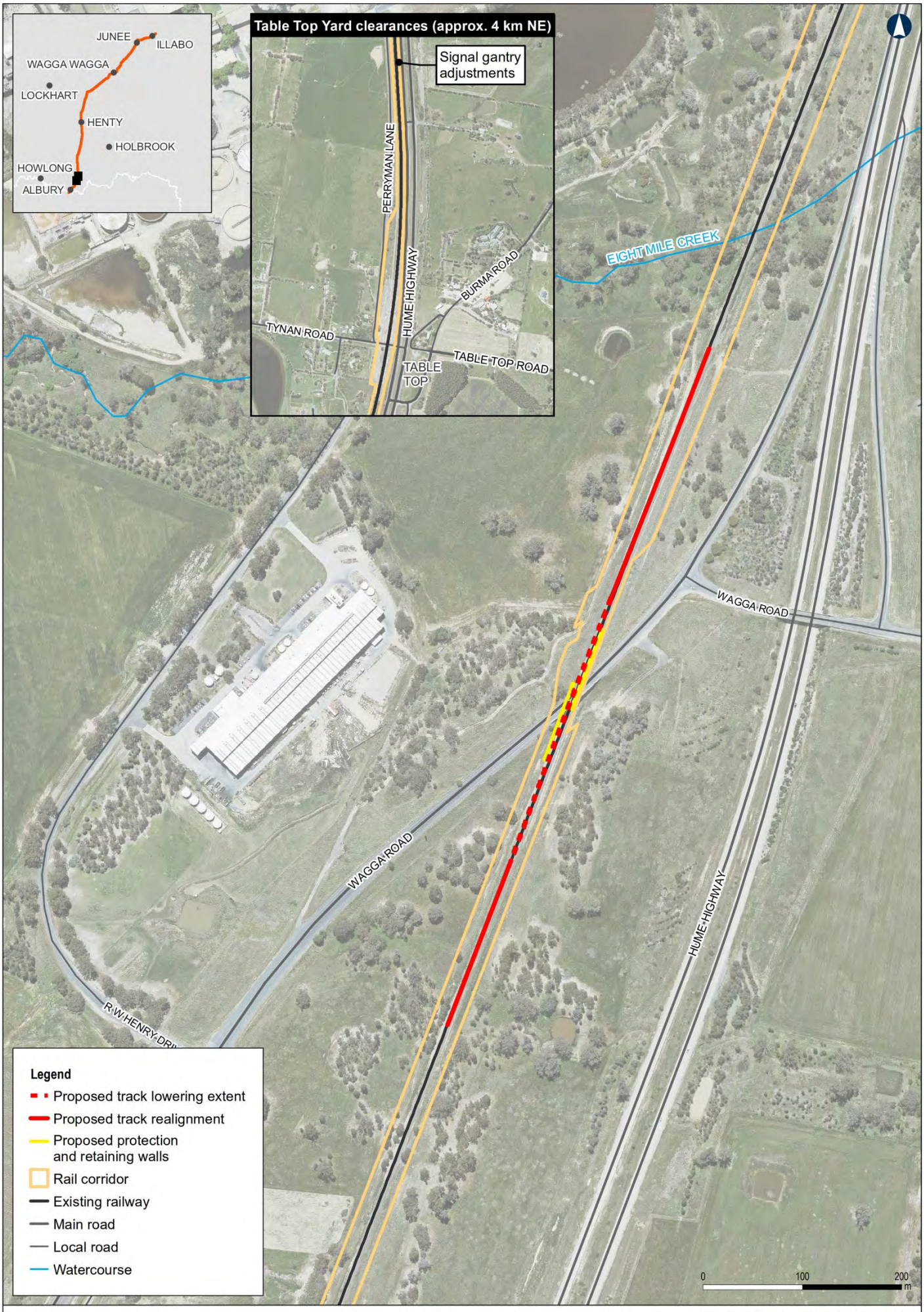


Figure A-13 Key features of Albury Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:7,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA13_KeyfeaturesofAlburyStationandsurrounds_r1v2.mxd



A-14 Key features of Billy Hughes bridge and Table Top Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:5,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA14_KeyfeaturesofBillyHughesbridgeandTableTop_r1v2.mxd

Figure A-15 Key features of Culcairn Yard clearances and pedestrian bridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:3,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA15_KeyFeaturesofCulcairnYardClearancesandPedestrianBridge_r1v2.mxd

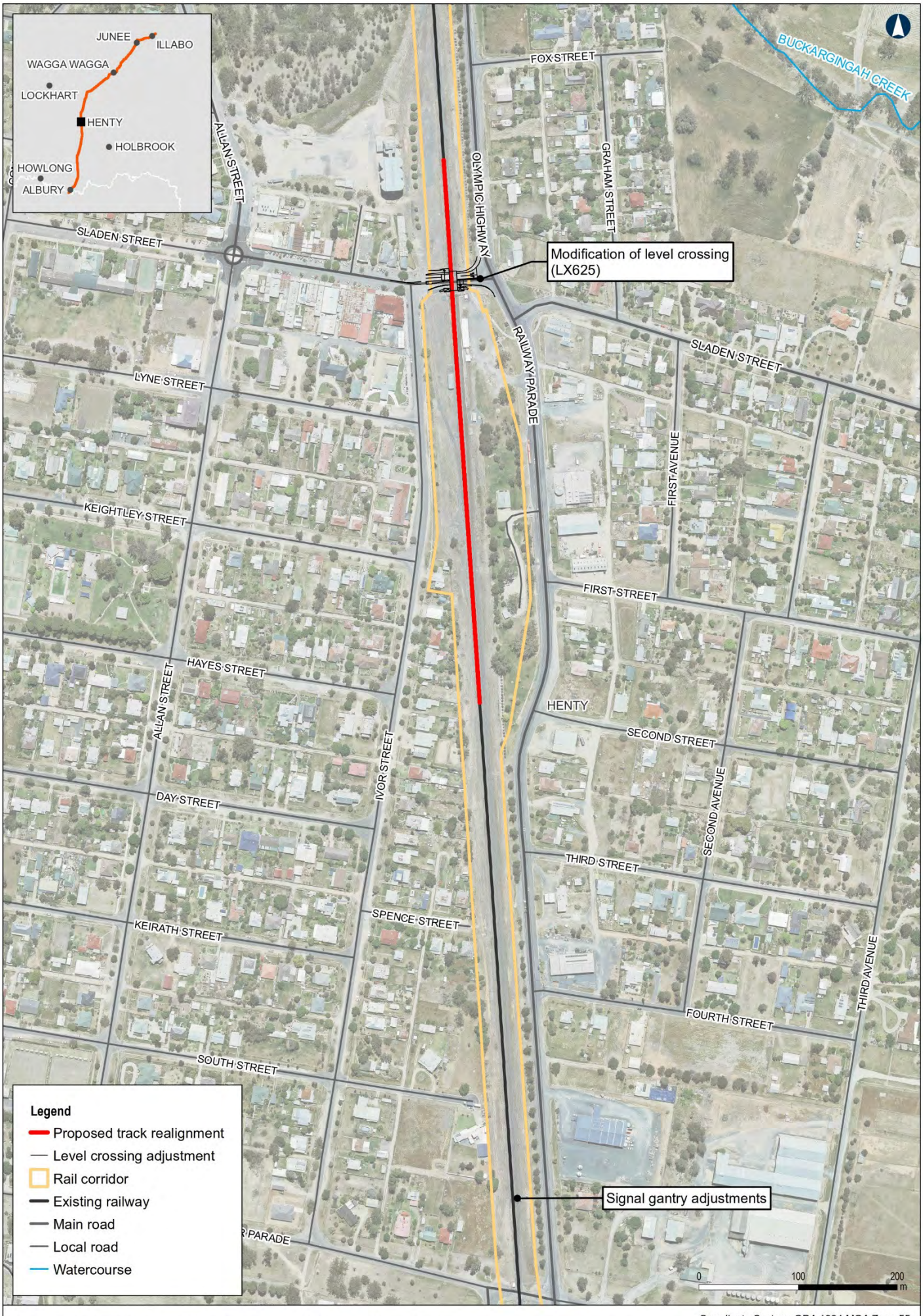


Figure A-16 Key features of Henty Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:5,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA16_KeyFeaturesofHentyYardClearances_r1v2.mxd

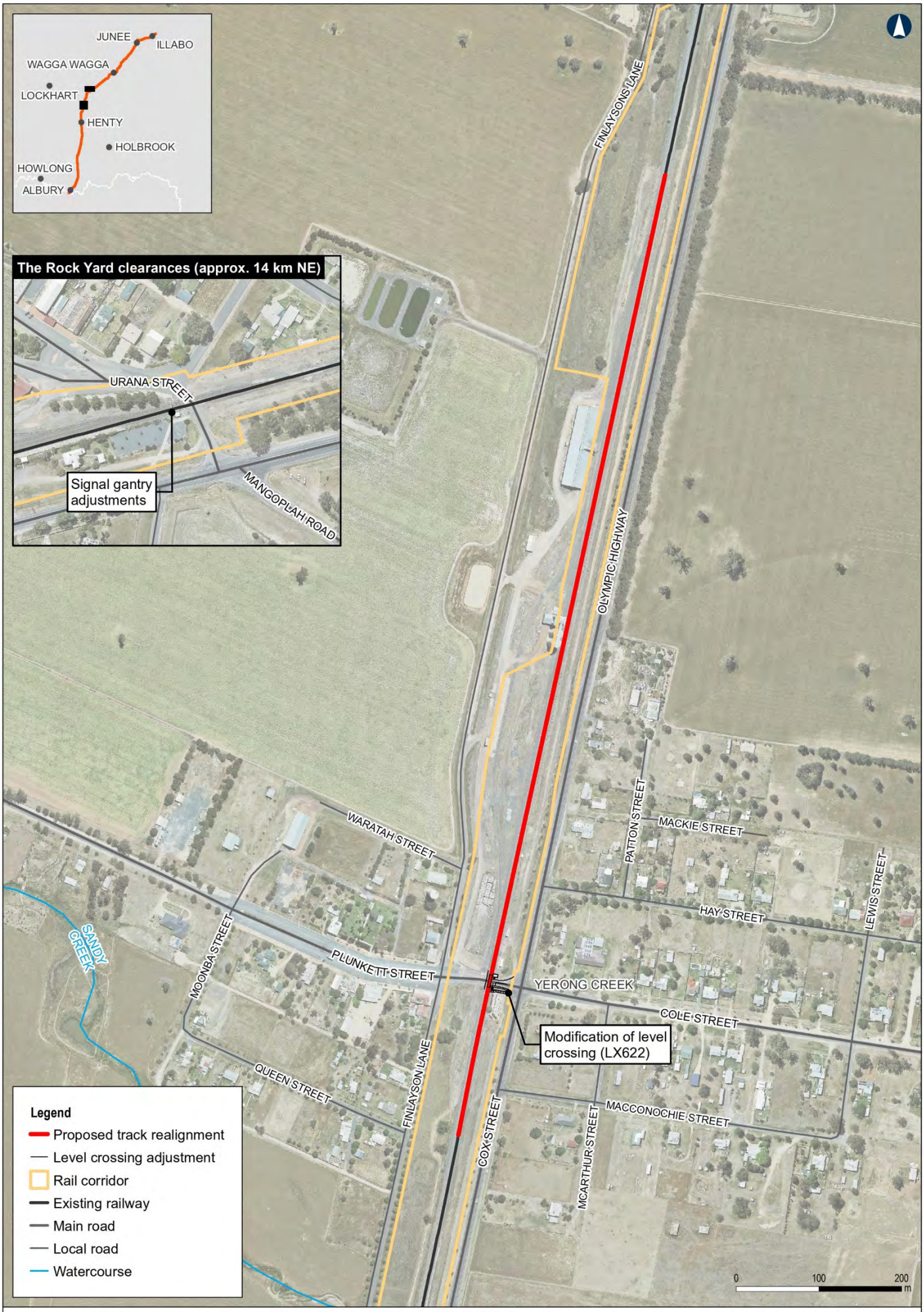


Figure A-17 Key features of Yerong Creek and The Rock Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA17_KeyFeaturesofYerongCreekandTheRockYardclearances_r1v2.mxd

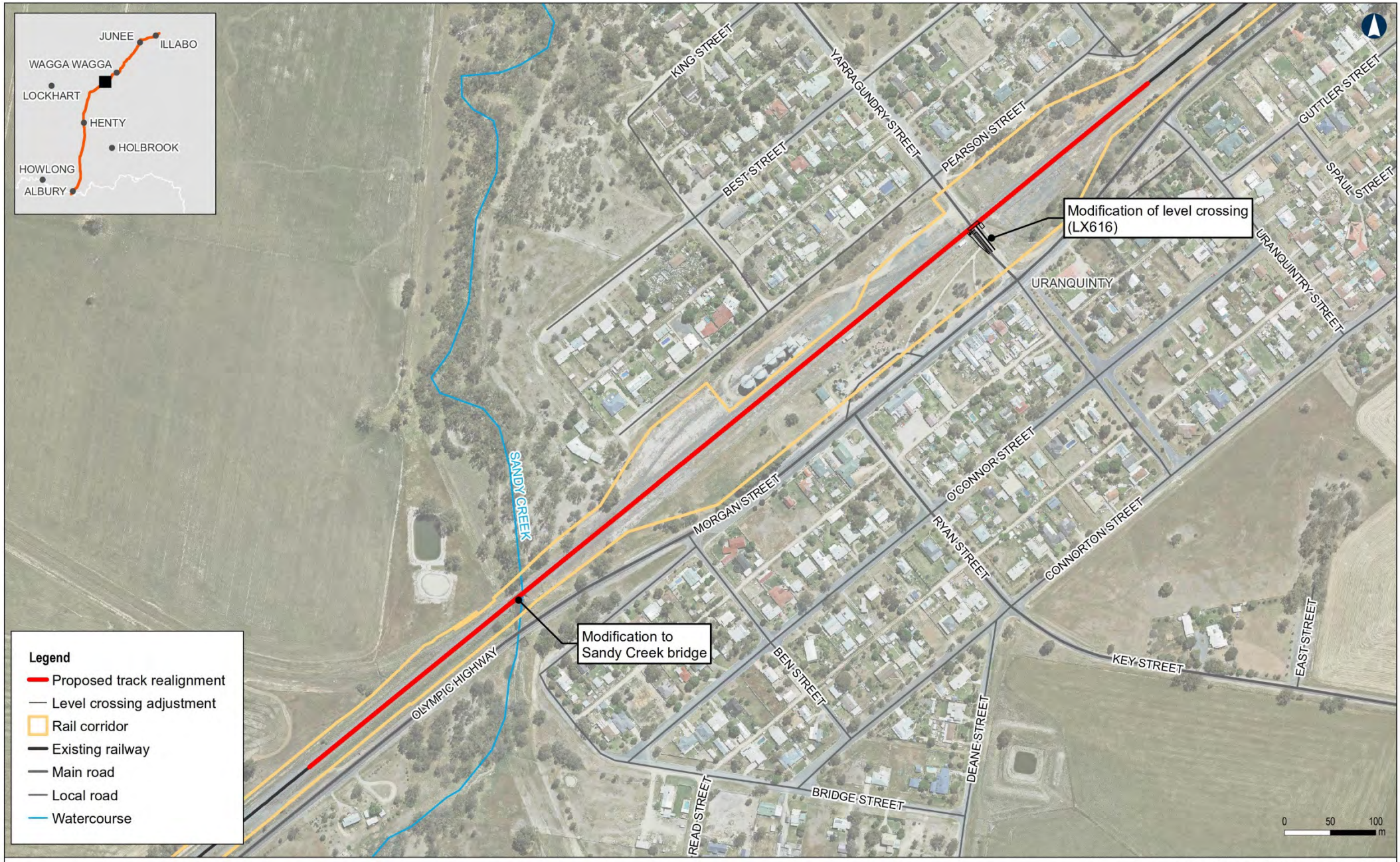


Figure A-18 Key features of Uranquinty Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:5,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA18_KeyFeaturesofUranquintyYardClearances_r1v2.mxd

Figure A-19 Key features of Pearson Street bridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
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Paper size: A4
Date: 27/10/2023

210_EAP_FA19_KeyfeaturesofPearsonStreetbridge_r1v2.mxd

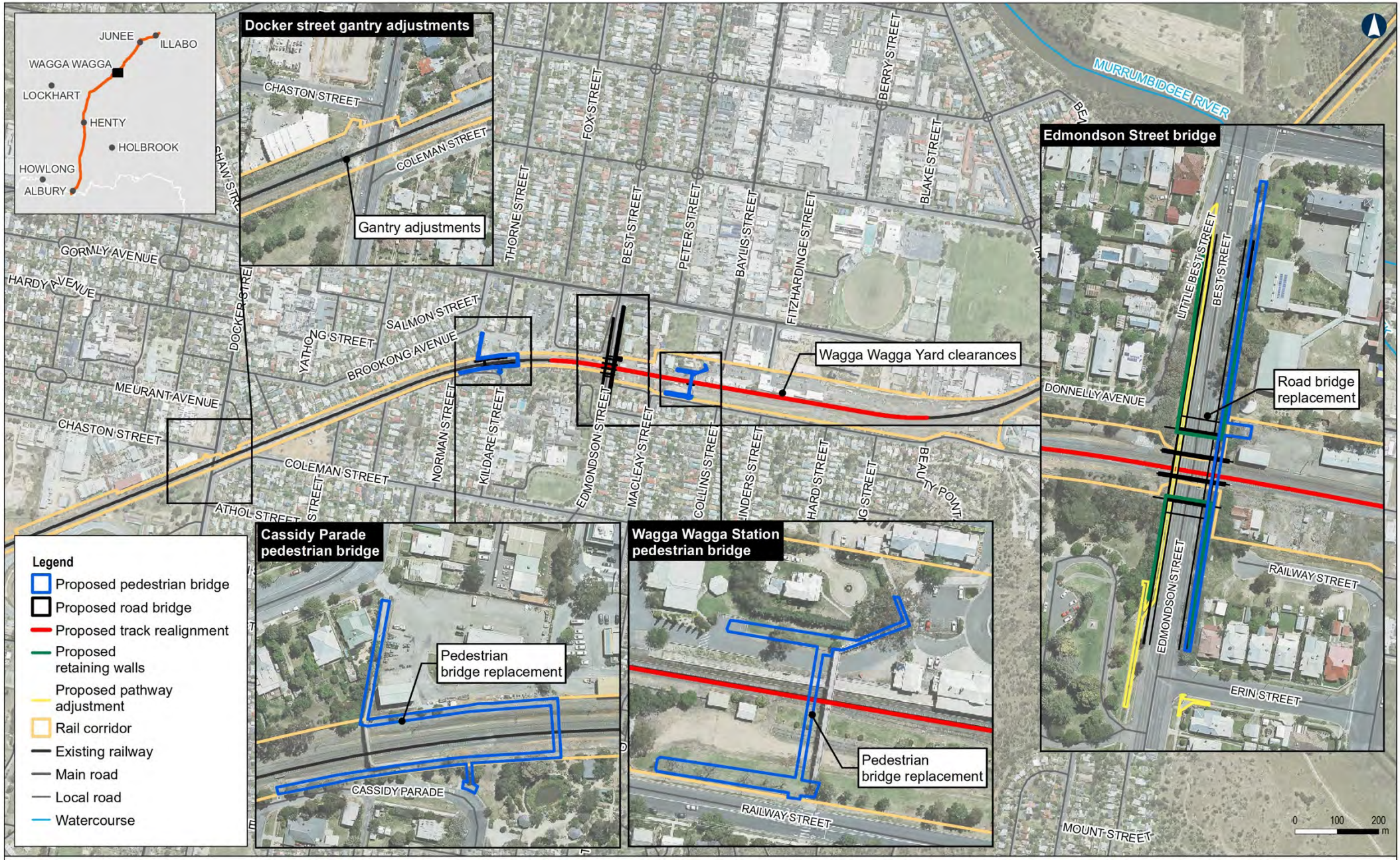

Figure A-20 Key features of Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:12,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA20_KeyfeaturesofWaggaWaggaStationandsurrounds_r1v2.mxd

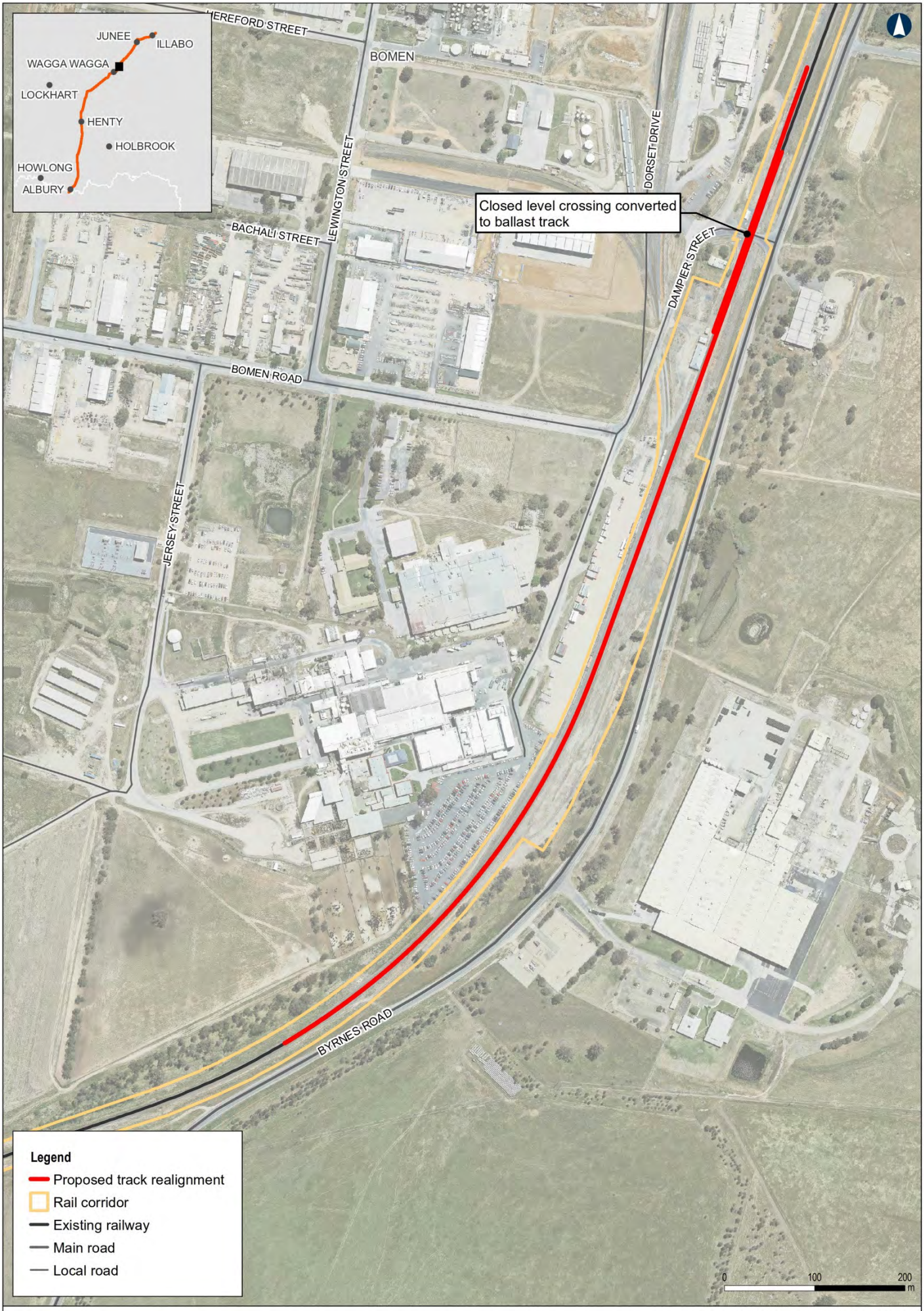

Figure A-21 Key features of Bomen Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
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Paper size: A4
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210_EAP_FA21_KeyfeaturesofBomenYardclearances_r1v2.mxd

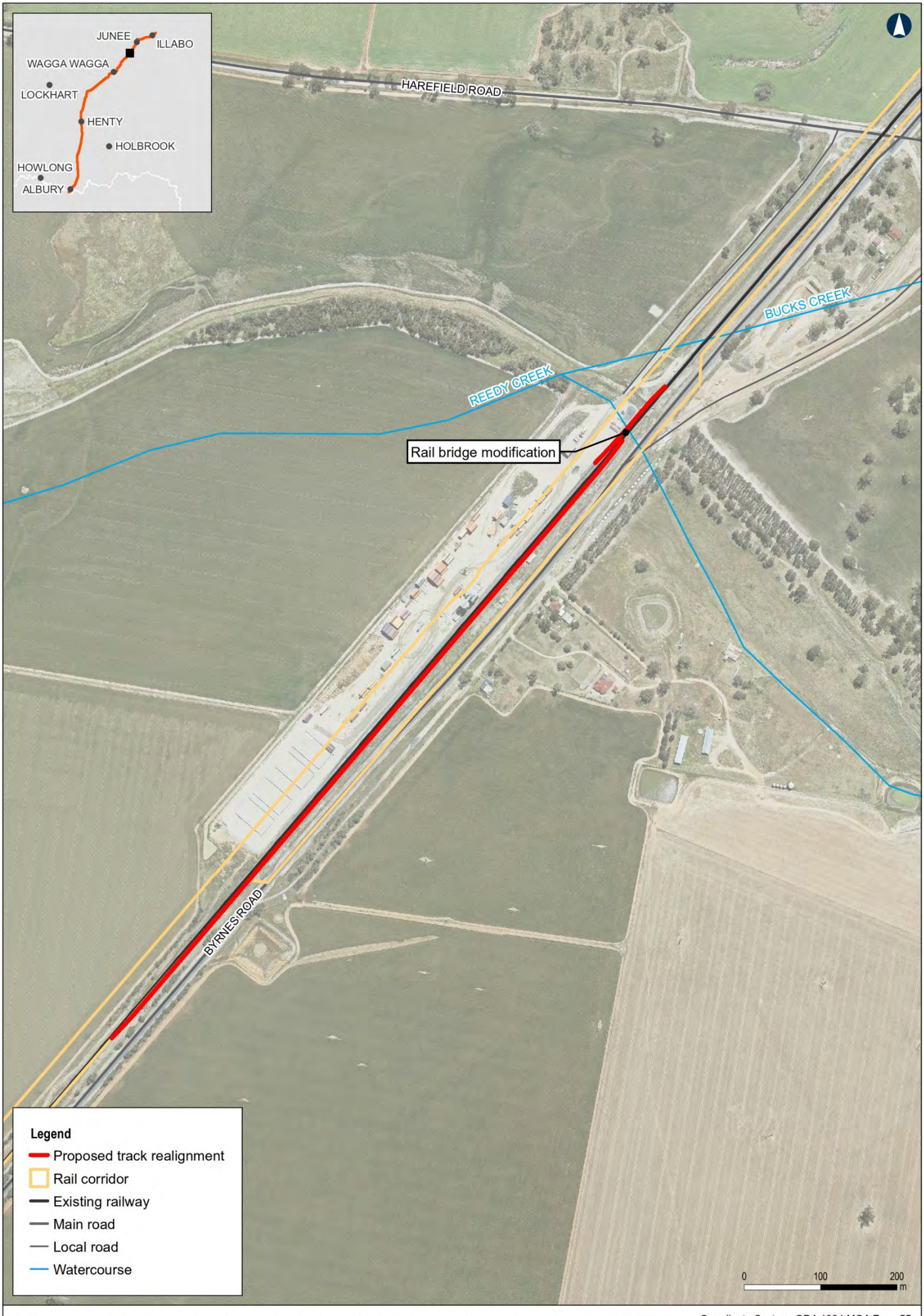

Figure A-22 Key features of Harefield Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA22_KeyfeaturesofHarefieldYardclearances_r1v2.mxd

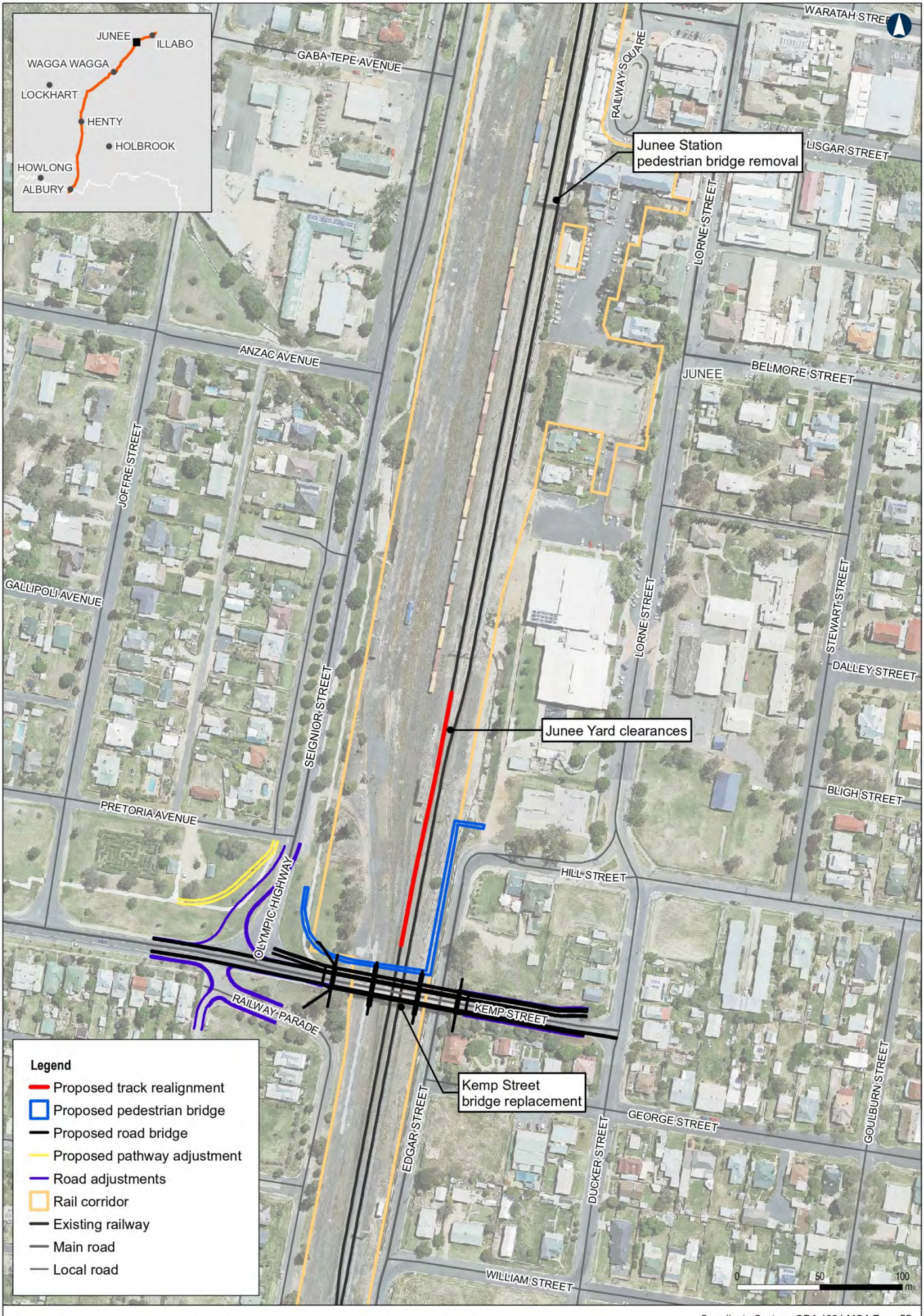

Figure A-23 Key features of Junee Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:3,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA23_KeyfeaturesofJuneeStationandsurrounds_r1v2.mxd

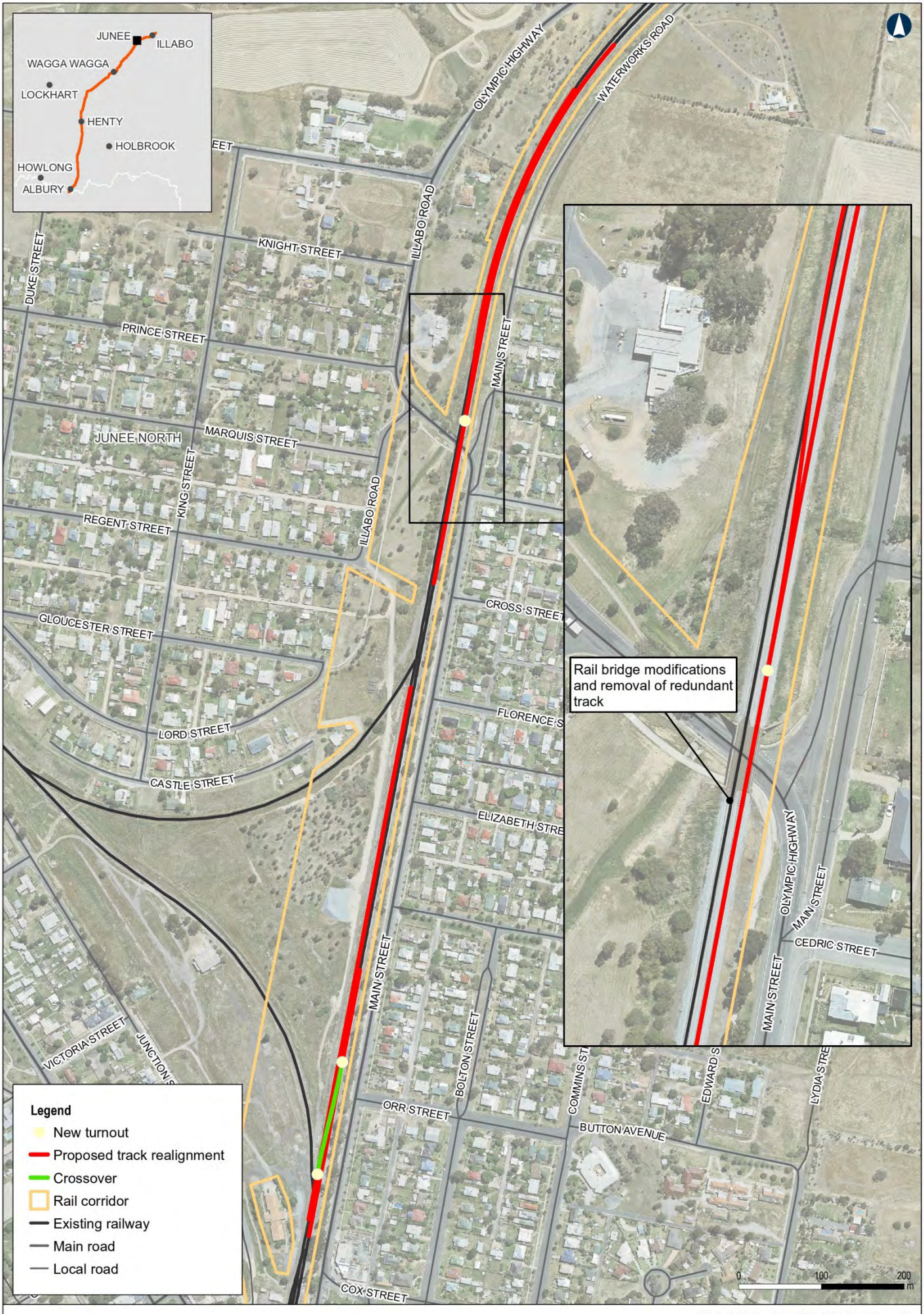

Figure A-24 Key features of Olympic Highway underbridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA24_KeyfeaturesofOlympicHighwayunderbridge_r1v2.mxd

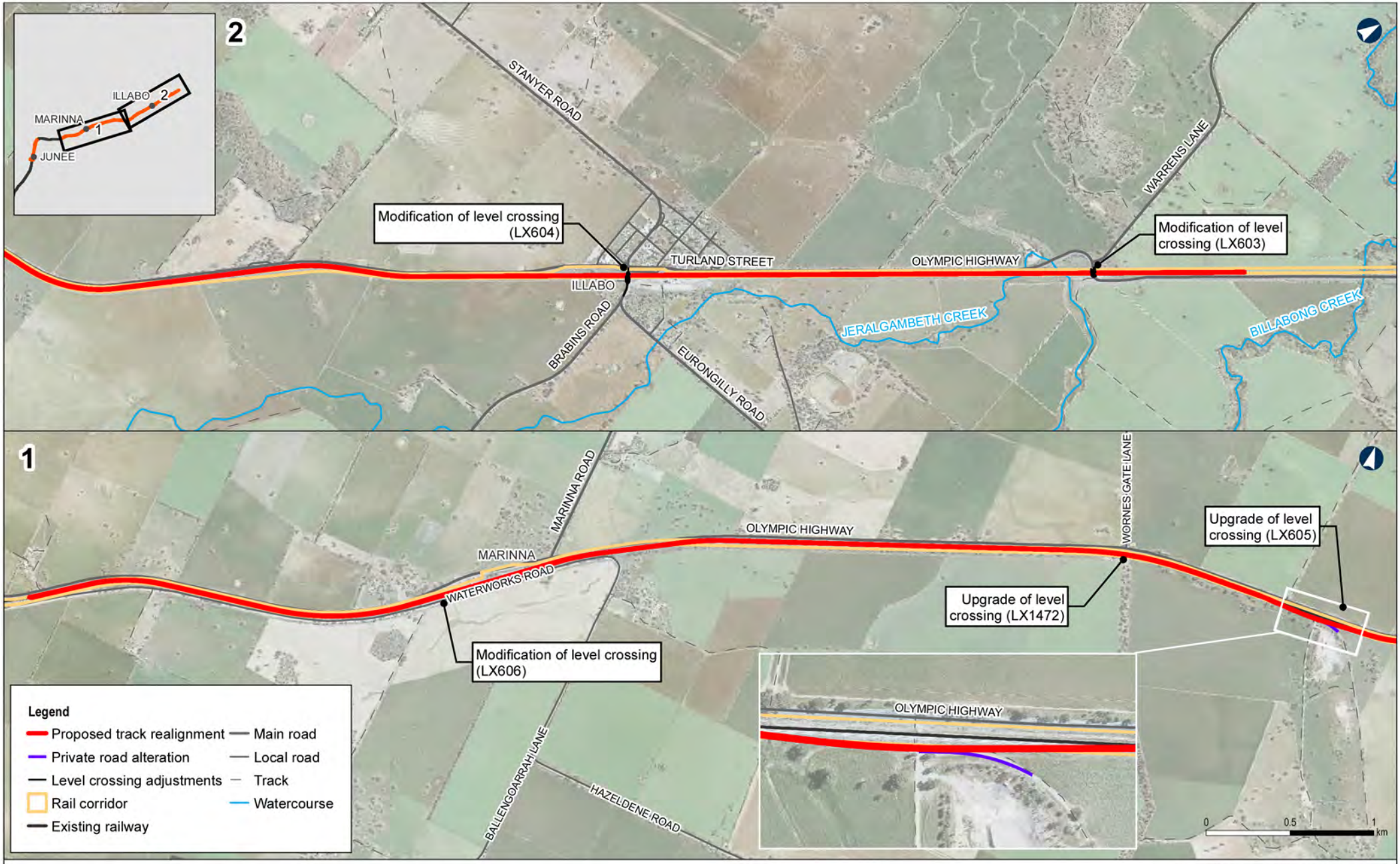

Figure A-25 Key features of Junee to Illabo clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:30,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA25_KeyfeaturesofJuneetoIllaboclearances_r1v2.mxd

A.3 Ancillary infrastructure

Ancillary infrastructure is proposed to support the key features of the proposal described in section A.2. This infrastructure includes modifications to level crossings, establishment of access tracks, modification to signalling infrastructure, new fencing and signage.

A.3.1 Level crossings

Level crossings are points where roads and rail tracks intersect. Passive crossings use stop or give-way signs for motorists, and 'Look for trains' signs for pedestrians. Active crossings have flashing lights and boom barriers for motorists, and, where provided, automated gates for pedestrians. These devices are activated prior to and during the passage of a train through a level crossing. All of the level crossings identified in Table A-7 aside from the Shire and Carter property access road (LX605) and Wornes Gate Lane (LX1472) level crossings are already controlled by flashing lights and boom barriers, which is the highest form of level crossing control under the Australian Standard (AS1742.7-2016).

Where track realignment occurs at these crossings, adjustment to the infrastructure is required to maintain compliance with Australian and ARTC level crossing standards. The road and crossing controls would need to be removed and reinstated, or modified, to accommodate the realignment of the intersecting tracks. This would involve localised pavement construction and widening the verges adjacent to the level crossings, as required. In some circumstances, drainage infrastructure at the crossing and signage on approach to the crossing would be modified. Nine level crossings would be modified to accommodate changes within the rail corridor, as described in Table A-7.

The final level crossing treatments would be subject to detailed design.

TABLE A-7 LEVEL CROSSING PROPOSED TO BE MODIFIED

Enhancement site	Level crossing	Road type	Existing level crossing type	Proposed work
Greater Hume-Lockhart precinct				
Henty Yard clearances	Sladen Street (vehicular and pedestrian) (LX625)	Local road	Active vehicular crossing and passive pedestrian crossing	Level crossing would be modified to accommodate the realigned track and the pedestrian crossing would be upgraded to an active crossing, with pedestrian mazes provided. ARTC is continuing to consult with Transport for NSW to determine a suitable solution to an existing potential short-stacking deficiency for heavy vehicles at this level crossing. This will be confirmed during detailed design. The proposed modifications associated with the realigned track do not introduce this deficiency.
Yerong Creek Yard clearances	Plunkett Street (vehicular and pedestrian) (LX622)	Local road	Active vehicular and pedestrian crossing	Level crossing would be modified to accommodate the realigned track.
Wagga Wagga precinct				
Uranquinty Yard clearances	Yarragundry Street (vehicular and pedestrian) (LX616)	Local road	Active vehicular and pedestrian crossing	Level crossing would be modified to accommodate the realigned track.
Bomen Yard clearances	Dampier Street	N/A	Closed off vehicular crossing	Closed level crossing would be converted to ballast track.
Junee precinct				
Junee to Illabo clearances	Waterworks Road (LX606)	Local road	Active vehicular crossing	Level crossing would be modified to accommodate the realigned track. Changes to priority (with new signage and pavement) would occur on the intersection of Waterworks Road and the level crossing to address short-stacking at this location.

Enhancement site	Level crossing	Road type	Existing level crossing type	Proposed work
	Wornes Gate Lane (LX 1472)	Crown road	Passive vehicular crossing	This level crossing is minimally used and is not the primary access point for any private property. The level crossing would be modified to accommodate the realigned track and upgraded from a passive to an active level crossing. However, ARTC's preferred design solution would be permanent closure of this level crossing, subject to stakeholder agreement. Consultation would continue separately with relevant stakeholders on the potential permanent closure of this level crossing; this action has not been included in the scope of the proposal and would occur through ARTC's operational responsibilities.
	Shire and Carter Property access road (LX605)	Private road	Passive vehicular crossing	Level crossing would be modified to accommodate the realigned track (about 16 m south of the existing) and upgraded from a passive to an active level crossing.
	Brabins Road (LX604)	Local road	Active vehicular crossing	Level crossing would be modified to accommodate the realigned track.
	Olympic Highway (LX603)	State road	Active vehicular crossing	Level crossing would be modified to accommodate the realigned track.

A.3.2 Access tracks

New access infrastructure is proposed within the rail corridor to ensure the proposed assets can be properly inspected and maintained. Rail maintenance access roads (RMAR) would be proposed at enhancement sites with inadequate access arrangements. All new culverts and bridge structures are proposed to have walkway provisions, including handrails, to meet safety requirements.

Site-specific infrastructure proposed also includes:

- Murray River bridge—a permanent walkway to facilitate inspection and maintenance activities would also be established through the centre of the bridge, between the dual tracks, and would not impact either track.
- Riverina Highway bridge:
  - a combined concrete-lined RMAR and drainage channel is proposed to be constructed on the north- western side of the bridge commencing at the existing concrete drain and terminating at the start of the track lowering
  - on the south-western side of the bridge, a similar scenario is proposed with combined RMAR and concrete channel to be constructed up to the proposed storage tank.
- Billy Hughes bridge:
  - staircases are proposed off the access tracks down the batters to provide foot access under the bridge
  - an approximately 20 m section of the existing RMAR on the north-western side of the site would be realigned.

Other access

As part of the work at LX605 in the Junee to Illabo clearances, an unsealed road in private property on the southern side of the rail corridor directly east of the Shire and Carter property level crossing (LX605) would be removed to accommodate the track realignment 16 m south from the existing track and level crossing location (Figure A-25). A separate unsealed road is available for the continued use of the landowner; however, opportunities would be investigated during detailed design to retain access to the impacted road.

To accommodate the realigned track, the rail corridor boundary would be adjusted and would require acquisition of approximately 0.5 hectares area of Crown road which runs parallel to the existing rail corridor. Subject to detailed design and property agreements, it is not anticipated that the land requirement of the Crown road would sever the road or impact on the ongoing use of the road.

A.3.3 Removal of redundant rail corridor structures

At Albury Yard clearances, a small concrete signal box (Signal Box 1a) would be removed. This structure is itself of no heritage significance and does not make a positive contribution to the heritage values of the Albury Station and Yard complex.

At Yerong Creek Yard clearances, the disused station platform and shed would be demolished to achieve the required clearances.

A.3.4 Signalling and communications

Where rail signalling or communication infrastructure is directly affected by the proposal or does not provide sufficient clearance within the enhancement sites, the infrastructure would be modified, replaced or removed as required.

Signalling infrastructure consists of lighting, cabling, ground-based signals and gantry-mounted signals within the rail corridor. Gantries are overhead metal structures with a frame supporting signals and lighting. Gantry adjustments to meet the required vertical and horizontal clearances are proposed at several enhancement sites, as shown in Figure A-12 to Figure A-25.

Implementation of ARTC's Advanced Train Management System (ATMS) would continue to be explored to manage signalling and communications for the wider rail network. ATMS is a communication-based train management system, which communicates via both voice and data between network control centres and locomotives operating on ARTC's rail network.

A.3.5 Signage

Rail signage, including kilometre posts, speed boards and control markers, would be provided in enhancement sites where existing signage is impacted. Road signage would also be provided, associated with level crossings, bridges and road realignments, as required.

A.3.6 Power

Two passive level crossings at the Junee to Illabo clearances would be converted to active crossings, which would require power supply arrangements to support the new signalling and boom gates. Underground electrical cables connecting the level crossings to a nearby power pole would be established parallel to the track.

A new power supply connection would be required for the pumping station at Riverina Highway bridge via an underground electrical cable connecting to an existing power line at the Riverina Highway bridge.

A.3.7 Fencing

Minor adjustments to existing fencing would be required where it is directly impacted by the proposal, including shifting small sections of fencing. No new fencing is proposed to be erected along the alignment.

A.4 Permanent land requirements

With respect to rail infrastructure, the proposal would be located within the existing ARTC lease. Adjustments to road infrastructure would be within existing road reserves or on NSW Government-owned land.

No private land would be permanently acquired for the proposal. An easement would be established on private property (Lot 2 DP543801) at the Edmondson Street bridge enhancement site. The 25 m wide easement would be established to maintain access to a power utility that would be relocated along the western side of the Edmondson Street, south of the rail line.

To accommodate the 16 m horizontal track realignment at LX605, the rail corridor boundary would be adjusted and would require acquisition of a 0.5 ha of Crown road which runs parallel to the existing rail corridor.

A.5 Urban design and landscaping

During detailed design, an urban design and landscape plan would be prepared by a suitably qualified consultant in consultation with relevant stakeholders, including councils and the community. The plan would guide appropriate urban design responses for key bridge infrastructure and landscaping approaches for the proposal. It would build on urban design, and landscaping objectives and opportunities that have been identified during design development for the proposed road and pedestrian bridges (refer to Technical Paper 10: Landscape and Visual). These responses would be refined and investigated further during detailed design to assist in minimising the potential impacts of these structures on the surrounding community and capitalise on opportunities to improve visual amenity.

The plan would be prepared in accordance with relevant guidelines, policies and strategies, including:

- *Inland Rail Landscape and Rehabilitation Strategy* and *Inland Rail Landscape and Rehabilitation Framework*, which have been developed to establish governing landscape objectives and principles, as well as outline landscape and rehabilitation treatment solutions for various phases of the overall program
- Urban Green Cover in NSW: technical guidelines (Office of Environment and Heritage, 2015)

- Bridge aesthetics: design guidelines to improve the appearance of bridges in NSW (Transport for NSW (Transport for NSW), 2019a)
- Beyond the Pavement 2020: Urban design approach and procedures for road and maritime infrastructure planning, design and construction (Transport for NSW, 2020a)
- *Urban Design for Regional NSW* (Government Architect NSW, 2020)
- Crime prevention through environmental design (CPTED) principles (Department of Urban Affairs and Planning, 2001)
- Australian Standard AS4282-1997 *Control of the obtrusive effects of outdoor lighting* (Standards Australia, 1997b)
- Noise wall design guideline. Design guideline to approve the appearance of noise walls in NSW (Transport for NSW, 2021a)
- Landscape Guideline: Design guideline to improve the quality, safety, and cost effectiveness of green infrastructure in road corridors (RMS, 2018a).

A.6 Operation of the proposal

A.6.1 Train operations

The Main South Line between Albury and Illabo forms part of the regional rail network managed and maintained by ARTC. Train services would continue to be provided by a variety of operators.

The proposal would be fully operational by late 2026 with enhancement sites progressively commissioned on completion of construction. Regarding the operation of the overall Inland Rail program, in line with the Australian Government's response to the Independent Review of Inland Rail, a staged approach is being taken to deliver the Inland Rail program. The sections of Inland Rail between Beveridge in Victoria and Parkes in New South Wales have been prioritised for completion by 2027. Future decisions by the Australian Government on the delivery of Inland Rail sections north of Narromine will be considered when the Government has more certainty as to the delivery and full cost of Inland Rail. This includes Inland Rail achieving the required environmental approvals and securing land required for the Inland Rail corridor.

Inland Rail would operate 24-hours per day and would accommodate double-stacked freight trains up to 6.5 m high and up to 1,800 m in length. Freight train speeds would be consistent with current train speeds and would travel up to 115 km/hr per hour.

The average number of freight trains movements between Albury and Illabo varies. It currently has an average of up to 12 movements per day. It is estimated that the operation of Inland Rail would increase freight train movements to a total of 18 freight trains per day in the early phase of Inland Rail's operation when all projects are completed, and up to a total of 20 freight trains per day over the following years upon further take up of the service. The Inland Rail trains would be a mix of grain, bulk freight and other general transport trains.

Train timetabling would be the responsibility of operators. Current passenger services between Melbourne and Sydney would continue to operate along the Main South Line.

A.6.2 Maintenance activities

Standard ARTC maintenance activities would be undertaken during operations and there would be no change to the maintenance schedule. Typically, these activities would involve minor maintenance works such as bridge and culvert inspections, through to major maintenance such as reconditioning of track and topping up of ballast as required. Maintenance activities do not form part of the State Significant Infrastructure application for the proposal.

Works within the rail corridor would be undertaken in accordance with ARTC's standard operating procedures and the Environment Protection Licence (EPL), thereby reducing the potential for impacts on the health and safety of workers, visitors and users.

Business-as-usual rail maintenance activities by ARTC, such as raising and/or replacement of existing signal gantries, are excluded from this proposal.

A.6.3 Employment

The proposal would be maintained by the existing workforce. No additional positions would be created by the proposal.

A.7 Construction of the proposal

This chapter provides an outline of the indicative construction activities likely to be used to construct the Albury to Illabo (A2I) section of the Inland Rail program (the proposal). It includes a summary of the proposed timing, an indicative construction methodology, initial construction timeframes, likely resources, and proposed access arrangements. This information is preliminary only and is based on the current stage of the design.

A final construction methodology and program would be developed by the construction contractor based on the conditions of approval and the mitigation and management measures provided in the Preferred Infrastructure Report.

A.8 Construction overview

Construction within each precinct would generally involve site establishment, main construction works and finishing works as outlined in section A.9. In addition, enabling works may be carried out as part of construction of the proposal. To facilitate construction, the proposal site would contain a range of construction features, including construction compounds and access tracks, as required.

Subject to planning approval, construction is planned to commence in early-2024 and would be completed by mid-2025. The duration of construction would vary across the precincts: Albury, Greater Hume–Lockhart, Wagga Wagga and Junee. Construction across the precincts would occur concurrently, at times (refer to section A.10).

The construction methodology would be refined as the design of the proposal progresses and with the construction contractor. A summary of the construction phase of the proposal is in Table A-8.

TABLE A-8 PROPOSAL SUMMARY TABLE—CONSTRUCTION

Proposal element	Summary	Ref
Proposal site area	100 hectares (ha)	
Schedule	Mid-2024 to late-2026	Section A.10
Workforce	Anticipated peak of 770 staff	Section A.12.1
Cut/fill	Generation of approximately 132,000 cubic metres (m^3) of excavated material.[1]	Section A.12.3
Ancillary facilities	Establishment and use of temporary ancillary facilities, including material and earthworks stockpiling areas, laydown areas, construction support areas for bridges, and site compounds located as needed within the proposal site. Other temporary facilities include construction sedimentation basins and access tracks during construction.	Section A.13, and Figure A-27 to Figure A-40
Utilities	Adjustment, protection, or relocation of existing utilities within the proposal site.	Section A.16
Dewatering	Interception of groundwater at the Riverina Highway bridge and Kemp Street bridge enhancement sites may result in dewatering of approximately 12.1 megalitres (ML) of groundwater.	Section A.12.3
Property	Temporary property occupation and property access requirements during construction.	Section A.14 and Figure A-27 to Figure A-40

1. This volume does not account for potential reuse where practicable.

A.9 Indicative construction activities

Site establishment and enabling works would be completed at the beginning of construction at all enhancement sites, followed by the main construction activities. Finishing works would be completed at the completion of construction.

The main construction activities vary across the proposal site depending on the enhancement site and consist of:

- track works
- rail bridge works
- road bridge works

- pedestrian bridge works
- associated infrastructure works such as signalling works, culvert works and level crossing alterations.

A.9.1 Site establishment and enabling works

Site establishment and enabling works would typically be carried out before the start of substantial construction to make the areas ready for key construction sites and to provide protection to the public and/or the environment. It would generally involve the following activities:

- consultation with landholders/occupants, where required, and ensure land access is available
- implementation of all ARTC rail site protection requirements (including the provision of site Protection Officers) prior to accessing the rail corridor
- existing condition surveys of buildings and infrastructure such as public and private roads
- environmental investigations, where required, heritage protections, salvage and/or conservation works
- installation of site fencing and temporary signage for restricted access and traffic diversion (if necessary)
- installation of site environmental management including drainage and erosion management controls
- establishment of site access locations, compound sites and the location of stockpiles
- preparation of the site for main construction works (levelling, grading and/or compacting, as required, except where archaeological heritage potential is present)
- delivery and stockpiling of bulk materials, including ballast and capping
- vegetation trimming, clearing and removal, where required, including slashing, mulching, and stockpiling within the proposal site for reuse
- demolition of minor structures and removal of existing road and rail infrastructure located within the proposal site
- utility adjustment or protection where required (refer to section A.16).

The following activities carried out before the start of construction do not form part of the proposal:

- surveys, test drilling, test excavations, geotechnical investigations or other tests, surveys, sampling, or investigation for the purposes of the design or assessment of the project
- the use of an existing rail corridor, or an existing rail facility adjoining an existing rail corridor, for delivery or storage of tracks, sleepers, ballast, posts, or culverts
- the adjustment, relocation, upgrade, or replacement of existing utilities infrastructure, unless existing water flows within or through the existing rail corridor will be permanently affected or where native vegetation clearing that is likely to significantly affect threatened species within the meaning of Part 7 of the *Biodiversity Conservation Act 2016* (NSW) occurs.

Where these works occur before commencement of construction, separate environmental assessments and approvals would be obtained, where required.

A.9.2 Track works

Track realignment (less than 0.3 m)

For track realignments less than 0.3 m, the general method for the works is:

- inspect track formation to determine condition
- undertake formation widening to accommodate the realigned track, including stripping topsoil and extending the formation (that is the ground surface that supports the track)
- remove, relocate or replace turnouts, if required
- top up ballast, where required
- run tamper machine along the track to horizontally shift track in in increments and level out ballast
- run regulator machine along the track to ensure ballast is distributed and shaped to support the track
- restress track and commission.

Track realignment (greater than 0.3 m and/or track formation replacement)

For track realignment over 0.3 m and/or replacement of track formation, the general method is:

- undertake earthworks to establish new cess drainage

- strip topsoil and excavate existing track formation as required for track realignment
- establish foundation for location of realigned track formation
- place structural fill and capping material for track formation
- install sleepers, rail, and top up ballast
- run tamper machine to level out ballast
- re-stress track and commission.

Track lowering

The general method for track lowering is:

- create access for piling rigs
- undertake large diameter piling and preparation works for small piles
- undertake small piling works
- install protection and or retaining walls on the piles
- undertake track lowering excavation and drainage installation
- install sleepers, rail, and top up ballast
- re-stress track and commission.

A.9.3 Rail bridge works

Rail bridge alterations

Alterations to four rail underbridges would be required to accommodate track realignment. The general construction method is:

- disconnect track and support structure from existing bridge
- lift off and remove track structure
- alter the bridge support structure (abutments and piers), as required
- undertake strengthening works including installation of metal plates along the bridge span, if required
- replace or modify track support structure
- reinstall structure onto the abutments and piers, as required
- reinstall realigned track on bridge.

Murray River bridge alterations

The proposed bridge works on the Murray River bridge are unique from the other rail bridge works due to the design of the bridge. The general construction method is:

- establish exclusion zone in the Murray River in accordance with Transport for NSW (Transport for NSW) requirements, including set up of navigation marks, buoyage and signage
- install scaffolding and temporary bracing structure on the bridge in stages to maintain partial access for watercraft beneath the bridge
- set up of environmental and safety controls for construction work on the bridge including netting around scaffolding
- undertake drilling of attachment holes for new metal sections
- localised corrosion protection of works
- remove top chord bracing and install stanchions to achieve additional vertical clearance
- undertake bridge structure modifications and reinstate top chord bracing on the stanchions (the existing top chord bracing would be re-used if it is deemed to be in satisfactory condition)
- remove temporary bracing in stages
- repaint disturbed lead-based paint work
- remove scaffolding in stages.

A.9.4 Road bridges works

Road bridge replacement

New road bridges would be constructed at Edmondson Street, Wagga Wagga, and Kemp Street, Junee. The general method of construction is:

- establish road and pedestrian detour controls
- establish crane pads to the north and south of the bridge
- demolish the existing bridge structure
- construct bridge foundations, footings, abutments and piers
- excavate material for piling pads to support the piling rigs
- install internal piles, piles caps for protection and retaining walls
- excavate out remaining materials for retaining walls
- complete reinforced earth retaining wall to height and backfill to underside of the bridge
- install bridge decks (excluding decks over the rail track) for the bridge approaches
- install central deck over the rail track
- complete road works to tie-in to existing roads, intersections and pedestrian and/or pedestrian paths (as required), including drainage works
- install road furniture (including signage) and street lighting
- complete asphalting and line marking
- remove detours and traffic controls.

A.9.5 Pedestrian bridges

Three pedestrian bridges would be replaced and two disused bridges would be removed as part of the proposal. Two additional pedestrian bridges would be constructed.

Bridge removal

The general method for the demolition of pedestrian bridges is:

- establish pedestrian detours and/or traffic management controls as required
- construct crane pad and install the crane
- disconnect pedestrian bridge decks from piers and remove
- demolish existing piers and backfill to existing surface level
- remove approach stairs on both sides of track
- remove detours and traffic controls.

Bridge construction

The general method of bridge construction is:

- site clearance and, if needed, demolition of the existing bridge (as per the methodology described under pedestrian bridge removal above)
- undertake piling for the relocation on any piers
- construct bridge footings, abutments and piers
- install new bridge decks on the piers, new stairs and ramps
- install new steel truss structure on bridge deck
- install safety screens and handrails
- finishing and landscaping, where appropriate
- remove detours.

A.9.6 Associated infrastructure works

Culverts works

As a result of track lowering or realignment, culverts may require extension or replacement. Culverts or culvert extensions would be pre-cast offsite and installed along the proposal alignment as the works progress. A general method for the installation of culverts is:

- establish crane pad
- remove track and disconnect culvert structure
- remove culverts if required for full replacement
- install prefabricated replacement culverts or extensions to culvert
- install scour protection as required such as ripraps
- place ballast, sleepers, and rail on top of the culverts
- tamp the ballast and weld the tracks.

Signalling works

A general method for signalling works is:

- for existing signalling:
  - disconnect the feed for existing ground supported or overhead signalling
  - relocate, replace or adjust support structure for example the poles for overhead lines
  - relocate, replace or adjust signal cabling and lighting
- for new signalling:
  - install support structure
  - install signal cabling and lighting
  - connect the feed for the signalling
  - commission ground or overhead signal.
- For signalling works involving gantries, the general method for these works are:
  - for removal of gantry:

    remove existing gantry from footings (i.e. cut or remove bolts)

    lift gantry off footings and place nearby for dismantling

    remove redundant footings if required

    backfill footing holes
  - replace and/or relocate a gantry by:

    remove the existing gantry structure

    undertake piling for new gantry structure, if required

    install new gantry footing

    install new gantry structure
  - for minor adjustments:

    removing low metal sections from gantry structure

    raising horizontal section of the gantry frame.

Level crossing works

The general methodology for works on level crossings is:

- close relevant road and implement detour and traffic controls
- disconnect signalling infrastructure
- strip track and level crossings surface panels
- realign track
- install level crossing surface panels

- install or modify pedestrian maze if required
- replace level crossing controls or modify existing controls
- for level crossing activation:
  - install cabling to connect to power
  - install boom gates and lighting
- reconnect signalling
- provide standard level crossing signs and road markings, if impacted.

A.9.7 Finishing works

Testing and commissioning of the rail line and communications/signalling systems would be carried out to ensure that all systems and infrastructure are designed, installed, and operated according to ARTC's operational requirements. Testing for connections to other rail lines would also be required for those sections of track. This would be undertaken prior to use during scheduled rail possessions or other periods when existing rail lines are not operational.

All disturbed areas not required for ongoing operations would be rehabilitated. Finishing and rehabilitation would be undertaken progressively and would include the following typical activities:

- demobilise or remove construction compounds and facilities
- remove all remaining materials, waste, and redundant structures
- decommission all temporary work site signs
- remove temporary fencing
- establish permanent fencing, where required
- decommission site access roads that are no longer required, including reinstatement of topsoil and vegetation, where required
- restore disturbed areas, as required, including revegetation and landscaping, where required.

Where relevant, sites that were occupied temporarily and do not form part of the permanent infrastructure, such as construction compound sites, would be rehabilitated in accordance with the urban design and landscape plan (refer to Chapter A.1: Proposal features and operation).

A.10 Construction schedule and staging

Subject to planning approval and consultation with the construction contractor, construction is planned to commence in mid-2024 and will be completed by late-2026. An indicative construction program is shown in Table A-9. Docker Street gantry works would be completed as part of the Wagga Wagga Yard clearances.

The staging of works is generally focused around and dependent upon 60-hour rail possessions, as described in section A.11.1, which typically occur twice a year. The duration of works at each enhancement site would vary according to the required construction activities. Enhancement sites would be progressively commissioned and rehabilitated as works are completed.

Final staging of works and detailed possession planning would occur during detailed construction planning. This may involve additional rail possessions.

TABLE A-9 INDICATIVE CONSTRUCTION PROGRAM

Enhancement Sites	Duration (months)	2024				2025				2026			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Albury precinct													
Murray River bridge	9												
Albury Station pedestrian bridge	13												
Albury Yard clearances	8												
Riverina Highway bridge	6												
Billy Hughes bridge	11												
Table Top Yard clearances	20												
Greater Hume - Lockhart precinct													
Culcairn pedestrian bridge	1												
Culcairn Yard clearances	8												
Henty Yard clearances	13												
Yerong Creek Yard clearances	3												
The Rock Yard clearances	2												
Wagga Wagga precinct													
Uranquinty Yard clearances	15												
Pearson Street bridge	20												
Cassidy Parade pedestrian bridge	24												
Edmondson Street bridge	14												
Wagga Wagga Station pedestrian bridge	9												
Wagga Wagga Yard clearances	6												
Bomen Yard clearances	6												
Junee precinct													
Harefield Yard clearances	7												
Kemp Street bridge	18												
Junee Station pedestrian bridge	1												
Junee Yard clearances	10												
Olympic Highway underbridge	10												
Junee to Illabo clearances	23												

Period from site establishment to opening at the enhancement site

A.11 Hours of construction

The proposal involves enhancement works that are on or immediately adjoin active rail lines that need to remain operational throughout construction with minimal disruption. Such work is subject to safe working arrangements to ensure worker safety. Additionally, there are proposed works that do not occur in close proximity to high-risk locations (such as road bridges).

Work on operational track can occur under two types of safe working arrangements: being rail possessions (sometimes referred to as closures) and temporary track occupancy authorisations (when there are suitable five-to-nine-hour gaps between scheduled trains that can allow certain work to be carried out) (refer to section A.11.1). Work may also be needed in areas adjacent to track work locations before and after these periods, to prepare for or complete construction.

As a result, the proposed construction hours (as shown in Table A-10 and Figure A-26) have been developed to:

- balance worker safety and rail corridor access, to support efficiencies in the workforce utilisation and to reduce construction durations as far as practicable
- reduce community impacts, by minimising the overall duration of disruption and amenity impacts from construction activities and road diversions.

TABLE A-10 CONSTRUCTION HOURS

Construction type	Construction hours	Comments or exceptions
Work not subject to rail possessions or track occupancy authorisation. This can include site establishment, finishing works and main construction activities such as bridge works.	▸ Recommended standard hours: ▸ Monday to Friday: 7 am to 6 pm ▸ Saturday: 8 am to 1 pm ▸ Sundays and public holidays: No works or public holidays.	These hours would apply to all enhancement sites for construction. These hours are adopted from the *Interim Construction Noise Guideline* (DECC, 2009).
	Inland Rail Standard Program Construction Hours: ▸ Monday to Friday: 6 am to 6 pm ▸ Saturday: 6 am to 6 pm ▸ Sundays and public holidays: 6 am to 6 pm.	To balance constructability, workforce and community impacts, extended construction hours are sought from the recommended standard hours in the *Interim Construction Noise Guideline* (DECC, 2009) at all enhancement sites. The adopted construction hours are called 'Inland Rail Standard Program Construction Hours' and are applied to: ▸ reduce the duration of construction impacts on individual receivers ▸ minimise disruption to the community and commuters using the neighbouring road network. Where a sensitive receiver (such as a residence, school or hospital) is predicted to be noise affected for more than three months: ▸ Inland Rail Standard Program Construction Hours would only apply for a maximum three-month period at that enhancement site ▸ no work would be undertaken every alternative week between the hours of 6 pm on Saturday and 7am Monday. ▸ Under the Inland Rail Standard Program Construction Hours, only low impact noise activities are permitted between 6.00 am and 7.00 am. 'Noise affected' is defined as an exceedance of the applicable noise management level as specified in the *Interim Construction Noise Guideline* (DECC, 2009) for residential and non-residential sensitive receivers.

Construction type	Construction hours	Comments or exceptions
	▸ Out of Hours Works: ▸ Monday to Sunday: 6pm – 10pm (Evenings) ▸ Monday to Sunday 10pm – 6am (Night) (10pm – 7am under recommended standard hours)	There will be instances where works are required outside of the Inland Rail Standard Program Construction Hours, known as Out of Hours Works (OOHW). OOHW may be undertaken if one or more of the following applies: ▸ delivery of oversized plant or structures where required by the police or other authorities for safety reasons ▸ emergency work to avoid the loss of life or damage to property, or to prevent environmental harm ▸ large concrete pours for new bridges, to allow it to be completed in one pour and avoid high temperatures during the daytime ▸ works where it is required to minimise impacts on road users and customers (such as bridge deck installation or utility works) ▸ low impact noise activities at any time where: ▸ construction causes $L_{Aeq(15\ minute)}$ noise levels no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), and no more than the 'noise affected' noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* at other sensitive land uses ▸ vibration is no more than the preferred values for human exposure to vibration specified in Table 2.2 or Table 2.4 (as applicable) of *Assessing Vibration: a technical guideline* (DEC, 2006a). ▸ where permitted by an environment protection licence ▸ where agreement is reached with affected receivers. ▸ All OOHW will be subject to further assessment an community engagement. Where construction works are predicted to exceed Noise Management Levels during OOHW, additional mitigation will be applied.
Work subject to rail possessions or track work authorisations, and any necessary ancillary works	24-hours per day during rail possessions and track work authorisations (typically up to 60-hour periods).	Further detail on rail possessions and track work authorisation the type of work occurring during these periods is provided in section A.11.1.
Highly noise intensive work	▸ 8 am to 6 pm Monday to Friday ▸ 8 am to 1 pm Saturday ▸ in continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block.	Except where permitted by an environmental protection licence (EPL), highly noise intensive works would be restricted to these hours when these works result in an exceedance of the applicable noise management level at the same receiver. Highly noise intensive works are defined as works that result in noise levels ≥75 dB at a sensitive receiver.

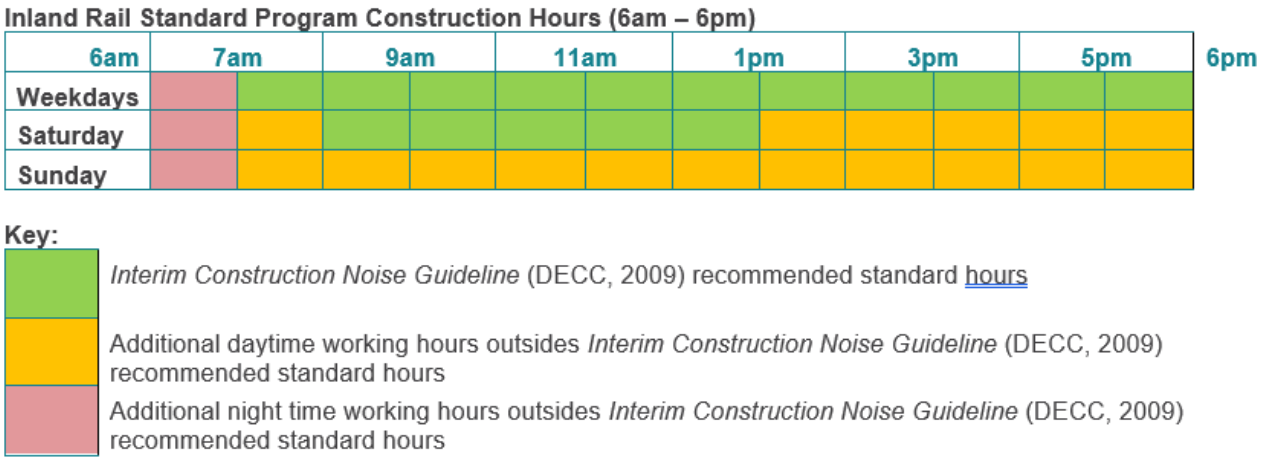

FIGURE A-26 PROPOSED INLAND RAIL PROGRAM CONSTRUCTION HOURS

In addition to the construction hours identified in Table A-10, other construction works would be carried out outside standard construction hours, including:

- delivery of oversized plant or structures where required by the police or other authorities for safety reasons
- emergency work to avoid the loss of life or damage to property, or to prevent environmental harm
- large concrete pours for new bridges, to allow it to be completed in one pour and avoid high temperatures during the daytime
- works where it is required to minimise impacts on road users and customers (such as bridge deck installation or utility works)
- low impact noise activities at any time where:
  - construction causes $L_{Aeq(15\ minute)}$ noise levels no more than 5 dB(A) above the rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), and no more than the 'noise affected' noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* at other sensitive land uses
  - vibration is no more than the preferred values for human exposure to vibration specified in Table 2.2 or Table 2.4 (as applicable) of *Assessing Vibration: a technical guideline* (DEC, 2006a).
- where permitted by an environment protection licence
- where agreement is reached with affected receivers.

A.11.1 Work during possessions or under track occupancy authorisations

Work under rail possessions would be carried out during scheduled possession periods (that is, the times that the movement of trains along the rail corridor are stopped for maintenance). Rail possessions are typically for 60-hour periods, twice a year—in March and September. During rail possessions, works may need to be carried out on a 24-hour basis. Track works (such as track realignment, track lowering, and connecting tracks) can only occur under rail possessions.

Alternatively, track works may occur where single-line running is possible (such as in Albury Yard). Single-line running refers to when trains are able to use another line for travel in either direction when one track is occupied, and would be subject to a track occupancy authorisation. Opportunities for single-line running would be confirmed during detailed design and informed by operational requirements.

Outside scheduled rail possessions, works would also occur within available five- to nine-hour windows when train services are not scheduled and when authorised by ARTC (called a track occupancy authorisation). These periods are determined in consultation with operators of freight and passenger train services, and may occur outside the primary construction hours outlined in Table A-10.

Indicative works that would occur during a rail possessions and/or subject to a track occupancy authorisation are outlined in Table A-11. Construction compounds and laydown areas that support these works would also be in use during these periods.

Detailed possession planning would be documented in the Construction Environmental Management Plan, and associated traffic and transport management sub-plan. The plans would be prepared in consultation with Transport for NSW.

A construction noise and vibration impact statement would be prepared for these works in association with the construction noise and vibration management sub-plan. This would identify site specific mitigation measures.

TABLE A-11 INDICATIVE USE OF RAIL POSSESSIONS AND TRACK OCCUPANCY AUTHORISATIONS

Construction activities	Rail possessions	Under track occupancy authorisation
Track realignment works	Track realignments works at each enhancement site are planned around the use of one rail possession with the exception of the Junee to Illabo clearances, which require two rail possessions. Level crossing works and rail bridge realignment works would be undertaken during the same rail possessions.	Track realignment works where single line running can occur. Associated construction activities directly over or in close proximity to the track. These activities include track widening, drainage works and signalling adjustments. More substantial track realignment works can occur where single line running is possible.
Track lowering works	Track lowering at each enhancement site is planned around three rail possessions. There would be breaks in the construction schedule between the rail possessions.	Associated construction activities directly over or in close proximity to the track. These works including drainage works, piling, construction of the protection and retaining walls.
Murray River bridge structure alterations	These works are generally not planned around rail possessions. Work planned to be undertaken under a track occupancy authorisation may be undertaken during a rail possession where schedules overlap. An exception would be at Kemp Street bridge where a minor rail possession would be used for piling works and trains would be diverted to other lines temporarily to minimise disruption to train services.	All the bridge works are proposed to be undertaken twice a week during five-hour windows, which would likely occur in the evening and early night-time hours.
Pedestrian bridge removal		Bridge removal when the structure is lifted over the track (under one authorisation period).
Pedestrian bridge replacement		Bridge construction when the bridge structure is lifted over the track (under one authorisation period).
Road bridge works		The works over or near the track include demolition, piling, wall construction and lifting of the bridge decks into place This would occur under four nine-hour track occupancy authorisation periods.

A.12 Construction resources

A.12.1 Workforce

Construction workforce numbers would vary across the proposal site due to scheduling, and the scale and type of construction activities required in different enhancement sites. Peak workforce numbers as identified in Table A-12 would occur when works in different enhancement sites occur concurrently, which would generally be during rail possessions. Workforce numbers would peak during each 60-hour possession (these typically occur in March and September).

For the majority of the construction period, the workforce would average up to about 50 to 90 people in each of the precincts due to scheduling of construction works.

TABLE A-12 ESTIMATED AVERAGE AND PEAK WORKFORCE NUMBERS

Precinct	Estimated average workforce	Estimated peak workforce during a 60-hour possession
Albury	50	180
Greater–Hume Lockhart	90	180
Wagga Wagga	50	110
Junee	80	300
Proposal (All precincts)	**170**	**770**

Given the nature of the workforce requirements, accommodation would be via the short-term accommodation market. Detailed construction planning would aim to distribute construction workforce across scheduled rail possessions throughout the construction period to minimise the peak demand on short-term accommodation market. This would be coordinated with the accommodation strategy for the adjoining Illabo to Stockinbingal project.

A.12.2 Plant and equipment

A range of plant and equipment would be used during construction. The final equipment and plant requirements would be identified by the construction contractor. An indicative list of plant and equipment that would be used for each construction activity is in Table A-13. Trucks, light vehicles, water carts and handheld tools would be required to complete construction at each enhancement site.

TABLE A-13 INDICATIVE CONSTRUCTION PLANT AND EQUIPMENT

Plant	Track realignment (<0.3 m)	Track realignment (>0.3 m)	Track lowering	Rail bridge alterations	Murray River bridge alterations	Road bridges	Pedestrian bridge replacement	Pedestrian bridge removal
Excavator		x	x			x		x
Positrack		x	x					
Backhoe	x		x					
Hydremas	x	x	x					
Loader	x	x	x					x
Tamper	x	x	x					
Regulator	x	x	x					
Ballast box	x	x	x					
Padfoot or smooth drum roller		x	x		x	x		
Grader		x	x	x	x	x	x	
Bulldozer			x					
Rail saw	x	x		x				
Grinder	x	x		x	x			
Welding equipment	x	x		x	x			
Franna crane				x		x	x	
50–350 tonne crane				x	x	x	x	x
Elevated work platform				x		x	x	x
Vacuum sheathed drills					x			
Self-contained abrasive blasting unit					x			
Concrete pump				x		x	x	
Hi-rail micro-piling rig			x					
Bored piling rig			x			x	x	
Micro-tunnelling equipment			x					
Rattle guns					x			
Road construction equipment (aggregate spreader, line marking tools and small compactor)						x		

A.12.3 Materials

Construction of the proposal would require a range of materials including (but not limited to):

- general fill and structural fill
- aggregates for capping and scour protection
- materials for the rail track, such as steel rails, sleepers, ballast
- steel and concrete for bridges
- precast culverts, pipes, pit, bridge girders and retaining wall panels
- asphalt for road works
- cabling for signalling and electrical components
- materials for utility adjustments
- water.

Key materials required for construction of the proposal are outlined in this section.

Ballast, capping and fill

The spoil and waste ballast volumes estimated to be generated during construction and the volumes of ballast, capping and fill required for the proposal are in Table A-14. All excavated material is expected to be re-used for construction fill, where practicable and ballast removed during track works would be re-used where it is in a suitable condition. All volumes have been estimated based on refence design and preliminary geotechnical investigations and would be subject to further refinement during detailed design.

TABLE A-14 PRELIMINARY ESTIMATE OF CONSTRUCTION MATERIAL VOLUMES

	Material generated		Material required			
Precinct	Excavated material (m^3)	Ballast (m^3)	General fill (m^3)	Capping (m^3)	Structural fill (m^3)	Ballast (m^3)
Albury	27,300	3,700	4,000	5,500	3,300	4,000
Greater–Hume Lockhart	7,800	2,200	2,200	1,200	1,900	2,200
Wagga Wagga	28,400	5,800	5,800	4,700	5,700	5,800
Junee	68,500	4,400	22,800	12,300	24,600	22,800
TOTAL	132,000	16,100	34,800	23,700	35,500	34,800

Quarries within the region with the required approvals such as Boral, Rocky Point, Hanson and Signature quarries would be used to supply capping and ballast for the proposal, where possible. Any heavy vehicle movements from these quarries would be via existing heavy vehicle routes to the proposal site. Regional quarries would be investigated further during the detailed design phase.

The final destinations for excess ballast and spoil would be confirmed prior to construction commencing. Waste management centres in the region which may be used for disposal depending on capacity and licensing requirements are Albury, Gregadoo and Junee waste management centres.

The earthworks requirements for the proposal would be subject to further refinement during detailed design and construction planning following detailed geotechnical investigations. This would seek to minimise the final volume of spoil as far as practicable.

Further information on waste (including spoil) management is in EIS Chapter 23: Waste management and resource use.

Sleeper and rail

Sleepers and rail would be required for track realignment and lowering works. Existing sleepers and rail would be re-used where the condition is adequate for use. New sleepers and rail are proposed to be delivered to the proposal site via existing rail lines during pre-construction. Concrete would be supplied by commercial suppliers.

Water

Water is required during construction for a range of activities, including:

- earthworks and formation preparation and material conditioning
- dust suppression
- concrete production
- vehicle and equipment wash down
- site services at compounds
- landscaping and rehabilitation.

Final water requirements would be subject to weather conditions and the methodology selected by the construction contractor. Based on preliminary construction planning, it is estimated that a total of about 56.9 ML would be required during construction as identified in Table A-15. The volume required would vary according to the type of construction activity at each enhancement site. Opportunities to reduce water use would be further explored during detailed design and construction planning.

TABLE A-15 ESTIMATED WATER VOLUME REQUIREMENTS DURING CONSTRUCTION

Precinct	Estimated water requirement (ML)
Albury	9.7
Greater–Hume Lockhart	3.4
Wagga Wagga	13.5
Junee	30.3
Total	**56.9**

It is anticipated that construction water would be transported via water trucks. The preferred method would be confirmed by the construction contractor during detailed construction planning.

The construction water balance is considered in Chapter 18: Hydrology, flooding, and water quality.

Construction water sources would be finalised during the detailed design phase, considering:

- climatic conditions in the lead up to construction
- agreements with local governments for sourcing mains water
- agreements with water supply authorities (such as Riverina Water) for sourcing water or treated non-potable water.

At this stage, extraction of water from surface or groundwater sources, such as use of groundwater bores, for the purpose of water supply is not envisioned. Dewatering would occur during some excavation works and this groundwater take may be subject to a water access licence (refer to Chapter 4 of the EIS). Interception of groundwater at the Riverina Highway bridge and Kemp Street bridge enhancement sites may result in dewatering of approximately 12.1 ML of groundwater. Use of groundwater sourced during excavation works would be considered during detailed construction planning to determine suitability for use.

A.12.4 Site servicing requirements

Work areas and construction compounds would be self-sufficient for utilities such as water, sewer, electricity, and telecommunications. Portable amenities blocks would be used that can be pumped out at regular intervals by suitably licensed contractors. Local power generation from portable generators would be installed and diesel resupplied using mobile refuelling services for construction plant and equipment.

Where utilities are located close to the sites, opportunities to connect to existing sources would be explored with relevant providers.

A.13 Construction compounds and laydown areas

Site establishment involves setting up temporary construction compounds for use throughout the construction period. The proposed locations of compounds within the proposal site are shown in Figure A-27 to Figure A-40. These locations are indicative and subject to detailed design and construction planning requirements.

Site compounds are designated areas containing key construction facilities. Depending on length and complexity of construction activities, the site compounds would consist of:

- laydown areas
- site offices

- toilets
- potable water tanks
- generators
- parking area
- storage facilities for smaller construction items such as equipment and chemicals.

Laydown areas are designated locations where stockpiles and bulk materials such as ballast or prefabricated units would primarily be stored during construction. Stockpiling may occur outside designated laydown areas within the construction site for short durations. Hazardous chemicals such as fuel for plant would be kept within storage facilities in accordance with relevant standards.

A.14 Temporary land requirements

Construction would require temporary use of land outside the rail corridor for the duration of the construction period. These areas would be required for some key construction infrastructure, site compound placement, access and to facilitate manoeuvring of construction plant and machinery. The proposed temporary occupation and use of these areas are subject to further engagement and agreement with landowners. Initial discussions about establishing agreements with landowners for the proposal's property requirements commenced in March 2022. As discussions are ongoing, the location and area of individual property requirements may change or be removed. The final land requirements for the proposal would be confirmed during detailed design.

The indicative footprints of land outside the rail corridor proposed for use is shown in Figure A-27 to Figure A-40. Road occupancy licences from the relevant road authorities would be required for occupation of the road reserve. Lease agreements for temporary land requirements would be established with the relevant landholders or permits in the case of Crown land. Further information is in EIS Chapter 12: Land use and property.

A-27 Construction layout of Murray River Bridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:4,300
Paper size: A4
Date: 27/10/2023

210_EAP_FA27_ConstructionlayoutofMurrayRiverBridge_r1v2.mxd

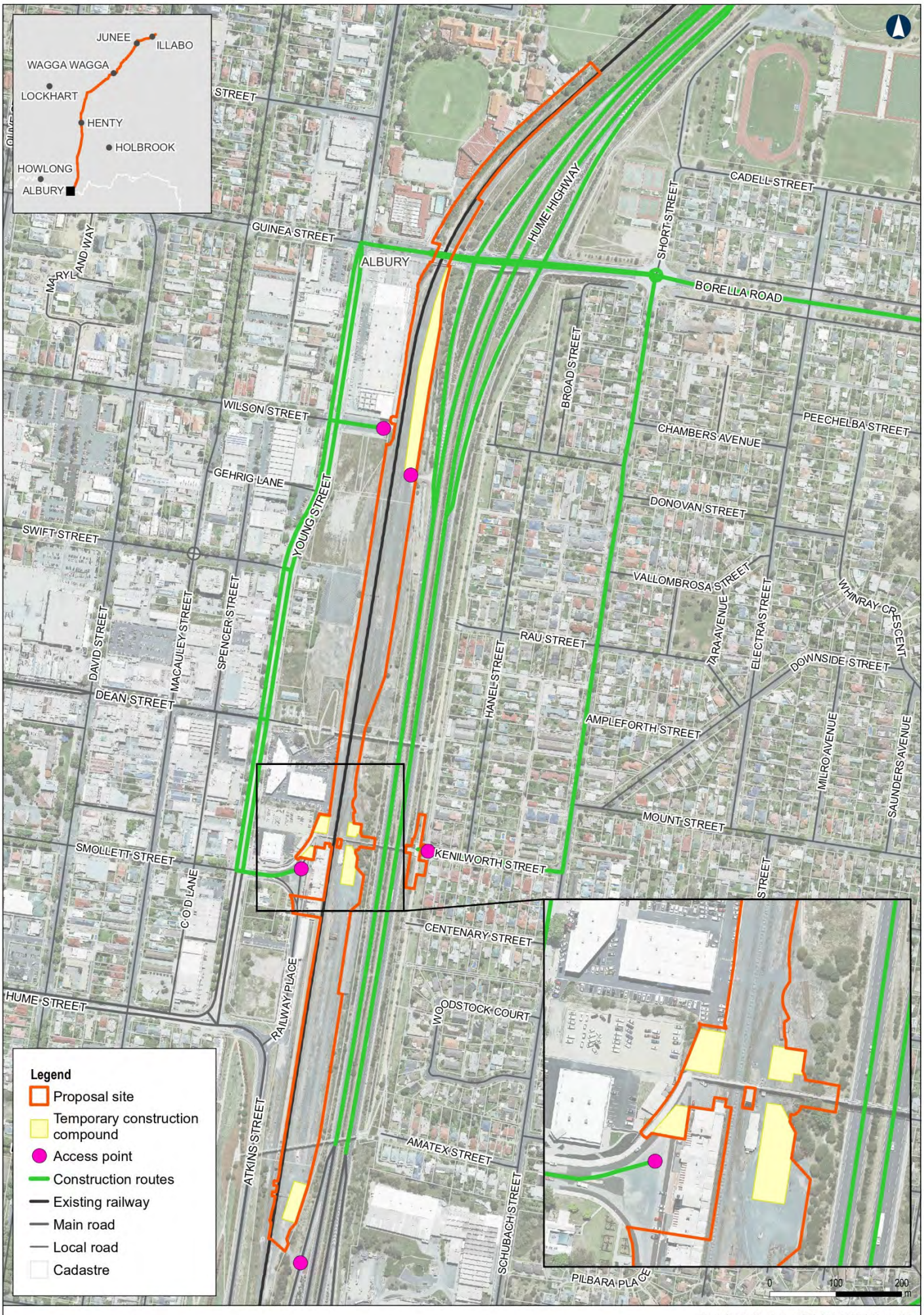

Figure A-28 Construction layout of Albury Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:7,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA28_ConstructionlayoutofAlburyStationandsurrounds_r1v2.mxd

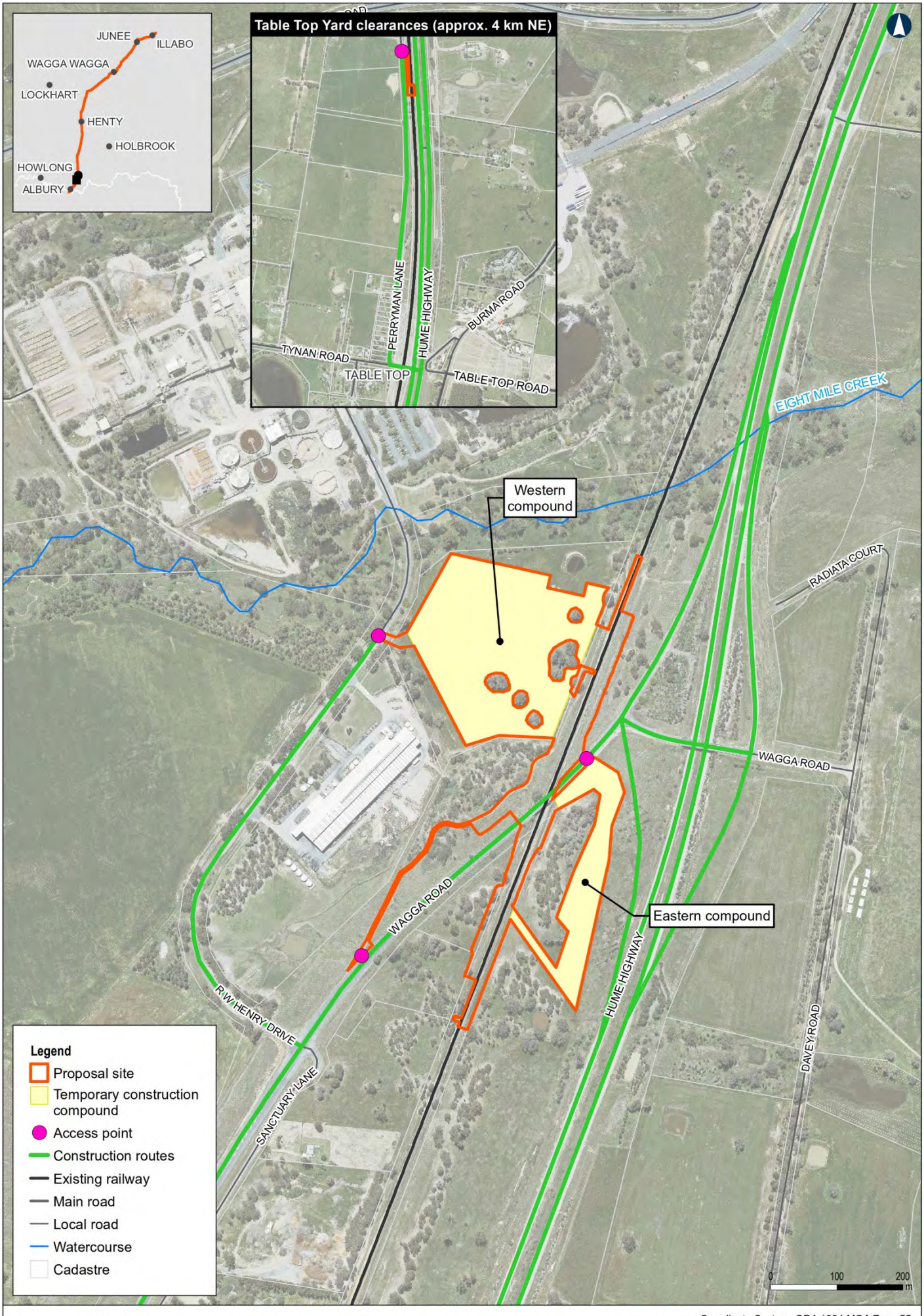

Figure A-29 Construction layout of Billy Hughes bridge and Table Top Yard

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:7,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA29_ConstructionlayoutofBillyHughesbridgeandTableTopYard_r1v2.mxd

Figure A-30 Construction layout of Culcairn Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:3,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA30_ConstructionlayoutofCulcairnYardclearances_r1v2.mxd

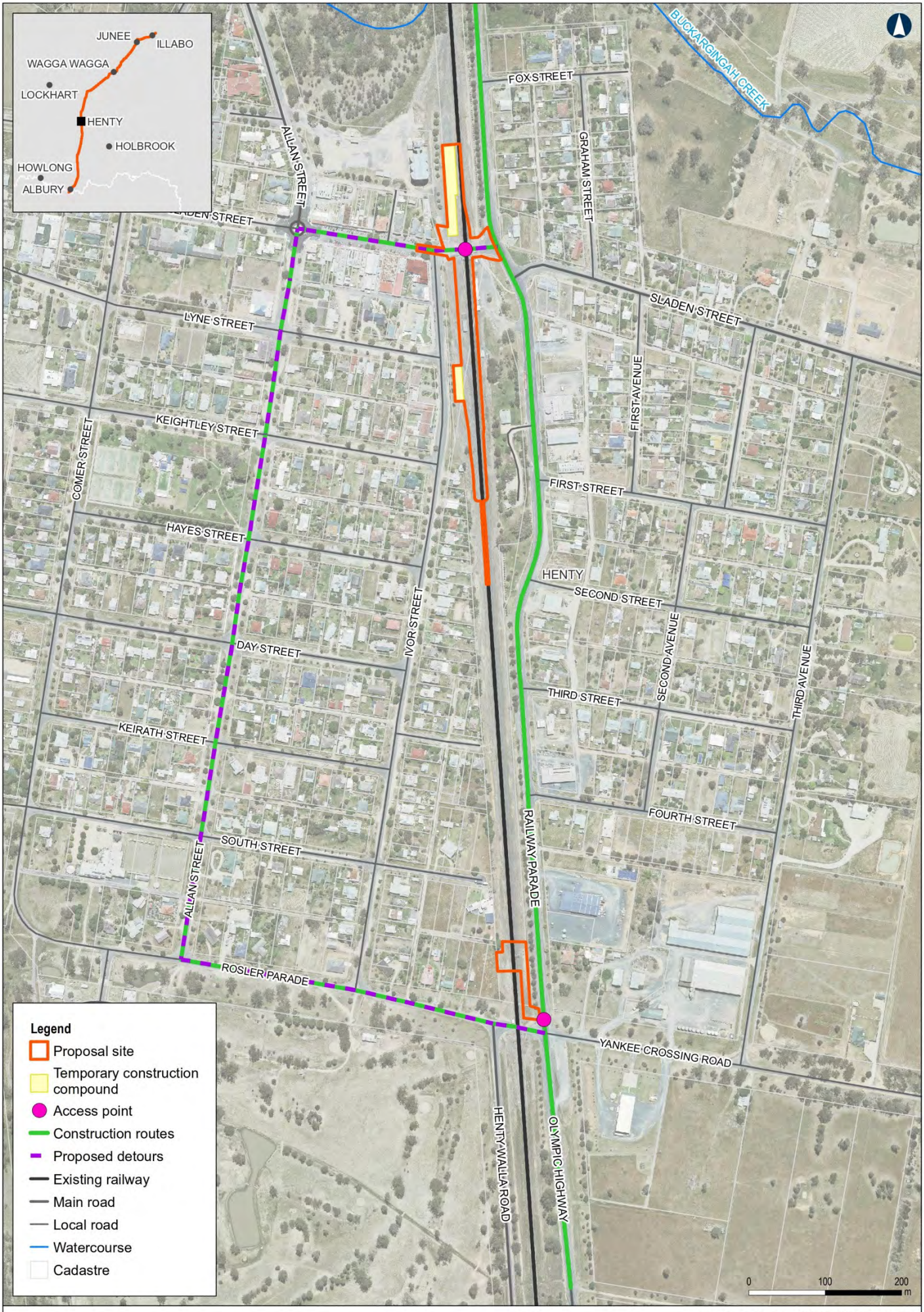

Figure A-31 Construction layout of Henty Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA31_ConstructionlayoutofHentyYardclearances_r1v2.mxd

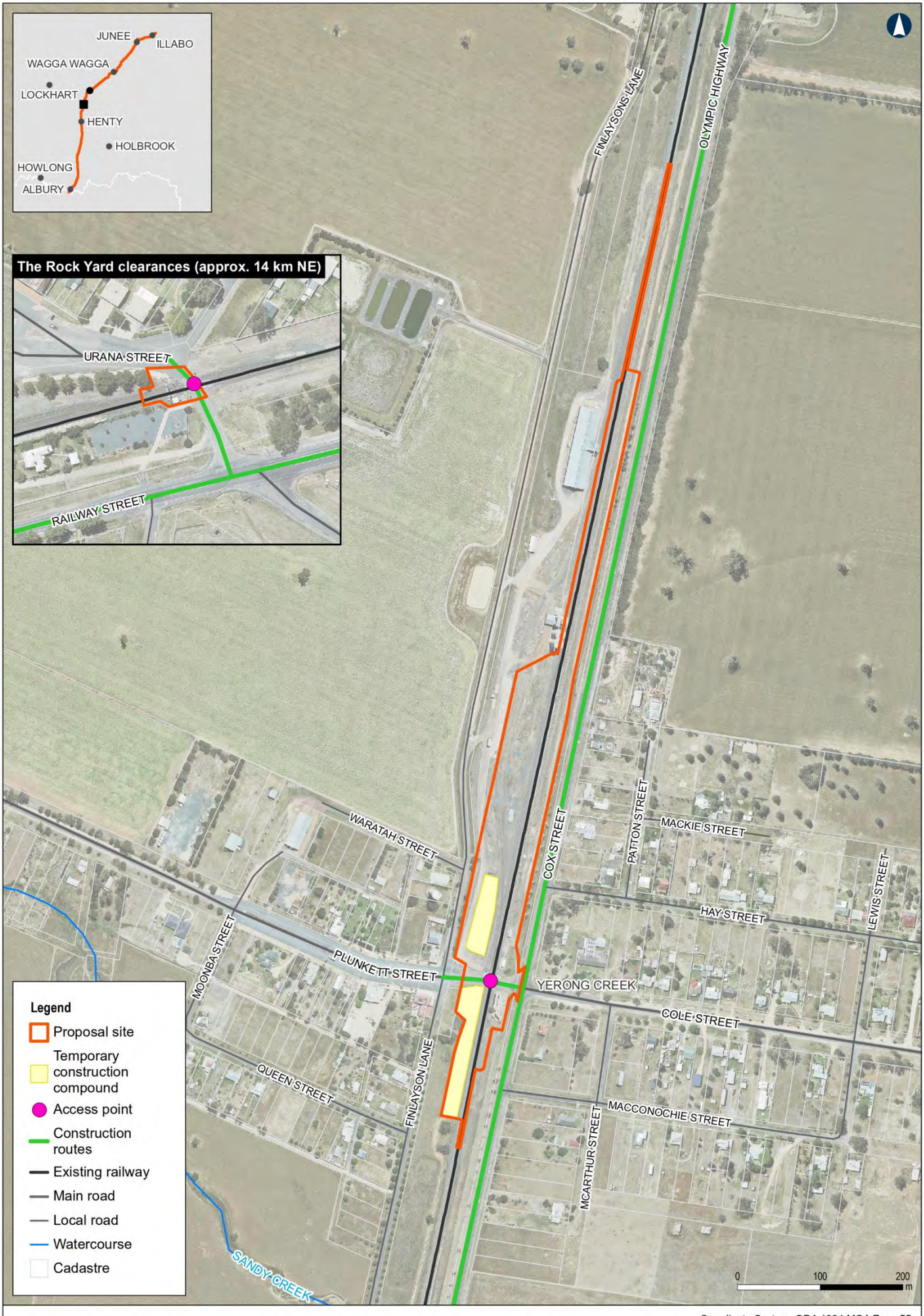

Figure A-32 Construction layout of Yerong Creek and The Rock Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA32_ConstructionlayoutofYerongCreekandTheRockYardclearances_r1v2.mxd

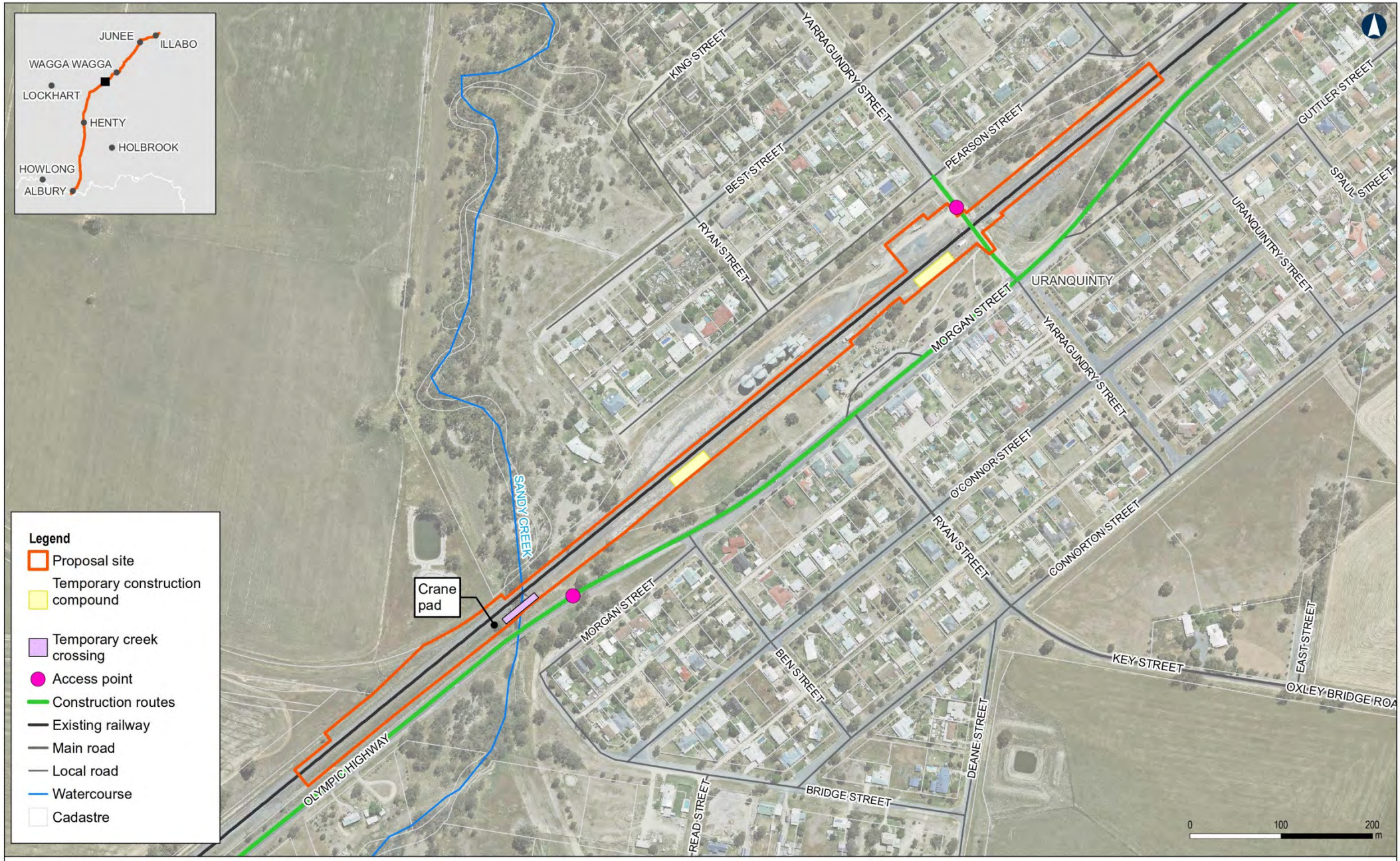

Figure A-33 Construction layout of Uranquinty Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:5,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA33_ConstructionlayoutofUranquintyYardclearances_r1v2.mxd

Figure A-34 Construction layout of Pearson Street bridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA34_ConstructionlayoutofPearsonStreetbridge_r1v2.mxd

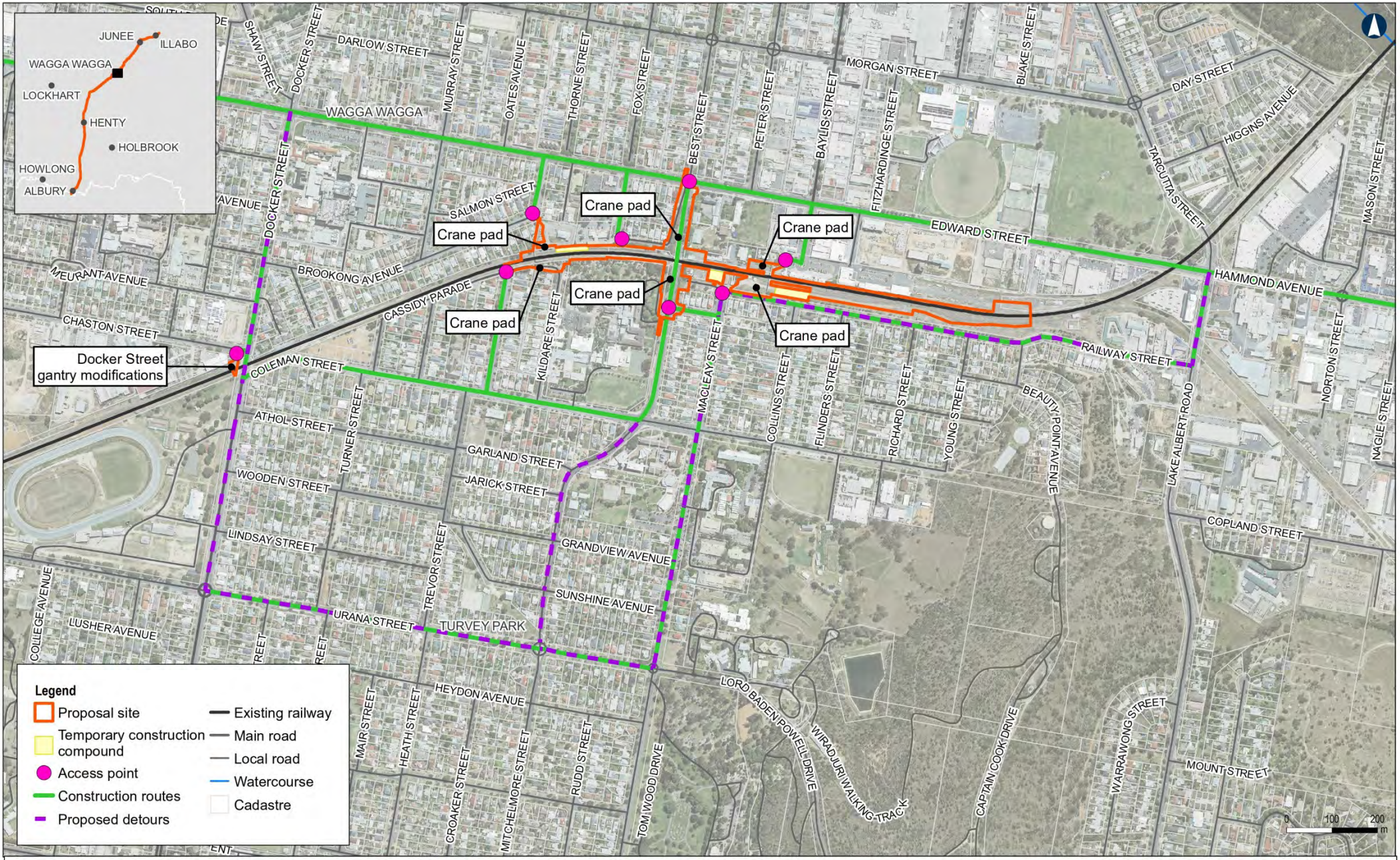

Figure A-35 Construction layout of Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:11,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA35_ConstructionlayoutofWaggaWaggaStationandsurrounds_r1v2.mxd

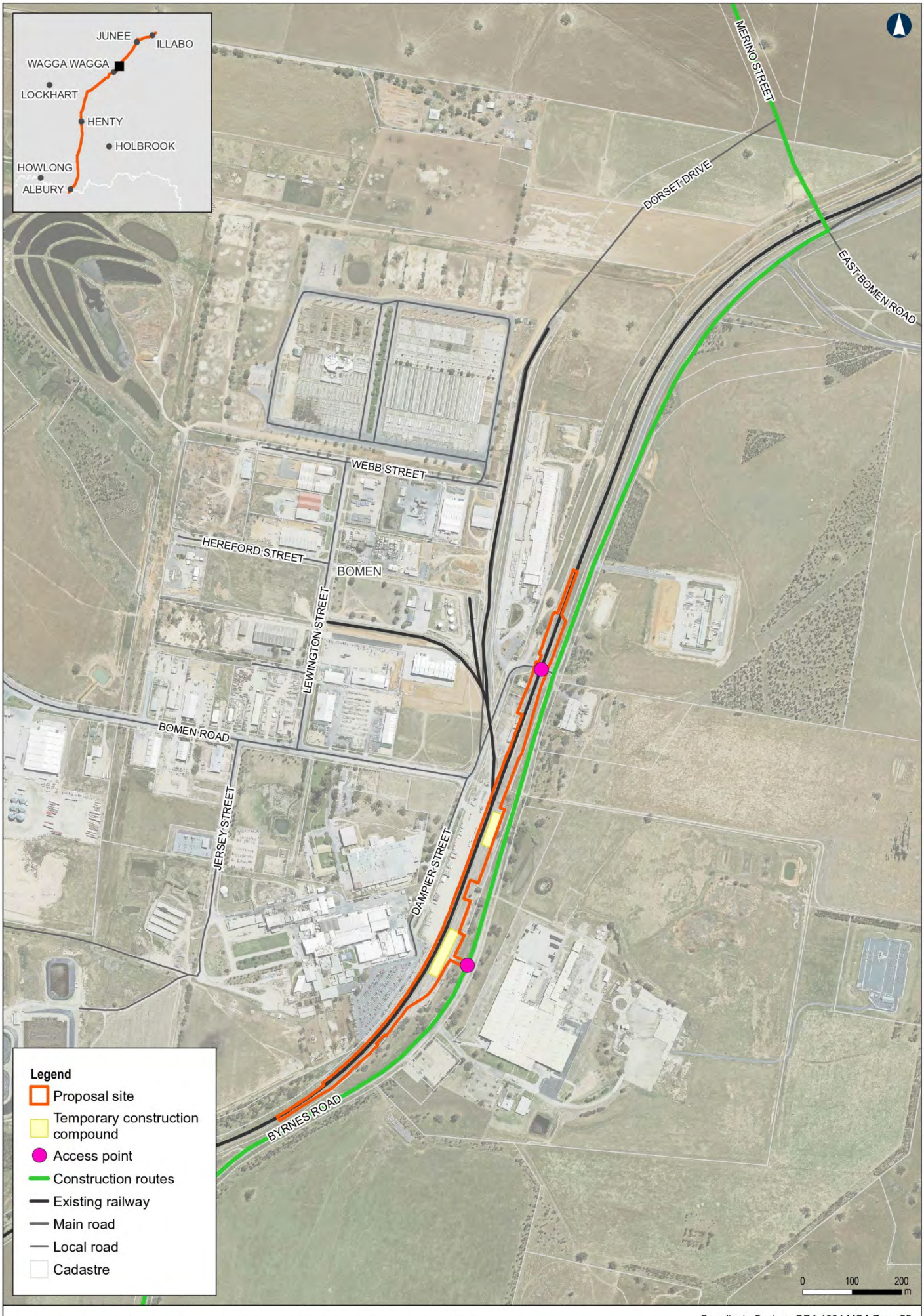

Figure A-36 Construction layout of Bomen Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:10,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA36_ConstructionlayoutofBomenYardclearances_r1v2.mxd

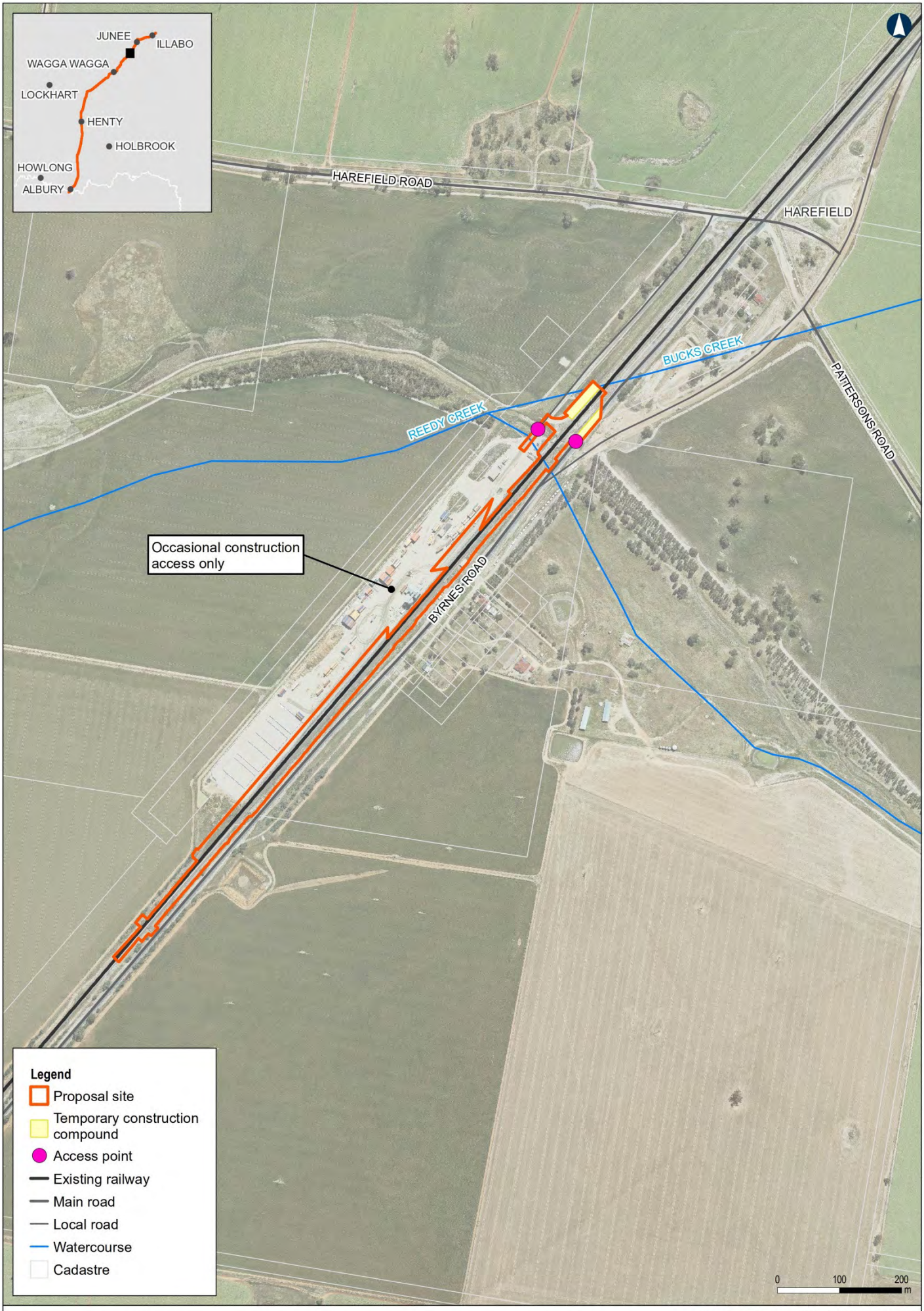

Figure A-37 Construction layout of Harefield Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA37_ConstructionlayoutofHarefieldYardclearances_r1v2.mxd

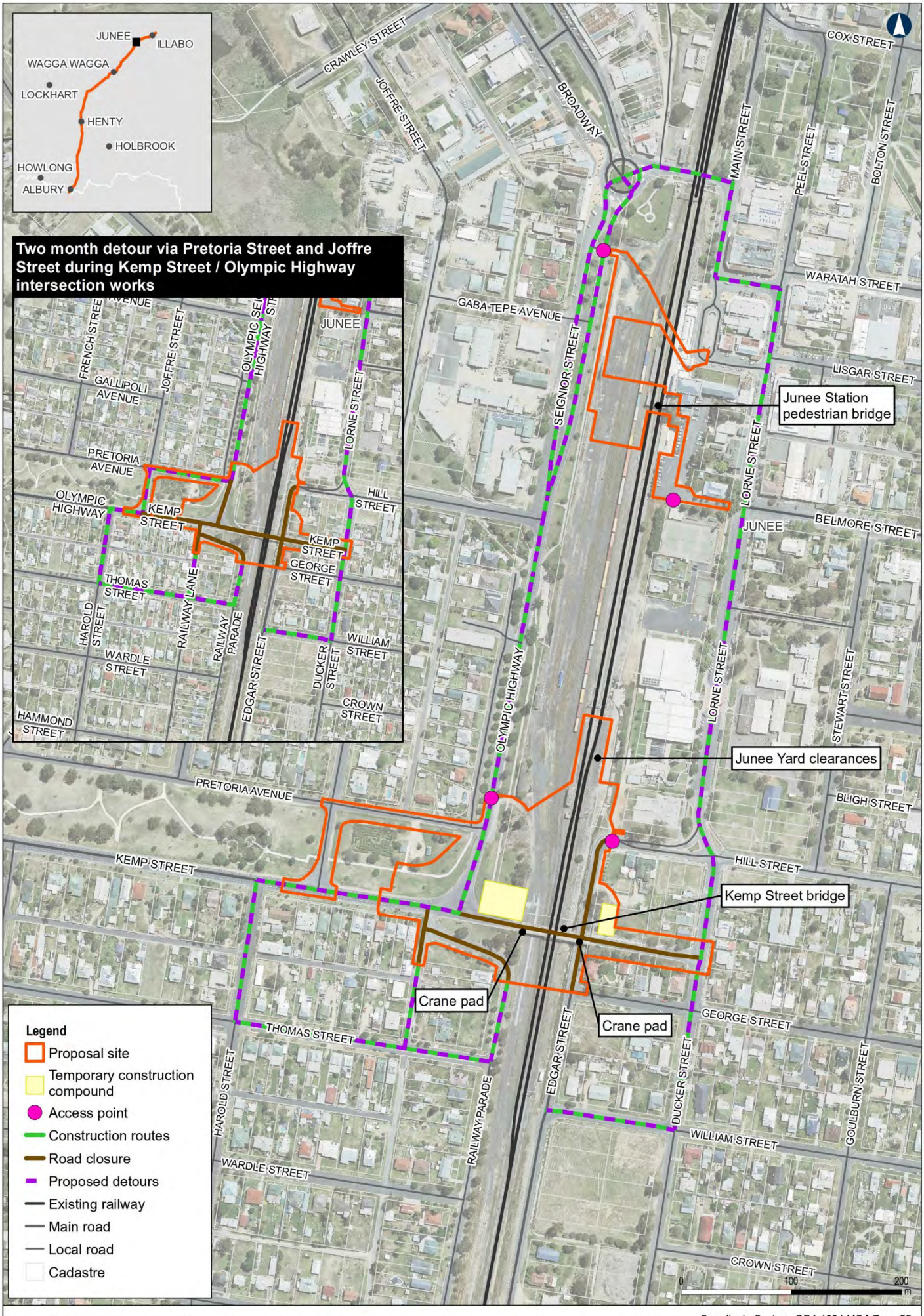

Figure A-38 Construction layout of Junee Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA38_ConstructionlayoutofJuneeStationandsurrounds_r1v2.mxd

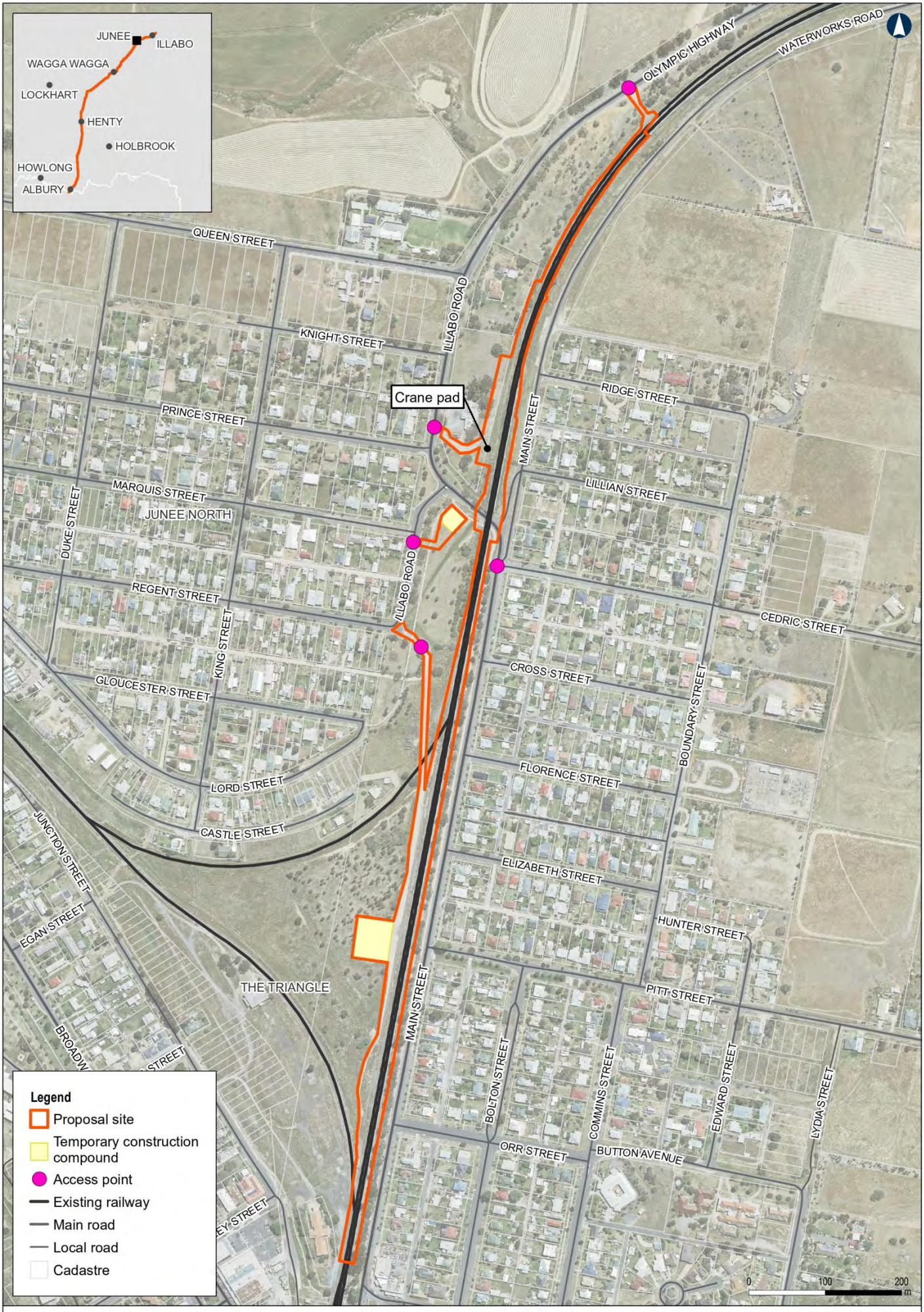

Figure A-39 Construction layout of Olympic Highway underbridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:8,500
Paper size: A4
Date: 27/10/2023

210_EAP_FA39_ConstructionlayoutofOlympicHighwayunderbridge_r1v2.mxd

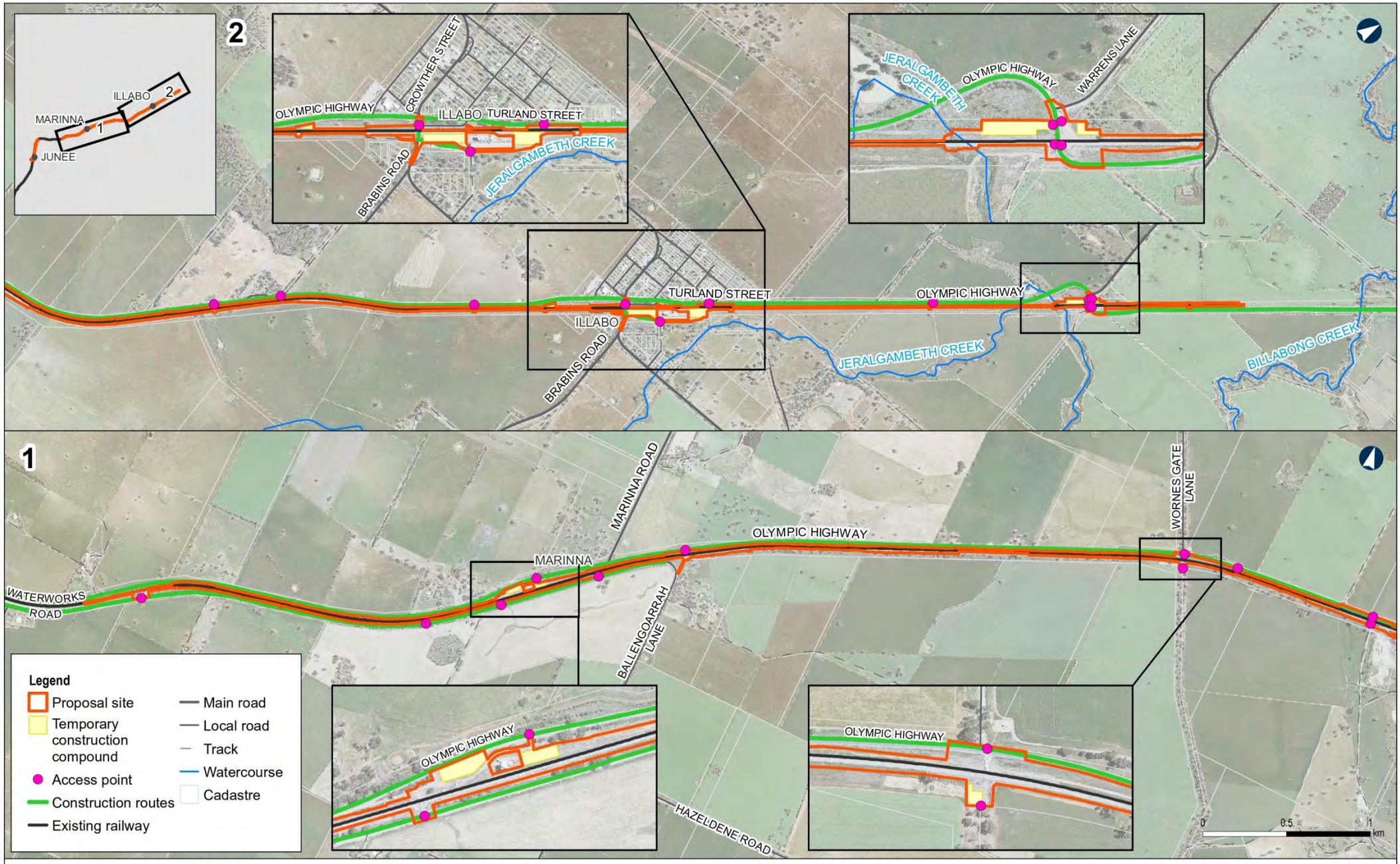

Figure A-40 Construction layout of Junee to Illabo clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:30,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA40_ConstructionlayoutofJuneetoIllaboclearances_r1v2.mxd

A.15 Transport, access, and haulage arrangements

A.15.1 Construction access and traffic

Indicative access to each enhancement site is shown in Figure A-27 to Figure A-40. Deliveries from the wider region would use the regional public road network to link with these access routes.

Temporary access tracks from public roads to a construction compounds would be established, where required, for the duration of construction. All connections to public roads would be designed to the appropriate standard and in consultation with the road manager. Temporary connections to public roads and temporary tracks would be removed when the access is no longer required and would be restored to pre-existing conditions.

Construction vehicle movements would comprise both heavy and light vehicles and would vary across the proposal site depending on the construction activity being undertaken. Light vehicle movements would be predominantly workers arriving and leaving the sites and would peak with the workforce numbers during rail possessions.

Heavy vehicle movements would be due to deliveries of plant and materials and removal of waste and spoil. Heavy vehicle movements would generally peak during removal of waste after demolition or during material deliveries for track works or bridge works. Deliveries and waste removal would be contained to the propose primary construction hours as far as practicable; however, some heavy vehicle movements may be required during out of hours work. Indicative construction traffic volumes and access arrangements are summarised in Table A-16. These volumes and access arrangements would be refined during detailed design by the construction contractor.

TABLE A-16 ESTIMATED TRAFFIC VOLUMES AND PROPOSED ACCESS ARRANGEMENTS

	Peak estimated vehicle movements (one-way) in an hour		
Enhancement site	**Light**	**Heavy**	**Construction access arrangements**
Albury Precinct			
Murray River bridge	27	2	Heavy and light vehicle access would be from Olive Street via Willowbank Drive. Light vehicles access would also be via Abercorn Street and Townsend Street. Minor regrading works and placement of geotextile and gravel along the existing unformed section of Townsend Street would occur to ensure it is suitable for light vehicles. This regrading would be limited to the width of the existing track.
Albury Station pedestrian bridge	13	8	Site access would predominantly be from Railway Place via Young Street and Atkins Street. Access to the work on the western ramp would be via Kenilworth Street.
Albury Yard clearances	27	18	The southern access would via the northbound on-ramp to the Hume Highway at the East Street interchange (under traffic management) and the northern access would be via the Hume Highway off-ramp to Borella Road (under traffic management).
Riverina Highway bridge	40	10	Access would be from Wilson Street off Young Street on the western side and the Hume Highway off-ramp to Borella Road (under traffic management) on the eastern side. One-off access through The Scots School Albury may be required to establish the piling rig subject to agreement.
Billy Hughes bridge	47	10	Eastern and western compounds would be accessed from Wagga Road via the Wagga Road interchange at the Hume Highway. A private track would be used to access the construction compound to the west of the rail corridor off Wagga Road subject to landholder agreement (Albury City Council). A secondary access would be provided via an existing property access point off R W Henry Drive to the western compound.
Table Top Yard clearances	7	2	Access would be from Perrymans Lane.
Greater Hume–Lockhart Precinct			
Culcairn pedestrian bridge/Culcairn Yard clearances	40	8	Access to the rail corridor and construction compounds would be via Railway Parade. This access is shared with GrainCorp. Access to the signal gantry and the pedestrian footbridge would be from Balfour Street.
Henty Yard clearances	40	8	Access would be via Sladen Street. Access to the southern gantry would be via Railway Parade.

Enhancement site	Peak estimated vehicle movements (one-way) in an hour		Construction access arrangements
	Light	Heavy	
Yerong Creek Yard clearances	40	8	Access would be via Plunkett Street.
The Rock Yard clearances	7	1	Access would be via Urana Street.
Wagga Wagga Precinct			
Uranquinty Yard clearances	27	8	Access would be via Yarragundry Street. A temporary waterway crossing at Sandy Creek would be established to facilitate access to the site to the east of the creek.
Pearson Street bridge	33	3	Access would be via Urana Street near the rail corridor and though the Wagga Show Campground and via Fernleigh Road through the council depot access road. Access to the rail corridor from the north would be via an internal access road from Cheshire Street.
Cassidy Parade pedestrian bridge	13	3	Access from the north would be via Brookong Avenue and Donnelly Avenue/Fox Street. Access from the south would be via Cassidy Parade.
Edmondson Street bridge	20	5	Access from the north would be from Best Street and Little Best Street. Access from the south includes: ▸ Edmondson Street ▸ Mount Erin Heritage Centre driveway off Edmondson Street ▸ Railway Street at the northern end of MacLeay Street.
Wagga Wagga Station pedestrian bridge	13	3	Access from the north would be via Railway Street near MacLeay Street from the south. Access from the north would be via Station Place through the Multicultural Council of Wagga Wagga access gate. Docker Street and Chaston Street would be used to access the gantry proposed to be modified to the west of the Docker Street level crossing.
Wagga Wagga Yard clearances	27	10	
Bomen Yard clearances	27	8	Access would be via Dampier Street and Byrnes Road. A new access point would be constructed into Byrnes Road.
Junee Precinct			
Harefield Yard clearances	47	8	Access would be via Byrnes Road and a private access road off Harefield Road.
Kemp Street bridge	20	8	Access would be from the Edgar Street from the east and the Olympic Highway (Kemp Street and Seignior Street) from the west.
Junee Yard clearances	23	8	
Junee Station pedestrian bridge	7	1	Access would be via Lorne Street from the east and via a Seignior Street from the west.
Olympic Highway underbridge	53	8	Access would be via Illabo Road and Olympic Highway from the east and Main Street near the Olympic Highway from the west.
Junee to Illabo clearances	60	8	Access would be via several locations along the Olympic Highway including at level crossings and culvert works locations. Access in Illabo would be via Junee Street, Crowther Street and Turland Street.

Construction worker parking

Construction workers would be required to drive and park at enhancement sites or could travel to/from sites via private bus transport arranged by the construction contractor. The numbers of construction workers requiring parking would vary over the duration of the construction program. Generally, workers would arrive at the beginning of a shift in the morning and leave at the end of a shift in the evening. For out-of-hours work, workers would arrive in the evening and leave in the night or morning, depending on shift requirements.

The number of car parking spaces at the construction compounds would be determined during construction planning. Worker parking would generally be contained to the rail corridor. During rail possessions, when the number of workers would likely peak, there may be a need for temporary use of on-street and road-side parking. Measures to manage any potential parking impacts during construction are discussed in Chapter 9: Transport and traffic.

A.15.2 Traffic management and access

During construction, traffic management measures would be implemented to ensure the ongoing functionality of surrounding roads, and the safety of members of the public, motorists, and construction workers in consultation with relevant road authorities. Over-size and over-mass vehicles would be required for the delivery and removal of large plant and equipment on discrete occasions. There would be a higher proportion of these movements during site establishment and site closure, as large plant and equipment are moved to and from site, respectively. A turn path analysis has been carried out for the proposal and potential measures to manage over-size and over-mass vehicles have been identified in section 6.1 of the PIR.

At enhancement sites where temporary road closures are required, access to properties would be maintained or alternative arrangements would be made in agreement with the affected stakeholders. The proposal would also temporarily alter cyclist and pedestrian access through road and pedestrian bridge closures. Temporary traffic and pedestrian detours would be implemented as discussed below.

Temporary detours

Temporary road closures would be required for the road bridge replacements in Junee and Wagga Wagga. Level crossing works would be completed under traffic control to maintain traffic flow, where possible; however, one level crossing at Henty Yard clearances and four level crossings at Junee to Illabo clearances would be closed to complete works. Detours would be established where road or level crossing closures are required.

Pedestrian detours would be required during the replacement of pedestrian bridges at Albury and Wagga Wagga in addition to the road bridge replacements at Edmondson Street bridge and Kemp Street bridge enhancement sites.

Details of temporary detours required during construction are discussed further in section 3.2.2.2. The required detours would be further refined during detailed design in consultation with Transport for NSW, councils and other relevant stakeholders.

TABLE A-17 TEMPORARY DETOURS

Enhancement site	Closure	Approximate duration	Detour summary
Albury Precinct			
Albury Station pedestrian bridge	Pedestrian bridge	8 months	During the demolition of the existing pedestrian bridge and construction of the new pedestrian bridge at Albury Station, pedestrians would be diverted for around six months to the existing bridge infrastructure located around 170 m to the north at Dean Street (a pedestrian bridge). An additional route is also available around 450 m to the south, connecting Atkins Street and Amatex Street.
Greater Hume–Lockhart Precinct			
Henty Yard clearances	Sladen street level crossing	5 days	Traffic would be diverted to the Rosler Parade level crossing located 1 km to the south. Pedestrian movements across the rail corridor during the closure would be maintained.
Wagga Wagga Precinct			
Cassidy Parade pedestrian bridge	Pedestrian bridge	6 months	Temporary pedestrian and cyclist detours would be required while works are carried out on Cassidy Parade pedestrian bridge (see Figure A-41). Pedestrians would be diverted to the Docker Street level crossing to the west and Edmondson Street bridge to the east. Closure of Cassidy pedestrian bridge is planned to commence after Edmondson Street road and pedestrian bridges have been reopened to enable pedestrians and cyclists to be detoured to at least one of the bridges during construction works.

Enhancement site	Closure	Approximate duration	Detour summary
Edmondson Street bridge	Edmondson Street	11 months	Pedestrians would be diverted to Wagga Wagga Station pedestrian bridge to the east and Cassidy Parade pedestrian bridge to the west while works are carried out on Edmondson Street bridge (see Figure A-40). For vehicular detours, a traffic management strategy would be implemented for motorists to divert to the remaining rail corridor crossings while Edmondson Street bridge is unavailable (see Figure A-36). Little Best Street would be partially occupied; however, access would be available throughout construction.
Wagga Wagga Station pedestrian bridge	Pedestrian bridge	7 months	Pedestrians would be diverted to the new Edmondson Street bridge over the rail corridor while works are carried out on Wagga Wagga Station pedestrian bridge (see Figure A-40).
Junee Precinct			
Kemp Street bridge	Kemp Street	12 months	Vehicular detours would be required while works are carried out on Kemp Street bridge (see Figure A-43). The pedestrian bridge would be constructed and opened prior to closure of Kemp Street bridge to minimise disruption to pedestrians and cyclists. Detours would be required for: ▸ vehicles using Kemp Street bridge. Traffic would be detoured to the Olympic Highway crossing of the rail corridor approximately 700 m to the north ▸ the Olympic Highway during intersection works. Traffic would travel a short section of local roads via Joffre Street and Pretoria Avenue for around two months. This would require temporary widening of these roads and adjustments to road drainage, as well as a temporary change in priority for detoured traffic at the three impacted intersections, and the temporary removal of on-street parking for the duration of the detour. The temporary adjustments would be removed once the detour is no longer required. Local access to Railway Lane and Railway Parade would also be via Harold Street and Thomas Street for the two months ▸ access to the Olympic Highway via Railway Lane would be closed for the duration of construction. Alternative access to the highway is available via Harold Street ▸ the section of Edgar Street between George and Hill Street would be closed for the duration of the bridge works. The driveway access to rear of the Locomotive Hotel would be maintained.
Olympic Highway underbridge	Footpath	5 days	Temporary closure of the pedestrian footpath under the rail corridor may be required during works on the underbridge around the rail possession.
Junee to Illabo clearances	Waterworks Road level crossing (LX604)	3 days	Motorists would need to use Waterworks Road to travel to/from the Olympic Highway.
	Wornes Gate Road level crossing (LX1472)	5 days	Alternative route using Hazeldene Road would need to be used.
	Shire and Carter property level crossing (LX605)	3 days	Timing of this closure and detour would be coordinated with Junee Shire Council and the landowner. Heavy and light vehicles use this level crossing daily and increased usage occurs during the harvest season. Alternative access is available for the Carter property via Hazeldene Road to travel west (via Ballengaoarrah Lane and Waterworks Road), or east (via Brabins Road). For the Junee Shire Council property (a quarry), alternative access would not be available. Access to this property by council is infrequent but can involve multiple heavy vehicle trips.

Enhancement site	Closure	Approximate duration	Detour summary
	Olympic Highway level crossing (LX603)	3 days	A temporary crossing approximately five metres from the existing level crossing would be constructed to maintain highway access across the rail corridor.

Alternative public transport arrangements

Construction works within the rail corridor would occur during scheduled rail possessions or under track occupancy authorisations. During rail possessions, alternative transport arrangements would be implemented in consultation with relevant stakeholders. Works carried out under a track occupancy authorisation would cause minimal disruption to rail passenger services.

Bus routes would be disrupted during the replacement of Edmondson Street bridge and Kemp Street bridge, and level crossing closures at Henty Yard clearances and Junee to Illabo clearances. Adjustments to these bus routes would be determined in consultation with Transport for NSW and the bus operators. This may require adjustment to bus stops to accommodate altered services (refer to Chapter 9: Transport and traffic for further detail on traffic impacts).

A bus shelter on Illabo Street, Junee, may also require temporary relocation to minimise conflicts with the access to the Olympic Highway underbridge construction compound. This relocation would be determined in consultation with Transport for NSW and the bus operators.

Waterway access

During construction on the Murray River bridge, waterway access beneath the bridge would be partially restricted for construction and safety purposes in accordance with the *Marine Safety Act 1998* (NSW). Partial access for watercraft would be maintained by staging the works across the bridge and a Marine Traffic Management Plan would be implemented to minimise potential access impacts to vessels. A temporary exclusion zone would be established in the Murray River in accordance with Transport for NSW requirements including the set-up of navigation marks, buoyage and signage.

All other watercourses within the proposal site are ephemeral and access to these watercourses would be restricted while construction is underway.

Emergency access

Emergency vehicle access to nearby buildings and surrounding areas would be maintained. Emergency vehicles would need to use alternative routes when roads or level crossings are temporarily closed during construction.

Emergency services would be consulted (such as fire, police and ambulance) during the preparation of the site-specific traffic management plans, to obtain requirements for the proposal. An Emergency Management Plan would coordinate these measures and provide a framework for input into the site-specific traffic management plans.

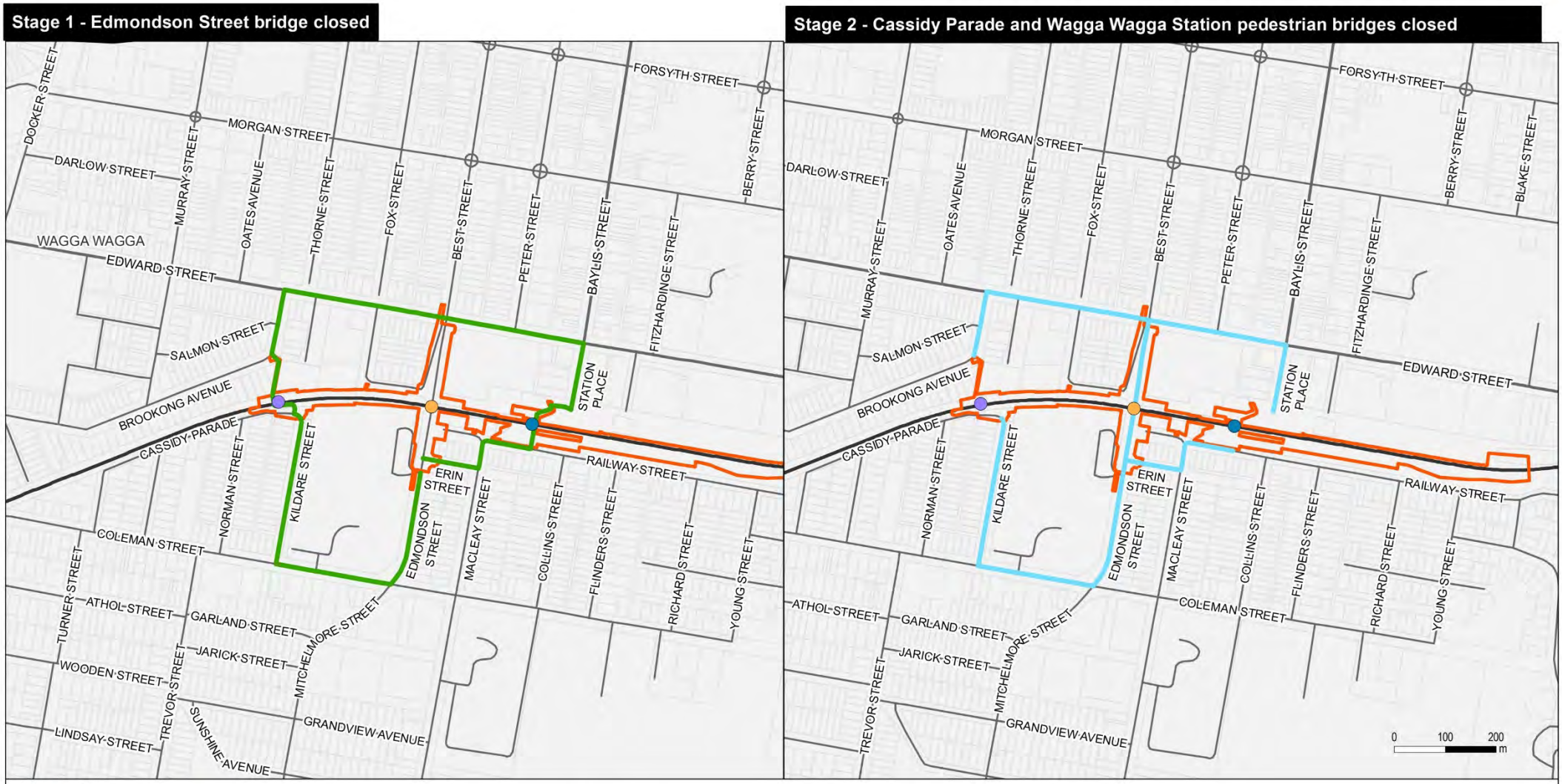

Figure A-41 Pedestrian detours and staging at Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:11,000
Paper size: A4
Date: 27/10/2023

210_EAP_FA41_PedestriandetoursandstagingatWaggaWaggaStationandsurrounds_r1v2.mxd

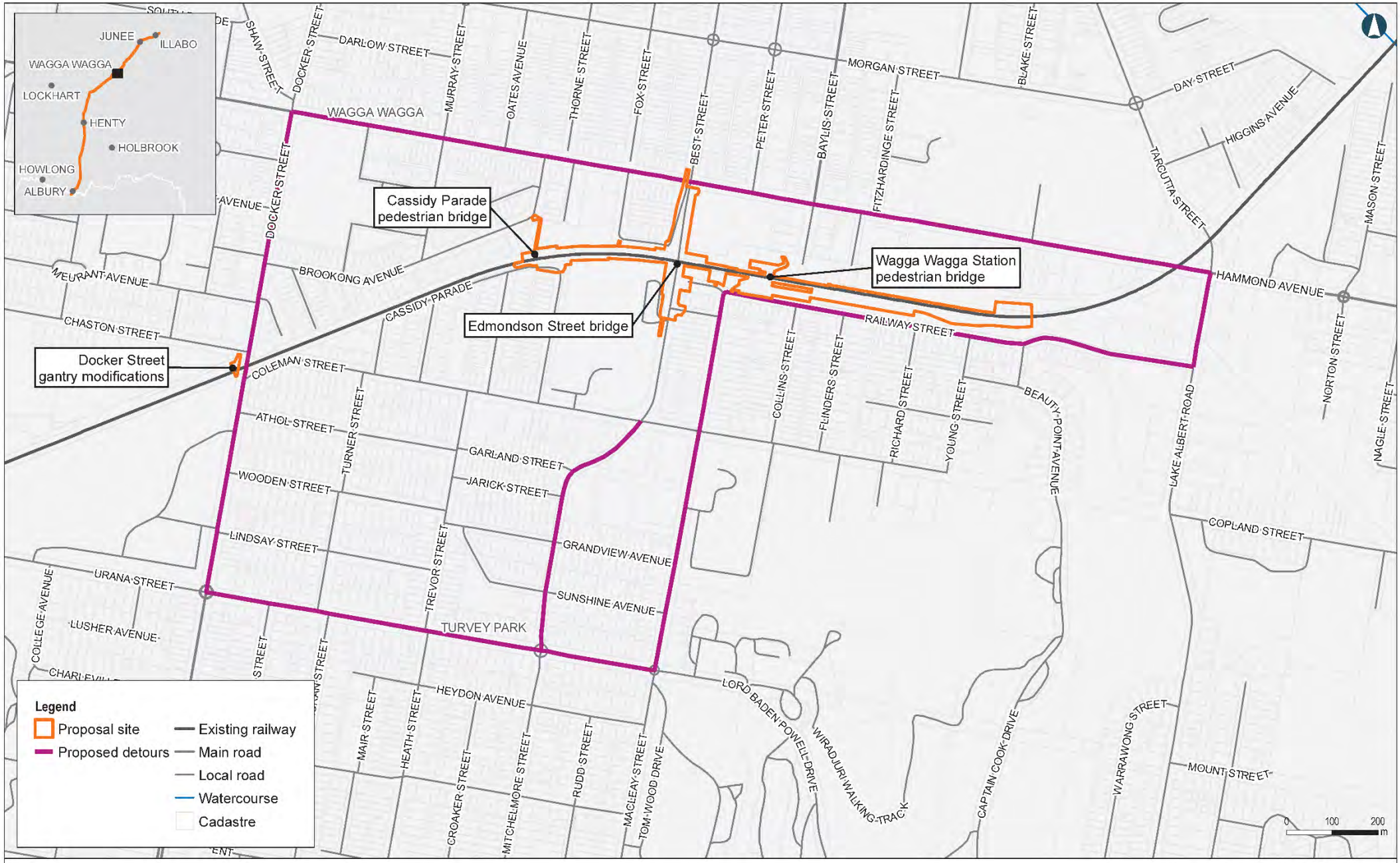

Figure A-42 Vehicle and cyclist detour during Edmondson Street bridge closure

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:11,000
Paper size: A4
Date: 11/04/2022

210_EAP_F0816_VehicleDetour_Wagga_r1v1.mxd

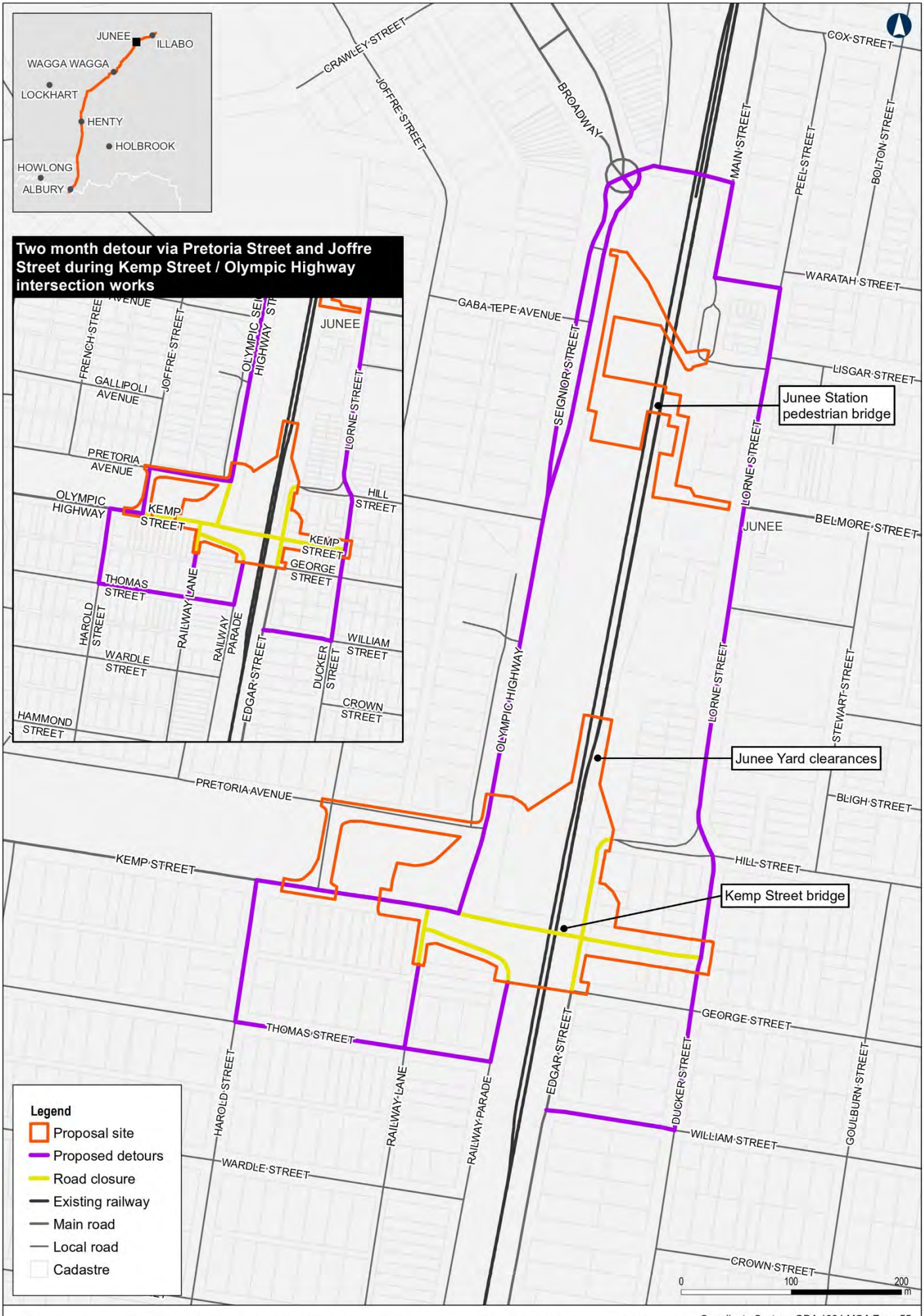

Figure A-43 Vehicle and cyclist detour during Kemp Street bridge closure

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:4,500
Paper size: A4
Date: 27/10/2023

Data Sources: ARTC, NSWSS

210_EAP_FA43_VehicleandcyclistdetoursduringKempStreetbridgeclosure_r1v2.mxd

A.16 Utilities

Consultation with public utility authorities is being undertaken as part of the design process to identify and locate existing utilities, and incorporate utility authority requirements for relocations and/or adjustments. Preliminary investigations have indicated that a number of utilities would need to be relocated or adjusted as part of the proposal. Utilities identified include:

- high and low voltage electrical power lines (Essential Energy)
- water mains and pipelines (councils, Riverina Water and Goldenfields Water)
- sewer mains and pipelines (councils)
- overhead or buried telecommunications (including Telstra, NBN and Optus)
- buried low- and high-pressure gas pipelines (APA and Jemena).

Depending on the interaction, the utilities may remain unaffected, require protection, or require relocation. Additional services investigations would be undertaken during detailed design in consultation with the relevant utility authorities.

These utility relocations and adjustments would generally be contained with the proposal site; however, consultation with utility providers is ongoing and confirmation of the final treatment solution would occur during detailed design.

EIS Appendix D: Utilities Management Framework has been prepared, adopting a risk-based approach to avoiding and/or minimising impacts associated with the relocation and/or adjustment of public utilities affected by the proposal. The framework provides a consistent approach to the assessment and management of public utilities relocation/adjustment across all proposal activities. This includes where additional assessment and approval may be required for utility works outside the proposal site in addition to any approval granted for this proposal.

Utility works that meet the definition of clause 7(5) of Schedule 5 of the State Environmental Planning Policy (Planning Systems) 2021 do not form part of the proposal. This includes the adjustment, relocation, upgrade or replacement of existing utilities prior to commencement of construction unless:

- existing water flows within or through the rail corridor would be permanently affected, or
- clearing of native vegetation would be required that is likely to significantly affect threatened species within the meaning of Part 7 of the *Biodiversity Conservation Act 2016* (NSW).

Where these works occur before commencement of construction, separate environmental assessments and approvals would be obtained, where required. This could include utility work as described in EIS Appendix D: Utility Management Framework, depending on the final construction methodology and schedule as determined by the construction contractor.