CHAPTER 17

Landscape and visual amenity

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT

ARTC | INLAND RAIL
An Australian Government Initiative

Contents

Figures

Tables

17. Landscape and visual amenity

This chapter provides a summary of the potential impacts of the Albury to Illabo (A2I) section of the Inland Rail program (the proposal) on landscape and visual amenity. The assessment is provided in Technical Paper 10: Landscape and visual.

17.1 Summary

The proposal would result in temporary changes to the landscape and visual amenity of the surrounding area during construction due to the removal of vegetation, general construction activities, earthworks, lighting for night works, and the presence of large machinery and equipment such as excavators, cranes and piling rigs. The potential impacts on visual amenity of these changes would depend on the nature and intensity of the construction activity at each enhancement site at a given point during construction; however, adverse impacts would be temporary and limited to the construction period. High–moderate adverse impacts would occur at Albury Station, Edmondson Street bridge, Wagga Wagga Station, and Kemp Street bridge enhancement sites, where more substantial bridge works would occur and where areas of public open space would be temporarily disrupted.

Detailed design and construction planning will seek to further minimise the construction footprints and light spill from temporary lighting on adjacent receivers as far as reasonably practicable. Construction compounds would be located, as far as practicable, away from sensitive receivers and designed and orientated to minimise visual impacts.

Once operational, the key landscape and visual changes would be associated with the new road and pedestrian bridges. The bridges would be taller with more prominent structures, and existing vegetation would be removed to facilitate the construction of these bridges. The more frequent and larger freight trains would also be more visually prominent than those currently seen; however, these changes would be generally in character with the existing rail corridor and would not alter the use or amenity of the landscape.

The landscape and visual impacts from these new elements across most enhancement sites would generally be negligible to moderate. A high–moderate visual impact was identified at some viewpoints to the new pedestrian or road bridges at Albury (Albury Station pedestrian bridge) and Wagga Wagga (Edmondson Street bridge and Wagga Wagga Station pedestrian bridge). This impact would be mainly due to the taller structures, as well as the larger and more frequent freight trains. The design of the proposed new bridges would be sympathetic to the surrounding environment and heritage character of the area.

During detailed design, an urban design and landscape plan would be prepared by a suitably qualified consultant to provide a consistent approach to design and landscaping. This would be context-specific to ensure the design is well integrated into its surrounding environment.

17.2 Approach

17.2.1 Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements (SEARs) related to landscape and visual, and where in the environmental impact statement (EIS) these have been addressed, are detailed in Appendix A: Secretary's Environmental Assessment Requirements.

17.2.2 Relevant legislation, policies and guidelines

The assessments were undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act)
- *Beyond the Pavement: Urban design approach and procedures for road and maritime infrastructure planning, design and construction* (Transport for NSW (TfNSW), 2020a)
- *Guideline for landscape character and visual impact assessment – Environmental impact assessment practice note EIA-NO4* (TfNSW, 2020b)
- *Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW* (TfNSW, 2019a)
- *AS4282:2019 Control of the obtrusive effects of outdoor lighting (*Standards Australia, 2019)
- *NSW Sustainable Design Guidelines Version 4.0* (TfNSW, 2017b)
- *Technical guideline for Urban Green Cover in NSW* (Office of Environment and Heritage (OEH), 2015)
- *Urban Design for Regional NSW* (NSW Government Architect, 2020)

- *Destination Riverina Murray* (Destination Riverina Murray, 2018)
- *Riverina Murray Regional Plan 2036* (Department of Planning and Environment (DPE), 2017).

17.2.3 Methodology

Study area

The study area for the landscape and visual assessment includes the potential visual catchment of the proposal. This area varies according to topography and land cover (vegetation and built form).

Field survey

Field investigations were undertaken during April 2021 to inform the landscape and visual assessment. Photographs of key features on the site and surrounding landscape were taken, including views to the site from publicly accessible areas surrounding the proposal site, including from residential streets, commercial and public realm areas.

Assessment methodology

The landscape and visual assessment involved:

- identification of landscape character areas, both across the entire proposal and for each enhancement site
- division of the study area into broad landscape character areas that reflect the qualities of the built, natural and cultural environment, including geology, topography, vegetation, waterways, built form, patterns and types of land use
- identification of any significant viewpoints and vistas identified in the review of relevant planning instruments and masterplans, and from field observations
- determination of visual catchment and select views representative of the site, including views from areas where the greatest number of viewers are likely to congregate, such as lookouts, major roads and scenic routes, and locations in sensitive recreational and natural areas. The visual impact on private landowners has been assessed generally and using views from publicly accessible locations in local streets and parks. This is consistent with the *Guideline for landscape character and visual impact assessment*
- identification of the daytime sensitivity of each landscape character area and viewpoint (refer to Table 17-1)
- identification of the night-time visual sensitivity by determining the environmental zone(s) (defined in A*S/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting*) that best describes the existing night-time conditions (refer to Table 17-2)
- preparation of photomontages for selected viewpoints to support the assessment of impact
- assessment of the likely magnitude of change (refer to Table 17-3) expected as a result of the proposal, which is then combined to make an overall assessment of landscape or visual impact (refer to Table 17-4 and Table 17-5)
- providing management and mitigation measures.

TABLE 17-1 DAY TIME SENSITIVITY LEVELS

Daytime sensitivity	Landscape description	Visual description
National	▸ Landscape feature or place protected under national legislation or international policy, e.g. the Red Top Lookout at the world heritage listed Mungo National Park; or, Anzac Parade, Canberra ▸ These landscapes are generally unique and uncommon nationally.	▸ Heavily experienced view to a national icon, e.g. view to Sydney Opera House from Circular Quay or Lady Macquarie's Chair; view along Anzac Parade to Parliament House, Canberra ▸ Views to areas with a scenic value of national importance or to landscape features of the state ▸ Views from world heritage listed places ▸ These views are generally unique and uncommon nationally.
State	▸ Landscape feature or place that is heavily used and/or is iconic to the state, e.g. recreational trails and lookouts in Kosciuszko National Park ▸ These landscapes are generally unique to or uncommon within the state.	▸ Heavily experienced view to a feature or landscape that is iconic to the state, e.g. views from Kosciuszko lookout in Kosciuszko National Park ▸ Views to areas with a scenic value recognised by the state

Daytime sensitivity	Landscape description	Visual description
		• These views are generally unique or uncommon within the state.
Regional	• Landscape feature or place that is heavily used and valued by residents of a major portion of a city or a non-metropolitan region • Places with regionally important scenic value or landscape features, e.g. The Rock Nature Reserve, Albury and Wagga Wagga railway stations, and conservation areas • These places are generally unique or uncommon within the region.	• Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space, e.g. views from the lookout at The Rock Scenic Reserve • Views to areas of regionally important scenic or landscape value or to landscape features of the region, e.g. view along Dean Street to Monument Hill, or views from the Bomen Axe Quarry Aboriginal Place • These views are generally unique or uncommon within the region.
Local	• Landscape feature valued and experienced by groups of residents and/or local recreational users • Places of local scenic value or local landscape features, e.g. Monument Hill Parklands and Dean Street conservation area in Albury • These places are likely to be somewhat common within the landscape.	• High-quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users • Views to areas of local scenic value or to local landscape features, e.g. views from heritage conservation areas, railway stations and local parks • These views are somewhat common within the landscape.
Neighbourhood	• Places without any particular scenic values or local landscape features • These places are likely to be common within the landscape.	• Views where visual amenity is not particularly important to the wider community, such as lower quality views briefly glimpsed from roads • These views are likely to be common within the landscape.

TABLE 17-2 NIGHT-TIME VISUAL SENSITIVITY LEVELS

Night-time visual sensitivity	Environmental zones (AS4282:2019)	Description
Very high	A0: Intrinsically dark	• The United Nations Educational, Scientific and Cultural Organisation (UNESCO) Starlight Reserve, International DarkSky Association (IDA) Dark Sky Parks • Major optical observatories • No road lighting—unless specifically required by the road-controlling authority.
High	A1: Dark	• Relatively uninhabited rural areas • No road lighting—unless specifically required by the road-controlling authority.
Moderate	A2: Low district brightness	• Sparsely inhabited rural and semi-rural areas.
Low	A3: Medium district brightness	• Suburban areas in towns and cities.
Very low	A4: High district brightness areas	• Town and city centres and other commercial areas, residential areas abutting commercial areas.

TABLE 17-3 MAGNITUDE OF CHANGE LEVELS

Magnitude of change	Landscape description	Day-time visual description	Night-time visual description
High	▸ The landscape is altered such that the proposal dominates and/or transforms its character, amenity and/or function in an adverse or beneficial way.	▸ The view is altered such that the proposal visually alters and transforms the character of the view in an adverse or beneficial way ▸ It would result in a substantial change in the amenity of the view.	▸ Substantial change to the level of skyglow, glare or light spill expected ▸ The lighting of the proposal would transform the character of the surrounding setting at night ▸ The effect of lighting would be experienced over a large area.
Moderate	▸ The proposal substantially changes and/or transforms the character, amenity, and function of the landscape in an adverse or beneficial way ▸ This would result in an extensive change in landscape values.	▸ The proposal is visually prominent and would result in a considerable change in the amenity of the view, in an adverse or beneficial way.	▸ Considerable change to the level of skyglow, glare or light spill ▸ The lighting of the proposal would noticeably contrast with the surrounding landscape at night ▸ The effect of lighting would be experienced across a medium portion of the landscape.
Low	▸ The proposal somewhat changes the character, amenity and function of the landscape in an adverse or beneficial way ▸ This would result in a noticeable change in landscape values.	▸ The proposal is somewhat prominent and would result in a noticeable change in the amenity of the view, in an adverse or beneficial way.	▸ Alteration to the level of skyglow, glare or light spill would be expected ▸ The lighting of the proposal would not contrast substantially with the surrounding landscape at night ▸ The effect of lighting would be experienced across a small portion of the landscape.
Negligible	▸ The proposal would not change the character, amenity and/or function of the landscape ▸ If there is a change, it would not be perceived as altering the landscape values.	▸ The proposal is not visible, is not visually prominent in the view and/or is compatible with the character of the view ▸ It would result in no perceived change in the amenity of the view.	▸ Either the level of skyglow, glare and light spill is unchanged ▸ If it is altered, the change is generally unlikely to be perceived by viewers or compatible with the existing or intended future use of the area.

TABLE 17-4 IMPACT LEVELS—LANDSCAPE AND VISUAL (DAYTIME)

	Sensitivity				
Magnitude of change	**National/Very high**	**State/High**	**Regional/Moderate**	**Local/Low**	**Neighbourhood/Very low**
High	Very high	Very high	High	High–Moderate	Moderate
Moderate	Very high	High	High–Moderate	Moderate	Minor
Low	High	High–Moderate	Moderate	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

TABLE 17-5 IMPACT LEVELS—VISUAL (NIGHT-TIME)

	Sensitivity				
Magnitude of change	**Very high**	**High**	**Moderate**	**Low**	**Very low**
High	Very high	High	High–moderate	Moderate	Moderate–minor
Moderate	High	High–moderate	Moderate	Moderate–minor	Minor
Low	High–moderate	Moderate	Moderate–minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Photomontages

Photomontages have been prepared to illustrate the expected changes to viewpoints as a result of the proposal. The photomontages used in this assessment represent the operational view of the proposal. Images of construction activities have not been prepared as these are temporary activities that would change throughout construction.

The viewpoints selected for photomontages were chosen to:

- represent a range of viewing locations along the rail corridor, from a distance and orientation where the proposal would be most visible.
- illustrate views from areas with the greatest visual sensitivity and where the most viewers would be located.

The photomontages have been prepared for several viewpoints to illustrate the new road and pedestrian bridges in Albury, Wagga Wagga and Junee as these present the greatest visual change and have the largest potential number of receivers. A view of the proposal at Culcairn was selected to illustrate the scale of double-stacked freight trains during operation in a location typical of townships along the proposal site.

17.2.4 Key risks

An environmental risk assessment was undertaken for the proposal (refer Appendix E: Environmental risk assessment). Potential landscape and visual impacts with an assessed risk rating of medium or above are:

- adverse impacts during construction on visual amenity and landscape due to construction work in the vicinity of sensitive receivers
- permanent visual impacts on sensitive visual receivers as a result of replacing key infrastructure such as road and pedestrian bridges
- introduction of double-stacked trains into the landscape
- light impacts from out-of-hours (OOH) work during construction.

17.3 Existing environment

The proposal generally follows the existing Main South Line that runs between Albury and Sydney, through the Riverina region of NSW. This includes enhancement sites between the Murray River bridge in Albury to the Billabong Creek north-east of Illabo, passing through the Albury, Greater Hume, Lockhart, Wagga Wagga and Junee local government areas (LGAs).

The Riverina region of NSW is generally an agricultural area, characterised by flat, low-lying rural plains associated with the catchments of the Murray and Murrumbidgee rivers and their tributaries, including Sandy Creek and Billabong creeks. The landscapes across the study area vary between urban centres at Albury and Wagga Wagga, regional towns and rural areas.

The proposal is located at the boundary of the upper and lower slopes of the South Western Bioregion, which are characterised:

- for the upper slopes: steep, hilly and undulating ranges and granite basins, with open forests and woodlands. This area generally includes Albury, The Rock, Uranquinty, Wagga Wagga and Junee
- for the lower slopes: undulating and hilly ranges, and isolated peaks set in wide valleys at the peaks of the Riverina alluvial fans. This area generally includes Culcairn, Henty and Yerong Creek, as well as between Bomen and Harefield.

A common feature of the landscape and visual catchment across all precincts is the operational rail corridor of the Main South Line. This corridor has been largely cleared of native vegetation and generally consists of grassland with a few scattered trees. Station precincts of state heritage significance are located along the rail line, as described in Chapter 11: Non-Aboriginal heritage. Some stations remain in operation for passenger services; however, stations at Yerong Creek, Bomen, Harefield and Illabo are no longer used.

The proposal does not pass through or near any national parks or state forests; however, there are recreational areas at The Rock Nature Reserve (south-west of The Rock) and the Doodle Comer Swamp Nature Reserve (south-west of Henty).

17.3.1 Landscape

Albury precinct

The landscape character areas for the Albury precinct enhancement sites are identified in Table 17-6. Detailed descriptions of each landscape character area are provided in Chapter 5 of Technical Paper 10: Landscape and visual.

The Albury Station heritage landscape has a regional sensitivity. The built form in this area is of State heritage significance (SSI) and includes 'one of the most prominent station buildings in NSW', with its 'landmark tower', which provides a 'prominent element within the Albury townscape' (Heritage NSW, 2021). There are large numbers of people who transit through the area around Albury Station, with this area playing an important role as an entry to Albury.

At the Table Top Yard clearances enhancement site, the proposal would include the removal of the signal gantry. Due to the small scale of these works there would not be a landscape or visual impact expected at this location. Landscape sensitivity is discussed further in section 5 of Technical Paper 10: Landscape and visual.

TABLE 17-6 LANDSCAPE CHARACTERS IN THE STUDY AREA—ALBURY

Enhancement site	Landscape character area	Sensitivity
Murray River bridge	Murray River plains	Local
Albury Station Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Albury Station heritage landscape	Regional
	The Scots School and adjacent rail corridor	Local
	Hume Highway and adjacent open space	Local
Billy Hughes bridge	Billy Hughes bridge industrial and rural area	Neighbourhood

Greater Hume–Lockhart precinct

The landscape character for the Greater Hume–Lockhart precinct enhancement sites are identified in Table 17-7. The landscape character areas of Culcairn, Henty and Yerong Creek rural town centres include state heritage listed railway station areas and historic built form. Detailed descriptions of each landscape character area and discussion on landscape sensitivity are provided in section 5 of Technical Paper 10: Landscape and visual.

TABLE 17-7 LANDSCAPE CHARACTERS IN THE STUDY AREA—LOCKHART AND GREATER HUME

Enhancement site	Landscape character area	Sensitivity
Culcairn Yard clearances and pedestrian bridge	Culcairn rural town centre	Local
Henty Yard clearances	Henty rural town centre	Local
Yerong Creek clearances	Yerong Creek rural town centre	Local

Wagga Wagga precinct

The landscape character units for the Wagga Wagga precinct enhancement sites are identified in Table 17-8. Detailed descriptions of each landscape character area are provided in section 5 of Technical Paper 10: Landscape and visual.

The Wagga Wagga Station precinct has regional sensitivity and is centred on the state heritage listed station. This area is an important entry to Wagga Wagga and attracts a large number of travellers using the station but also local residents, students and visitors using the existing footbridge to cross the rail corridor. This includes people walking the city centre to Botanic Gardens trail. The landscape has a concentration of heritage buildings in addition to the station that form part of a local heritage conservation area.

Landscape sensitivity is discussed further in section 5 of Technical Paper 10: Landscape and visual.

TABLE 17-8 LANDSCAPE CHARACTERS IN THE STUDY AREA—WAGGA WAGGA

Enhancement site	Landscape character area	Sensitivity
Uranquinty Yard clearances	Uranquinty rural town centre	Local
Pearson Street bridge	Pearson Street and rail corridor	Neighbourhood
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga	Cassidy Parade and Brookong Avenue residential area	Local
	Edmondson Street bridge landscape	Local

Enhancement site	Landscape character area	Sensitivity
Station pedestrian bridge and Wagga Wagga Yard clearances	Wagga Wagga Railway Station heritage landscape	Regional
Bomen Yard clearances	Bomen SAP industrial area	Neighbourhood

Junee precinct

The landscape character units for the Junee precinct enhancement sites are identified in Table 17-9. Detailed descriptions of each landscape character area are provided in section 5 of Technical Paper 10: Landscape and visual.

The Junee Station and town centre is focused around the state heritage listed railway station, which '*is a key element in the streetscape of this part of Junee*' (Heritage NSW, 2021) and forms the central part of Junee Heritage Conservation Area (Junee LEP).

Landscape sensitivity is discussed further in section 5 of Technical Paper 10: Landscape and visual.

TABLE 17-9 LANDSCAPE CHARACTERS IN THE STUDY AREA—JUNEE

Enhancement site	Landscape character area	Sensitivity
Harefield Yard clearances	Harefield rural landscape	Neighbourhood
Kemp Street bridge	Kemp Street and south Junee	Local
Junee Station Yard clearances and pedestrian bridge	Junee Station and town centre	Local
Olympic Highway underbridge	Olympic Highway and north Junee	Neighbourhood
Junee to Illabo clearances	Junee to Illabo rural landscape	Neighbourhood

17.3.2 Viewpoints

Albury precinct

The viewpoints for the Albury precinct enhancement sites are identified in Figure 17-1 and described in Table 17-10. The potential for a view from the Junee Post Office, a national heritage listed property, was considered in the visual assessment; however, the important view lines associated with this heritage item are views to the post office façade from Lorne Street, which are oriented away from this proposal site. Due to intervening vegetation and existing car parking area to the west (rear) of this property, separating this property from the works, there would not be a visual impact from this property.

TABLE 17-10 IDENTIFIED VIEWPOINTS OF THE PROPOSAL SITE—ALBURY

Viewpoints	Description	Day-time sensitivity
Murray River bridge		
Viewpoint 1: Views south from Townsend Street	Townsend Street is a local access road, beyond the entry to the residential property. The view is glimpsed from a small number of vehicles travelling on a local access road.	Neighbourhood
Viewpoint 2: Views southwest from the Hume Highway	A large number of vehicles travelling at high speed along the Hume Highway southbound have glimpses of the Murray River bridge. The bridge is not a prominent visual feature due to its limited visibility from the highway.	Local
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge		
Viewpoint 3: View south from open space east of the Hume Highway bridge	The Albury–Thurgoona Trail attracts large numbers of recreational users. The Hume Highway footbridge attracts use from across the local area to access the Albury Station and town centre	Local
Viewpoint 4: Views northwest from Albury Station	Views within the station precinct would be experienced by high numbers of rail customers and is a main entry point to Albury. The concentration of unique built features, such as the station buildings and signal box, add to the visual character.	Local
Viewpoint 5: View south from the Harold Mair bridge	Harold Mair bridge is identified as a lookout on the Albury–Thurgoona. Views from this bridge are designed to align with the centre of town and provide a view to the Albury Station.	Regional

Viewpoints	Description	Day-time sensitivity
Viewpoint 6: View north from the Riverina Highway bridge	The view does not contain any important visual and landscape features and is seen by pedestrians passing over the bridge for a short distance and glimpsed from vehicles travelling at speed across the Riverina Highway bridge.	Neighbourhood

No viewpoints have been assessed for Table Top Yard clearances enhancement site due to the minor nature of the works proposed, which is modifications to signal gantry. No viewpoints have been assessed for Billy Hughes bridge enhancement sites as it has limited visibility. The surrounding landscape includes areas of bushland and scattered trees, which provide screening. There are short-term views to the rail corridor from road users on Wagga Wagga Road, in the vicinity of the rail underpass. There may be glimpses to this site from surrounding rural areas between RW Henty Drive and the Hume Highway.

Figure 17-1 Albury precinct viewpoints

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:15,000
Paper size: A4
Date: 12/11/2021

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Greater Hume–Lockhart precinct

The viewpoints for the Greater Hume–Lockhart precinct enhancement sites are identified in Figure 17-2 and described in Table 17-11.

TABLE 17-11 IDENTIFIED VIEWPOINTS OF THE PROPOSAL SITE—GREATER HUME–LOCKHART

Viewpoints	Description	Day-time sensitivity
Culcairn Yard clearances and pedestrian bridge		
Viewpoint 7: Views from the parkland reserve on Railway Parade	The parkland reserve is part of the state heritage listed Culcairn Station and includes views to the historic station and town centre. The parkland would attract local residents and travellers using the amenities and rest stop facilities.	Local
Henty Yard clearances		
Viewpoint 8: View north along Ivor Street	Ivor Street is a local street set back from the main street of town with unobstructed views to the rail corridor. This view would be experienced by local residents and visitors to the adjacent church and residences.	Neighbourhood
Yerong Creek clearances		
Viewpoint 9: View east from Plunkett Street	This view is located within the Yerong Creek Urban Conservation Area and includes several heritage character buildings. This view would be seen by local residents and visitors from the surrounding rural area.	Local

No viewpoints have been assessed for The Rock Yard clearances due to the minor nature of the works proposed, which is replacement of signal gantry.

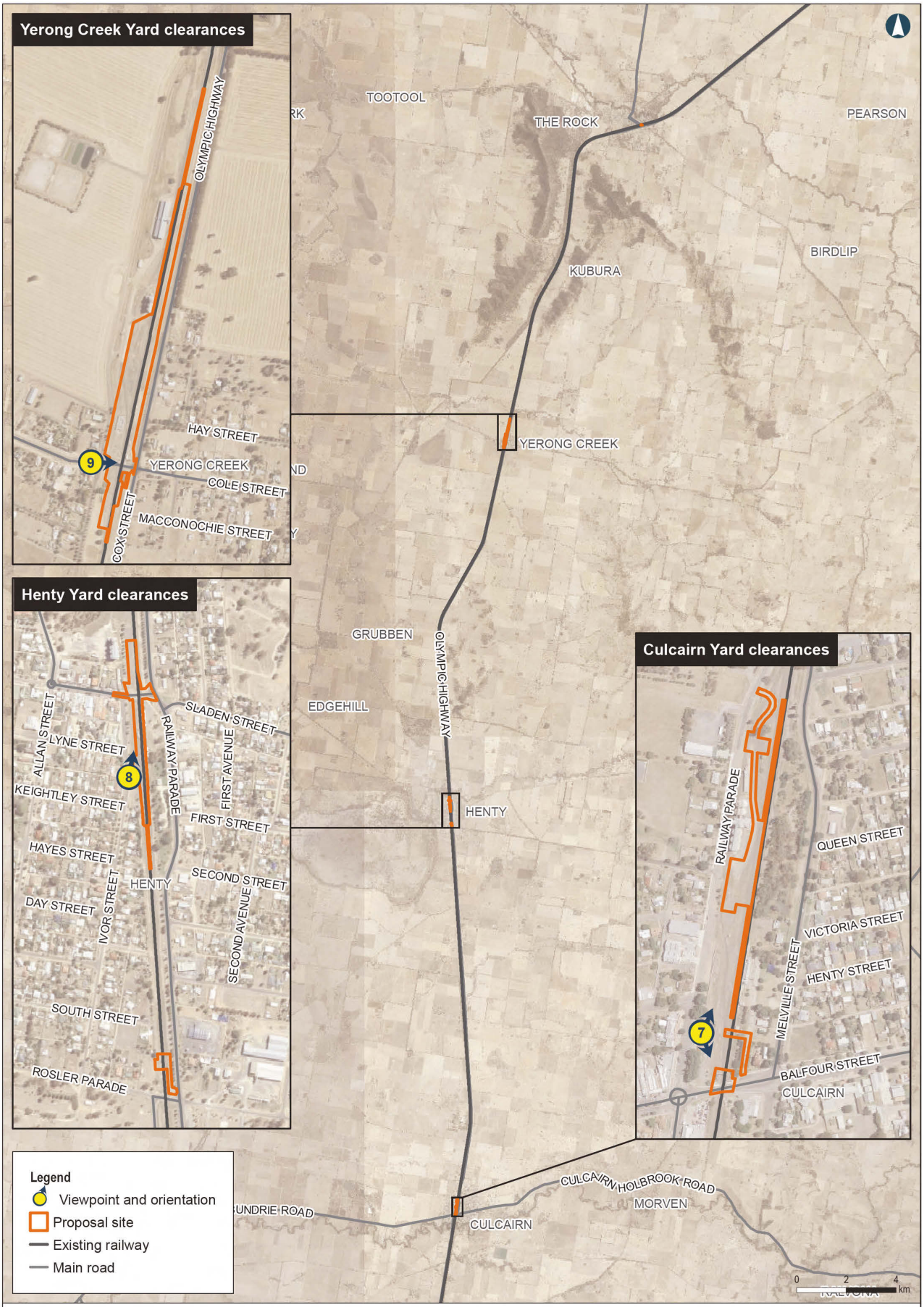

Figure 17-2 Greater Hume-Lockhart precinct viewpoints

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:200,000
Paper size: A4
Date: 12/11/2021

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Wagga Wagga precinct

The viewpoints for the Wagga Wagga precinct enhancement sites are identified in Figure 17-3 and described in Table 17-12.

TABLE 17-12 IDENTIFIED VIEWPOINTS OF THE PROPOSAL SITE—WAGGA WAGGA

Viewpoints	Description	Day-time sensitivity
Uranquinty Yard clearances site		
Viewpoint 10: View south west from Pearson Street	This view would be experienced by residents in adjoining residential properties and from vehicles travelling on Pearson Street. The historic station platform, silos and adjacent 'Memorial Avenue' trees are important local features in the view.	Local
Viewpoint 11: View north from rail corridor parkland reserve	Viewed by park users engaged in recreational activities. The view includes glimpses to the 'Memorial Avenue' trees.	Local
Pearson Street bridge		
Viewpoint 12: View east from Pearson Street bridge	This view is mainly experienced from vehicles travelling at moderate speed along Pearson Street bridge and, less frequently, by pedestrians using the bridge footpath. The view does not include any areas of local scenic value or local landscape features.	Neighbourhood
Viewpoint 13: View west from Urana Street	This view would be briefly glimpsed from vehicles travelling along Urana Street and from the dwellings facing Pearson Street and the rail corridor. The view does not contain any areas of local scenic value or any local landscape features.	Neighbourhood
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances		
Viewpoint 14: View north west from Cassidy Parade	This view is available from a local street near the entry to the Erin Earth Centre. Viewed by local residents from small playground and crossing. While this view is from a street within the heritage conservation area, it is oriented towards the rail corridor.	Local
Viewpoint 15: View south from Brookong Street	This connection is a part of the Burke link cycle route and would attract pedestrians and cyclists that cross the rail corridor. This view would be seen from the adjacent residences and, while it includes some historic character residences, also includes the Telstra depot, which detracts from the amenity of this view.	Local
Viewpoint 16: View north along Edmondson Street	This view is appreciated from a large number of vehicles using Edmondson Street. There would be large numbers of pedestrians accessing the adjacent schools via the bridge. This view includes areas within the heritage conservation area and glimpses to the Mount Erin Boarding/Kildare Catholic College grounds.	Local
Viewpoint 17: View south from Best Street	Best Street is located in the Wagga Wagga heritage conservation area. This view would be experienced from a large number of vehicles and pedestrians using the footpath near the school.	Local
Viewpoint 18: View east along Railway Street	Railway Street is located in a heritage conservation area. This view would be experienced by local residents and people accessing the station and using the Wagga Wagga Station pedestrian bridge to cross the rail corridor, and approach the school and town centre to the north of the railway line.	Local
Viewpoint 19: View south west from Station Place	Station Place is located within the heritage conservation area and includes several landmark buildings in the view. This view would be experienced by local residents and people accessing the station and approaching the Wagga Wagga Station pedestrian bridge.	Local
Bomen Yard clearances		
Viewpoint 20: View south along Byrnes Road	This view is appreciated at speed from a major road passing through the industrial core of Wagga Wagga Special Activation Precinct. While the heritage buildings associated with the former station are visible, they do not appreciably improve the amenity of this view.	Neighbourhood

Viewpoints	Description	Day-time sensitivity
Viewpoint 21: View southwest from the Bomen Axe Quarry Aboriginal Place	This view is appreciated from a location of importance to the local Aboriginal community and includes panoramic views across the surrounding valleys.	Regional

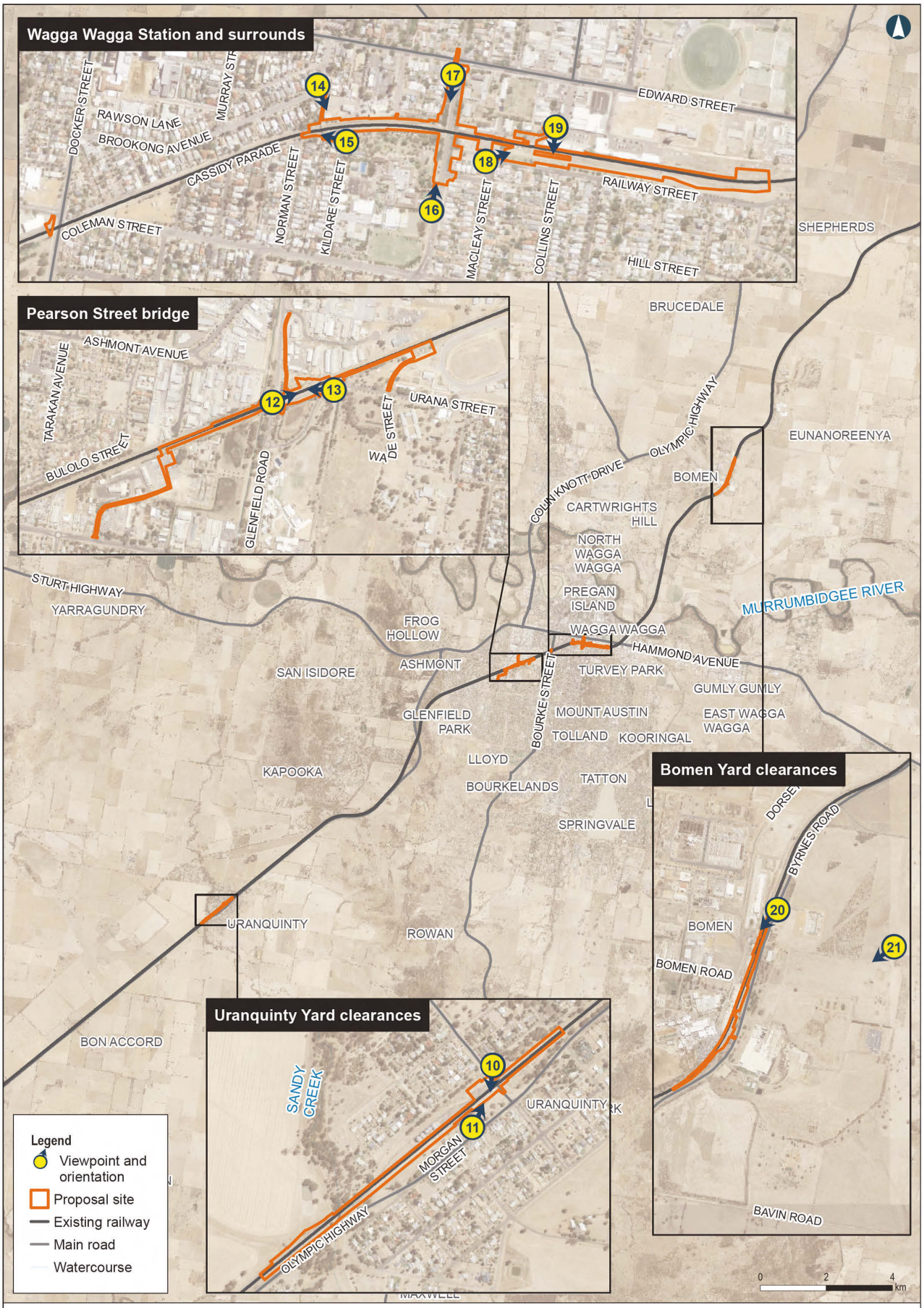

Figure 17-3 Wagga Wagga precinct viewpoints

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:150,000
Paper size: A4
Date: 13/12/2021

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Junee precinct

The viewpoints for the Junee precinct enhancement sites are identified in Figure 17-4 and described in Table 17-13. No viewpoints have been assessed for Harefield due to the nature of the works at this enhancement site.

TABLE 17-13 IDENTIFIED VIEWPOINTS OF THE PROPOSAL SITE—JUNEE

Viewpoints	Visual catchment	Day-time sensitivity
Kemp Street bridge		
Viewpoint 22: View east along Kemp Street	This view is from the Highway and park, which would attract residents and visitors from across the town. Endeavour Park and the vegetated ridgeline is a landscape feature in this view.	Local
Viewpoint 23: View northwest from Edgar Street	This view would be seen from vehicles passing along Edgar Street and from the residences on Edgar Street facing the rail corridor and at the corner of George Street. This is a moderately trafficked route and forms a main entry to town.	Local
Viewpoint 24: View south from the Junee Railway Station platform	This view is from the platform of the heritage listed Junee Station. This view would be seen from groups of rail users accessing the station and also adjacent residences.	Local
Junee Yard clearances and pedestrian bridge		
Viewpoint 25: View north along the Junee Station platform	This view is located within a heritage conservation area and contains several visual and landscape features. This is a main route through town and would be seen by a large number of road users and from the commercial and residential properties to the west of Seignior Street.	Local
Viewpoint 26: View south along Seignior Street	Oblique view to the heritage listed station building and pedestrian bridge. This is a location where locals would gather to access passenger trains and is a point of arrival for visitors to Junee.	Local
Olympic Highway underbridge		
Viewpoint 27: View north east from Illabo Road	This view is generally experienced by local residents within the residences on Illabo Road and from recreational users of the parkland, which would attract users from the surrounding residential area.	Local
Viewpoint 28: View south west from Waterworks Road	This view is experienced by local residents within the adjacent residential area, which includes existing dwellings and new lots.	Neighbourhood
Junee to Illabo clearances		
Viewpoint 29: View southwest from the Olympic Highway rest stop, Illabo	This view would be experienced by a moderate number of people including those using the rest stop and open space, and from vehicles travelling along the adjacent highway.	Local
Viewpoint 30: View south from Wood Street, Illabo	This view would be experienced by residents in adjoining residential properties and from vehicles, travelling along this local road. The historic character concrete silo is an important local visual feature in the view.	Neighbourhood

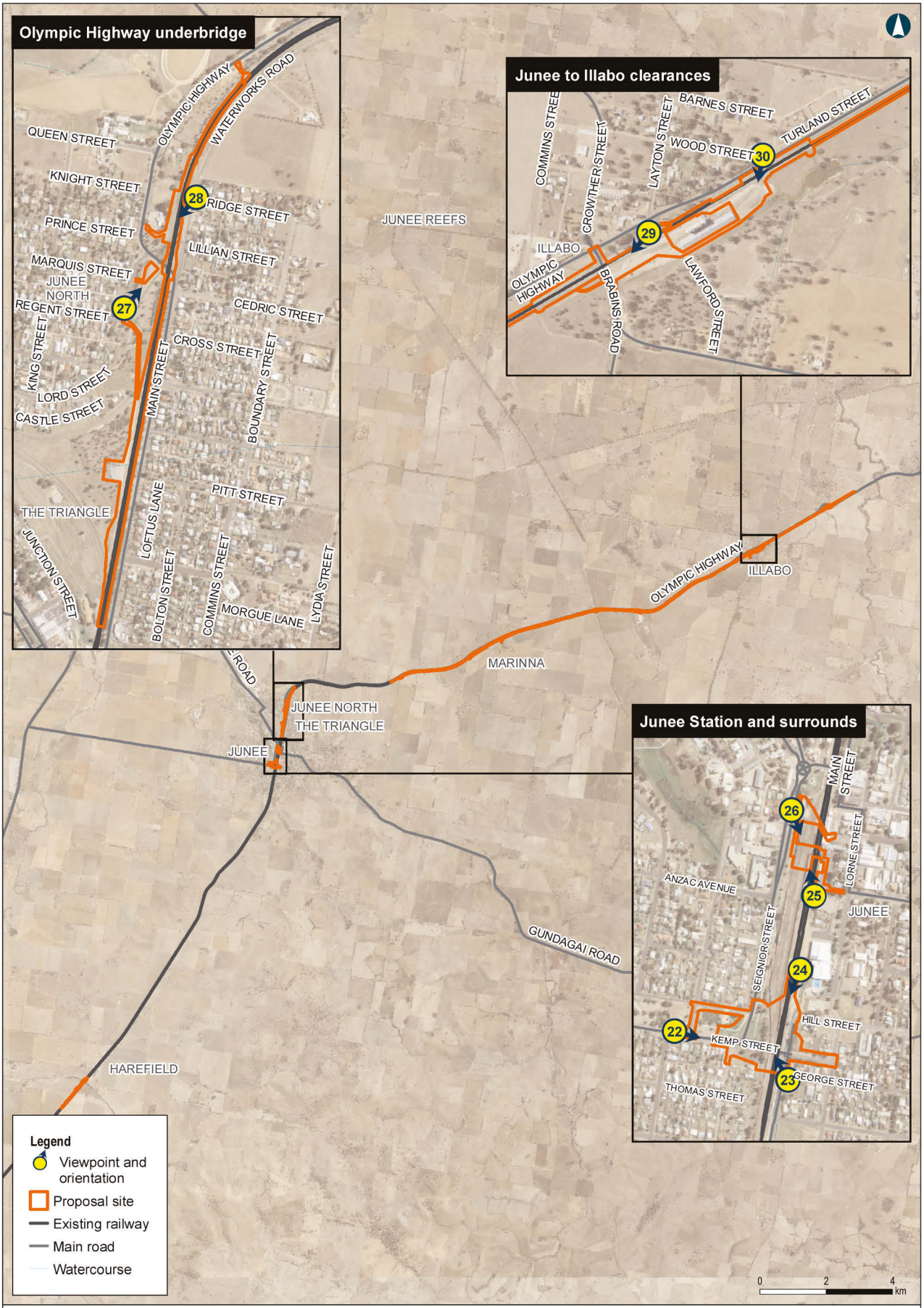

Figure 17-4 Junee precinct viewpoints

Data Sources: ARTC, NSWSS

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:150,000
Paper size: A4
Date: 19/02/2022

210_EAP_F1704_LVIA_Junee_r1v4.mxd

17.3.3 Night-time visual environment

The existing night-time visual environment within the study area is described in Table 17-14. The night-time visual sensitivity varies due to the proximity of each enhancement site to regional urban areas and industrial areas. Enhancement sites in rural areas with scattered residential properties generally have higher sensitivity ratings as there are fewer light sources causing sky glow and light spill in the area.

The existing headlights from vehicles travelling along nearby local and state roads, and the headlights from trains along the existing rail corridor, also contribute to the brightness of each area.

TABLE 17-14 NIGHT-TIME VISUAL SENSITIVITY

Precinct	Enhancement site	Sensitivity
Albury	Murray River bridge	Low
	Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Very Low
	Billy Hughes bridge	Moderate
Greater Hume–Lockhart	Culcairn Yard clearances and pedestrian bridge	Low
	Henty Yard clearances	Moderate
	Yerong Creek Yard clearances	Moderate
Wagga Wagga	Uranquinty Yard clearances site	Moderate
	Pearson Street bridge	Low
	Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Low
	Bomen Yard clearances	Low
Junee	Harefield Yard clearances	Moderate
	Kemp Street bridge	Low
	Junee Station Yard clearances and pedestrian bridge	Low
	Olympic Highway underbridge	Low
	Junee to Illabo clearances	Moderate

17.4 Impact assessment—construction

The proposal would result in temporary changes to the landscape and visual amenity of the study area during construction. These changes would be experienced by visual receivers, such as residents, motorists, workers and visitors of recreational areas in the vicinity of the proposal site, particularly those near the viewpoints identified in Section 17.3.

Construction of the proposal would include the use of large machinery and equipment such as excavators, graders, cranes, piling rigs and scaffolding. Construction compounds would also be established, including site offices and amenities, and storage of construction plant and equipment, as described in more detail in Chapter 8: Construction of the proposal. The potential impacts on visual amenity of these changes would depend on the nature and intensity of the construction activity at each enhancement site at a given point during construction. The greatest potential for visual impacts would be at sensitive receivers with views towards construction compounds and bridge structures under construction.

Other construction activities that may result in changes to visual amenity include:

- the removal and/or trimming of vegetation
- earthworks and ground disturbance
- lighting for night works with potential impacts on neighbouring properties and residents
- increase in heavy vehicle movements on the road network.

The removal of vegetation and earthworks would lead to visual impacts until the works are complete and disturbed areas are rehabilitated. Vegetation would be reinstated, and rehabilitation of disturbed areas would be undertaken progressively, consistent with the ARTC Rehabilitation Strategy.

The construction schedule of the proposal, as described in Chapter 8: Construction of the proposal, is planned to be over a period of 16 months. The visual impacts from construction would generally be short term, as construction at 14 enhancement sites with gantry modifications, pedestrian bridge removal and track realignment (with the exception of the Junee to Illabo clearances) would be up to around three months. Construction of pedestrian bridges are typically planned to be completed in around six months. Road bridge replacements, track lowering and track realignment works at Junee to Illabo clearances would take between 10 and 16 months to complete.

17.4.1 Landscape character

In most instances across the enhancement sites, impacts to landscape character are considered to be negligible to minor, as works would result in a low magnitude of change. This is because:

- works within the rail corridor would temporarily alter a localised area of a wider landscape. Trees or open spaces adjacent to these enhancement sites would not be impacted
- the works are occurring in the industrial landscape of the area with a neighbourhood sensitivity.

Where increased impacts to landscape character occur, this is primarily due to the scale of the works occurring during construction and/or due to the higher sensitivity of the landscape character unit, such as:

- bridge demolition and construction work within and external to the rail corridor, which would require the removal of urban trees, local diversions and temporary impacts to areas of open space or, in limited instances, private property
- works within heritage railway precincts that are of regional sensitivity (Junee, Albury and Wagga Wagga). Refer to Chapter 11: Non-Aboriginal heritage for further discussion on heritage.

TABLE 17-15 IMPACT TO LANDSCAPES WITHIN THE STUDY AREA—CONSTRUCTION

Enhancement site	Landscape character	Sensitivity	Magnitude of change	Landscape impact
Albury precinct				
Murray River bridge	Murray River plains	Local	Low	Minor adverse
Albury Yard clearances, Albury station pedestrian bridge and Riverina Highway bridge	Albury Station heritage landscape	Regional	Low	Moderate adverse
	The Scots School and adjacent rail corridor	Local	Negligible	Negligible
	Hume Highway and adjacent open space	Local	Moderate	Moderate adverse
Billy Hughes bridge	Billy Hughes bridge industrial and rural area	Neighbourhood	Low	Negligible
Greater Hume–Lockhart precinct				
Culcairn Yard clearances and pedestrian bridge	Culcairn rural town centre	Local	Low	Minor adverse
Henty Yard clearances	Henty rural town centre	Local	Low	Minor adverse
Yerong Creek clearances	Yerong Creek rural town centre landscape character area	Local	Low	Minor adverse
Wagga Wagga precinct				
Uranquinty Yard clearances	Uranquinty rural town centre	Local	Low	Minor adverse
Pearson Street bridge	Pearson Street and rail corridor	Neighbourhood	Low	Negligible
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Cassidy Parade and Brookong Avenue residential area	Local	Moderate	Moderate adverse
	Edmondson Street bridge landscape	Local	Moderate	Moderate adverse
	Wagga Wagga Railway Station heritage landscape	Regional	Moderate	High–moderate adverse
Bomen Yard clearances	Bomen SAP industrial area	Neighbourhood	Negligible	Negligible
Junee precinct				
Harefield Yard clearances	Harefield rural landscape	Neighbourhood	Negligible	Negligible
Kemp Street bridge	Kemp Street and south Junee	Local	High	High–moderate adverse
Junee Yard clearances and Junee Station pedestrian bridge	Junee Station and town centre	Local	Negligible	Negligible
Olympic Highway underbridge	Olympic Highway and north Junee	Local	Moderate	Moderate adverse
Junee to Illabo clearances	Junee to Illabo rural landscape	Neighbourhood	Low	Negligible

17.4.2 Viewpoint impact

There would be negligible-to-minor visual impacts across the enhancement sites due to construction, except where more substantial works are required in the Albury, Wagga Wagga and Junee precincts. Impacts to the identified viewpoints in the study area are described in Table 17-16.

Impacts are generally negligible or low where these works are largely confined to the rail corridor and are considered in this context. Moderate-to-high impacts occur where substantial construction works and large-scale construction equipment are visible and/or occur in close proximity to surrounding receivers, and result in more substantial changes within public spaces, such as streets, open spaces and removal of urban vegetation. The proposal would result in a high–moderate visual impact at four viewpoints near the bridge replacement works in Albury, Wagga Wagga and Junee due to the scale of construction activities in these locations.

TABLE 17-16 IMPACT OF CONSTRUCTION ON VIEWPOINTS IN THE STUDY AREA

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Albury Precinct				
Murray River bridge	Viewpoint 1: Views south from Townsend Street	Neighbourhood	Low	Negligible
	Viewpoint 2: Views southwest from the Hume Highway	Local	Low	Minor adverse
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Viewpoint 3: View south from open space east of the Hume Highway bridge	Local	Low	Minor adverse
	Viewpoint 4: Views northwest from Albury Station	Local	Moderate	Moderate adverse
	Viewpoint 5: View south from the Harold Mair bridge	Regional	Moderate	High–moderate adverse
	Viewpoint 6: View north from the Riverina Highway bridge	Neighbourhood	Low	Negligible
Greater Hume–Lockhart precinct				
Culcairn Yard clearances and pedestrian bridge	Viewpoint 7: Views from the parkland reserve on Railway Parade	Local	Low	Minor adverse
Henty Yard clearances	Viewpoint 8: View north along Ivor Street	Neighbourhood	Low	Negligible
Yerong Creek clearances	Viewpoint 9: View east from Plunkett Street	Local	Low	Minor adverse
Wagga Wagga precinct				
Uranquinty Yard clearances	Viewpoint 10: View south west from Pearson Street	Local	Low	Minor adverse
	Viewpoint 11: View north from rail corridor parkland reserve	Local	Low	Minor adverse
Pearson Street bridge	Viewpoint 12: View east from Pearson Street bridge	Neighbourhood	Low	Negligible
	Viewpoint 13: View west from Urana Street	Neighbourhood	Low	Negligible
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Viewpoint 14: View north west from Cassidy Parade	Local	Moderate	Moderate adverse
	Viewpoint 15: View south from Brookong Street	Local	Moderate	Moderate adverse
	Viewpoint 16: View north along Edmondson Street	Local	Moderate	Moderate adverse
	Viewpoint 17: View south from Best Street	Local	High	High–moderate adverse
	Viewpoint 18: View east along Railway Street	Local	High	High–moderate adverse
	Viewpoint 19: View south west from Station Place.	Local	Moderate	Moderate adverse
Bomen Yard clearances	Viewpoint 20: View south along Byrnes Road	Neighbourhood	Negligible	Negligible
	Viewpoint 21: View southwest from the Bomen Axe Quarry Aboriginal Place	Regional	Negligible	Negligible

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Junee precinct				
Kemp Street bridge	Viewpoint 22: View east along Kemp Street	Local	High	High–moderate adverse
	Viewpoint 23: View northwest from Edgar Street	Local	Moderate	Moderate adverse
	Viewpoint 24: View south from the Junee Railway Station platform	Local	Low	Minor adverse
Junee Station Yard clearances and pedestrian bridge	Viewpoint 25: View north along the Junee Station platform	Local	Moderate	Moderate adverse
	Viewpoint 26: View south along Seignior Street	Local	Moderate	Moderate adverse
Olympic Highway underbridge	Viewpoint 27: View north east from Illabo Road	Local	Moderate	Moderate adverse
	Viewpoint 28: View south west from Waterworks Road	Neighbourhood	Low	Negligible
Junee to Illabo clearances	Viewpoint 29: View southwest from the Olympic Highway rest stop, Illabo	Local	Negligible	Negligible
	Viewpoint 30: View south from Wood Street, Illabo	Neighbourhood	Negligible	Negligible

17.4.3 Night-time visual impact

There would be night activity during rail possessions, and during extended construction hours, along the proposal site. This would include task lighting, construction vehicle headlights and lighting associated with site offices, storage and laydown areas. Light generated during construction would be designed to minimise light spill with consideration to *AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting* (Standards Australia, 1997b), where practicable. Generally, lighting would be designed to minimise light spill beyond the construction areas.

OOH work is proposed at each site within the precinct except at Table Top Yard and The Rock Yard clearances sites. Night-time visual impacts during construction are outlined in Table 17-17.

Minor-to-moderate night-time visual impacts would be due to light spill and sky glow from construction areas. Moderate–minor impacts are expected at enhancement sites that are located in rural and regional towns that have higher sensitivity levels, or in urban areas where more substantial construction work is required in close proximity to residences.

TABLE 17-17 NIGHT-TIME VISUAL IMPACT ASSESSMENT DURING CONSTRUCTION

Enhancement site	Sensitivity	Magnitude of change	Visual impact
Albury Precinct			
Murray River bridge	Low	Negligible	Negligible
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Very Low	Low	Negligible
Billy Hughes bridge	Moderate	Low	Moderate–minor adverse
Greater Hume–Lockhart Precinct			
Culcairn Yard clearances and pedestrian bridge	Low	Low	Minor adverse
Henty Yard clearances	Moderate	Low	Moderate–minor adverse
Yerong Creek clearances	Moderate	Low	Moderate–minor adverse
Wagga Wagga precinct			
Uranquinty Yard clearances	Moderate	Low	Moderate–minor adverse
Pearson Street bridge	Low	Low	Minor adverse

Enhancement site		Sensitivity	Magnitude of change	Visual impact
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Residences to the north of the rail corridor on Brookong Avenue and on Cassidy Parade, residences on Donnelly Avenue and Little Best Street and Erin Street, and residences on Railway Street to the south of the Wagga Wagga Railway Station and the former Station Master's residence	Low	Moderate	Moderate–minor adverse
	From other residential properties overlooking the rail corridor at additional distance to the corridor with potential filtering of views through existing trees and by intervening buildings	Low	Low	Minor adverse
Bomen Yard clearances		Low	Negligible	Negligible
Junee Precinct				
Harefield Yard clearances		Moderate	Low	Moderate–minor adverse
Kemp Street bridge		Low	Moderate	Moderate–minor adverse
Junee Yard clearances and pedestrian bridge		Low	Negligible	Negligible
Olympic Highway underbridge		Low	Moderate	Moderate–minor adverse
Junee to Illabo clearances		Moderate	Low	Moderate–minor adverse

17.5 Impact assessment—operation

The proposal would result in the alteration and introduction of infrastructure along the rail corridor. The main features of the proposal with the potential for landscape and visual impacts include:

- new replacement road bridges
- new replacement pedestrian bridges
- removal of pedestrian bridges
- modification to the structure of existing rail bridges
- track lowering and protection walls
- more frequent freight trains passing by with increased height and length.

Operation of the proposal as part of Inland Rail would involve double-stacked freight trains up to 6.5-m high and up to 1,800-m long travelling along the rail corridor (see Figure 17-5). While the frequency and height of trains (double-stacked) would increase along the rail corridor and become a more dominant feature, the changes would be generally in character with the existing rail corridor and would not significantly alter the use or visual amenity of the landscape.

Track lowering of up to 2 m beneath a bridge would generally have a low magnitude of impact as the deeper cutting would further obstruct views of trains passing along the rail corridor. The protection walls would be consistent with the character of the rail corridor and bridge and would have limited visibility due to their location directly beneath the bridge.

Track realignment is proposed at a majority of the enhancement sites, which would have an imperceptible change to landscape character. As such, the realignment of the track at the enhancement sites would generally have a low magnitude of change and would be consistent with the existing rail corridor. The alterations to rail bridges to accommodate track realignment would be minimal and would not result in a prominent visual change to the structures. Replacement and alteration of rail signalling, such as gantries and ground signalling, would also have a low magnitude of change within the existing rail corridor.

Changes to the visual catchment at night-time would be associated with alterations to rail signalling, level crossings, street and bridge lighting associated with bridge works and an increased number of trains with headlights along the rail corridor. Night-time visual impacts were found to be negligible to moderate–minor across the four precincts, as outlined in sections 17.5.1, 17.5.2, 17.5.3 and 17.5.4. Refer to section 5 of Technical Paper 10: Landscape and visual for full assessment of night-time impacts.

The assessment has not relied on new vegetation that would be planted as part of the urban design and landscaping plan for the proposal. Any proposed vegetation would take time to establish and any effect on visibility and landscape character would occur over time as the vegetation matures. The proposed operational features of each enhancement site are described in more detail in Chapter 7: Proposal features and operation.

FIGURE 17-5 EXAMPLE OF DOUBLE-STACKED FREIGHT TRAIN

17.5.1 Albury precinct

The operational landscape and visual amenity impacts at the enhancement sites within the Albury precinct are described in this section. The key visible elements in proposed in the Albury precinct include:

- Murray River bridge modification resulting in the arches being raised about 2 m higher than the existing structure and reinforcing the bridge, using similar materials and style as the existing arches
- removal of the existing pedestrian bridge over the rail corridor at Albury Station and replacement with a taller and more visually prominent pedestrian bridge, including anti-throw screens and accessible ramps, on both the eastern and western side of Kenilworth Street and Railway Place
- track lowering under the Riverina Highway and Billy Hughes bridge by up to 1.6 m, including protection walls and associated drainage infrastructure
- more frequent and larger freight trains intermittently obstructing the views across the rail corridor.

Landscape impact

The assessed impact to landscapes within the Albury precinct is provided in Table 17-18.

The new pedestrian bridge would be sympathetic to the heritage station buildings and seen within the context of other large-scale contemporary bridges. While the bridge would have a larger footprint and presence in this precinct, it would not impact the prominence of the main station building and function of the station as the main entry to Albury. As such, the proposal would result in a low magnitude of change, resulting in a moderate adverse impact given the regional sensitivity of this landscape character unit.

TABLE 17-18 OPERATIONAL IMPACT TO LANDSCAPES WITHIN THE ALBURY PRECINCT

Enhancement site	Landscape character	Sensitivity	Magnitude of change	Landscape impact
Murray River bridge	Murray River plains	Local	Low	Minor adverse
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Albury Station heritage landscape	Regional	Low	Moderate adverse
	The Scots School and adjacent rail corridor	Local	Negligible	Negligible
	Hume Highway and adjacent open space	Local	Low	Minor benefit
Billy Hughes bridge	Billy Hughes bridge industrial and rural area	Neighbourhood	Negligible	Negligible

Viewpoint impact

The assessed visual impact to identified viewpoints within the Albury precinct is provided in Table 17-19. A photomontage of the proposed Albury Station pedestrian bridge has been provided for Viewpoint 4 and Viewpoint 5, as presented in Figure 17-6 and Figure 17-7.

Moderate and high–moderate adverse impacts would occur at two assessed views at Albury Station (Viewpoint 4 and Viewpoint 5). The new pedestrian bridge would be a larger structure and more prominent in views from Railway Place, the station platform and from the Harold Mair bridge. For views from the platform, the new bridge structure would be taller and would rise above the brick signal box. For views from the Harold Mair bridge, the new bridge would be a strong linear element, and would rise above the roofline of the brick signal hut and the lower rooflines of the northern station buildings.

The proposed track lowering at the Riverina Highway and Billy Hughes bridge enhancement sites would be a cutting, reducing the visibility of the rail corridor and future additional trains. The landscape surrounding Billy Hughes bridge enhancement site includes areas of bushland and scattered trees, which provide further screening to the rail corridor. Due to the scale and nature of the works at this enhancement site there would be no visual impact.

TABLE 17-19 OPERATIONAL IMPACT ON IDENTIFIED VIEWPOINTS IN THE ALBURY PRECINCT

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Murray River bridge	Viewpoint 1: Views south from Townsend Street	Neighbourhood	Low	Negligible
	Viewpoint 2: Views southwest from the Hume Highway	Local	Low	Minor adverse
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Viewpoint 3: View south from open space east of the Hume Highway bridge	Local	Negligible	Negligible
	Viewpoint 4: Views northwest from Albury Station	Local	Moderate	Moderate adverse
	Viewpoint 5: View south from the Harold Mair bridge	Regional	Moderate	High–moderate
	Viewpoint 6: View north from the Riverina Highway bridge	Neighbourhood	Low	Negligible

FIGURE 17-6 VIEWPOINT 4: EXISTING VIEW NORTH EAST FROM RAILWAY PLACE AT ALBURY STATION (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN***

FIGURE 17-7 VIEWPOINT 5: EXISTING VIEW SOUTH FROM THE HAROLD MAIR BRIDGE (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN***

Night-time visual environment

Night-time visual impacts during operation in the Albury precinct are outlined in Table 17-20. The proposal would have generally negligible impacts in the Albury precinct as train headlights would not be directed into private residences. There would, however, be permanent lighting proposed for the new pedestrian bridge, particularly in the vicinity of Railway Place, at the western bridge ramps.

TABLE 17-20 OPERATIONAL IMPACT ON NIGHT-TIME VISUAL SENSITIVITY

Enhancement site	Sensitivity	Magnitude of change	Impact
Murray River bridge	Low	Negligible	Negligible
Albury Yard clearances, Albury Station pedestrian bridge and Riverina Highway bridge	Very low	Low	Negligible
Billy Hughes bridge	Moderate	Negligible	Negligible

17.5.2 Greater Hume–Lockhart precinct

The operational landscape and visual amenity impact at the enhancement sites within the Greater Hume–Lockhart precinct are described in this section. Track realignments of less than 0.7 m are proposed at Culcairn Yard, Henty Yard and Yerong Creek clearances enhancement sites. The key visible element proposed in the Greater Hume–Lockhart precinct is the removal of the existing pedestrian bridge south of Culcairn Station.

The more frequent and larger freight trains would intermittently obstruct the views across the rail corridor and would be more visually prominent that those currently seen.

Landscape impact

The assessed impact to landscapes within the Greater Hume–Lockhart precinct is provided in Table 17-21.

TABLE 17-21 OPERATIONAL IMPACT ON LANDSCAPE CHARACTERS IN THE GREATER HUME–LOCKHART PRECINCT

Enhancement site	Landscape character	Sensitivity	Magnitude of change	Impact
Culcairn Yard clearances and pedestrian bridge	Culcairn rural town centre	Local	Moderate	Moderate adverse
Henty Yard clearances	Henty rural town centre	Local	Moderate	Moderate adverse
Yerong Creek Yard clearances	Yerong Creek rural town centre landscape character area	Local	Low	Minor adverse

Viewpoint impact

The assessed visual impact to identified viewpoints within the Greater Hume–Lockhart precinct is provided in Table 17-22. A photomontage of the proposal at Culcairn Station has been provided for Viewpoint 7 as presented in Figure 17-8.

TABLE 17-22 OPERATIONAL IMPACT ON IDENTIFIED VIEWPOINTS FOR GREATER HUME–LOCKHART PRECINCT

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Culcairn Yard clearances and pedestrian bridge	Viewpoint 7: Views from the parkland reserve on Railway Parade	Local	Moderate	Moderate adverse
Henty Yard clearances	Viewpoint 8: View north along Ivor Street	Neighbourhood	Moderate	Minor adverse
Yerong Creek clearances	Viewpoint 9: View east from Plunkett Street	Local	Moderate	Moderate adverse

FIGURE 17-8VIEWPOINT 7: EXISTING VIEW NORTH FROM PARKLAND RESERVE ON RAILWAY PARADE (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). *NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN*

Night-time visual environment

Night-time visual impacts during operation are outlined in Table 17-23. Moderate–minor adverse impacts would occur due to more frequent train movements within regional towns, which are areas of moderate sensitivity. Intervening trees and distance would reduce any potential visual impact from the moving train headlights.

TABLE 17-23 OPERATIONAL IMPACT ON NIGHT-TIME VISUAL SENSITIVITY IN GREATER HUME–LOCKHART PRECINCT

Enhancement site	Sensitivity	Magnitude of change	Impact
Culcairn Yard clearances and pedestrian bridge	Low	Low	Minor adverse
Henty Yard clearances	Moderate	Low	Moderate–minor adverse
Yerong Creek clearances	Moderate	Low	Moderate–minor adverse

17.5.3 Wagga Wagga precinct

The operational landscape and visual amenity impacts at the enhancement sites within the Wagga Wagga precinct are described in this section. The key visible elements proposed in the Wagga Wagga precinct include:

- track lowering under Pearson Street bridge by up to 2 m, including protection walls, retaining walls and drainage works
- removal of the existing pedestrian bridge over the rail corridor at Cassidy Parade and replacement with a new pedestrian bridge, taller than the existing bridge height by about 2.5 m, with anti-throw screens, stairs and ramps
- replacement of the Edmondson Street bridge over the rail corridor with a road bridge 2.8 m higher than the existing, including:
  - completion of road tie-in works and adjustments on Erin Street and Best Street
  - reduction in area available for roadside vegetation the western side of Edmondson Street
- removal of the existing pedestrian bridge over the rail corridor at Wagga Wagga Station and replacement with a new pedestrian bridge, taller than the existing bridge by about 2 m, with anti-throw screens, stairs and ramps connecting to Station Place and Railway Street

- more frequent and larger freight trains intermittently visible along the rail corridor.

Track realignment and gantry alterations are proposed at multiple sites in this precinct.

Landscape impact

The assessed impact to landscapes within the Wagga Wagga precinct is provided in Table 17-24, noting:

- at Uranquinty, the character of the existing rail corridor would be retained and new infrastructure would be consistent with the rail corridor; however, the proposal would result in a change in use that would intensify this activity and would impact the amenity of the surrounding spaces (such as the adjoining reserve)
- at Wagga Wagga Station, the pedestrian bridge would improve pedestrian accessibility and would respond to the aesthetic qualities of this heritage precinct.

TABLE 17-24 OPERATIONAL IMPACT ON LANDSCAPE CHARACTERS IN THE WAGGA WAGGA PRECINCT

Enhancement site	Landscape character	Sensitivity	Magnitude of change	Impact
Uranquinty Yard clearances	Uranquinty rural town centre	Minor adverse	Moderate	Moderate adverse
Pearson Street bridge	Pearson Street and rail corridor	Negligible	Low	Negligible
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Cassidy Parade and Brookong Avenue residential area	Moderate adverse	Low	Minor adverse
	Edmondson Street bridge landscape	Moderate adverse	Low	Minor adverse
	Wagga Wagga Railway Station heritage landscape	High-moderate adverse	Low	Moderate adverse
Bomen Yard clearances	Bomen SAP industrial area	Negligible	Negligible	Negligible

Viewpoint impact

The assessed visual impact to identified viewpoints within the Wagga Wagga precinct is provided in Table 17-25. Photomontages of the proposed Cassidy Parade pedestrian bridge (Viewpoint 14), the new Edmondson Street bridge (Viewpoint 17) and the new Wagga Wagga Station pedestrian bridge (Viewpoint 18 and Viewpoint 19) are presented in Figure 17-9, Figure 17-10, Figure 17-11, Figure 17-12 and Figure 17-13 respectively. The new replacement bridges would be taller and more visually prominent with increased opportunity for pedestrians to overlook adjacent properties. Overshadowing has the potential to occur on some properties on Erin and Little Best streets in winter, due to the increased height of Edmondson Street bridge. There may also be some overshadowing of properties to the north and south of the rail corridor, due to Wagga Wagga Station pedestrian bridge.

TABLE 17-25 OPERATIONAL IMPACT ON IDENTIFIED VIEWPOINTS WITHIN THE WAGGA WAGGA PRECINCT

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Uranquinty Yard clearances	Viewpoint 10: View south west from Pearson Street	Local	Moderate	Moderate adverse
	Viewpoint 11: View north from rail corridor parkland reserve	Local	Moderate	Moderate adverse
Pearson Street bridge	Viewpoint 12: View east from Pearson Street bridge	Neighbourhood	Low	Negligible
	Viewpoint 13: View west from Urana Street	Neighbourhood	Low	Negligible
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances	Viewpoint 14: View north west from Cassidy Parade	Local	Moderate	Moderate adverse
	Viewpoint 15: View south from Brookong Street	Local	Low	Minor adverse
	Viewpoint 16: View north along Edmondson Street	Local	Moderate	Moderate adverse
	Viewpoint 17: View south from Best Street	Local	High	High–moderate adverse
	Viewpoint 18: View east along Railway Street	Local	High	High-moderate adverse

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
	Viewpoint 19: View south west from Station Place	Local	Moderate	Moderate adverse
Bomen Yard clearances	Viewpoint 20: View south along Byrnes Road	Neighbourhood	Negligible	Negligible
	Viewpoint 21: View southwest from the Bomen Axe Quarry Aboriginal Place	Regional	Negligible	Negligible

FIGURE 17-9 VIEWPOINT 14: EXISTING VIEW NORTH WEST FROM CASSIDY PARADE (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN***

FIGURE 17-10 VIEWPOINT 17A: EXISTING VIEW SOUTH TO EDMONDSON STREET BRIDGE FROM BEST STREET (WITH LITTLE BEST STREET IN VIEW) (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAILED DESIGN***

FIGURE 17-11 VIEWPOINT 17B: EXISTING VIEW SOUTH TO EDMONDSON STREET BRIDGE FROM BEST STREET, ADJACENT TO SOUTH WAGGA PUBLIC SCHOOL (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN***

FIGURE 17-12 VIEWPOINT 18: EXISTING VIEW EAST ALONG RAILWAY STREET (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAILED DESIGN***

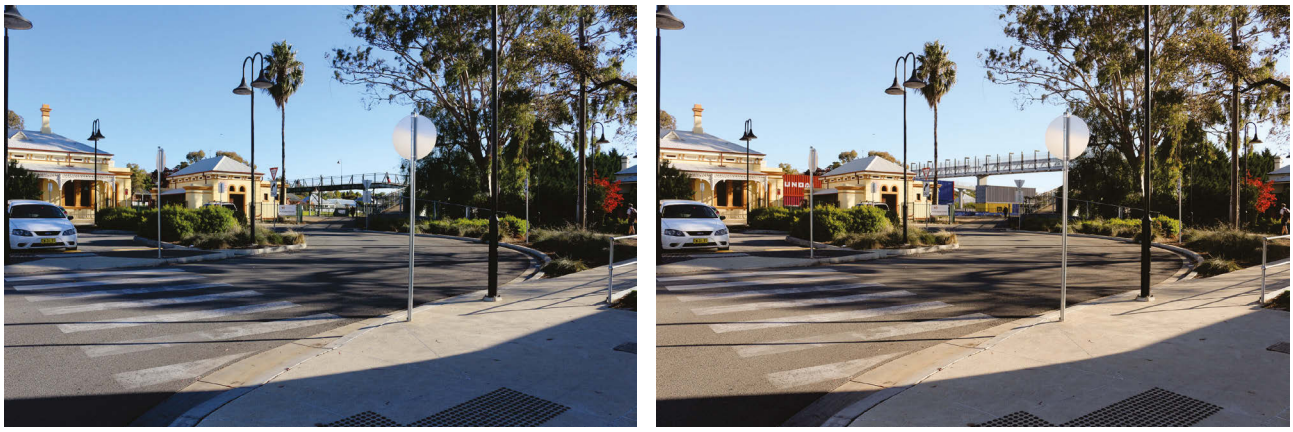

FIGURE 17-13 VIEWPOINT 19: EXISTING VIEW SOUTH WEST FROM STATION PLACE (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). ***NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAILED DESIGN***

Night-time visual environment

Night-time visual impacts during construction are outlined in Table 17-26. Moderate–minor adverse impacts would occur due to:

- more frequent train movements within regional towns, which are areas of moderate sensitivity, given the existing low district brightness at these locations
- more frequent train movements resulting in an increased lighting impact at certain residences adjacent to the rail corridor within Wagga Wagga, noting this would be minimised by intervening fences and vegetation
- street lighting and vehicular headlights on the new Edmondson Street bridge, which would be at an increased elevation compared to the existing structure. The lighting of the bridge, connecting roads and footpaths would be designed to minimise any light spill or direct light intrusion into the neighbouring residential properties.

TABLE 17-26 OPERATIONAL IMPACT ON NIGHT-TIME VISUAL SENSITIVITY OF THE WAGGA WAGGA VISUAL CATCHMENT

Enhancement site		Sensitivity	Magnitude of change	Impact
Uranquinty Yard clearances		Moderate	Low	Moderate–minor adverse
Pearson Street bridge		Low	Low	Minor adverse
Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga	Residences to the north of the rail corridor on Brookong Avenue and on Cassidy Parade, residences on Donnelly Avenue and Little Best Street, and Erin Street, and residences on Railway Street to the south of the	Low	Moderate	Moderate–minor adverse

Enhancement site		Sensitivity	Magnitude of change	Impact
Wagga Yard clearances	Wagga Wagga Railway Station and the former Station Master's residence			
	From other residential properties overlooking the rail corridor at additional distance to the corridor with potential filtering of views through existing trees and by intervening buildings	Low	Low	Minor adverse
Bomen Yard clearances		Low	Negligible	Negligible

17.5.4 Junee precinct

The operational landscape and visual amenity impacts at the enhancement sites within the Junee precinct are described in this section. The key visible elements proposed in the Junee precinct include:

- replacement of the Kemp Street bridge over the rail corridor with a road bridge 2.8 m higher than the existing, including:
  - completion of road tie-in works and adjustments on Kemp Street and the corner of Joffre Avenue and Seignior Street
  - changes to the configuration of open space at Endeavour Park and open space adjoining the rail corridor. There would be no net loss of open space at this location.
- track lowering beneath the Pearson Street bridge
- removal of the existing pedestrian bridge over the rail corridor at Junee Station
- upgrade of two level crossings from passive to active, including boom gates and flashing lights at Shire and Carter property access road (LX605) and Wornes Gate Lane (LX 1472)
- more frequent and larger freight trains intermittently obstructing the views across the rail corridor.

Landscape impact

The assessed impact to landscapes in the Junee precinct is provided in Table 17-27.

At the Kemp Street and south Junee landscape character unit, the new road bridge would be a more prominent structure, requiring a larger footprint compared to the current bridge. This would also require removal of mature vegetation, permanent adjustments to the eastern extent of Endeavour Park, to accommodate the modified highway intersection, and would change connectivity for pedestrians and cyclists. The changes to Endeavour Park would impact the amenity of the park at this location and would be visible from the western areas of the park given the change in terrain. Replacement landscaping would minimise this impact over time. The reconfigured open space would be subject to further refinement as part of the urban design and landscape plan for the proposal and in consultation with Junee Shire Council. This would consider pedestrian and cyclist connectivity, landscaping enhancements and uses of the reconfigured spaces. Some vegetation would be reinstated along the bridge embankments to the east and west of the corridor; however, the larger bridge structure would reduce the area available for vegetation. This would reduce the effectiveness of the reinstated vegetation to screen the larger bridge structure and to provide shade for pedestrians using the bridge.

TABLE 17-27 OPERATIONAL IMPACT ON LANDSCAPE CHARACTER IN THE JUNEE PRECINCT

Enhancement site	Landscape character	Sensitivity	Magnitude of change	Impact
Harefield Yard clearances	Harefield rural landscape	Neighbourhood	Negligible	Negligible
Kemp Street bridge	Kemp Street and south Junee	Local	Moderate	Moderate adverse
Junee Yard clearances and pedestrian bridge	Junee Station and town centre	Local	Low	Minor adverse
Olympic Highway underbridge	Olympic Highway and north Junee	Local	Low	Minor adverse
Junee to Illabo clearances	Junee to Illabo rural landscape	Neighbourhood	Low	Negligible

Viewpoint impact

The assessed visual impact to identified viewpoints within the Junee precinct is provided in Table 17-28. A photomontage of the proposed road bridge replacement at Kemp Street bridge enhancement site has been provided for Viewpoint 23, as presented in Figure 17-14. The new Kemp Street bridge would be a larger and more visually prominent feature within the assessed views. This would result in a moderate magnitude of change and a moderate adverse impact. Moderate impacts would occur at Illabo (viewpoint 29) as the trains would be more visually prominent and more frequent than those currently seen in this view.

At the Harefield Yard clearances enhancement site, the proposal would include track realignment, the widening of an underbridge and the replacement or modification of a signal gantry. There would be views to this work from a short section of Byrnes Road, from within the adjacent freight container terminal, and across the surrounding rural properties. These views would be somewhat contained by the existing grain silos, freight containers and roadside vegetation. Due to the small scale of these works, there would not be a visual impact expected at this location.

TABLE 17-28 OPERATIONAL IMPACT ON IDENTIFIED VIEWPOINTS WITHIN THE JUNEE PRECINCT

Enhancement site	Viewpoint	Day-time sensitivity	Magnitude of change	Visual impact
Kemp Street bridge	Viewpoint 22: View east along Kemp Street	Local	Moderate	Moderate adverse
	Viewpoint 23: View northwest from Edgar Street	Local	Moderate	Moderate adverse
	Viewpoint 24: View south from the Junee Railway Station platform	Local	Moderate	Moderate adverse
Junee Yard clearances and pedestrian bridge	Viewpoint 25: View north along the Junee Station platform	Local	Low	Minor adverse
	Viewpoint 26: View south along Seignior Street	Local	Low	Minor adverse
Olympic Highway underbridge	Viewpoint 27: View north east from Illabo Road	Local	Low	Minor adverse
	Viewpoint 28: View south west from Waterworks Road	Neighbourhood	Moderate	Minor adverse
Junee to Illabo clearances	Viewpoint 29: View southwest from the Olympic Highway rest stop, Illabo	Local	Moderate	Moderate adverse
	Viewpoint 30: View south from Wood Street, Illabo	Neighbourhood	Moderate	Minor adverse

FIGURE 17-14 VIEWPOINT 23: VIEW NORTHWEST FROM EDGAR STREET (LEFT) AND INDICATIVE PHOTOMONTAGE OF PROPOSAL (RIGHT). *NOTE: INDICATIVE LANDSCAPE TREATMENTS, SUBJECT TO DETAIL DESIGN*

Night-time visual environment

Night-time visual impacts during construction are outlined in Table 17-29. Moderate–minor adverse impacts would occur due to:

- more frequent train movements, resulting in an increased lighting impact at limited residences adjacent to the rail corridor in Junee (particularly where the track is curved), noting this would be minimised by intervening fences and vegetation, or the changes in terrain
- street lighting and vehicular headlights on the new Kemp Street bridge, which would have increased visibility given the increased height of the bridge, the proximity of adjacent residential receivers and the wider visual catchment. The lighting of the bridge, connecting roads and footpaths would be designed to minimise any light spill or direct light intrusion into the neighbouring residential properties
- more frequent freight train movements within Junee to Illabo rural landscape, which are areas of moderate sensitivity, given the existing low district brightness at these locations.

TABLE 17-29 OPERATIONAL IMPACT ON NIGHT-TIME VISUAL SENSITIVITY OF THE WAGGA WAGGA VISUAL CATCHMENT

Enhancement site	Sensitivity	Magnitude of change	Impact
Harefield Yard clearances	Moderate	Low	Moderate–minor adverse
Kemp Street bridge	Low	Moderate	Moderate–minor adverse
Junee Yard clearances and pedestrian bridge	Low	Low	Minor adverse
Olympic Highway underbridge	Low	Low	Minor adverse
Junee to Illabo clearances	Moderate	Low	Moderate–minor adverse

17.6 Mitigation and management

17.6.1 Approach to mitigation and management

During detailed design, an urban design and landscape plan would be prepared by a suitably qualified consultant to provide a consistent approach to design and landscaping. This would be context specific, and include a vision, and place-specific objectives and principles, to ensure the design is well integrated into its surrounding environment. 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.

Inland Rail Landscape and Rehabilitation Strategy, Inland Rail Landscape and Rehabilitation Framework and *Landscape Specification* 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.

An urban design and landscape plan would be prepared to guide rehabilitation planning, implementation, monitoring and maintenance of disturbed areas. The strategy would include measures to provide for the long-term rehabilitation of areas disturbed by construction. This would assist in minimising the potential for visual impacts as a result of construction.

17.6.2 Mitigation measures

Measures that will be implemented to address potential impacts on landscape and visual amenity are listed in Table 17-30.

TABLE 17-30 LANDSCAPE AND VISUAL MITIGATION MEASURES

Stage	Ref	Impact/issue	Mitigation measure
Detailed design/pre-construction	LV1	Landscape and visual impact	Detailed design and construction planning will seek to further minimise the construction and operation footprints to avoid impacts on mature vegetation, as far as reasonably practicable.
Detailed design/pre-construction	LV2	Landscape and visual impact	An urban design and landscape plan will 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 will be undertaken in accordance with the urban design objectives developed for the design, and the urban design and landscape plan.

Stage	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.
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* (TfNSW, 2019a).
Detailed design/pre-construction/ construction	LV5	Landscape and visual impact	Any landscape works are to be completed in accordance with Inland Rail's Landscape and Rehabilitation Framework, Landscape Rehabilitation Strategy, and Landscape Specification. Rehabilitation of disturbed areas will be undertaken progressively in accordance with the urban design and landscape plan and individual property agreements, where relevant. Landscaping works will be monitored and maintained until vegetation has established in accordance with ARTC's procedures or as agreed with the relevant landowner.
Detailed design/pre-construction	LV6	Night-time visual impacts	Temporary lighting will be designed and sited to minimise light spill on adjacent receivers as far as practicable with consideration of *AS 4282-2019 Control of the Obtrusive Effects of Outdoor Lighting* (Standards Australia, 2019).
Detailed design/pre-construction	LV7	Night-time visual impacts	Light spill onto private property due to permanent lighting and train headlights will be managed in accordance with *AS 4282-2019 Control of the Obtrusive Effects of Outdoor Lighting* (Standards Australia, 2019) as far as practicable.
Construction	LV8	Landscape and visual impact	Construction compounds will be located, as far as practicable, within cleared areas and away from sensitive receivers. Compounds will be designed and orientated to minimise visual impacts. This will include locating areas of low visual amenity away from sensitive receivers and erecting boundary screening around compounds, where appropriate.
Construction	LV9	Landscape and visual impact	Trees to be retained will be protected prior to the commencement of construction in accordance with *AS4970-2009 Protection of trees on development sites* (Standards Australia, 2009a).
Construction	LV10	Landscape and visual impact	All trees removed for the proposal (that are not subject to biodiversity offsets) will be replaced at a ratio of 2:1 in locations within the enhancement sites or in the general locality to the enhancement sites, as determined in consultation with stakeholders and relevant local council. A tree is defined as woody perennial plants above 3 m in height.
Detailed design/pre-construction	LV11	Landscape and visual impact	During detailed design and in consultation with the relevant council, opportunities to screen the rail corridor and enhance local landscape character through the provision of additional trees and shrubs within local parks, and streets adjoining enhancement sites will be investigated in locations such as Culcairn, Henty, Yerong Creek and Uranquinty.

Effectiveness of mitigation measures

The mitigation measures provided in Table 17-30 are anticipated to reduce the likelihood and/or consequence of the identified risks. Mitigation measures that rely on landscape screening would have limited effectiveness in the short term and reduce the impact level slowly over time. Where an identified impact is reduced but not eliminated, it would be reviewed through the urban design and landscape plan to determine if further action is required. Overall, there would be residual visual impacts due to the scale and extent of the proposal that cannot be reduced or eliminated.

Urban design objectives have been incorporated into the concept design and would be further explored during detailed design. The urban design and landscape plan would develop a solution that maximises the protection of the existing visual values and landscape character of the proposal site and neighbouring areas.

Audits and reporting of the effectiveness of environmental management measures is generally carried out to show compliance with management plans and other relevant approvals and would be outlined in detail in the CEMP. The rehabilitation of disturbed areas would include procedures for monitoring and maintaining landscaped areas to ensure planting becomes established.

17.6.3 Interactions between mitigation measures

Mitigation measures in other chapters that are relevant to the management of landscape and visual amenity impacts include:

- Chapter 15: Noise and vibration, specifically the potential
- Chapter 11: Non-Aboriginal heritage, specifically details measures for avoiding and minimising impact to heritage structures and areas
- Chapter 12: Land use and property, specifically details measures that address the impacts to land uses such as recreational land
- Chapter 26: Cumulative impacts, specifically details measures that address consultation with relevant stakeholders to manage the interface of nearby projects under construction at the same time.

Together, these measures would minimise the potential landscape and visual amenity impacts of the proposal. There are no mitigation measures identified in the assessment of other environmental aspects that are likely to affect the assessment of air quality impacts.

17.6.4 Residual risk

Residual impacts are impacts of the proposal that may remain after implementation of the management and mitigation measures detailed in section 17.6.1 and section 17.6.2. These are summarised in Table 17-31.

Further information on the approach to the environmental risk assessment, including descriptions of criteria and risk ratings, is provided in Appendix E: Environmental risk assessment.

TABLE 17-31 RESIDUAL RISK MANAGEMENT—LANDSCAPE AND VISUAL

Stage	Potential impact	Pre-mitigated rating	Mitigation measures[1]	Residual risk rating	Residual risk management[2]
Construction	Temporary light spill due to OOH work during construction	Medium	LV7	Low	N/A
Construction	Adverse temporary impacts (visual and landscape) due to construction work in the vicinity of sensitive receivers	Medium	LV1, LV2, LV6, LV9, LV10	Low	N/A
Operation	Visual impact of operational lighting at night-time	Low	LV8	Low	N/A
Operation	Potential changes (potentially positive and negative) to visual setting and landscape character due to the replacement of key bridge infrastructure and other visible key rail infrastructure	High	LV2, LV3, LV4, LV5, LV6, LV11, LV13	Medium	The urban design and landscape plan would consider the use of materials and treatments to minimise potential impact with consideration of the surrounding landscape and context.
Operation	Potential changes to the visual setting and landscape character due to the introduction of double-stacked trains along an existing rail corridor	Medium	LV2, LV13	Low	The urban design and landscape plan would consider the use of materials and treatments to minimise potential impact with consideration of the surrounding landscape and context.

1. As described in Table 17-30.
2. For residual impacts with a risk rating of medium or above.