

CHAPTER 07

Proposal features and operation

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

ARTC

INLAND
RAIL
An Australian Government Initiative

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7. Proposal features and operation

This chapter provides a description of the Albury to Illabo (A2) section of the Inland Rail program (the proposal) features and operation for the purposes of the Environmental Impact Statement (EIS). It includes a description of the infrastructure proposed and how the proposal would operate. The proposed approach to construction of the proposal is described in Chapter 8: Construction of the proposal.

7.1 Overview

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 7-1.

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 (as described in this chapter) was developed is in Chapter 6: Alternatives and proposal options. Any design modifications that occur as a result of matters arising during the exhibition of this EIS would be identified in a Preferred Infrastructure Report or Amendment Report.

TABLE 7-1 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 7-7 to Figure 7-20
Track work	Adjustments to 44 km of track comprising: ▶ track realignment at 14 enhancement sites ▶ track lowering under bridges at three enhancement sites.	▶ Section 7.2.1 ▶ Figure 7-1 and Figure 7-2
Bridge structures	▶ Modification of four rail bridges ▶ Replacement of two road bridges ▶ Replacement of three pedestrian bridges ▶ Removal of two pedestrian bridges.	▶ Section 7.2.2 ▶ Figure 7-3, Figure 7-4, Figure 7-5 and Figure 7-6
Local road network	▶ Intersection works to integrate replacement road bridges at Wagga Wagga and Junee. ▶ Adjustment of nine level crossings	▶ Section 7.2.2 ▶ Section 7.3.1 ▶ Figure 7-11 to Figure 7-2
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 7.2.1
Ancillary facilities	Road infrastructure, access tracks, signalling including gantry works, signage, fencing and landscaping.	▶ Section 7.3
Commencement of operations	2025, with Inland Rail as whole to commence operations in 2027.	▶ Section 7.6.1
Operational workforce	Supported by the existing ARTC workforce.	▶ Section 7.6.3

A summary of the key features proposed at each enhancement site are provided in Table 7-2. Associated works, including culverts and signalling (e.g. ground signals, gantries and overhead cabling), would occur where track realignments occur as required.

TABLE 7-2 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 section over the rail corridor) and adjustments to the ramps on the eastern section of the bridge near Kenilworth Street.
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
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
Junee Station pedestrian bridge	▶ Pedestrian bridge removal
Junee Yard clearances	▶ Track realignment
Olympic Highway underbridge	▶ Track realignment ▶ Rail bridge alterations
Junee to Illabo clearances	▶ Track realignment ▶ Level crossing modifications, including the upgrade of two level crossings.

7.2 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 7-7 to Figure 7-20.

7.2.1 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 7-3.

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 to Figure 7-1). 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 7-2). 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 7-3 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
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

Enhancement sites	Track	Length (approximate)	Maximum extent of horizontal realignment (approximate)	Maximum depth of lowering (approximate)
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	Main line (down)	15,440 m	0.65 m	N/A
	Main line (up)	15,440 m	0.35 m	N/A

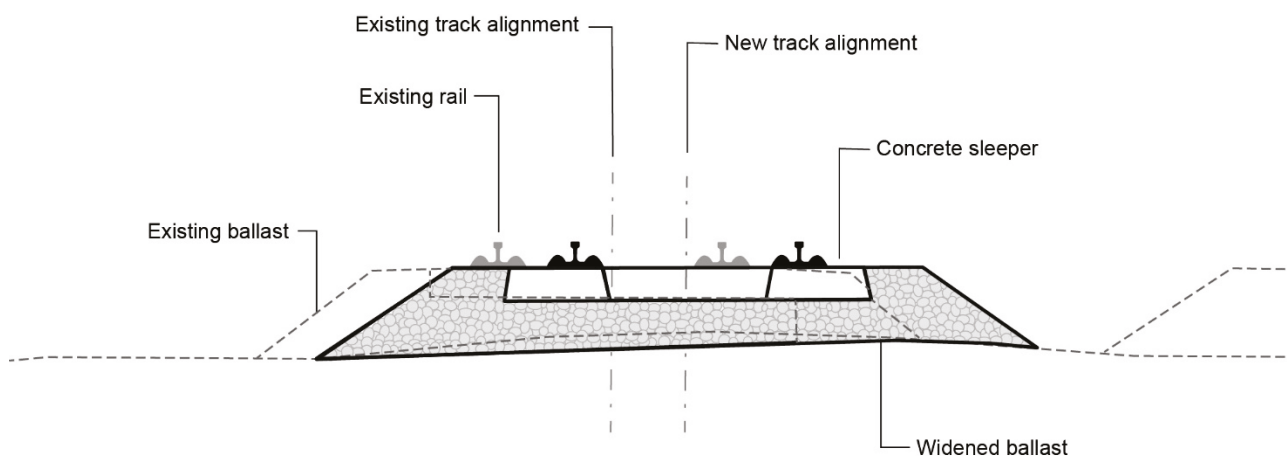


FIGURE 7-1 INDICATIVE TRACK REALIGNMENT

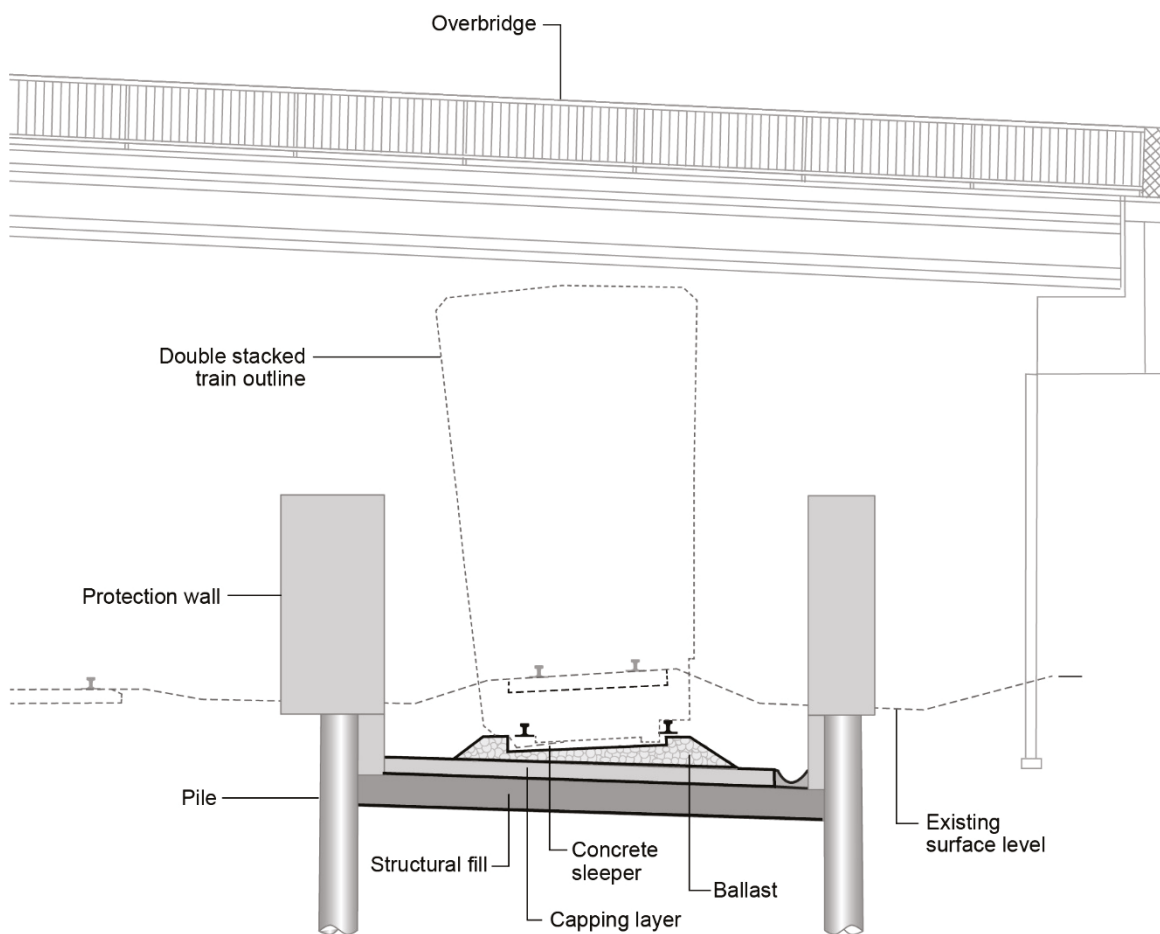


FIGURE 7-2 INDICATIVE TRACK LOWERING

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 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.

7.2.2 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 7-4.

TABLE 7-4 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 metal truss bracing over the bridge does not provide sufficient vertical clearance for the proposed double-stacked freight trains. The top bracing is proposed to be raised by approximately 1.9 m and bracing would be reinstated in accordance with the heritage style of the existing bridge. The raised bracing installed would be in the same style, colour and similar materials (wrought iron) (refer to Figure 7-3). Opportunities to retain and repurpose the original materials removed from the structure such as the top bracing, would be investigated. In addition to these works, a permanent walkway would also be established on the southern side of the bridge to facilitate inspection and maintenance activities.

Enhancement site	Proposed rail bridge alterations
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. The bridge is proposed to be modified to accommodate the realignment of the main line track by approximately 0.3 m (refer to Figure 7-13). The modification involves shifting the main line track and the metal structure supporting it across the bridge. New precast bearing blocks on the bridge piers 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 7-17). 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 down line track would be replaced and/or strengthened to accommodate the realigned position (refer to Figure 7-19). The up-line track would become redundant but may remain in place on the bridge.

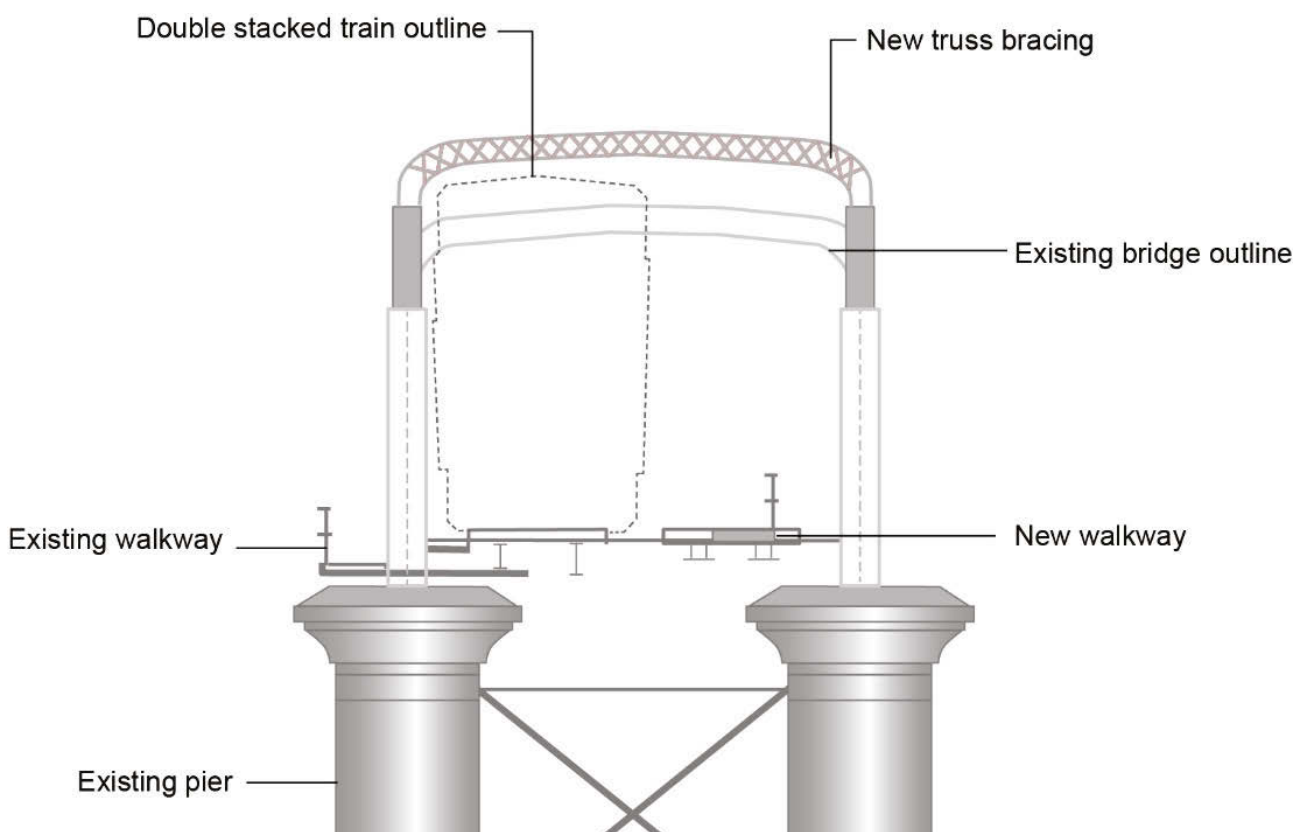


FIGURE 7-3 THE MURRAY RIVER BRIDGE (AS PROPOSED)

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 7-5). Track lowering at the Riverina Highway bridge, Albury, and at Billy Hughes bridge, Ettamogah, would not require modifications to the bridge structures.

TABLE 7-5 NEW ROAD 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 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 retaining walls of 10 m in height on each side of the rail corridor to support the northern and southern bridge approaches (refer to Figure 7-4). Shared paths for pedestrians and cyclists would be provided on both sides of Edmondson Street south of the bridge. Pedestrian fencing is to be provided between the roadway and shared path over the bridge. Tie-in works would be required to integrate the new road bridge with the existing road network, 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 7-15). The bridge would have a posted speed limit of 50 kilometres per hour (km/hr). Throw screens and street furniture (e.g. lighting) would be provided.
Junee precinct	
Kemp Street bridge	Kemp Street bridge is a six-span bridge that carries two lanes of traffic and two pedestrian paths across the railway corridor and Edgar Street in Junee. The bridge would be replaced with a three-span bridge including new piers and abutments along its existing alignment (refer to Figure 7-5). 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 approach and western approach. The new bridge would have two lanes for traffic and one shared path along the northern side that would connect into the existing road and pedestrian network (refer to Figure 7-18). The current staircase to Edgar Street would not be reinstated. Modifications to intersections and associated pedestrian paths would be adjusted to accommodate the new bridge structure. The bridge would have a posted speed limit of 50 km/hr. Throw screens and street furniture (e.g. lighting) would be provided.

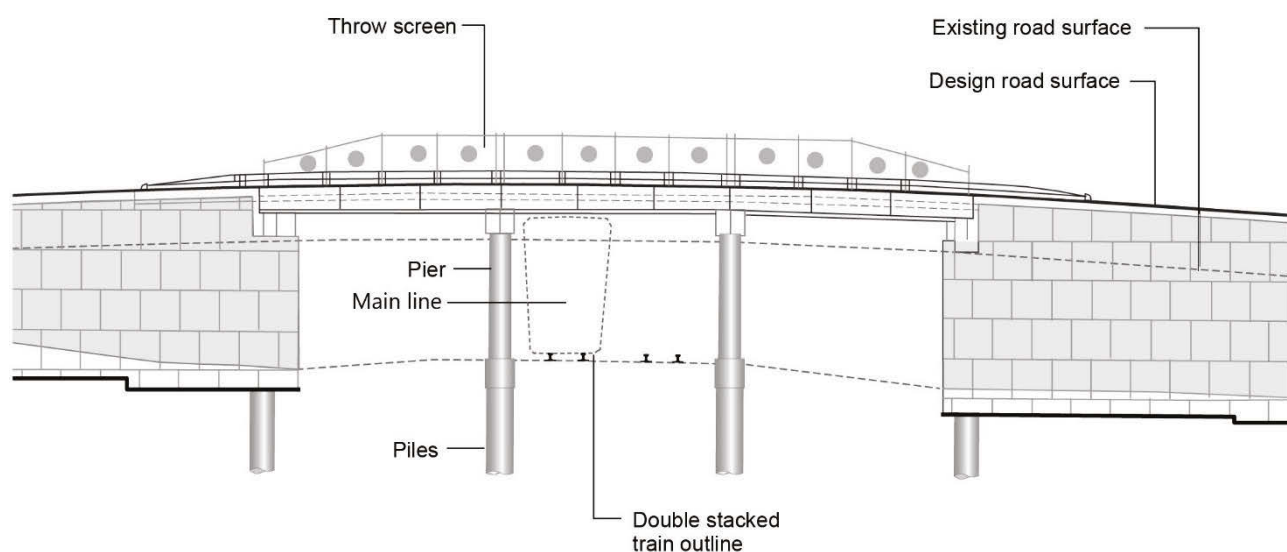


FIGURE 7-4 INDICATIVE EDMONDSON STREET BRIDGE

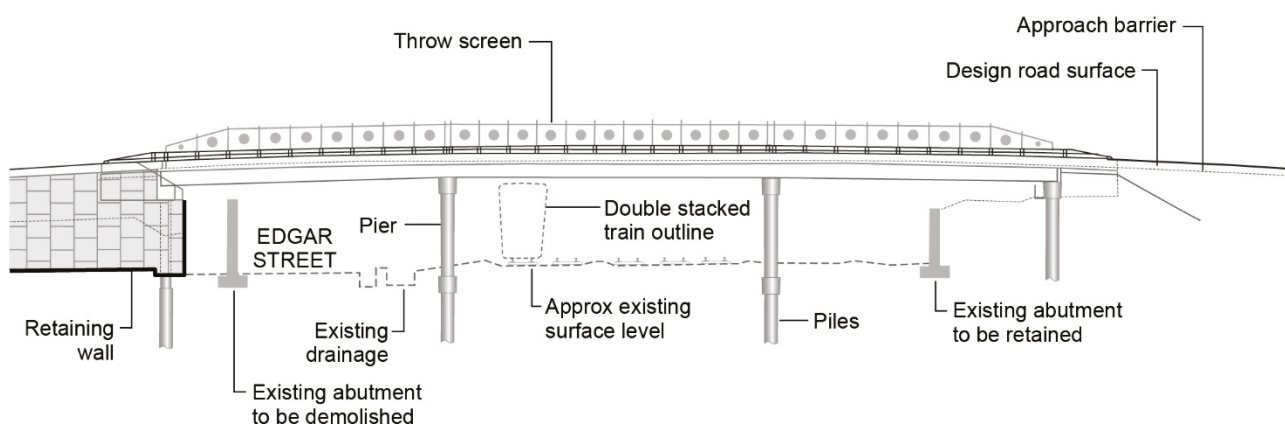


FIGURE 7-5 INDICATIVE KEMP STREET BRIDGE

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 7-6. 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 7-6.

TABLE 7-6 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 metres tall at its highest point. Stairs and a ramp would be provided at the eastern side of the pedestrian bridge to tie in with existing footpaths and station roads including adjustments to the pedestrian crossing on Railway Place. Two public parking spaces at the northern end of Albury Station would be removed as the ramp would result in the narrowing of Railway Place. Two ramps would also be established on the western end of the existing section of bridge connecting to Kenilworth Street (refer to Figure 7-8).
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 7-10). 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 concrete 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 7-15). 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 concrete 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 7-15). 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 unused platform on the eastern side of the track, would be removed (refer to Figure 7-18). 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.

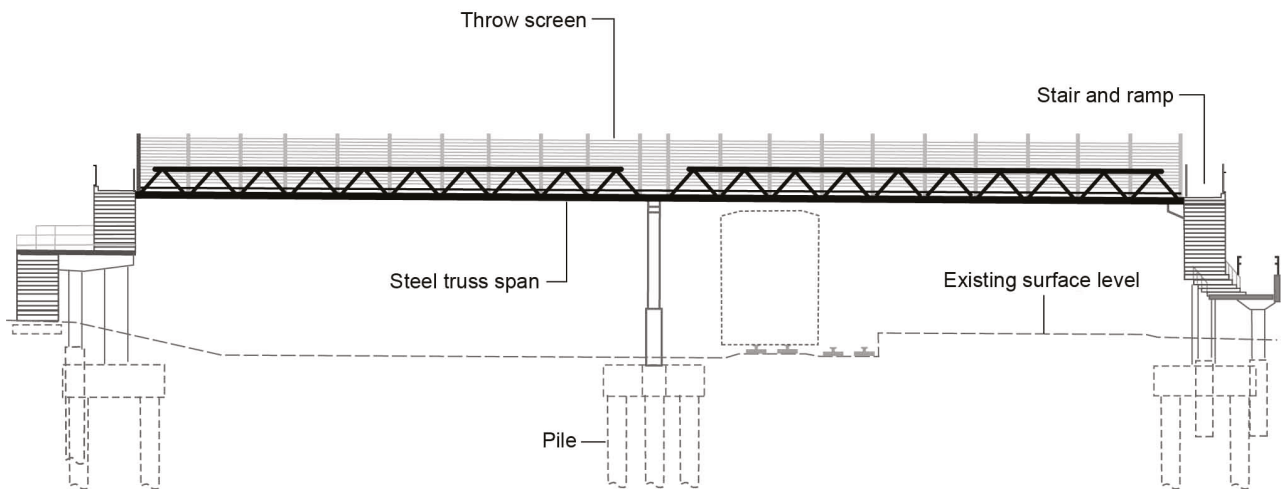
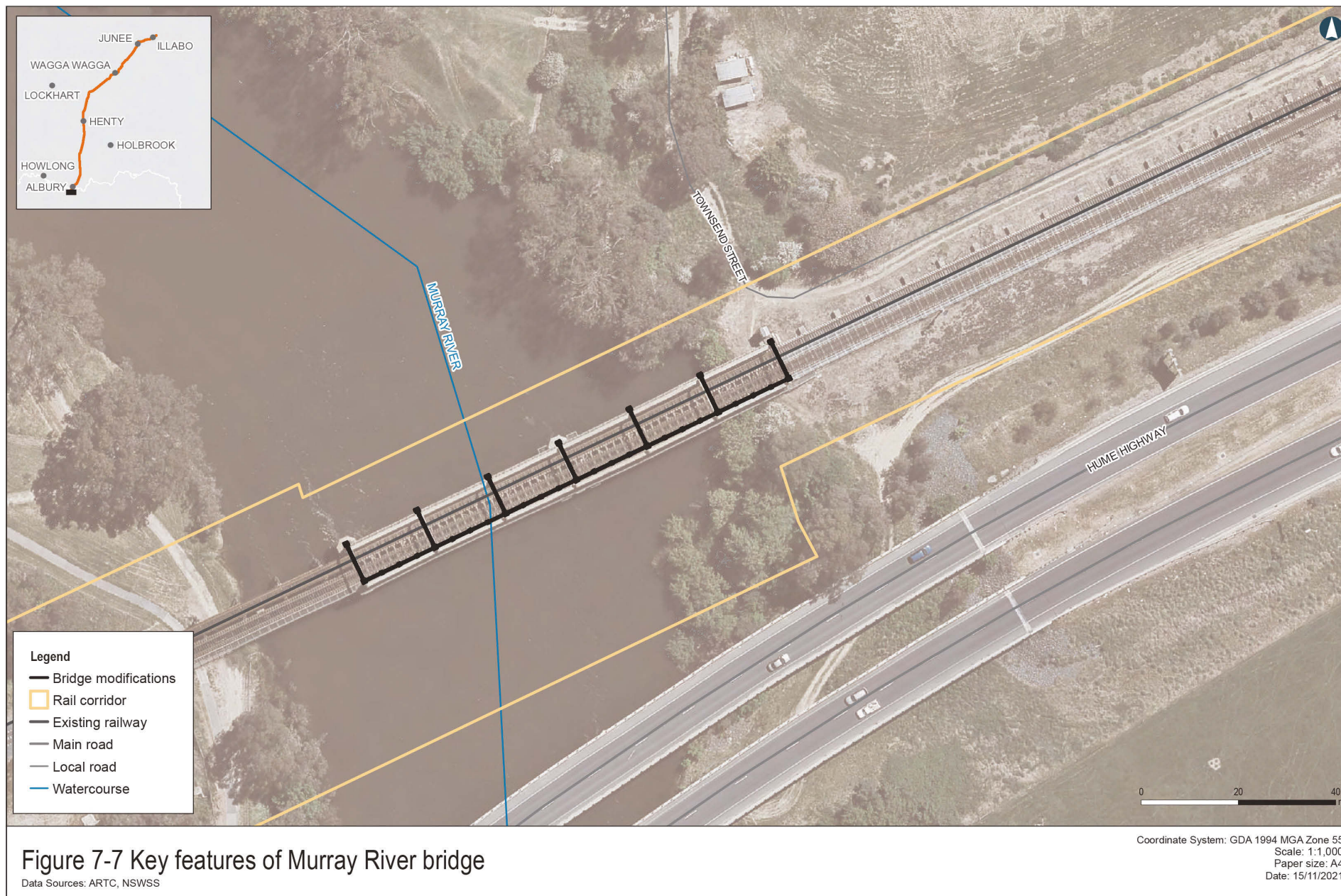


FIGURE 7-6 INDICATIVE PEDESTRIAN BRIDGE



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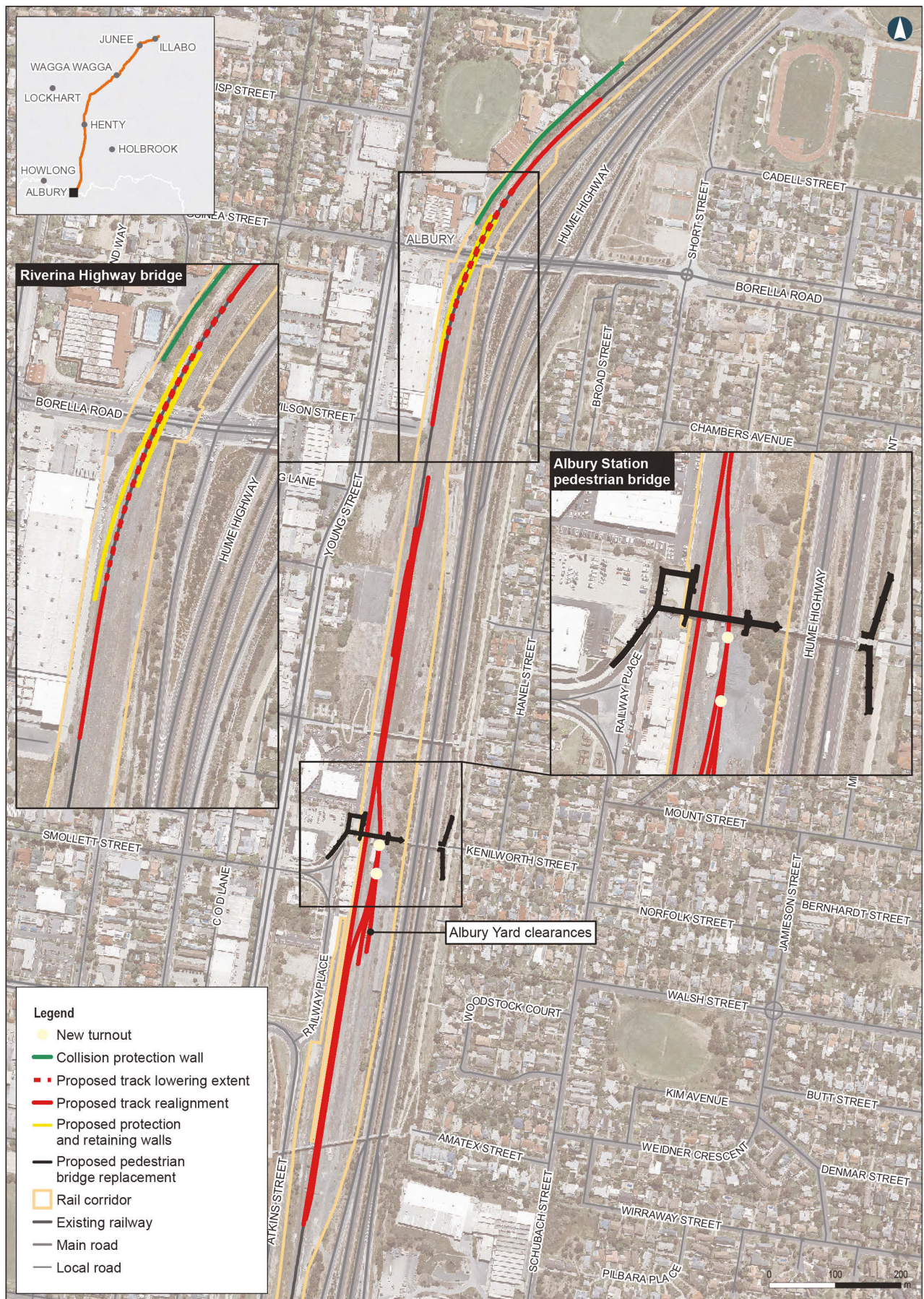
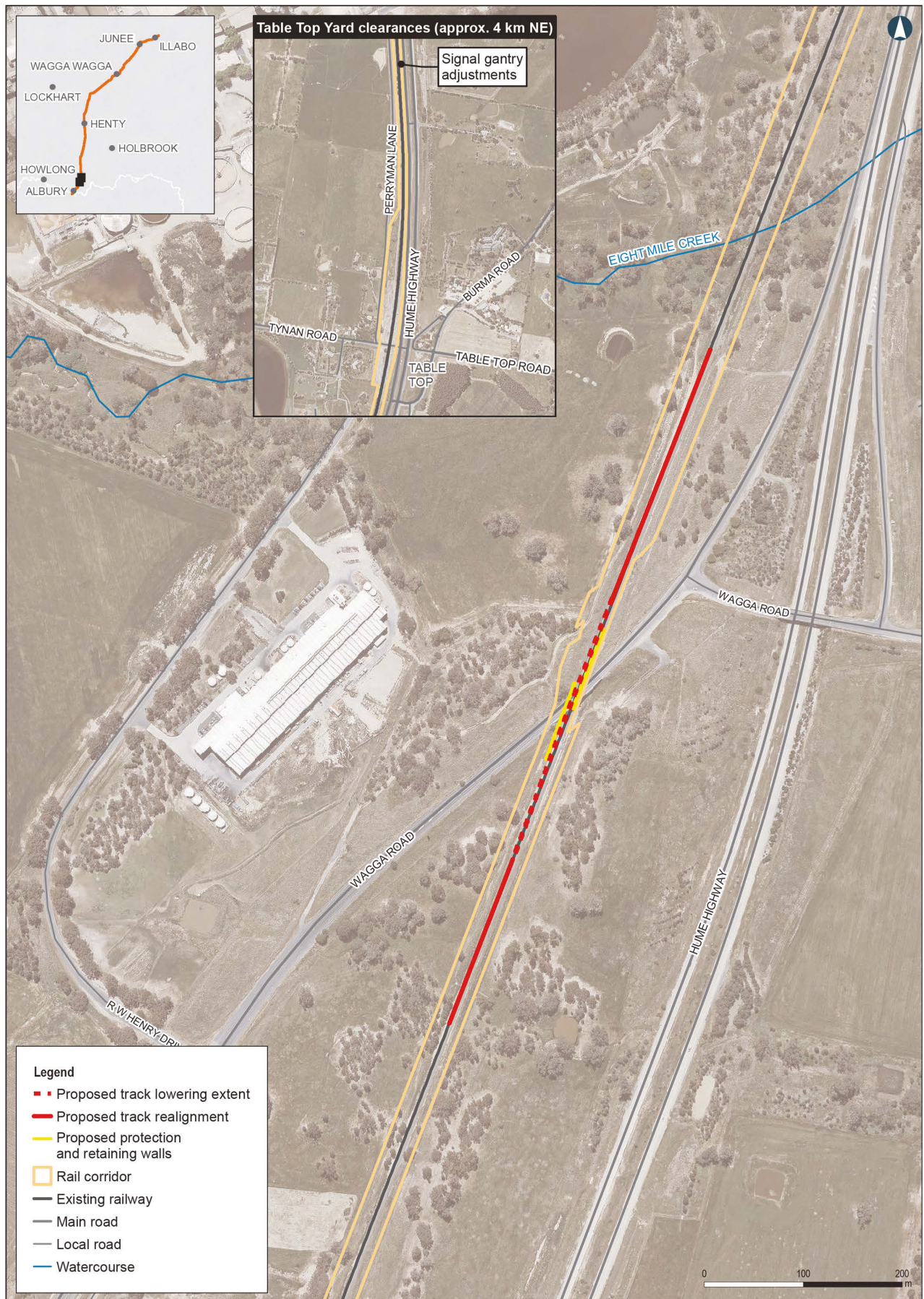


Figure 7-8 Key features of Albury Station and surrounds

Data Sources: ARTC, NSWSS

210_EAP_F0708_AlburyYard_KeyFeatures_r1v5.mxd



7-9 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: 15/11/2021

210_EAP_F0709_BillyHughes_KeyFeatures_r1v4.mxd



Figure 7-10 Key features of Culcairn Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
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 Paper size: A4
 Date: 9/12/2021

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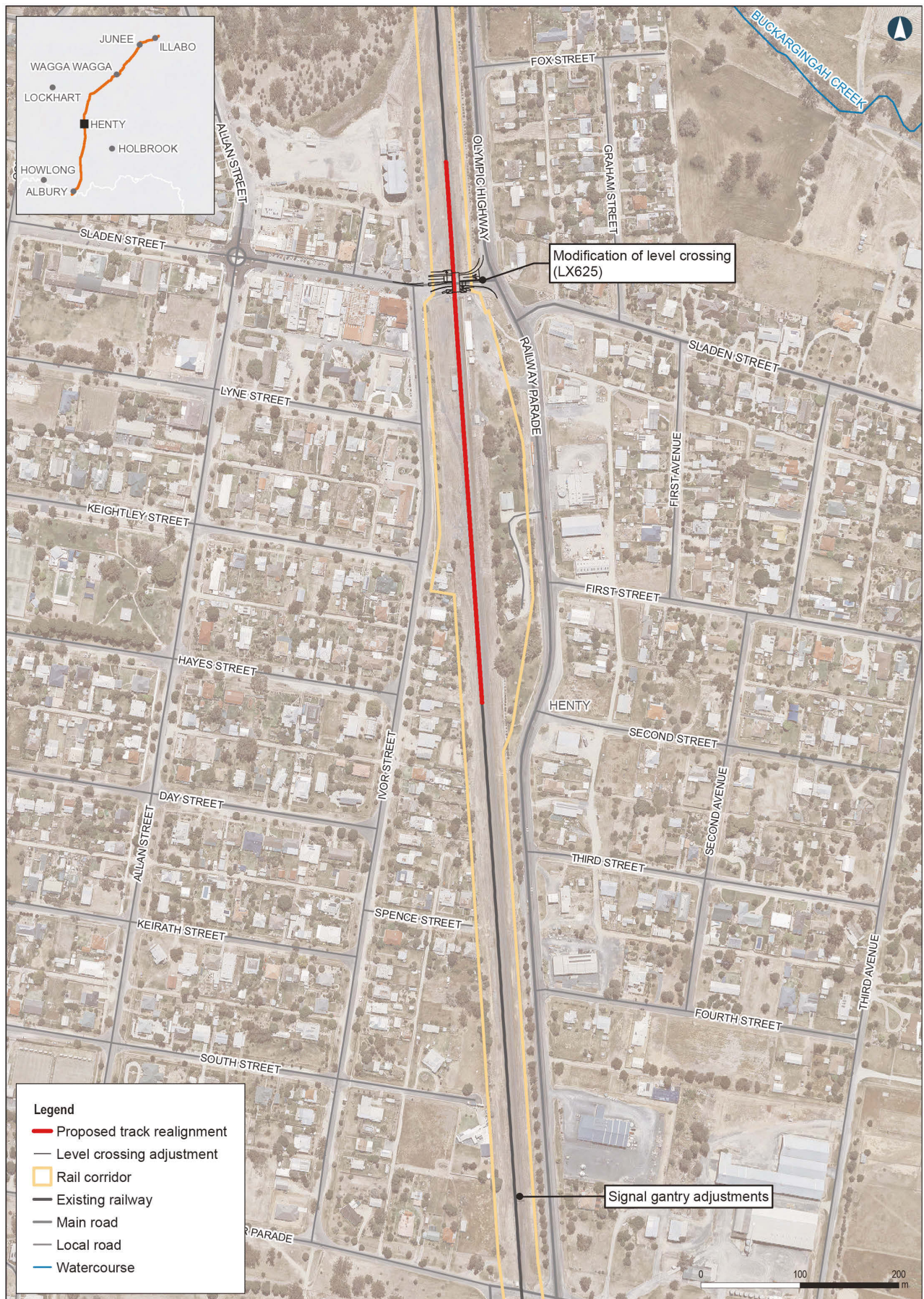
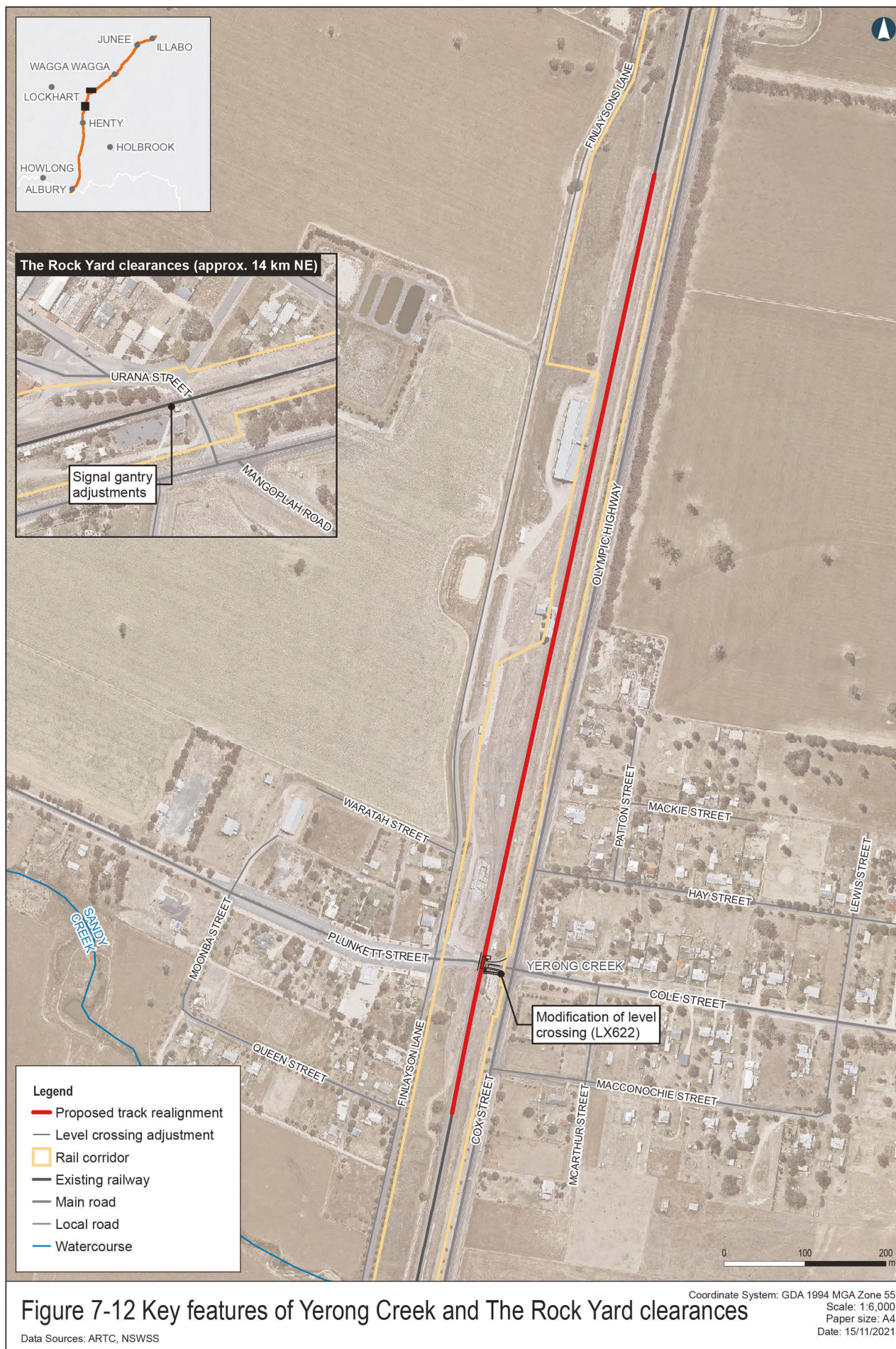
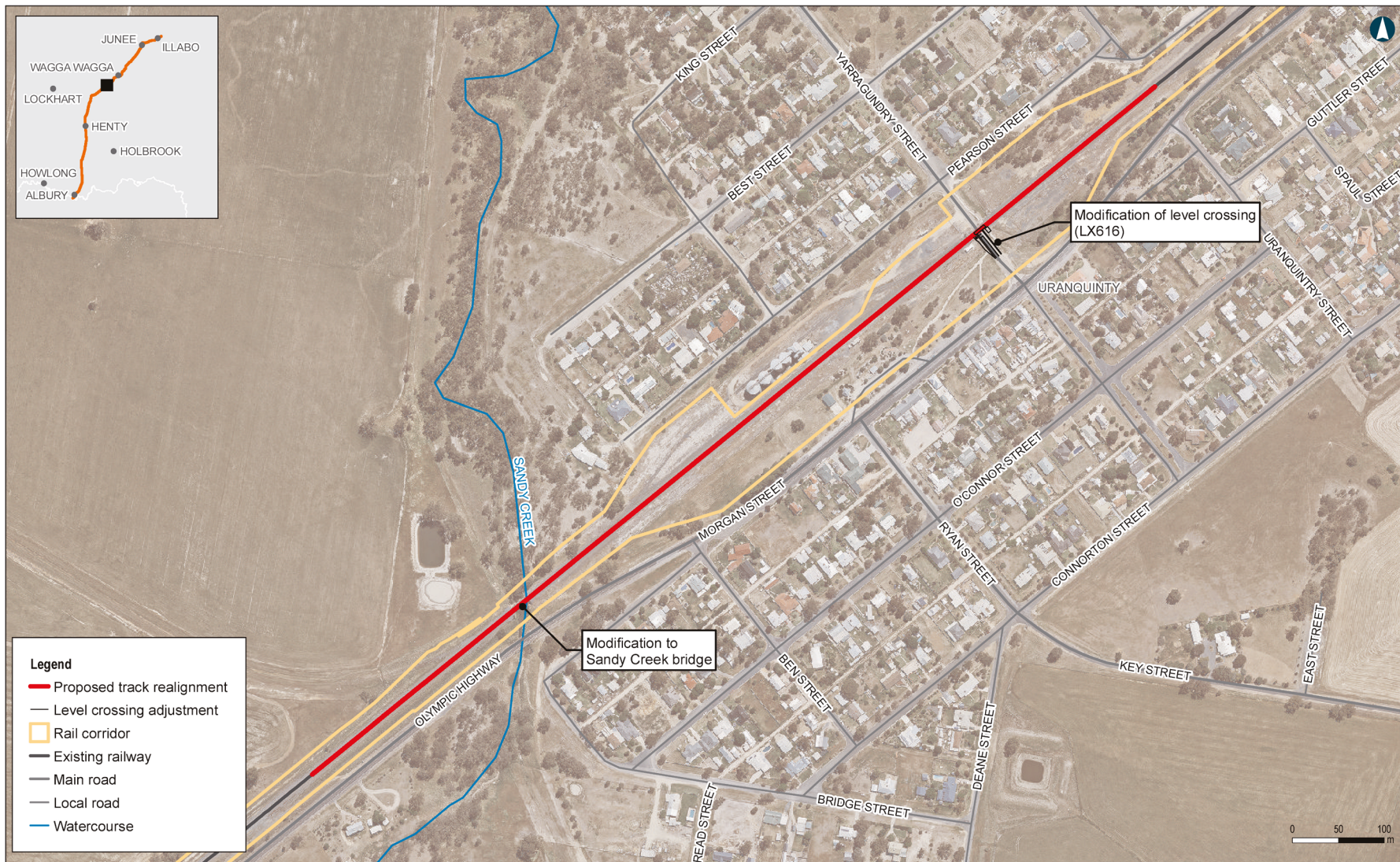


Figure 7-11 Key features of Henty Yard clearances

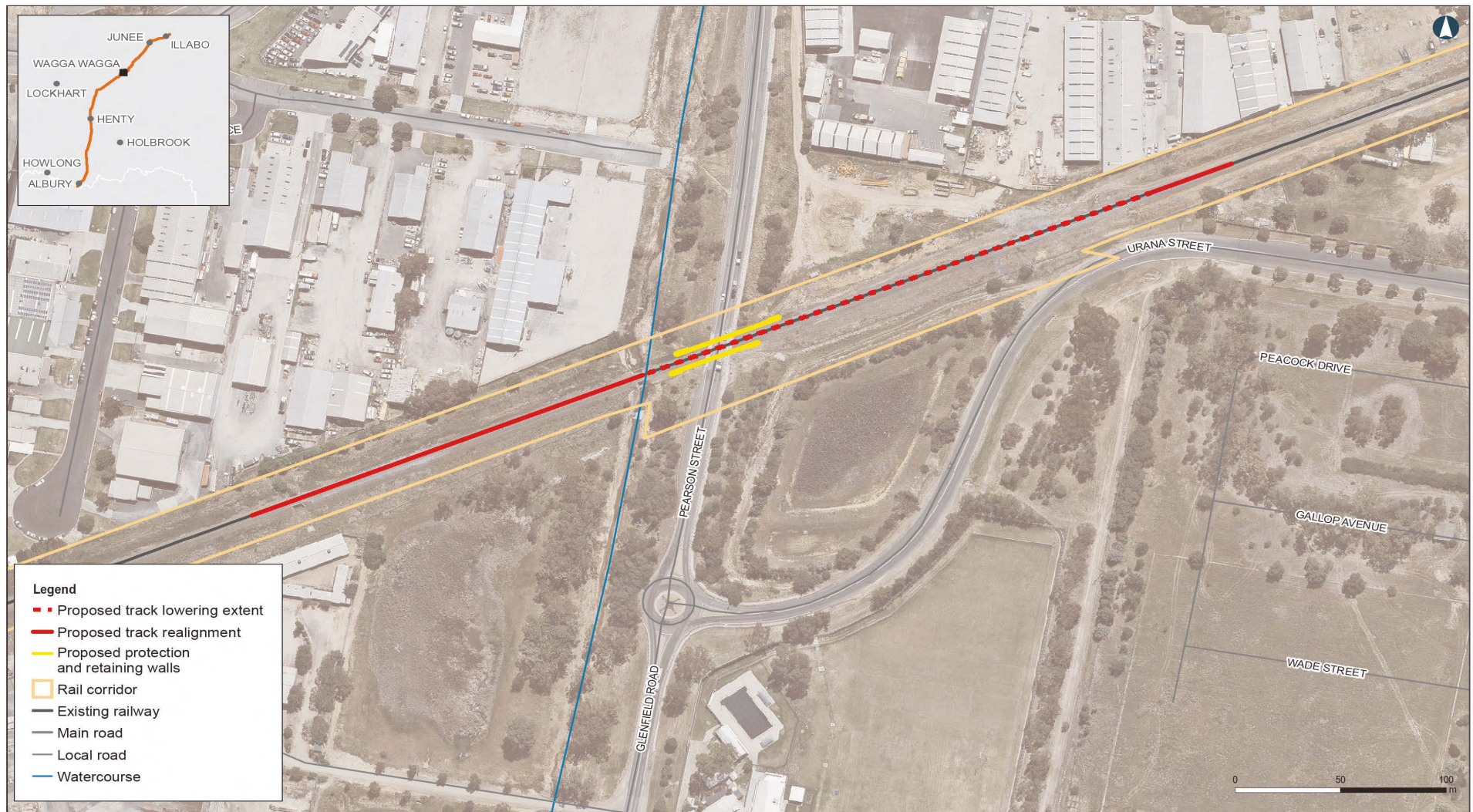
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210_EAP_F0713_Uranquinty_KeyFeatures_r1v5.mxd



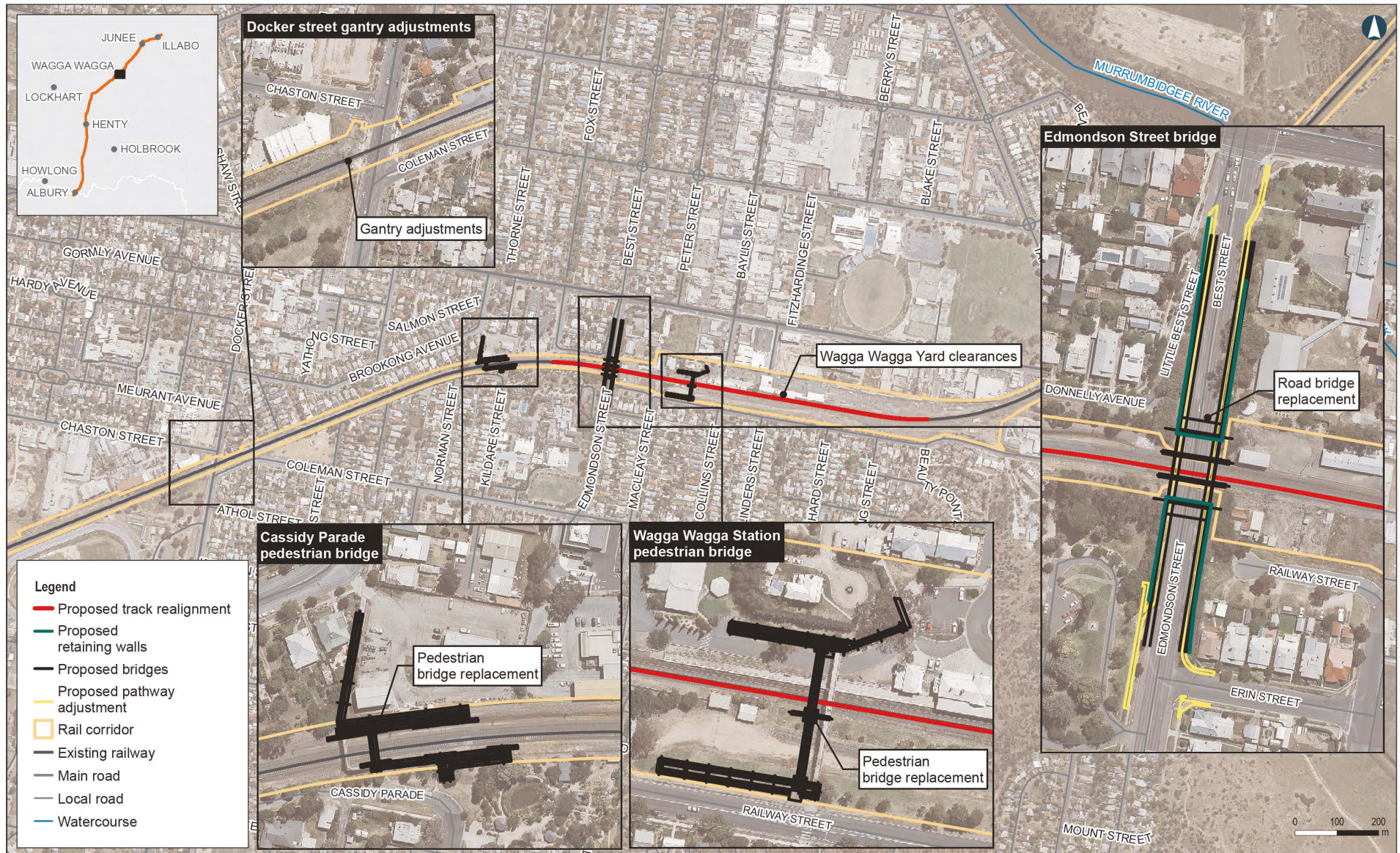


Figure 7-15 Key features of Wagga Wagga Station and surrounds

Data Sources: ARTC, NSWSS

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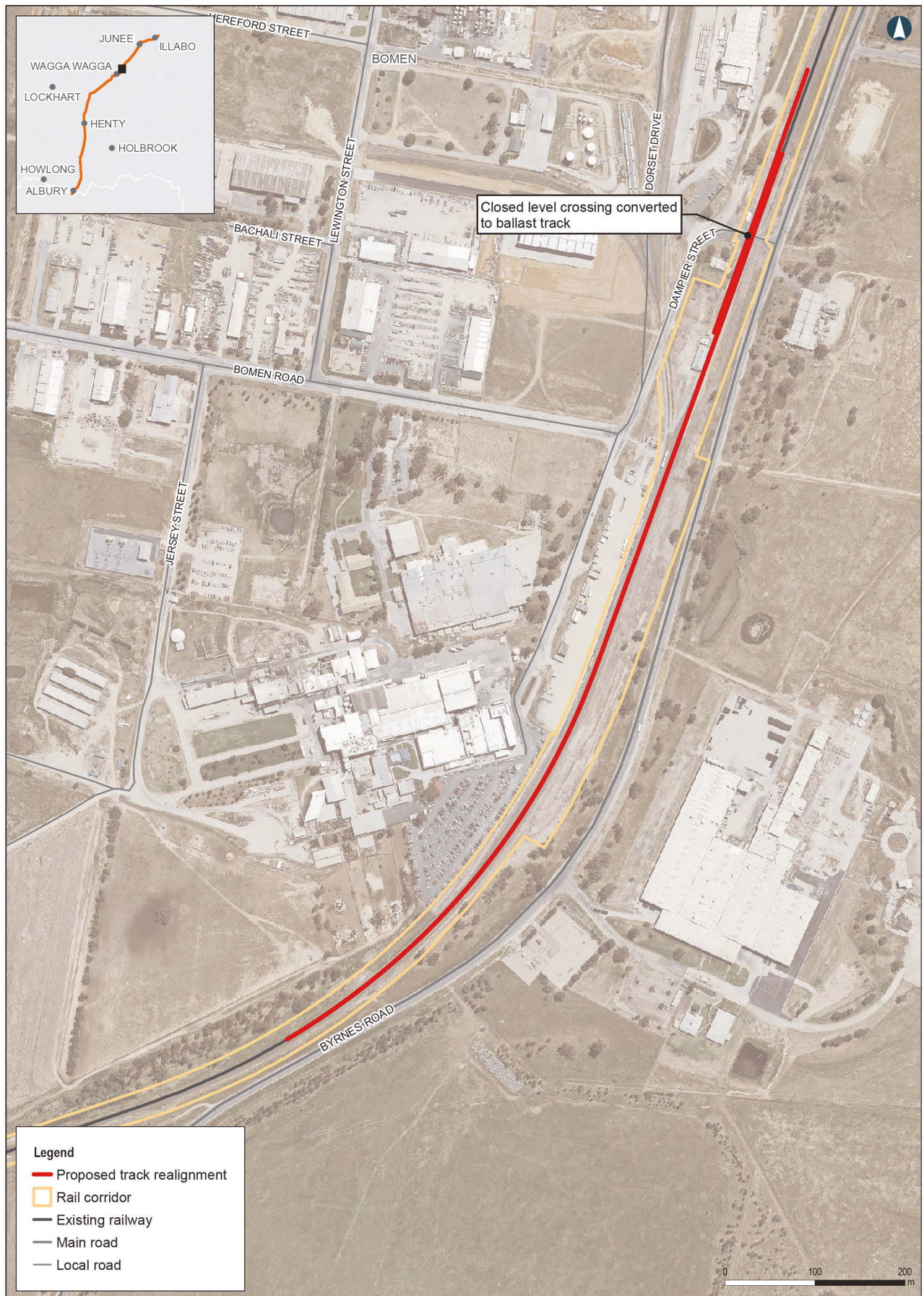


Figure 7-16 Key features of Bomen Yard clearances

Data Sources: ARTC, NSWSS

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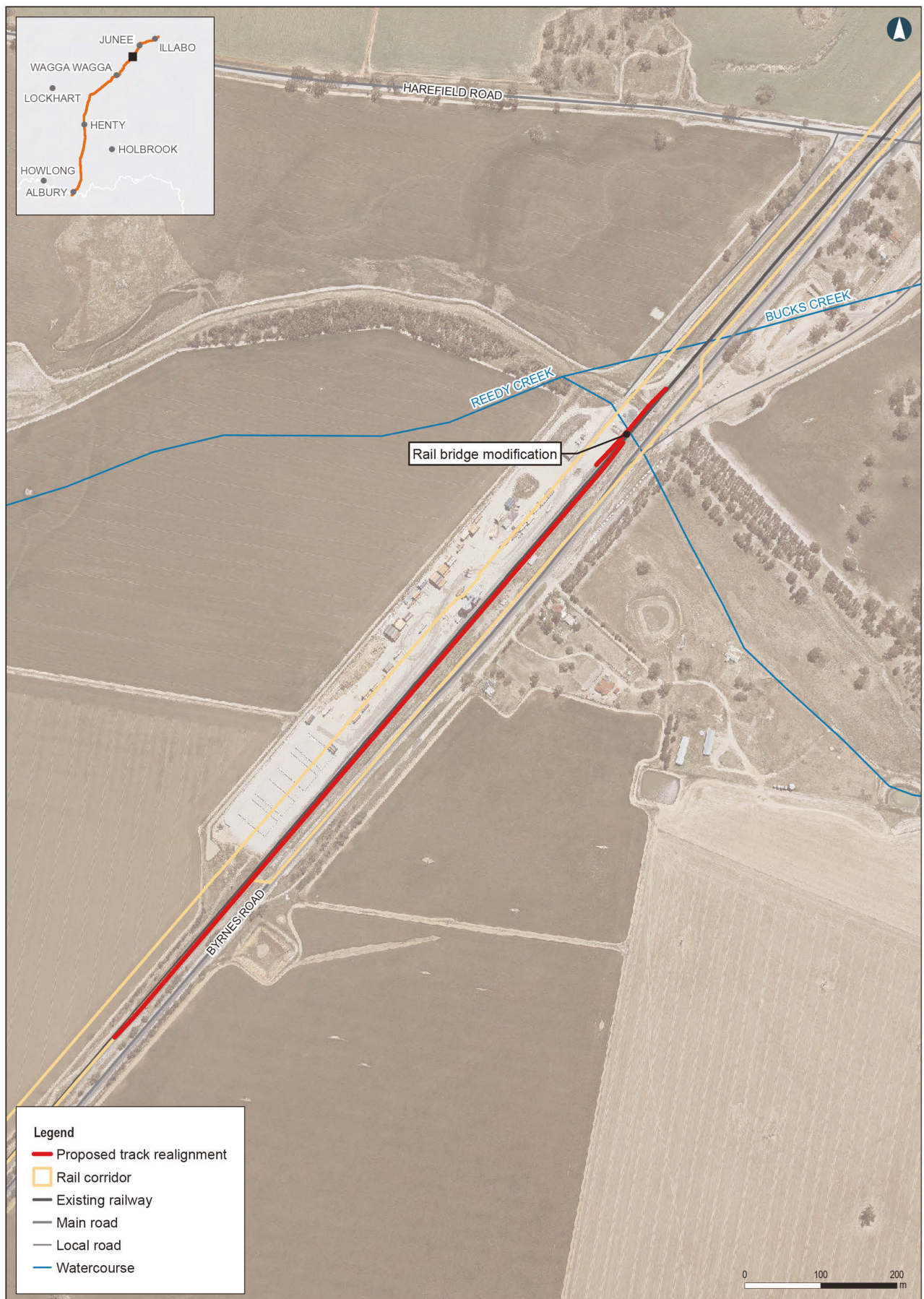


Figure 7-17 Key features of Harefield Yard clearances

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
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 Date: 15/11/2021

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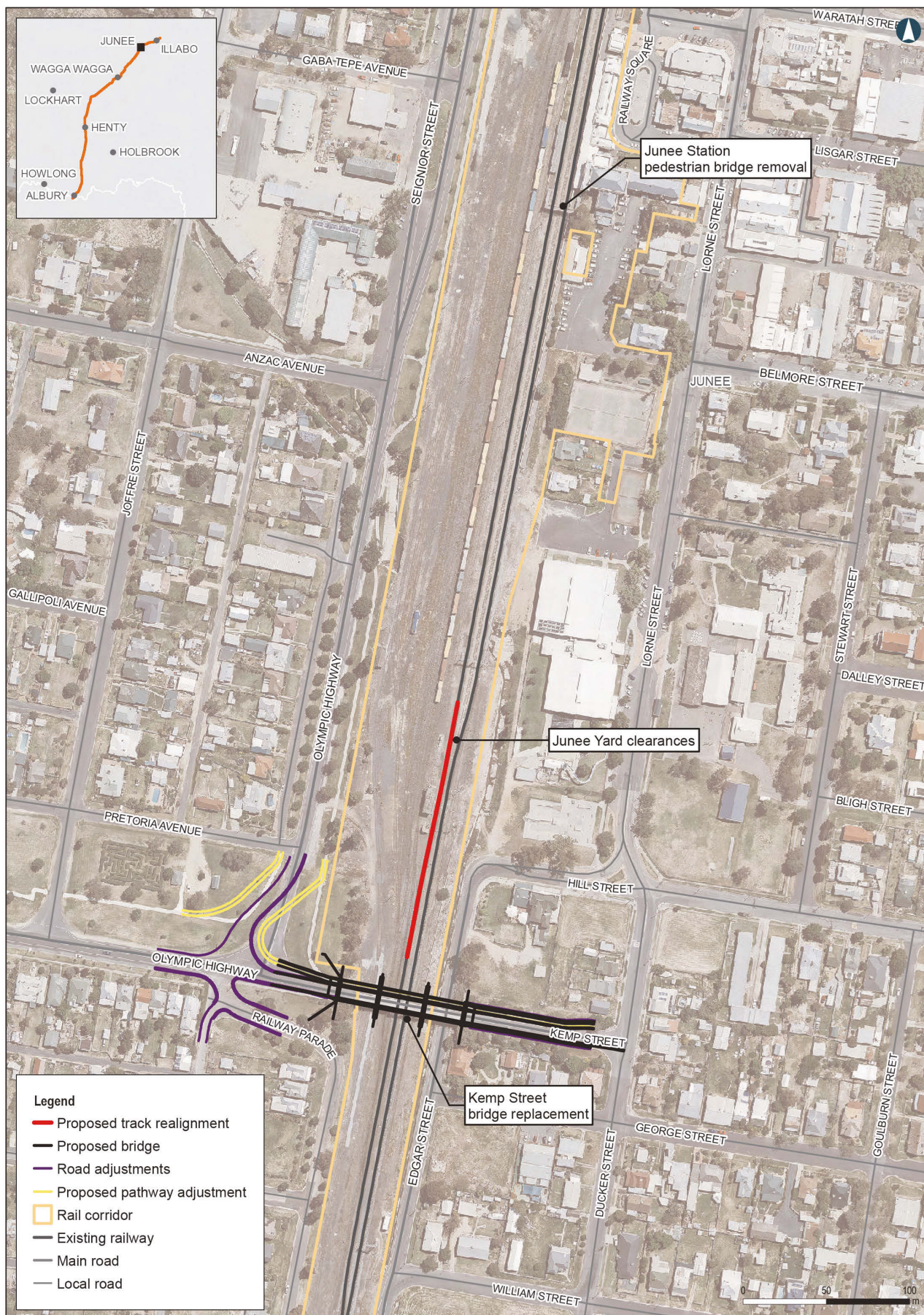


Figure 7-18 Key features of Junee Station and surrounds

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
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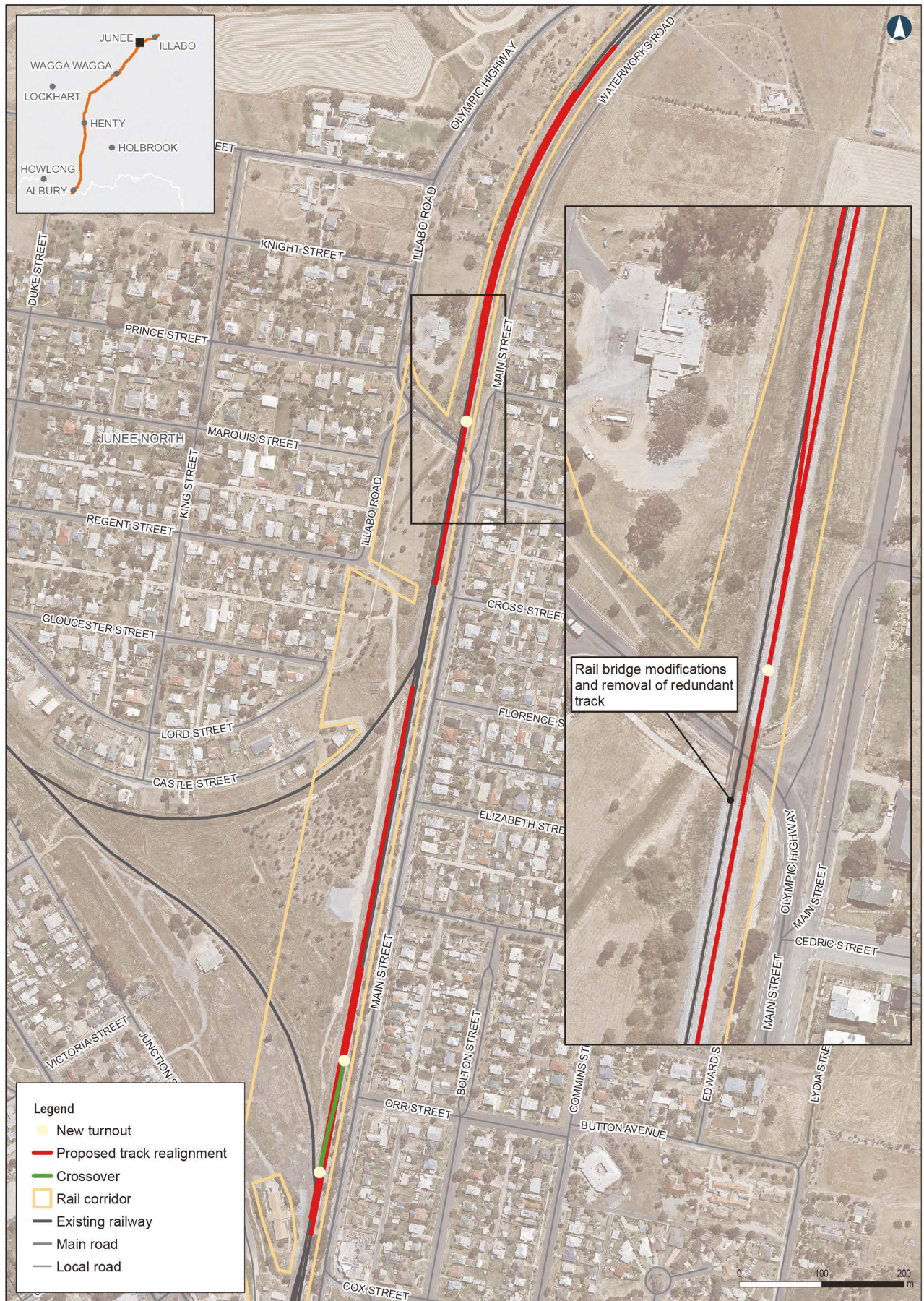
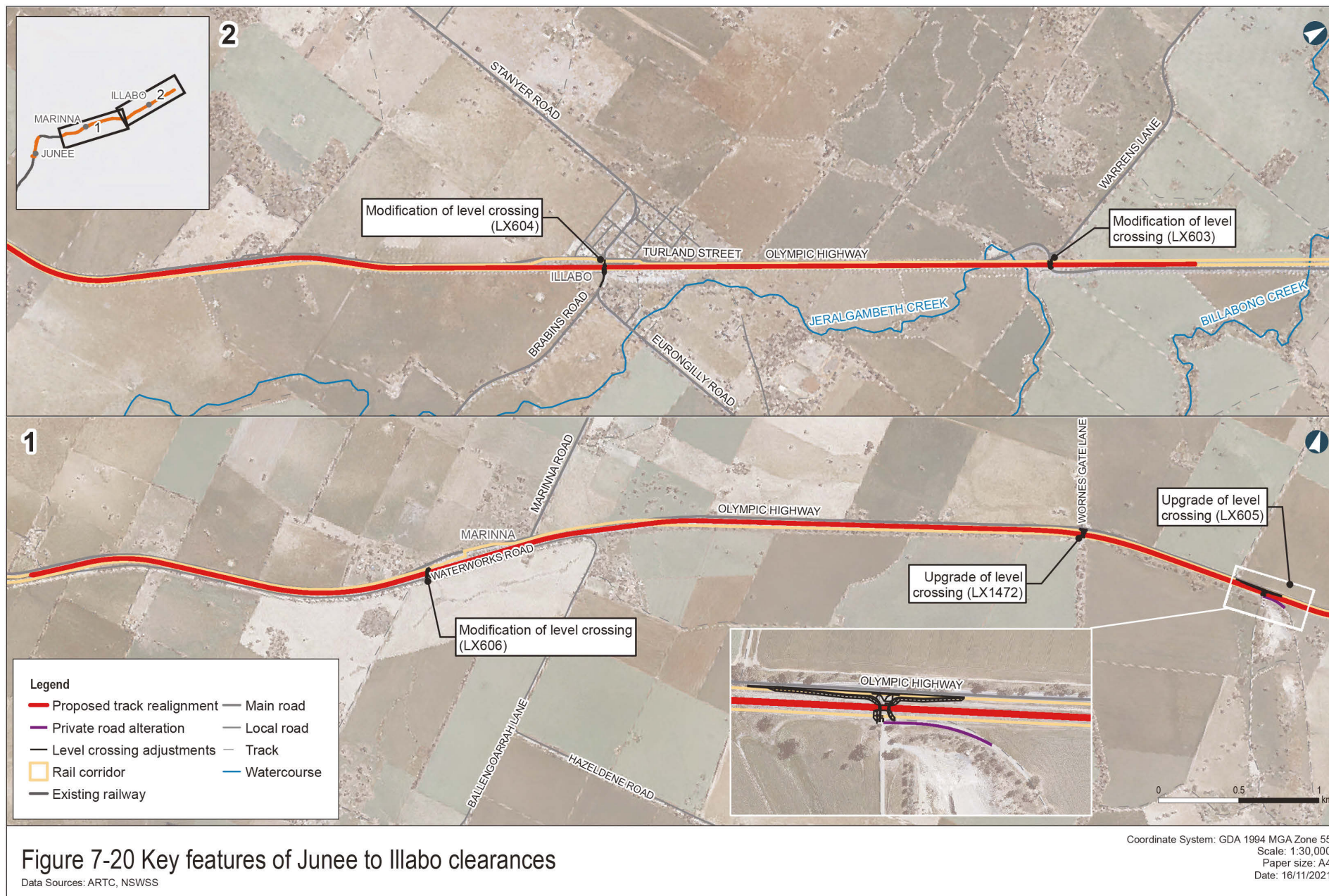


Figure 7-19 Key features of Olympic Highway underbridge

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:6,000
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7.3 Ancillary infrastructure

Ancillary infrastructure is proposed to support the key features of the proposal described in section 7.2. This infrastructure includes modifications to level crossings, establishment of access tracks, modification to signalling infrastructure, new fencing and signage.

7.3.1 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 7-7 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 7-7.

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

TABLE 7-7 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 TfNSW 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.
	Wornes Gate Lane (LX 1472)	Local road	Passive vehicular crossing	Level crossing would be modified to accommodate the realigned track and upgraded from a passive to an active level crossing.
	Shire and Carter Property access road (LX605)	Private road	Passive vehicular crossing	Level crossing would be modified to accommodate the realigned track and upgraded from a passive to an active level crossing. Additional storage lanes and a concrete island would be established on the level crossing

Enhancement site	Level crossing	Road type	Existing level crossing type	Proposed work
				approach from the Olympic Highway to limit movements to left-in and left-out.
	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.

7.3.2 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 new permanent walkway would be attached to the bridge to facilitate maintenance and inspection.
- ▶ 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 Junee to Illabo clearances, a private unsealed road on the southern side of the rail corridor directly east of the Shire and Carter property level crossing (LX605) would be realigned to accommodate a drainage channel (Figure 7-20). An approximately 130 m section of this road would be moved south by about 6 m.

7.3.3 Removal of redundant rail corridor structures

At Albury Yard clearances, a small concrete signal box (Signal Box 1a) would be removed. At Yerong Creek Yard clearances, the disused station platform and shed would be demolished to achieve the required clearances.

7.3.4 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. Gentries 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 7-7 to Figure 7-20.

ARTC's Advanced Train Management System (ATMS) would continue to be implemented 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.

7.3.5 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.

7.3.6 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.

7.3.7 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.

7.4 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.

7.5 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 (TfNSW), 2019a)
- ▶ *Beyond the Pavement 2020: Urban design approach and procedures for road and maritime infrastructure planning, design and construction* (TfNSW, 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* (TfNSW, 2021a)
- ▶ *Landscape Guideline: Design guideline to improve the quality, safety, and cost effectiveness of green infrastructure in road corridors* (RMS, 2018a).

7.6 Operation of the proposal

7.6.1 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 in 2025 with enhancement sites progressively commissioned on completion of construction. Inland Rail as a whole would be operational when all 13 sections are complete, which is estimated to be in 2027.

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. The possible future use of the railway between Albury and Illabo by freight trains up to 3,600-m long would be subject to separate assessment. Freight train speeds would be consistent with current train speeds and would typically range from 60 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. In 2025, this would increase up to 18 freight trains per day in 2025, further increasing up to 20 per day in 2040.

In 2020, approximately 10 million tonnes of freight were transported on the Main South Line between Albury and Illabo. By 2025, the total annual freight tonnages would increase to about 13 million tonnes in 2025 and 19 million tonnes in 2040. 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.

7.6.2 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.

7.6.3 Employment

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