

Newell Highway Heavy Duty Pavements, Narrabri to Moree

Urban design, landscape character and
visual impact assessment report

Roads and Maritime Services | May 2018



Executive Summary

Roads and Maritime Services (Roads and Maritime) proposes to carry out major pavement upgrades to five segments of the Newell Highway (the highway) between Narrabri and Moree in north-west NSW, within the existing road corridor (the proposal). The proposal is located in Narrabri Shire and Moree Plains Local Government Areas (LGAs) (see Figure 1.1).

The landscape character and visual impact assessment forms part of the REF prepared for the proposal, and assesses the proposals impacts of landscape character and its visual implications. Through this assessment process key areas of impact are defined and proposals for addressing these impacts determined.

The Proposal

Key features of the proposal include:

- Upgrade and resurface five segments of the existing highway between Narrabri and Moree to a heavy duty (HD) pavement
- Road widening to provide 3.5 metre wide lanes and two metre shoulders
- Provision of a one metre wide painted median
- Provision of 1.5 kilometre long overtaking lanes at five locations (three northbound and two southbound)
- Upgrading of the existing intersections along the Newell Highway to channelised right hand turn, with an axillary left hand turn intersection treatments
- Provision of a central two way right turn lane at Bellata
- Provision of three metre wide shoulders for 30 metres on either side of property accesses
- Upgrade drainage to improve the highway flood immunity to a minimum of five year average recurrence interval (ARI) where feasible and reasonable □
- Utility relocations as required
- Property acquisitions as required
- Temporary construction ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures within the road corridor.

The proposal would be delivered in five segments with a combined length of 33.8 kilometres of upgrades along the highway between Narrabri and Moree.

Design Guidelines

In developing the urban design, landscape character and visual assessment the design has been undertaken in accordance with a number of Roads and Maritime Service Guidelines in order to inform the design process and its outcomes. These guidelines included:

- Road Design Guidelines
- Environmental Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment - EIA-N04
- Beyond the Pavement, Urban Design Policy, Procedures and Design Principles, Roads and Maritime January 2014
- Landscape Guidelines, Roads and Traffic Authority, April 2008
- Bridge Aesthetics - Design Guidelines to improve the aesthetics of bridges in NSW, 2012.

Context

An understanding of the highways context is essential to ensure that the responses proposed are informed and reflect the planning and uses which occur within the vicinity of the corridor.

A review of context once undertaken which encompasses:

- Landuse
- Heritage
- Vegetation
- Topography.

Urban Design Strategy

In developing a design response which addresses the impacts to landscape character and the visual environment a number of principles were developed.

Principle 1 - Contribute to the overall landscape structure and revitalisation of the region

Principle 2 – Respect the land uses and built form of the corridor

Principle 3 – Connecting modes and communities

Principle 4 – Fit the landform of the corridor

Principle 5 – Responding to natural patterns

Principle 6 – Protect and enhance the heritage and cultural values of the corridor

Principle 7 – Designing an experience in movement

Principle 8 – Creating self-explaining road environments

Principle 9 – Achieving integrated and minimal maintenance design.

From these principles an overall strategy was developed for the road and its response. Key elements of the strategy are:

- Limiting vegetation loss - either through revisions to alignment or scale of proposed cross section;
- Providing screening to properties which have been impacted by the proposal through the opening up of views to the proposed alignment;
- Providing definition to the changing land uses associated with the townships through which the highway passes; and
- Providing interest to the motorist along their journey in an effort to break down the sense of distance and provide a sense of progression and connection to context.

Landscape Character and Visual Assessment

The landscape character assessment identified five character zones:

- Intensive Agriculture
- Broad scale Agriculture – Open Woodlands
- Broad scale Agriculture – Grasslands
- Remnant Woodlands or screening vegetation
- Rural Village.

Generally, impacts were in the low to moderate range. Areas of highest sensitivity identified related to Rural Villages and Remnant Woodlands. This sensitivity has seen the overall Impact of these locations assessed as at the higher end of impacts ranging from high to moderate prior to mitigation. Post mitigation the highest ranking falls to moderate to high with the others staying at moderate. The focus on development should be in these locations.

Visual impact assessment assessed 19 viewpoints. Typically impacts were assessed as low or low to moderate. Like landscape character areas of highest sensitivity related to residential or village locations or forested locations which are limited within the corridor. These highest impacts post mitigation were assessed to be reduced to moderate.

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1 INTRODUCTION

1.1 Background

The A39 Newell Highway (the highway) is the longest highway in NSW, running 1058 kilometres through the state providing an essential road connection for central western NSW. The highway is a vital transport corridor between Victoria, NSW, and Queensland. The highway is a major interstate freight corridor, being the third largest in NSW providing access between key regional primary industries and export markets. The highway supports regional tourism with caravans being a major road user.

Both the *NSW Long Term Transport Master Plan (2012)* and the *NSW Freight and Ports Strategy (2013)* identify the need to develop a corridor strategy for the Newell Highway to support greater use of higher productivity vehicles (HPVs), and to prioritise the necessary road upgrades to enable HPV access on the entire length of the highway.

As the major rural highway west of the Great Dividing Range, the Newell Highway services western NSW north-south corridor.

1.2 Proposal Description

Roads and Maritime Services (Roads and Maritime) proposes to carry out major pavement upgrades to five segments of the Newell Highway (the highway) between Narrabri and Moree in north-west NSW within the existing road corridor (the proposal). The proposal is located in the Narrabri Shire and Moree Plains Local Government Areas (LGAs), as depicted Figure 1 – Regional Context Plan.

The proposal forms part of the *Newell Highway Corridor Strategy (Transport for NSW, 2015)* to provide an efficient and sustainable corridor that caters for increasing growth and improves safety along the Newell Highway. The Newell Highway carries substantial freight volumes, large volumes of inter-regional and local freight traffic, and is increasingly catering for substantial volumes of tourist traffic. The strategy identified that a large portion of the northern section of the highway is nearing its end of life, with regular failures occurring with structural pavement, as well as large sections not meeting desired cross section dimensions.

Key features of the proposal include:

- Upgrade and resurface five segments of the existing highway between Narrabri and Moree to a heavy duty (HD) pavement
- Road widening to provide 3.5 metre wide lanes and two metre shoulders
- Provision of a one metre wide painted median
- Provision of 1.5 kilometre long overtaking lanes at five locations (three northbound and two southbound)
- Upgrading of the existing intersections along the Newell Highway to channelised right hand turn, with an axillary left hand turn intersection treatments
- Upgrade of the existing intersections along the highway to either a basic right turn treatment or channelised intersection
- Provision of a central two way right turn lane at Bellata
- Provision of three metre wide shoulders for 30 metres on either side of property accesses
- Upgrade drainage to improve the highway flood immunity to a minimum of five year average recurrence interval (ARI) where feasible and reasonable
- Utility relocations as required
- Property acquisitions as required

- Temporary construction ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures within the road corridor.

The proposal would be delivered in five segments with a combined length of 33.8.2 kilometres of upgrades along the highway between Narrabri and Moree. The five segments are described in Table 1 below.

Table 1 – Proposal Segment Summary

Reference	Location	Proposed works
Narrabri to Moree Segment 1 (N2MS1)	6.4 kilometres to 12.9 kilometres north of Narrabri	Upgrade of 6.4 kilometres
Narrabri to Moree Segment 2 (N2MS2)	15.6 kilometres to 25.9 kilometres north of Narrabri	Upgrade of 10.5 kilometres Two overtaking lanes – north and south bound
Narrabri to Moree Segment 3 (N2MS3)	46.8 kilometres to 51.3 kilometres north of Narrabri	Upgrade of 4.5 kilometres One overtaking lanes northbound
Narrabri to Moree Segment 4 (N2MS4)	52.4 kilometres to 58.3 kilometres north of Narrabri	Upgrade of 5.9 kilometres
Narrabri to Moree Segment 5 (N2MS5)	88.4 kilometres to 96.3 kilometres north of Narrabri	Upgrading 8.9 kilometres of the Newell Highway Two overtaking lanes – northbound and southbound

The proposal scope seeks to reconfigure the alignment to meet the geometric requirements of high productivity vehicles and provide enhanced safety including the provision of safer overtaking and turning opportunities.

The posted speed limit on the highway is 110 kilometres per hour with 120 kilometres per hour design speed proposed through rural areas. Reduced speed limits apply at the following locations:

- Edgeroi, at the northern end of N2MS2 (80 kilometres per hour)
- Bellata, at the southern end of N2MS3 (60 kilometres per hour).

The highway cross section is to be revised to provide 3.5 metre wide travel lanes and 2 metre wide shoulder.

Construction of the proposal would be staged to enable work to be completed safely while maintaining traffic flows at all times. Construction would generally involve building one carriageway at a time, and switching traffic between the carriageways to preserve traffic flows for the duration of work.



Figure 1 – Regional Context Plan, the Newell Highway A39 - Narrabri to Moree (Based on Open Street Map data, 2018)

1.3 Purpose of Report

Tract Consultants Pty Ltd has been commissioned by Jacobs Group (Australia) Pty Ltd (Jacobs) to provide an Urban Design, Landscape Character and Visual Impact Assessment for the upgrade of the highway between Narrabri and Moree. As part of this process a review of the design has been undertaken and recommendations made as to its integration within the road corridor.

This assessment and recommendations form part of the Review of Environmental Factors (REF) submission for the approval of the works.

1.4 Background Documents

The Roads and Maritime Services have developed a range of documents which inform both the assessment process as well as the design responses associated with the development of the highway environment, Figure 2.

The following documents have been referred to, to inform the design development and assessment of the proposal. The documents cover both the assessment process as well as design inputs to ensure that the highways contribution to its urban and landscape context and visual impacts associated with this are appropriately managed and addressed as part of the development process. The documents include:

- Road Design Guidelines
- Environmental Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment - EIA-N04
- Beyond the Pavement, Urban Design Policy, Procedures and Design Principles, Roads and Maritime January 2014
- Landscape Guidelines, Roads and Traffic Authority, April 2008
- Bridge Aesthetics - Design Guidelines to improve the aesthetics of bridges in NSW, 2012.

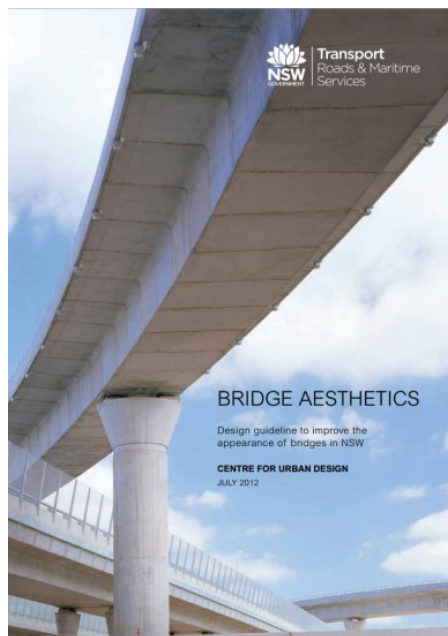


Figure 2 – Guideline Covers

2 CONTEXT

2.1 Location

The Newell Highway (A39) is the longest highway in NSW, running south to north through the State and providing an essential road connection for central western NSW. It forms a major interstate transport connection between Victoria, New South Wales and Queensland for freight and passengers, including tourists.

The proposal is located between Narrabri and Moree, (refer Figure 3 – Local Context Plan), and crosses the local government areas of Narrabri Shire and Moree Plains Shire Councils. It is located west of the Great Dividing Range in the north west of NSW. Narrabri is situated 560 kilometres north west of Sydney on the Kamilaroi Highway and 560 kilometres south west of Brisbane on the Newell Highway. Moree is located 120 kilometres south of the Queensland border and some 480 kilometres from Brisbane.

The highway is set within some of Australia's most productive agricultural landscapes with farming including cotton, wheat, beef and lamb production.

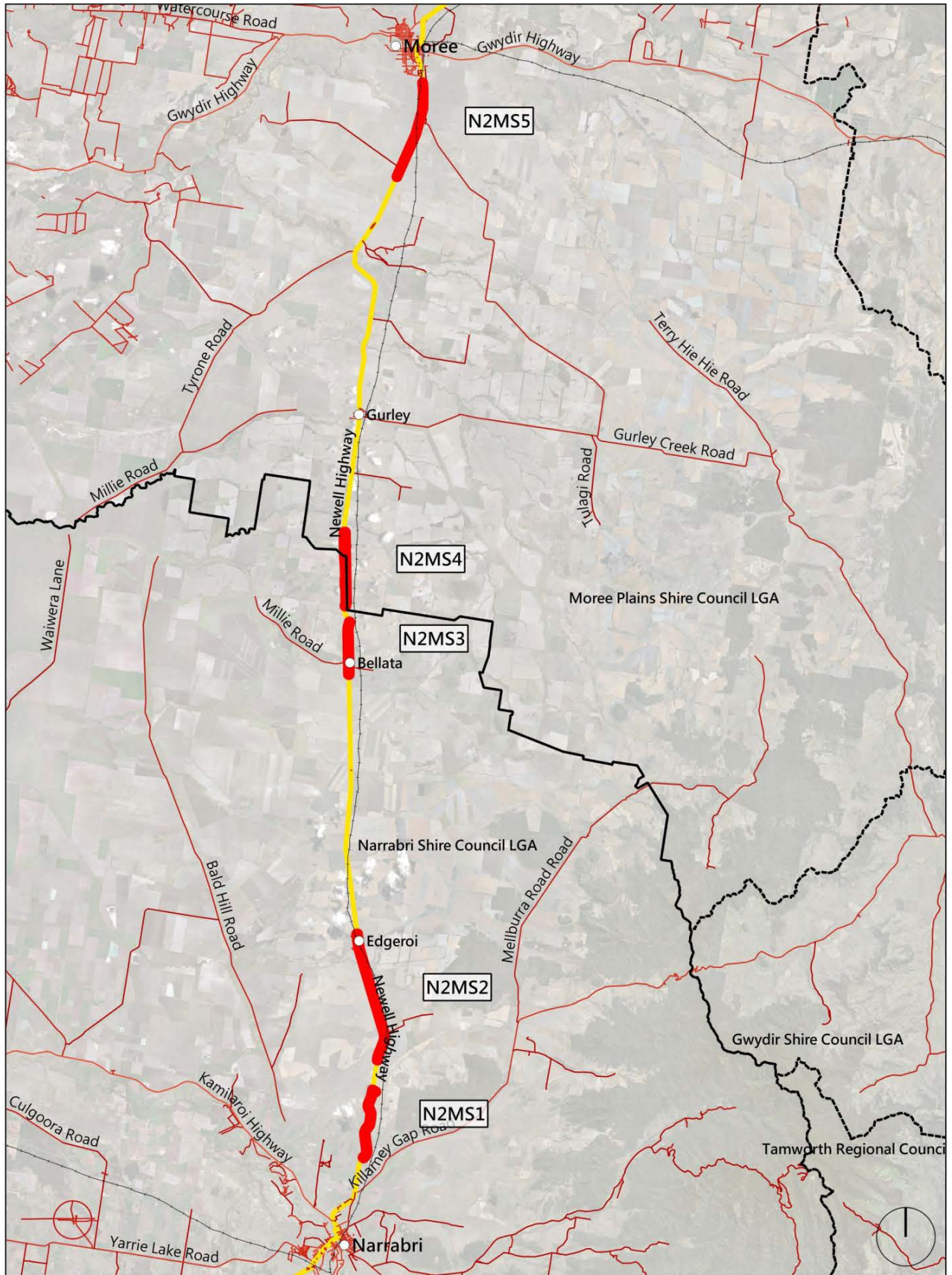


Figure 3 – Local Context Plan, A39 the Newell Highway - Narrabri to Moree (Based on Open Street Map data, 2018)

2.2 Land Zoning

The proposal passes through the local government areas of Narrabri Shire and Moree Plains Shire.

N2MS1 to N2MS3 are located within the Narrabri Shire with N2MS4 and N2MS5 located within the Moree Plains Shire. As such they are subject to the Narrabri Local Environmental Plan 2012 and Moree Plains Local Environmental Plan 2011, respectively.

2.2.1 RU-1 Primary Production

Zoning within the proposal segments N2MS1 to N2MS5 is largely consistent in type, with the dominant land use being RU – 1 Primary Production. The objectives of zoning type RU-1 Primary Production include:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- To encourage diversity in primary industry enterprises and systems appropriate for the area
- To minimise the fragmentation and alienation of resource lands
- To minimise conflict between land uses within this zone and land uses within adjoining zones
- To permit development for certain purposes if it can be demonstrated that suitable land or premises are not available elsewhere.

Visually this has resulted in a relatively consistent outlook along the highway corridor with the key agricultural land uses involving intensive production of crops such as wheat, cotton and improved pasture, Figure 4. Some areas of less intensive use, such as grazing lands also occur within the zoning category, Figure 5. The following images highlight the typical range of vegetative structures related to land use that influence the broader landscape character.



Figure 4 – Intensive agricultural land use –

- a) View looking west over rail corridor from the Newell Highway, north of N2MS2 between Edgeroi and Bellata.
- b) View looking east towards Mt Kaputar from the Newell Highway, north of N2MS2 between Edgeroi and Bellata.



Figure 5 – Broad scale agricultural land use –
 a) View looking east towards Mt Kaputar from the Newell Highway, between Gurley Village and N2MS5
 b) View looking south along the Newell Highway south of Brigalow Lane intersection in N2MS4.

2.2.2 RU-5 Village

A number of villages occur along the proposal corridor. The most developed of these are Edgeroi located in N2MS2 and Bellata located in N2MS3. These villages are bisected north to south by the proposal, and are typically zoned as RU-1 Primary Production land characterised by agricultural and rail infrastructure to the west of the highway and RU-5 Village land typically of residential and commercial dwellings to the east of the highway.

The villages of Edgeroi and Bellata are characterised by large grain silos and agricultural infrastructure that reflect the longstanding agricultural industry of these rural centres and highlights their importance as grain transport hubs along the rail corridor. Both villages are connected via highway and rail infrastructure and offer services and amenity to both local community and visiting highway users. The objectives of zoning type RU-5 Village include:

- To provide for a range of land uses, services and facilities that are associated with a rural village
- To enable development of a scale compatible with the general residential character of village areas and which will not prejudice the viability of established shopping and commercial centres.

Figure 6 captures the feel and character of these highway villages and the scale of the highway corridor.



Figure 6 – a) View looking south on approach to Edgeroi village, located in N2MS2.
 b) View of the Newell Highway passing through the village of Bellata

2.2.3 IN-1 General Industrial

The IN-1 General Industrial zone is typically located in association with the regional centres, in this case the outskirts of Moree. It is typified by large warehouses and grain handling facilities, Figure 7. The objectives of zoning type IN-1 General Industrial include:

- To provide a wide range of industrial and warehouse land uses
 - To encourage employment opportunities

- To minimise any adverse effect of industry on other land uses
- To support and protect industrial land for industrial uses
- To enable development that is compatible with, or ancillary to, the industrial use of the land
- To prevent retail development, including stand-alone retail development that would be more appropriately located in another zone.



Figure 7 – Industrial Lands on the outskirts of Moree.

2.3 Existing relationship between the Newell Highway and Key Settlements

2.3.1 Edgeroi Village

Description:

Edgeroi is a rural village bisected by the highway and located in N2MS2, 25 kilometres north of Narrabri and 75 kilometres south of Moree. Highway speed throughout Edgeroi is restricted to 80 kilometres per hour.

Edgeroi Village has been zoned RU1 Primary Production to the western side of the highway. This area contains truck access roads and extensive gravel turn-around and parking areas surrounding large scale grain silos and other large industrial facilities. These elements are separated from the highway by the Narrabri to North Star rail corridor and associated rail line. The rail line is typically set back 50-100 metres from the existing highway, separated by broad grass verges. An intermittent buffer of trees along the western verge defines the road corridor while allowing open views through across the western side of the village to the flat crop lands beyond, refer Figure 8.

A collection of smaller properties along the eastern side of the highway make up the majority of the residential and commercial development of Edgeroi village and are zoned as RU5 Village. A small number of commercial premises and local amenities front the eastern side of the highway, set back approximately 15-20 metres from the highway shoulder behind informal open tarmac pull-in areas and grass verges.

Vegetation is more extensive throughout the eastern side of the village with loosely scattered trees providing shade to residential dwellings. Residences are typically separated from the highway by enclosed timber paling fences, with driveway access via a lay-by which runs adjacent and parallel to the highway.



Figure 8 – a) View looking south on approach to Edgeroi village, located in N2MS2.
b) View looking north on approach to Edgeroi village, located in N2MS2.

Key elements to be considered in the design:

- Northern and southern approaches to Edgeroi visually dominated by the farm infrastructure and rail corridor along the western side of the highway
- Highway speed is 80 kilometres per hour zone throughout the village
- Some intermittent remnant vegetation present along the village highway corridor approaches in either direction, otherwise dominated by broad open views
- Minimal edge treatment along highway margins, no narrowing of the shoulder, change to carriageway alignment or signage within the corridor to provide cues for traffic to respond.

2.3.2 Bellata Village

Description:

Bellata is a rural village bisected by the highway and located in N2MS3, 48 kilometres north of Narrabri and 53 kilometres south of Moree. The highway speed throughout Bellata is restricted to 60 kilometres per hour.

Lots on the western side of the highway within Bellata are zoned RU1 Primary Production. This area contains truck access roads and extensive gravel turn-around and parking areas surrounding large scale grain silos and other large industrial facilities along the northbound approach. These elements are separated from the highway by the Narrabri to North Star rail corridor.

Along the western verge between Temi Street and North Street intersections are some widely spaced, semi-mature native trees forming an avenue on entry into the town, Figure 9a. A small turf island with shade tree planting, signposted as Sugar's Park, provides an open space with outdoor seating and local interpretive signage, is situated immediately off the western highway shoulder. This gives way to an expansive gravel truck and car parking associated with a petrol station, restaurant and convenience store facilities which are set back approximately 30 metres from the western highway shoulder. This precinct is marked by tall palm trees set both within the verge and dividing median within the hard stand area, Figure 9b.

The southbound approach consists of a less formalised verge of unkempt grass and no avenue plantings. Plantings along this eastern verge are scattered and sparse, consisting of small trees.

A collection of smaller properties along the eastern side of the highway make up the majority of the residential and commercial development of Bellata village and are zoned as a single cluster of RU5 Village. A small number of commercial premises and local amenities including a mechanic shop and a post office front along the eastern side of the highway in the village centre set back approximately 5-10 metres from the highway with a broad gravel shoulder.

Vegetation is marginally more extensive to the eastern side of the village with scattered small trees and shrubs throughout the residential lots. Residences are typically open to the highway with low picket and wire mesh front fences, with direct driveway access from the highway shoulder.



Figure 9 – a) View looking north on approach to Bellata village, located in N2MS3.
b) View looking south on approach to Bellata village, located in N2MS3.

Key elements to be considered in the design:

- Northern and southern approaches to Bellata visually dominated by the farming infrastructure and rail corridor along the western side of the highway
- Highway speed 60 kilometres per hour zone throughout the village
- Some semi-mature native avenue trees are located along the western verge along northbound approach
- Small open park space with signature tree planting, outdoor seating and local interpretive signage is located directly off the carriageway along the western verge
- Minimal edge treatment along highway margins, no narrowing of the shoulder, change to carriageway alignment or signage within the corridor to provide cues for traffic to respond.

Heritage

2.3.3 Aboriginal Heritage

The original occupants of the region were the Kamilaroi (also Gamilaraay) Tribe. Aboriginal occupation of the NSW Darling Basin has been dated to over 42,000 years at Willandra Lakes (Bowler et al 2003). Around the 1830's, Europeans began to displace Aboriginal populations a product of conflicts, disease epidemics, and economic hardship. Conflict between Aboriginal people and European pastoralists probably occurred initially over competition for food and water resources. Conflict between Aboriginal people and European colonists was particularly violent in the Gwydir and Macintyre Valleys, with a number of massacres occurring. The names of a number of towns within the region are derived from words used by this population this includes Narrabri which describes the intersection of the rivers and translates as 'forked waters'.

Aboriginal culturally modified trees (scar trees) were found to be the most common site type in the region followed by artefact scatters and isolated finds. There are four known Aboriginal heritage sites located along the existing highway corridor, within the proposal works area (OzArk Environmental & Heritage Management, 2017).

The design of the highway avoids these constraints. The opportunity to interpret these connections as part of the urban design may be explored.

2.3.4 Non-Aboriginal Heritage

Post European settlement, the region has been shaped by the development and continued growth of the regions agricultural industry and associated urban expansion. The development of the highway has responded to this development, and the development of the towns within the region evolving with them.

European Explorers

The following explorers were key figures in European settlement of the region:

- 1818 - John Oxley became the first European to explore the district
- 1825 - Allan Cunningham explored the Boggabri Plains

- 1831 - Thomas Mitchell expedition to explore a vast inland river was inspired by the tales of escaped convict George Clarke who roamed what is now Narrabri Shire from 1826-1831.

Development of Towns

The history of the towns through which the highway passes is discussed on the local tourism site Visit Narrabri and highlights interesting and unusual facts about these localities. While not necessarily captured as part of the overall heritage impact assessment they provide an interesting overlay of social history which could be explored within the urban design response.

Edgeroi

The village is named after the famous 150,000-acre Edgeroi Station, which was one of the region's largest stations from the early 1880s until just after World War II, when it was divided into soldier settler blocks. The station's woolshed was once the largest in the southern hemisphere, with a 52-stand capacity. Remains of the old woolshed are visible on the left hand side of the road, 4 kilometres north after leaving Edgeroi. The now-disused railway station opened in 1897 and is located in the shadow of the silos adjacent and does not relate to the highway.

Bellata

Bellata village was formerly called Woolabra and is located on the Mungindi Rail Line, 615 kilometres from Sydney. The railway station opened in 1897 and was renamed in 1909. An interesting fact about Woolabra is that in the late 1800's when money was in short supply inland, Woolabra produced its own currency that was legal tender throughout NSW, the Woolabra one pound note. (<http://www.visitnarrabri.com.au/our-towns/bellata/>).

Four historic items located in Bellata are listed on both the SHI and the Narrabri LEP: AB Meppem & Co, Bellata, Post Office, Oldhams Smallgoods and Bellata Police Station. The Nandewar Hotel is listed on the SHI as being located in Bellata. However, the hotel burnt down more than a decade ago and no longer exists. Additionally, one item, LS Rowe Stock and Station Agents, located in Bellata, is listed on the Narrabri LEP.

The upgrade of the highway presents the opportunity to interpret the heritage of the region and reinforce its role as a tourist highway. Consideration should be given to ways in which this may be interpreted within the urban design response of the corridor.

2.4 Vegetation

The existing highway alignment passes through expansive areas of agricultural lands comprised of cleared grass and croplands. The vegetation of the highway corridor consists of predominantly remnant or regenerating vegetation or pasture escapes. The vegetation within the corridor is an important remnant of the vegetation which would have once been present in the adjoining landscape.

The vegetation of the alignment has been assessed as part of separate biodiversity assessment (Jacobs May 2018). This has identified five Threatened Ecological Communities (TEC'S) listed under the *NSW Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), and depicted in figures 10 and 11 including:

- Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland (Critically Endangered – EPBC Act)
- Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions (Endangered – BC Act) also includes Brigalow (*Acacia harpophylla* dominant and co-dominant) (Endangered EPBC Act)
- Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions (Endangered – BC Act) also includes Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (Endangered – EPBC Act)
- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (Endangered – BC Act) also includes Weeping Myall Woodlands (Endangered – EPBC Act).

- Carbeen Open Forest Community in the Darling Riverine Plains and Brigalow Belt South Bioregions (Endangered – BC Act).

In addition to this three threatened flora species were identified.

- *Homopholis belsonii* (Vulnerable EPBC Act and Endangered BC Act)
- *Desmodium campylocaulon* (Endangered BC Act)
- *Digitaria porrecta* (Endangered BC Act).



Figure 10 a) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions
b) Brigalow viney scrub open forest on loamy soils in low hill landscapes in the northern Brigalow Belt South Bioregion Source : Jacobs May 2018)





Figure 11 : a)Carbeen +/- Coolabah grassy woodland on floodplain clay loam soil on north-western NSW floodplains, mainly Darling Riverine Plain Bioregion
 b) Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion
 c) Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW
 d) Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Warialda region, Brigalow Belt South Bioregion
 e) Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion
 f) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion Source: Jacobs May 2018)

A further ten threatened flora species are considered at least moderately likely to occur based on the presence of suitable habitat.

Three threatened fauna species were recorded in the study area:

- Little Eagle (Vulnerable BC Act)
- Grey-crowned Babbler (Vulnerable BC Act)
- Glossy Black-cockatoo (Vulnerable BC Act).

The species composition of these communities informs the overall landscape design of the project. The vegetation which occurs along the alignments length should be reflected in the revegetation palette by the adoption of endemic species. The differing vegetation communities form a variable mosaic of vegetation which occurs primarily within the road and rail corridor and along rivers, creek lines and other water courses.

The design of the alignment should consider its impacts on these remnant vegetation communities minimise footprint and need for vegetation removal. Vegetation should be used to

inform the highway user by defining bends within the alignment, framing views and screening adjoining properties. A detailed species list is appended to the report, Appendix 1.

2.5 Topography and Drainage

2.5.1 Landform

The landscape is located within the alluvial floodplain of the Mehi and Gwydir Rivers and is relatively flat and level. The overall level change along the proposals length is 20 metres with grades typically flatter than 10 percent.

The Mountain ranges associated with Mt Kaputar National Park are visually dominant in the east moving to the southeast as you head from Narrabri through to Bellata.

2.5.2 Drainage

The drainage pattern within this landscape is comprised of two key drainage catchments. N2MS1 and N2MS2 are located within the Namoi River Catchment and segments N2MS3 to N2MS5 are located in the Gwydir River Catchment. Both river systems drain to the west and into the Darling River system.



Figure 12 – Bobbiwaa Creek, N2MS2

The proposal crosses a number of waterways including Bobbiwaa Creek, Tarlee Creek, Gehan Creek, Tookey Creek and Halls Creek. In addition to these creeks the proposal also crosses a number of other intermittent watercourses and irrigation canals. Three of these waterways have been identified as Class 3 Key Fish Habitat and include an unnamed tributary of Narrabri Creek, Bobbiwaa Creek and Tookey Creek.

All watercourse form part of the *aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River* (Lowland Darling River aquatic ecological community) which is listed as an endangered ecological community under the *Fisheries Management Act 1994*.

3 DESIGN STRATEGY

3.1 Introduction

The character of the Newell Highway is a product of the context (ie the land uses, topography, etc) through which it passes. As part of this context the road corridor, rail corridor and the travelling stock route, (which utilises the easement), have their own character which fits within the wider context. This character is a product of restrictions on maintenance leading to the retention and regeneration of the native vegetation communities within the road corridor. The vegetation which has grown in response to this lack of intervention creates a varying sequence of open and enclosed views.

The design response for the proposal needs to reflect both the easement character, as well as the broader landscape through which the proposal passes, addressing environmental, visual and physical constraints as part of a holistic design solution. To achieve this, a number of Principles and Objectives have been developed to inform the design development of the corridor.

3.2 Urban and Landscape Design Principles and Objectives

Beyond the Pavement: Urban Design Policy, Procedures, and Design Principles, Roads and Maritime Services (2014) define nine principles which should be considered in the development of a highway proposal. These have been developed to reflect the unique character of the road, its rural context and key land uses which adjoin it.

3.2.1 Principle 1 - Contribute to the overall landscape structure and revitalisation of the region

Objectives:

- Consider the Newell Highway's role in the movement of goods and people in the central region of New South Wales and its connection to the States and Markets of Queensland and Victoria
- Consider the role townships along the highway can play both within the community that they serve but also that of the travelling community
- Consider the design response for the road design and its setting to both inform traffic of the changing context but also encourage the breaking of the journey
- Consider the management of side connections to the highway to encourage the safe movement to and from these access points.

3.2.2 Principle 2 – Respect the land uses and built form of the corridor

Objectives:

- Minimise the footprint of the proposal to limit impacts to adjoining vegetation, communities, and farm holdings
- Design an alignment which minimises fragmentation of farm holdings or the loss of connections between paddocks
- Maintain the fundamental characteristics of the existing road corridor which signify the Newell Highway and the experience of the road user
- Maintain the ecological integrity of the vegetated sections and landscape character of the corridor.

3.2.3 Principle 3 – Connecting modes and communities

Objectives:

- Consider the relationship between road and rail given the general proximity of the railway line to the alignment. Design to limit impacts on flexibility or functionality of the adjoining network

- Provide safe and efficient access to towns
- Provide a response which acknowledges the population centres of Bellata and Edgeroi along the highway. Facilitate movement of people within this context providing an environment which reflects this human scale.

3.2.4 Principle 4 – Fit the landform of the corridor

Objectives:

- Consider the relationship between road and rail given the general proximity of the railway line to the alignment. Design to limit impacts on flexibility or functionality of the adjoining network
- Minimise the footprint of the proposal to limit impacts to adjoining vegetation communities and farm holdings
- Provide a formation which addresses the need for a flood free route.

3.2.5 Principle 5 – Responding to natural patterns

Objectives:

- The alignment selection should respond to the grain of the landscape and avoid, where possible, the disruption of stands of vegetation, both natural and cultural
- Integrate cut and fill embankments with surrounding terrain by grading out and varying slopes
- Preserve existing cultural patterns within the landscape
- Vary the gradient of earthworks to provide visual integration, interest, and to reflect characteristics of the surrounding landform and landscape.

3.2.6 Principle 6 – Protect and enhance the heritage and cultural values of the corridor

Objectives:

- Avoid, where possible, areas of identified historic and Aboriginal heritage and cultural value
- Acknowledge and respond to the heritage and cultural values of the rural landscape
- Acknowledge and respond to Aboriginal values and places in the broader landscape
- Consider the important value of productive landscape
- Consider the interpretation of the areas heritage along the corridor.

3.2.7 Principle 7 – Designing an experience in movement

Objectives:

- Maximise the opportunities for high quality and varied views of the rural landscape and adjacent mountain ranges
- Provide incidental events or visual stimuli along the corridor to provide a sense of progression and connection with the social, natural and geographic context of the corridor
- Celebrate the views of the ranges to the east and the endless plains to the west
- Use landscape to frame views.

3.2.8 Principle 8 – Creating self-explaining road environments

Objectives:

- Provide a landscape design that defines the edge of bends and leads the driver through the landscape
- Provide plantings at town centres that reinforces the reduced speed zones of these places
- Provide a landscape design which reflects the needs and performance requirements of intersections along the Highway.

3.2.9 Principle 9 – Achieving integrated and minimal maintenance design

Objectives:

- Develop a consistent approach to the design of bridges along the proposal. Urban design principals to be consistent with those outlined in 'Bridge Aesthetics: Design Guidelines To Improve The Appearance of Bridges in NSW' (Roads and Maritime, 2012)
- Develop a consistent approach to the design of soft landscaping along the route. Planting design Principles to be consistent with those outlined in the 'Landscape Guidelines: Landscape Design and Maintenance Guidelines to Improve the Quality, Safety and Cost Effectiveness of Road Corridor Planting and Seeding' (RTA, 2008)"
- Provide a landscape treatment which is self-reliant and regenerating with minimal maintenance input requirements
- Provide plantings to frame views and guide the driver along the alignment.

3.3 Proposal

The proposal would be delivered in five segments with a combined length of about 33.8 kilometres of upgrades along the Newell Highway between Narrabri and Moree.

Key features of the proposal include:

- Upgrading and resurfacing five segments of the existing Newell Highway between Narrabri and Moree to a heavy duty (HD) pavement
- Road widening to provide 3.5 metre wide lanes and two metre shoulders
- Provision of a one metre wide painted median
- Provision of 1.5 kilometre long overtaking lanes at five locations (three northbound and two southbound)
- Upgrading of the existing intersections along the Newell Highway to channelised right hand turn, with an axillary left hand turn intersection treatments
- Upgrading of the existing intersections along the Newell Highway to either a basic right turn treatment or channelised intersection
- Provision of a central two-way right turn lane at Bellata
- Provision of three metre wide shoulders for 30 metres on either side of property accesses
- Improving the Newell Highway flood immunity to a minimum of five year average recurrence interval (ARI) where feasible and reasonable
- Property acquisitions as required
- Utility relocations as required
- Temporary construction ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures within the road corridor as required.

3.4 Key Urban and Landscape Design Strategies

The design response for the alignment and its respective segments has largely focused on the retention of the existing landscape character or reinforcement/reinstatement of the vegetation types which characterise the respective sections of the corridor.

Key strategies for mitigation which should be considered in the development of the proposal are:

- Limiting vegetation loss - either through revisions to alignment or scale of proposed cross section
- Providing screening to properties which have been impacted by the proposal through the opening up of views to the proposed alignment

- Providing definition to the changing land uses associated with the townships through which the highway passes
- Providing interest to the motorist along their journey in an effort to break down the sense of distance and provide a sense of progression and connection to context.

To address these issues and provide appropriate mitigation strategies the following areas should be reviewed and considered in the development of the proposal:

3.4.1 Specific Landscape Strategies for each Project Section

The following section outlines key strategies to be adopted along the alignment to respond to the changing nature and context of the alignment and to assist its integration with the surrounds.

N2M1

- Provide woodland revegetation reflecting the remnant community between Ch 600 and 1700 east of the alignment and for much of the western edge
- Utilise vegetation to reinforce the alignment by defining edges of bends
- Provide screen planting to nearby residents
- Retain open views across the plains to Mt Kaputar and associated ranges to the east typical of the agricultural plains throughout this section
- Reinforce the vegetation of creek lines and watercourses which cross the alignment.

N2M2

- Provide woodland revegetation reflecting the remnant community in association with the creeklines of Tarlee Creek and Bobbiwaa Creeks
- Utilise vegetation to reinforce the alignment by defining edges of bends
- Provide screen planting to nearby residents
- Retain expansive open views for much of the corridor to the east reflecting the existing vegetation patterns.
- Use tree planting to both define the approach and arrival into/out of Edgeroi. Continue planting within the township to emphasis the change in highway condition and to enhance the overall character and liveability of the township.
- Respond to the built form of the township in a way that facilitates the interpretation and history of the town and the regions development, including that of the highway.

N2M3

- Use tree planting to both define the approach and arrival into/out of Bellata, reinforcing the existing vegetation patterns of the township. Continue planting within the township to emphasis the change in highway condition and to enhance the overall character and liveability of the township
- Respond to the built form of the township in a way that facilitates the interpretation and history of the town and the regions development, including that of the highway
- Provide woodland revegetation reflecting the remnant community in association with the creeklines of Gehan Creek and Myall Hollow Creek which mark the arrival from the south to the town
- Utilise vegetation to reinforce the alignment and screen the adjoining railway and its associated infrastructure
- Provide screen planting to nearby residents where impacted by the upgrade proposal
- Retain expansive open to the north of the town reflecting the existing vegetation patterns.

N2M4

- Provide woodland revegetation reflecting the remnant community
- Maintain sense of containment and enclosure characteristic of the present alignment.

N2M5

- Retain views to airfield
- Retain expansive views east and west of the alignment reflecting vegetation patterns
- Use tree planting to both define the approach and arrival into/out of Moree, reinforcing the existing vegetation patterns of the township. Continue planting on entry into Moree within the township to emphasis the change in highway condition
- Respond to the built form of the township in a way that facilitates the interpretation and history of the town and the regions development, including that of the highway.

3.4.2 Grading

Development of the design should seek to grade batters of the formation so that they are integrated and blend with the adjoining landform where possible. This would minimise the need for road barriers and provide a smooth transition between road and landscape, enabling the ground to flow over the alignment.

The current vegetation pattern provides an important part of the character providing a varying sequence of openness and enclosure. The retention of vegetation should be considered as part of the grading of the overall alignment. The use of shallower grades should not be adopted if it results in the loss of the native vegetation canopy where steeper grades would have seen this preserved.

3.4.3 Vegetation

The corridor has been identified as supporting a number of protected vegetation communities. The corridor provides a network of vegetation which provides a web of linking vegetation reserves and communities and enhances fauna connectivity in what is a highly modified and cleared landscape setting.

The revegetation response relates to the distribution of the various vegetation communities and seeks to respond by reinstating these. Revegetation however needs to work within the framework of road safety design parameters. This requires an offset of 12 metres for non-frangible trees from the travel lane which limits the spatial quality of the alignment. If existing vegetation occurs within this limit barrier treatments would be required or the trees removed.

The landscape design response is proposed to reinforce/reinstate the existing character of alternating experiences of the open landscape and enclosed landscape. This varies both according to segments and within the segment. For example, N2MS4 provides a sense of continuous enclosure and a relatively uniform canopy along the entire length.

Rural villages presently do not have a strong landscape character along the highway corridor and are currently not conducive to the provision of liveable spaces. It is proposed that the opportunity to enhance these environments and promote the enhancement of the identity of these villages along the corridor be explored. This may entail street tree planting in the form of avenue and feature planting.

Bellata currently has palm trees at a number of points along the alignment which provide a distinct character and identity but their sporadic nature sees the overall impact limited. Palms also contribute little to the overall environmental qualities of the street. The use of trees in association with the palms however has the potential to both signal change in the road environment consistent with the changes in speed limit but also provide an environment in which the traveller may be prepared to linger.

3.4.4 Road barriers

The use of road side barriers should be minimised where possible so that a forest of barriers does not become the most dominant element in the landscape. The use of wire rope barrier is preferred from a visual impact as it provides a relatively transparent profile compared to w-beam or concrete barriers. Key principles for the use of barriers should be as follows:

- Minimise the use of barriers in open agricultural areas where all new carriageways, service and access roads are usually visible. Investigate alternative solutions such as 1:4 batters
- In wooded areas consider using wire rope barriers to reduce the width of the clear zone and allow tree planting closer to travel lanes where applicable

3.4.5 Signage

The location and functionality of signage should be considered as part of the overall urban and landscape design development of the project. Signage should be kept to a minimum wherever possible whilst still taking traffic and road safety considerations into account. Signposting, including directional signposting must be integrated with the urban and landscape design. Signposting, variable message signs and variable speed limit signs must be designed and located so that they:

- Are not visually intrusive in the natural and coastal environment
- Do not affect the short distance or panoramic views of the landscape, the visual relationship of communities to the project or the quality of community environments
- Are compatible with, and integrated with the design of other structures such as bridges.

3.4.6 Interpretation

The Newell Highway and the regions through which they pass have a rich cultural overlay which could be explored as part of an overlay to the proposal.

The “Solar System Drive” has already been developed for part of the route. Starting at Bellata it promotes the connection to observation of the stars and Siding Spring Observatory, Coonabarabran, some 425 kilometres to the south of the project area.

This is a relatively esoteric concept which doesn’t add to the understanding of the region. It is suggested that an alternate strategy could be adopted to provide greater understanding of the context of the highway by exploring the rich heritage and predominant land use adjoining the corridor. Two examples of such projects include Yarriambiak Shire Council’s Silo Art Trail in North-western Victoria, and Shadows of the Past, implemented by The Southern Midlands Council Tasmania.

The Yarriambiak Art trail utilises the silos of their communities as a means of interpreting and celebrating the agricultural life and character of the region. Silos have been used due to their visual prominence but also their intrinsic role in farming communities as a place to come together during harvest to reconnect with old friends and share stories. These are depicted in Figures 13 and 14.



Figure 13 – Yarriambiak Art trail (From left to right) Roseberry Silo by Kaff-eine; Patchewollock Silo by Fintan Magee



Figure 14 – Yarriambiak Art trail (From left to right) Rupanyup Silo by Julia Volchkova Brim Silos by Guido Van Helten.

Similarly, the Southern Midlands Council, commissioned “Shadows of the Past” a project which interprets the heritage of the region in which it is set through the use of silhouettes within the landscape along the Heritage Highway, refer Figure 15. The project was an initiative of local artists Folko Kooper and Maureen Craig. The subject matter is derived from colonial records.



Figure 15 – Stage Coach – Spring Hill and Waiting for the Coach part of the Shadows of the Past installation

(Source: https://www.southernmidlands.tas.gov.au/ Shadows_of_the_Past/)

These provide two distinct art forms which could both enlighten and entertain travellers along this inland highway assist in the promotion of tourism and the regions identity. The rich tapestry of aboriginal past, explorer history, and development of the inland all provide a great resource to be explored.

4 ASSESSMENT METHODOLOGY

4.1 Introduction

This section of the report reviews the methodology and terminology used to assess the impacts and effects of the proposal on the key receptors with view of the highway. These include:

- Road users
- Industrial and educational facilities
- Residential dwellings
- Commercial buildings.

4.2 Landscape Character and Impact Assessment

The local landscape context has been analysed to determine individual areas of consistent or unique character at a finer scale to assist in understanding the broader local context and the implications of the proposal. This analysis considers both qualitative and quantitative factors to identify and define these landscape character zones (areas of similar spatial or character properties), and considers any potential changes to these zones as a result of the proposal.

Landscape character is defined as:

“The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.” (EIA No.4 Guidelines, 2013).

The proposal is assessed in terms of its impacts on these character zones with impact ranked in terms of sensitivity to change, and magnitude of change. This assessment differs from a visual impact assessment in that it assesses the overall impact of the proposal on an area’s character and sense of place, rather than impact to a specific receptor or viewpoint.

4.3 Visual Impact Assessment

The Visual Impact Assessment involves the assessment of the visibility of the proposal. For the purposes of the study visibility is considered in the following way:

4.3.1 Visibility

The visibility of a corridor or object relates to its ability to be seen. The area within which a project can be seen at eye level above ground level is referred to as the ‘view catchment’. Its extent will usually be defined by a combination of landform, vegetation and built elements. The view field of a corridor or object refers to a single defined prospector view of a landscape or scene and relates to a single point or viewer (receptor). Two types of viewers have been identified static and mobile

4.3.2 Static Receptors

Static receptors occur within the visual catchment of the corridor i.e. they are points, which have a view of or can be viewed from the corridor. The corridor of the proposal is visually defined by the topography, vegetation and built structures of the proposal, as well as those which adjoin the proposal alignment.

4.3.3 Mobile Receptors

Mobile receptors are the users of the highway corridor; in this instance the vehicles, pedestrians and cyclists that travel along part or all of the alignment. Their experience of any given space within the proposal is relative to their purpose, speed and is typically considered short term. Mobile receptors constitute the main visual receptors of the proposal due to the sparsely populated nature of the proposal alignment.

The impacts the two groups experience are unique in that the time and frequency of exposure differ.

4.4 Landscape Character and Visual Assessment Matrix

Landscape character and visual assessment are equally important. Landscape character assessment helps determine the overall impact of a proposal on an area's character and sense of place including all built, natural and cultural aspects, covering towns, countryside and all shades between. Visual impact assessment helps define the day to day visual effects of a proposal on people's views.

To quantify these impacts it is important to assess two qualities in relation to a view point. These are: - Sensitivity and Magnitude.

The *Roads and Maritime Visual Impact and Environmental Impact Assessment Guidance Note: Guidelines for landscape character and visual impact assessment*, (EIA No.4), (2013) document generally defines these terms as follows:

Sensitivity refers to the qualities of an area, the number and type of receptors and how sensitive the existing character of the setting or receptors are to the proposed change. For example, a pristine natural environment will be more sensitive to change than a built up industrial area.

Magnitude refers to the nature of the proposal. For example, a large interchange would have a very different impact on landscape character than a localised road widening in the same area.

Table 2 below summarises the ranking of the assessment of these two criteria and how they are combined to provide an overall impact assessment.

Table 2 – Landscape Character and Visual Impact Assessment Matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High Impact	High - Moderate	Moderate	Negligible
	Moderate	High - Moderate	Moderate	Moderate – Low	Negligible
	Low	Moderate	Moderate – Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

5 LANDSCAPE CHARACTER ASSESSMENT

5.1 Landscape Character Assessment

This section of the report reviews the physical attributes of the character zones and the proposal's potential impacts. As part of the character assessment, the assessment has reviewed the individual segments of the proposal and classified them into a number of differing character zones. Within these segments there are a number of common character zones identified. The following sections and figures illustrate and describe these character zones according to their segment.

5.2 Landscape Character Zone Definitions

5.2.1 Intensive Agriculture

Intensive agricultural land use is highly ephemeral and managed; refer Figure 16, with frequent and ongoing changes in appearance based on type of crops or seasonal variation. It generally has minimal to negligible vegetation structure to frame views or provide a specific spatial quality. Therefore, it typically has a low sensitivity to external influences and adjacent development.

- Comprised of typically flat open cultivated land with intensive cropping, primarily wheat, cotton or improved pasture
- Typically, with minimal visible vegetation structure
- Often expansive local and regional vistas.



Figure 16 – Typical Intensive Agriculture Character- Looking west from highway north of Spring Creek between N2MS1 and N2MS2.

5.2.2 Broad Scale Agriculture

Open Woodland

Broad Scale Agriculture - Open Woodland, depicted Figure 17, typically has less management than other landscape character zones in the proposal area, with minor seasonal changes in appearance based on type of vegetation and grazing patterns. It generally has well established long term vegetation structure with a moderate to high density screening of local and regional views. Therefore, it typically has a moderate sensitivity to external influences and adjacent development.

- General grazing lands, largely unimproved
- Grassland with dominant woodland character
- Typically with restricted views from proposal corridor or limited local views.



Figure 17 – Typical Broad Scale Agriculture - Open Woodland Character.

Grassland

Broad Scale Agriculture - Open Grassland, depicted Figure 18, typically has less management than other landscape character zones in the study area, with minor seasonal changes in appearance based on management regimes and grazing patterns. It generally has less seasonal variation in appearance than more intensive agricultural land use. It also has little long term vegetation structure that may be affected by adjacent development or providing screening of views or a specific spatial quality. Therefore, it typically has a low sensitivity to external influences and adjacent development.

- General grazing lands, largely unimproved
- Open grassland only briefly interrupted by larger vegetation
- Local or regional vistas.



Figure 18 – Typical Broad Scale Agriculture - Grassland Character – N2MS2 Looking east from highway south of Edgeroi village. CH4800.000

5.2.3 Enclosed Vegetated Corridor – Remnant Woodland or Screening Vegetation

Remnant Woodland or Screening Vegetation, depicted in Figures 19 and 20, typically experiences the least management and fewer external influences in comparison to the other landscape character zones in the proposal area. It generally experiences minimal seasonal change in appearance, depending on the type of vegetation, and presence of grazing or roadside maintenance patterns. It generally has well established long term or permanent vegetation structure with a high density and continuous screening of adjacent land, local and regional views. Therefore, it typically has a high sensitivity to external influences and adjacent development.

- Generally fenced off reserve or grazing lands, largely undeveloped
- Dominant woodland or avenue tree character
- Typically with fully enclosed view along corridor or very limited local views.



Figure 19 – Typical Remnant Woodland Character – N2MS4 Looking north along fully enclosed highway corridor from CH550.000 north of Tookey Creek.



Figure 20 – Typical Avenue Screening Vegetation – N2MS1 Looking south along semi-enclosed highway corridor from CH2180.000.

5.2.4 Rural Village

The rural village landscape, illustrated in Figures 21 to 23, typically has a higher level of development and more intensive management than other landscape character zones in the proposal area. Changes in character are typically determined by seasonal changes of cultural plantings and roadside maintenance patterns. It also typically has a well-defined permanent vegetation structure that is highly susceptible to adjacent development, as it often provides critical screening of residential views or specific spatial qualities. Therefore, it typically has a high sensitivity to external influences and adjacent development.

Key attributes of rural villages include:

- Urban precinct with a concentration of agricultural infrastructure such as storage silos and facilities, low density housing and occasional commercial development
- Vegetation structure often more formalised with linear avenue plantings and screening trees oriented along property boundaries and road margins
- Streetscape and limited local views.



Figure 21 – Bellata – Typical Rural Village highway streetscape – View south along the Newell Highway from Oak Street intersection.



Figure 22 – Bellata – Typical Rural Village local streetscape – View east along Wilga Street from the Newell Highway intersection.



Figure 23 – Edgeroi – Typical Rural Village streetscape – View south along the Newell Highway from N2MS2 - CH1000.000.

5.2.5 Industrial and Airport Precinct

This productive landscape setting is characterised by the built form and infrastructure associated with the processing and storage of the products of the land and service functions that support a rural community.

The built form is rudimentary in form and reflects the functional operations which occur within them, (Figure 24). The dominant element of this precinct is the silos and support sheds, followed by smaller warehousing and general industrial structures.

The landscape setting of this precinct is largely devoid of trees.

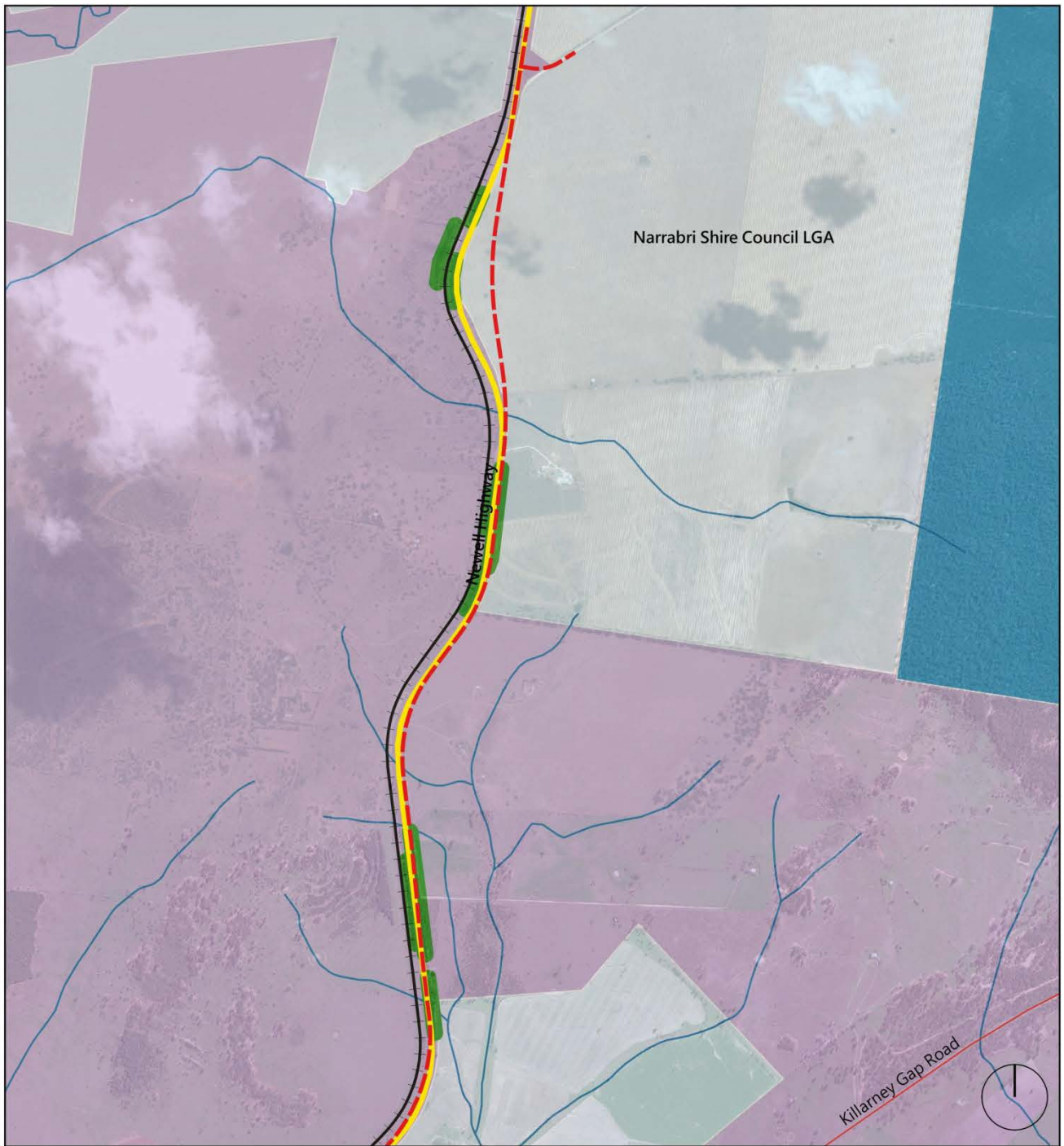
The industrial nature of the precinct has seen a low sensitive been assigned.

Key attributes:

- Large scale built form and infrastructure
- Limited vegetation cover and focus on amenity.



Figure 24 – Silos and sheds on the industrial fringe of Moree



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

500 0 500 1000 1500 2000 m

Figure 25 – N2MS1 – Landscape Character Map 1 of 1 (Based on Open Street Map data, 2018)

5.3 Landscape Character Zones

5.3.1 Landscape Character Zone - N2MS1

N2MS1 is the southern-most section of the proposal area, extending from the University of Sydney Plant Breeding Institute approximately 6.4 kilometres north of Narrabri, northwards for 6.4 kilometres to north of the entry to Murrumbilla Lane. The extents of the differing landscape character zones through which this section passes are illustrated in Figure 25.

Broad Scale Agricultural – Open Woodland and Grassland

The western side of the alignment is characterised primarily of broad scale agricultural land uses such as grazing. The immediate road verge is a travelling stock route with the inland rail a key infrastructure element within the landscape. The visibility of the rail is currently reduced by the density of groundcover (grasses). The effectiveness of this mitigation is determined by seasonal influences and maintenance regimes and may change with the upgrade of the inland rail. This would have a level of impact on the character of the surrounding landscape which has not been assessed as part of this proposal.



Figure 26 – Broad Scale Agricultural Landscape Character. N2MS1 – Looking southwest from CH6080.000.

West of the rail corridor to CH5980.000 consists of grassland with extensive scattered tree cover becoming increasingly dense further west, Figure 26. To the east of the highway, broad scale agricultural landscape is evident between CH1680.000 and CH3680.000 with grassland predominating, and vegetation typically restricted to drainage lines and boundaries, linking with Killarney State Conservation Reserve about 2 kilometres to the east.

Sensitivity: Low

This landscape is a combination of grassland throughout the wider highway corridor with scattered open woodland becoming established further away from the alignment and restricting wider regional views. This high fragmentation and distance to significant screening vegetation determines a low sensitivity to the proposal in this landscape character zone.

Magnitude: Low

The proposed realignment of the carriageways within this character zone will not impose a significant change in vegetation structure, view or spatial quality. Magnitude has been assessed as low.

Summary: Low

There would typically be a low level of impact on the character of broad scale grassland and open woodland landscape character based on the low sensitivity to changes in highway alignment and relative distance and fragmentation of existing trees.

Mitigation:

- Reinstatement of vegetation to reflect existing composition structure.

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Intensive Agricultural – Big Sky Views

From CH5980.000 there is a distinctive switch to intensive agriculture to the west of the corridor. The eastern side of the alignment is predominantly intensive agricultural production from CH3680.000 northwards and consisting of cropping such as wheat. Views typically extend uninterrupted to the horizon with little or no foreground elements, giving a sense of heightened exposure.

Further to the east, the extensive woodland reserves of Killarney State Conservation Area are just visible to highway traffic about 2.5 kilometres beyond the crop fields and underlining the ranges of Mt Kaputar beyond as shown above, Figure 27.



Figure 27 – Intensive Agricultural Landscape Character with Big Sky views. N2MS1 – Looking north east from Private Access to east of highway at CH4380.000.

Sensitivity: Low

Areas of intensive agricultural landscape character consisting of crop lands and uninterrupted views to the horizons have a low sensitivity to the proposal. This is due to the regional scale and constantly changing nature of cultivation and harvesting patterns dominating the landscape. Changes imposed on this landscape by the proposal would therefore be relatively minor in scale.

Magnitude: Low

The general absence of screening vegetation and dominance of regional views would not experience a significant change in quality imposed by the proposal.

Summary: Low

There would be typically be a low to negligible level of impact on the landscape character of intensively managed agricultural areas in N2MS1 based on these areas generally low sensitivity to changes in highway alignment and relative absence of existing screening trees.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views.

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Vegetated Highway Corridor – Enclosed

A straight section of N2MS1 highway between CH1380.000 and CH2480.000 has a distinct sense of enclosure and linearity created by native pines screening views along both highway margins, refer Figure 28. These screening trees have been recently damaged by fire along the western verge.



Figure 28 – Enclosed Vegetated Highway Corridor Landscape Character. N2MS1 – Looking north from CH1380.000.

Sensitivity: High

The section of highway within this character zone has well established and continuous vegetation structure screening adjacent land from traffic, as well as defining the corridor. This landscape character is considered to have high sensitivity to any impacts that would introduce a break in the continuous vegetated screening.

Magnitude: Moderate to High

The semi-enclosed woodland/avenue character and linear spatial quality of the highway would experience a significant change in quality from the proposed highway works due to the removal of significant sections of screening vegetation. This would likely open this section of highway to local and regional views. The magnitude of change has consequently been assessed as moderate to high.

Summary: High

There would typically be a high level of impact on the semi-enclosed woodland character of this landscape based on its high sensitivity to changes in highway alignment and significant loss of existing screening trees in close proximity to the carriageways.

Mitigation:

- Reinstatement of woodland vegetation to recreate sense of enclosure and continuity of canopy to assist in retaining fauna links and definition of the alignment.
- Limit extent of clearance by reviewing the proposed alignment.

The establishment of a wooded edge would maintain some of the overall character, altering alignment to avoid clearance of trees would also enhance retention of the character. Both would reduce the magnitude of impact lowering the overall impact to Moderate – high.



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

Figure 29 – N2MS2 – Landscape Character Map 1 of 2 (Based on Open Street Map data, 2018)



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

500 0 500 1000 1500 2000 m

Figure 30 – N2MS2 – Landscape Character Map 2 of 2 (Based on Open Street Map data, 2018)

5.3.2 Landscape Character Zones - N2MS2

The following chapter defines the landscape character zones of NSMS2 and is illustrated in Figures 29 and 30.

Intensive Agricultural – Big Sky Views

A significant portion of landscape just beyond the proposed road corridor to the east and west of N2MS2 is characterised by intensive agricultural land use as shown below, Figure 31.



Figure 31 – Intensive Agricultural Landscape Character with Big Sky views. N2MS2 – Looking west from CH5900.000.

Sensitivity: Low

Areas of intensive agricultural landscape character consisting of intensively managed crop fields and uninterrupted views to the horizon as shown above have a very low sensitivity to the type of changes likely to be introduced by the proposal, due to their constantly changing cultivation and harvesting patterns and vegetative structure.

Magnitude: Low

The general absence of screening vegetation and dominance of regional vistas would not experience a significant change in quality from the proposed highway works. The magnitude has consequently been assessed as low.

Summary: Low

There would be typically be a low level of impact on the character of intensively managed agricultural landscape in N2MS2 based on its low sensitivity to changes in highway alignment and relative absence of existing screening trees limiting the scale of change.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Broad Scale Agricultural – Open Woodland and Grassland

The highway corridor reads as broad scale agricultural land with combination of grasses and scattered canopy trees extending along the highway margins from the drainage line of Bobbiwaa Creek.

A section of land associated with Bobbiwaa Creek is broad scale agriculture with remnant vegetation and grasslands retained within the immediate environs of the creek and its banks.

The broader vegetation framework of N2MS2 links with the extensive woodland areas of Couradda National Park and Bobbiwaa State Conservation Area about 5-8 kilometres to the east of the highway.

The land to the west of the highway at Edgeroi associated with Tarlee Creek is broad scale agriculture with a significant area of intact remnant woodland retained within the north-western outskirts of the village bisected by Homestead Road.



Figure 32 – Broad Scale Agricultural Landscape Character. N2MS2 – Looking west from the Newell Highway at CH1900.000.

Sensitivity: Moderate

This character zone, as depicted in Figure 32, is a combination of grassland throughout the wider highway corridor with scattered open woodland becoming established further away from the highway restricting wider regional views. This has been assessed as having a low to moderate sensitivity to proposed works along the highway corridor.

Magnitude: Low

The proposed realignment of the carriageways will not impose a significant magnitude of change to the overall vegetation structure, view or spatial quality within this character zone and has been assessed as low.

Summary: Low to Moderate

There would be a low to moderate level of impact on the character of broad scale grassland and open woodland landscape based on the moderate sensitivity to changes in highway alignment and low level of impact associated with the proposal.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views
- Clusters of vegetation should be used to frame and direct views

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Edgeroi Rural Village

On approach to Edgeroi, particularly from the north (Figure 33), large grain silos and associated shed dominate the view. Once within the town environs Edgeroi presents as a rural village with

a relatively evenly distributed cover of mixed canopy trees within residential lots. Residential development is generally located to the west of the highway along Homestead Road and to the east along Couradda Road. There is comparatively little vegetation within the highway streetscape except for some semi-mature avenue trees on the northbound approach of the highway.



Figure 33 – Edgeroi Village Landscape Character. N2MS2 – Looking south from CH 1050.000.

Sensitivity: High

The village of Edgeroi and the housing which makes it has been assessed as being highly sensitive to changes in the highway. This reflects both the use of the highway and the role vegetation plays in mitigating the current highway functions. Vegetation presently plays an important role in screening residences and defining the spatial quality of the village all of which are susceptible to changes in the highway alignment.

Magnitude: Low

The proposal would not impose a significant broad scale change in vegetation structure, view or spatial quality that would impact the overall character of the village. The magnitude of change has been assessed as low.

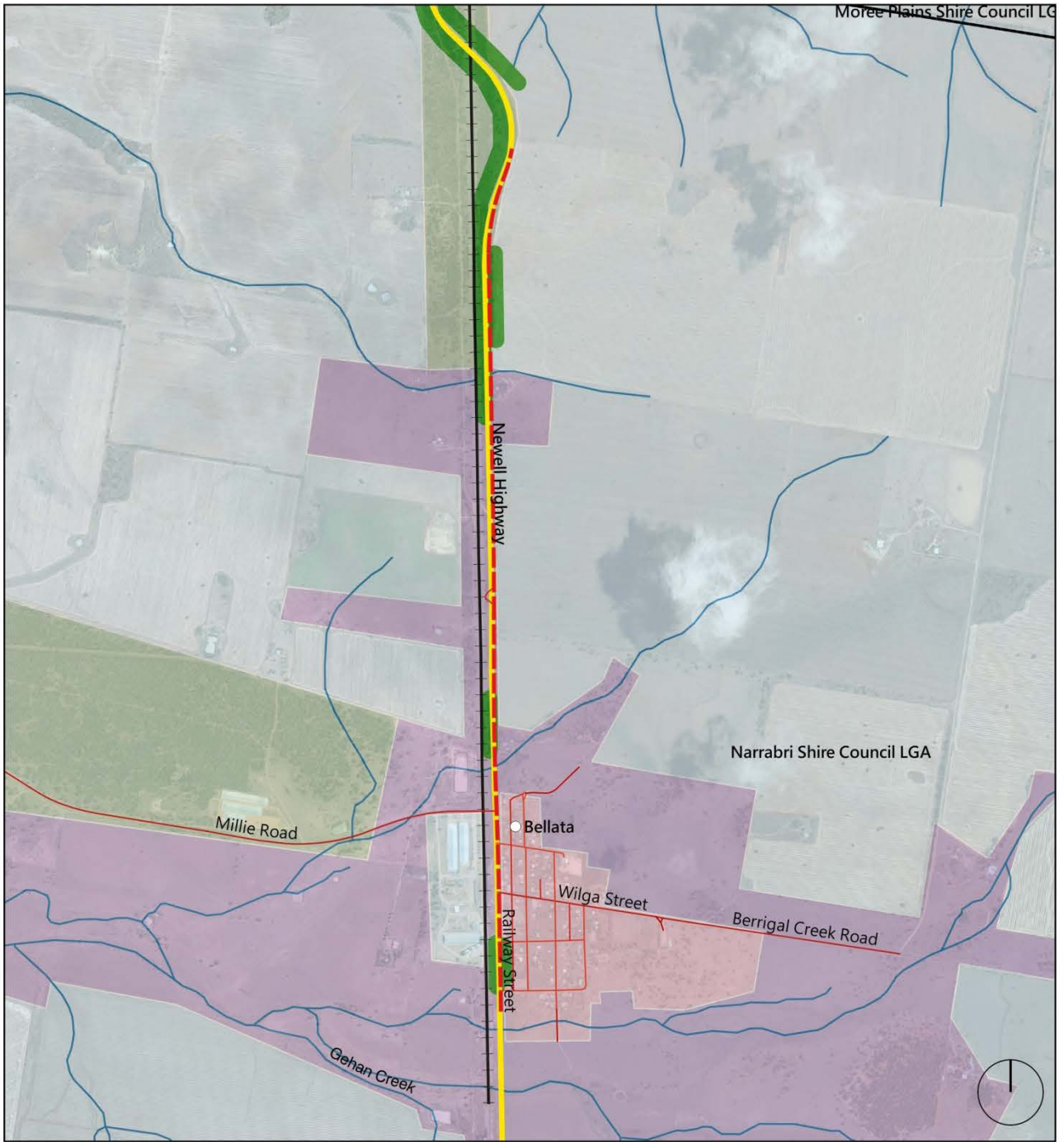
Summary: Moderate

Based on the high sensitivity of Edgeroi village to changes in the highway alignment and impacts on avenue and boundary plantings, combined with a low magnitude of change imposed by the proposal within the village, the overall impact has been assessed as moderate.

Mitigation:

- Reinforce village character by introducing planting of a scale and character consistent with that of the village.

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

Figure 34 –N2MS3 – Landscape Character Map 1 of 1 (Based on Open Street Map data, 2018)

5.3.3 Landscape Character Zones - N2MS3

The following chapter defines the landscape character zones of NSMS3 and is illustrated in Figure 34.

Broad Scale Agricultural – South of Bellata

Just to the south of the proposed works and the township of Bellata, Gehan Creek and Myall Hollow Creek form a distinctive entrance into Bellata. This is a broad scale agricultural landscape dominated by grasses and sedges associated with the drainage lines of the plains. This landscape is of low vegetation and provides extensive views to the east and the ranges associated with Mt Kaputar, refer Figure35.

The open grasslands extends along open creek lines with scattered open woodland becoming established further away from the highway. Open meadow/grazing margins extending along the highway and adjacent rail corridor.



Figure 35 – Broad Scale Agricultural Landscape Character with Big Sky views. N2MS3 – Looking east from CH 100.000.

Sensitivity: Low

Open grassland and open meadow/grazing margins extending along the highway and adjacent rail corridor have a low sensitivity to changes to the highway corridor due to their low scale and homogeneity of the landscape.

Magnitude: Low

The proposed alignment of the carriageways within this character zone will not impose a significant change in vegetation structure, view or spatial quality. The magnitude of change has been assessed as low.

Summary: Low

There would typically be a low level of impact on the character of broad scale grassland and open woodland landscape based on the low sensitivity to changes in highway alignment and the scale and nature of these changes.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views
- Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Bellata Rural Village

Bellata, a rural township on the highway, forms the dominant character zone of this segment of the upgrade and is depicted in Figure 36. The streets are a mix of a kerb and gutter and kerbless streets. The townships western edge is dominated by industrial structures including grain silos and a large petrol station and truck stop facility with residential properties located to the east of the highway. A large shoulder has been constructed to either side of the highway facility stopping and providing a broad expanse of pavement. Powerlines, line the eastern side of the highway limiting the potential for street tree planting.



Figure 36 – Bellata Village Landscape Character. N2MS3 – Looking south from CH 900.000.

Sensitivity: High

Bellata presents a structured and well defined landscape composed of a mix of single storey residential housing, avenues of trees lining the highway, and random plantings of trees within residential lots. This makes the rural village character relatively susceptible to changes in the highway corridor, as these elements often provides critical screening of views or assist in the creation of the spatial quality of the village.

Magnitude: Low

The proposed highway works within this character zone would not impose a significant change in vegetation structure, view or spatial quality that would impact the overall character of the village. It has consequently been assessed to have a low magnitude of impact.

Summary: Moderate

There would typically be a moderate level of impact on the character of the rural village landscape at Bellata based on its high sensitivity to changes in highway alignment and impacts on avenue and boundary planting, when considered against the low magnitude of change imposed by the on-line carriageway upgrade within the village.

Mitigation:

- Reinforce village character by introducing planting of a scale and character consistent with that of the village
- Provide avenue planting as a gateway to town in order to distinguish town from the highway

Mitigation while assisting in recreating the effect of the existing landscape and its context will not alter the overall impact on this landscape character zone.

Broad Scale Agricultural – North of Bellata

North of Bellata within the highway corridor the landscape is defined as Broad Scale Agriculture and is dominated by a combination of grassland and open woodland, refer Figure 37. Canopy cover is greatest to the west of the alignment with the scattered canopy to the east impacted by the realignment of the road to this edge.



Figure 37 – Broad Scale Agricultural /Rural Village Character. N2MS3 – Looking south from CH 1650.000.

Sensitivity: Low

Open grassland and open meadow/grazing margins extending along the highway and adjacent rail corridor have a low sensitivity to changes to the highway corridor.

Magnitude: Moderate

The proposed alignment of the carriageways within this character zone has the potential to open views as it impacts a thin and scattered canopy along the east of the alignment, altering the spatial quality of this approach. Its impact has been assessed as moderate.

Summary: Low to moderate

There would be a low to moderate level of impact on the character of the broad scale grassland and open woodland landscape. This reflects the low sensitivity to changes in highway alignment combined with the moderate scale of change as a result of the proposal.

Mitigation:

- Reinststate a combination of grassland / woodland canopy to integrate with the surrounding environs
- Woodland canopy should be used in clusters
- Minimise changes to the existing footprint by retaining the existing alignment.

Adoption of mitigation could lower the overall impact to low, reflecting a reduction in magnitude of change.

Intensive Agricultural – Big Sky

South of Bellata is primarily intensive agriculture croplands. This intensive agricultural landscape is composed primarily of crops and or improved pasture and extends to the horizon, Refer Figure 38.



Figure 38 – Intensive Agricultural Landscape Character. N2MS3 – Looking south from south of Bellata Village.

Sensitivity: Low

The very intensively managed crop lands and uninterrupted views to the horizons have a low sensitivity to changes in the adjoining landscape, due to the managed and changeable nature of this landscape type.

Magnitude: Low

The general absence of screening vegetation and dominance of regional vistas would not experience a significant change in quality from the proposed highway works.

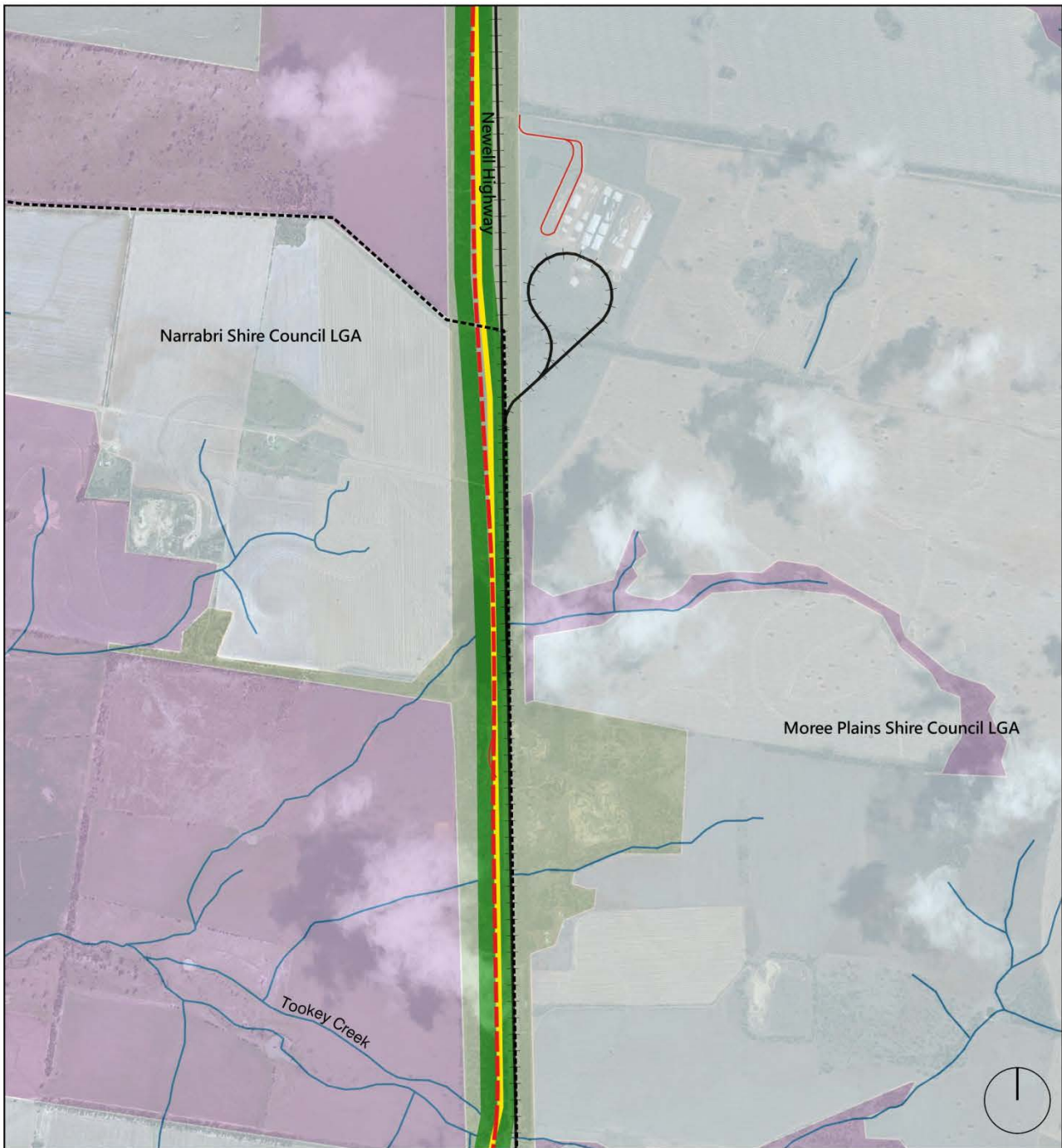
Summary: Low

There would be a low level of impact on the character of intensively managed agricultural landscape in N2MS3 based on its low sensitivity to changes in highway alignment and relative absence of existing screening trees.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views

Mitigation would not alter the overall impact on landscape character of the proposal but would see the works integrated with the general surroundings.



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

Figure 39 – N2MS4 – Landscape Character Map 1 of 1 (Based on Open Street Map data, 2018)

5.3.4 Landscape Character Zones - N2MS4

Section N2MS4 contrasts with all other section of the proposals work areas. The presence of a continuous woodland character to the highway alignment provides an enclosed character which is evident in the mapping of character zones as indicated in Figure 39.

Vegetated Highway Corridor – Enclosed

The landscape character of N2MS4 sees an increase in canopy vegetation and the overall natural landscape character. A continuous defined edge of native trees along with undulation in topography along the highway corridor, refer Figures 40 and 41, clearly define the corridor and distinguish it from other sections. The rail embankment now runs parallel to the corridor to the east of the alignment but is concealed from view along the alignment by the vegetation cover.

A truck stop results in a local change in the overall character with a large widening of the pavement and consequent change in spatial quality.

The northern limit is just prior to Waterloo Creek and also marks the transition from Narrabri to Moree Plains Shire Council areas.



Figure 40 – Enclosed Vegetated Highway Corridor Character. N2MS4 – Looking south from Private Access at CH 1750.000.



Figure 41 – Enclosed Vegetated Highway Corridor Character. N2MS4 – Looking south from CH 5900.000.

Sensitivity: High

This section of highway has a well-established and continuous vegetation structure which screens adjacent lands from traffic. Interruption to the extent of vegetation has the potential to change the sense of enclosure and definition to the corridor. The character zone has consequently been assessed as having a high sensitivity to change.

Magnitude: Low

The fully enclosed woodland character and linear spatial quality of the highway would experience a limited degree of change as occasional extents of vegetation are cleared to reflect an expanded road formation but retained alignment. This would not widen the physical corridor of the highway significantly and so is not considered to alter the spatial quality as perceived by road users. Its impact has been assessed as low.

Summary: Moderate

There would be a moderate level of impact on the enclosed woodland character of this landscape based on its high sensitivity to changes in highway alignment and potential loss of existing woodland trees in close proximity to the carriageways.

Mitigation:

- Reinststate woodland canopy to strengthen sense of enclosure. Planting to be outside of clear zone limits but should respond to the proposed alignment
- Maintain existing highway limits the extent of clearance required maintaining the general spatial character of the existing alignment.

Mitigation would reduce the impact of the proposal maintaining the overall spatial character of the existing road side trees.



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

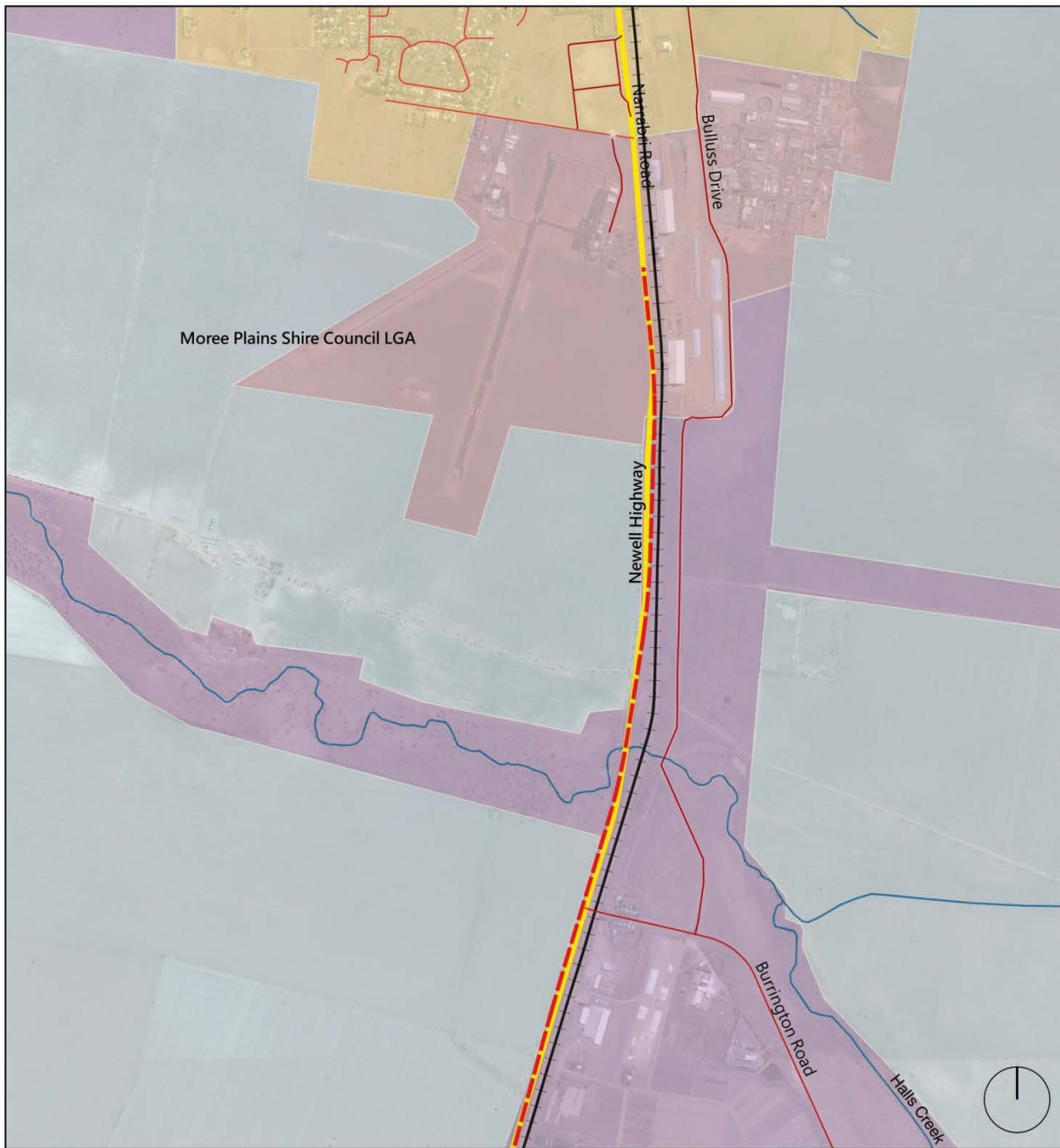
Built Form

Rural Dwelling

Landmark

500 0 500 1000 1500 2000 m

Figure 42 – N2MS5 – Landscape Character Map 1 of 2 (Based on Open Street Map data, 2018)



Legend

NSW LGA Boundary

Preferred Option

Transport

Local Roads

Newell Highway

Railway

Landscape Character Zones

Intensive Agriculture Area

Broad Scale Agriculture
- Grassland
- Woodland

Remnant Woodland

State Conservation Area

Rural Town

Rural Village

Airport/Industrial

Natural systems

Creekline

Vegetation Screen

Built Form

Rural Dwelling

Landmark

500 0 500 1000 1500 2000 m

Figure 43 – N2MS5 – Landscape Character Map 2 of 2 (Based on Open Street Map data, 2018)

5.3.5 Landscape Character Zones - N2MS5

N2MS5 is located at the northern end of the Narrabri to Moree corridor extends on the approach into Moree. Its extents and the character zones through which it passes are illustrated in the attached figures 42 and 43.

Broad Scale Agricultural

Defining much of the eastern edge of the corridor, this landscape is characterised by predominantly open or sparsely vegetated landscapes dominated by grassland highway margins and creek lines with the rail corridor evident to the east of the alignment. Trees are scattered and remote from the corridor and the areas subject to low levels of maintenance and stocking, as depicted Figure 44.



Figure 44 – Broad Scale Agricultural Landscape Character. N2MS5 – Looking northwest towards Halls Creek from CH5200.000.

Sensitivity: Low

The low and repetitive nature of the grassland and scattered open woodland that extends along the highway and adjacent rail corridor has a low sensitivity to potential changes as a result of the proposal. This reflects the relatively homogenous landscape of grassland and the lack of elements of scale to assist in delineating the changes.

Magnitude: Low

The proposed alignment within this character zone would not impose a significant change in vegetation structure, view or spatial quality and consequently its magnitude of change has been assessed as low.

Summary: Low

There would be a low level of impact on the character of broad scale grassland and open woodland landscape based on the low sensitivity to changes in highway alignment and relative distance and fragmentation of existing trees.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views

Mitigation would not alter the overall impact on landscape character of the proposal but would see the works integrated with the general surroundings.

Intensive Agricultural – Big Sky

Intensive Agricultural lands are located predominantly to the west of the alignment for much of its length, only broken by drainage corridors and the runway environs of the Moree Airport, Figure 45.

The landscape is characterised by a narrow grassland margin defining the highway corridor with the cultivated landscape beyond. The landscape consists of crops or cultivated earth depending on season. As the highway approaches Moree a number of billboards are set within this broad and open landscape setting.



Figure 45 – Intensive Agricultural Landscape Character with Big Sky views. N2MS5 – Looking west from CH 3950.000.

Sensitivity: Low

The very intensively managed crop fields and uninterrupted views to the horizons have a low sensitivity to changes in the adjoining landscape. Due to the constantly changing character associated with the landuse and the relatively low and horizontal nature of the proposal.

Magnitude: Low

The general absence of screening vegetation and dominance of regional vistas would not experience a significant change in quality of the landscape character from the proposed highway works. The magnitude of change has been assessed as low.

Summary: Low

There would be a low level of impact on the character of intensively managed agricultural landscape in N2MS5. This reflects the nature of the proposal and the low sensitivity to and magnitude of the changes proposed which would see a marginal increase in pavement width and formation in what is a broad and expansive landscape.

Mitigation:

- Reinstatement with grassland landscape to ensure retention of broadscale landscape views

Mitigation would not alter the overall impact on landscape character of the proposal but would see the works integrated with the general surroundings.

Industrial and Airport Precinct

As the alignment progresses closer to Moree industrial buildings become evident on the horizon to the east of the alignment, Figure 46. These include sales yard, water park and waste management plant, silos etc. To the west the intensive agriculture transitions to the airport airfield before a series of smaller sheds/ hangers become evident. This shift in scale of built form and infrastructure marks the arrival to Moree, and reminds the traveller of the importance the agricultural landscape plays in the region.



Figure 46 – Moree Industrial Precinct. N2MS5 – Looking north from CH 6200.000.

Sensitivity: Low

The industrial buildings restrict broader views to the eastern horizon and are visually dominant along the highway and within the wider landscape. This character zone typically would experience a high level of development and traffic movements throughout and beyond the highway corridor, and therefore would have a very low sensitivity to proposed highway upgrade works.

Magnitude: Low

The visual dominance and large scale of industrial structures reduces the potential magnitude of proposed works within the highway corridor on the overall wider landscape character.

Summary: Low

There would be typically be a low level of impact on the character of the rural industrial landscape in N2MS5 based on its low sensitivity to changes in highway alignment and relative absence of existing screening trees.

Mitigation:

- Investigate potential to enhance the arrival sequence through the planting of avenue planting as part of the arrival sequence to Moree.

Mitigation would not alter the overall impact on landscape character of the proposal but would see the works integrated with the general surroundings.

5.4 Landscape Character Assessment Summary

There are a limited range of landscape character areas occurring throughout the proposal area and these are generally repetitive throughout Segments N2MS1 to N2MS5. These character areas have been defined as follows:

- Intensive Agricultural
- Broad Scale Agriculture: Grassland and Open Woodland
- Vegetated Highway Corridor – Enclosed
- Rural Village
- Industrial and Airport Precinct.

Table 3 Summarises the overall character assessment of the corridor. Most of these character areas have been identified as having a low to moderate sensitivity to the proposed highway upgrade works, including intensive agricultural landscape, broad scale grassland and rural industrial areas.

Broad scale open woodland landscape generally has a moderate sensitivity to changes to the highway alignment and corridor.

N2MS4 has been determined to have the highest level of sensitivity as the highway margins are almost entirely vegetated and has been defined as an enclosed vegetated woodland corridor. Rural village character areas are also determined to have a high sensitivity.

The magnitude of change imposed by the proposed highway upgrade works is generally proportional to the proximity and density of existing vegetation along the corridor and whether the carriageways are to be realigned. Realigned sections of highway potentially require the removal of screening vegetation that defines the road user's perception of the wider landscape.

Subsequently, the only sections with an overall high rating of potential impacts to the landscape character are semi-enclosed vegetated section of N2MS1 which due to the realignment of the road sees this vegetation removed.

Table 3 – Landscape Character Assessment Summary

Segment	Character Definition	Sensitivity	Magnitude	Impact Summary	Post Mitigation Impact
N2MS1	Broad Scale Agriculture	Low	Low	Low	Low
	Intensive Agriculture – Big Sky	Low	Low	Low	Low
	Vegetated Highway – Enclosed	High	Moderate to High	High	Moderate to High
N2MS2	Intensive Agriculture – Big Sky	Low	Low	Low	Low
	Broad Scale Agriculture	Moderate	Low	Low to Moderate	Low to Moderate
	Rural Village – Edgeroi	High	Low	Moderate	Moderate
N2MS3	Broad Scale Agriculture – South of Bellata	Low	Low	Low	Low
	Rural Village – Bellata	High	Low	Moderate	Moderate
	Broad Scale Agriculture - North of Bellata	Low	Moderate	Low to Moderate	Low
	Intensive Agriculture – Big Sky	Low	Low	Low	Low
N2MS4	Vegetated Highway – Enclosed	High	Low	Moderate	Moderate
N2MS5	Broad Scale Agriculture	Low	Low	Low	Low
	Intensive Agriculture – Big Sky	Low	Low	Low	Low
	Industrial – Airport Precinct	Low	Low	Low	Low

6 VISUAL IMPACT ASSESSMENT

6.1 Key Viewpoints

The visual catchment of the proposal varies significantly along its length. Segments N2MS1 and N2MS2 having the broadest variety of views and visual character from enclosed highway and rail corridor views to rural village streetscapes, to regional big sky horizon views and mountain vistas.

N2MS3 views are typically limited to the Bellata rural village streetscape surrounds and approaches.

N2MS4 has the most restricted visual envelope with dense woodland lining both sides of the highway along its length. This contrasts strongly with N2MS5, which is predominantly a progression of open vistas that become increasingly focussed towards the highway corridor as advertising signage and large industrial built elements take visual priority and avenue planting encourages highway users to focus on the journey into and out of Moree.

The experience of the viewers varies according to the duration, field of view and nature of exposure to the proposal. The visual range has been considered to be the effective distance where a viewer from outside the highway corridor can be influenced by changes in traffic movement and discern individual details such as signage and planting elements within the highway corridor. This distance varies in relation to the topography and effectiveness of screening vegetation however the quality of detail in the landscape typically deteriorates rapidly for distances greater than of 200 metres.

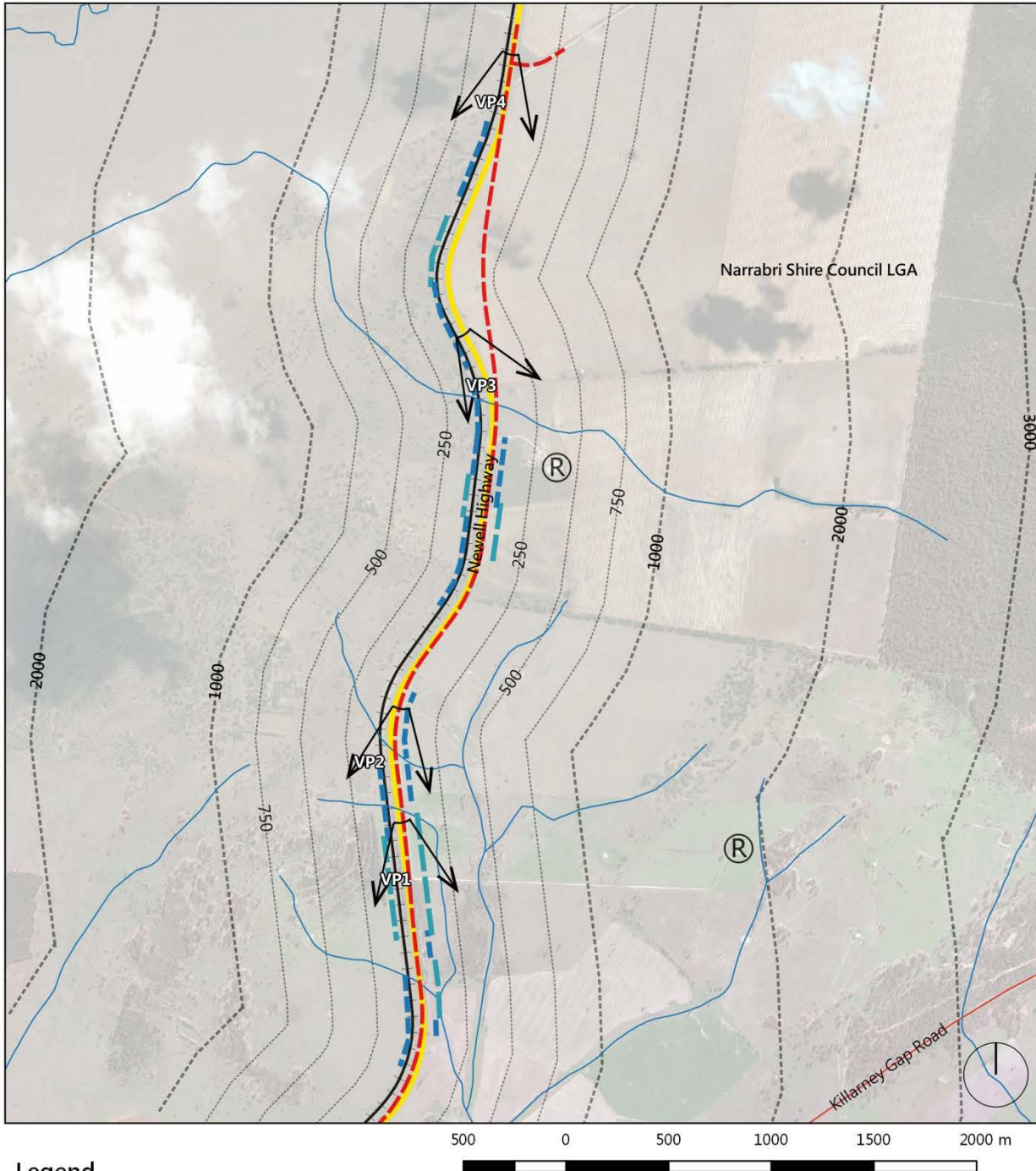
Visual receptors within the highway corridor are typically heavy freight vehicle traffic, interstate buses, commercial farm vehicles and holiday caravans with the rest made up by local commuters and visitors.

Of the adjoining observers it is the residential users who would be most sensitive to change. However residential impacts are rare. There are some exceptions where a few residential buildings have clear views of the highway, and these may experience a level of visual impact from potential loss of vegetation or changes to access.

Due to the potential differing sensitivities of viewers the worst case assessment is the stated value in terms of Sensitivity, Magnitude and overall visual impact. Within the text the specific rating of the individual viewers is stated as part of the detailed assessment.

Plans have been provided for each segment of the alignment with viewpoints keyed in. These are located at the start of the viewpoint assessment of each segment and include:

- N2MS1 Figure 47
- N2MS2 Figure 52 and 53
- N2MS3 Figure 59
- N2MS4 Figure 65
- N2MS5 Figure 68 and 69.



Legend

- NSW LGA Boundary
- Viewpoint Marker
- Preferred Option
- Distance Contours**
- Minor - 250m
- Major - 1000m

- Transport**
- Local Roads
- Newell Highway
- Railway
- Natural systems**
- Creekline

- Built Form**
- Rural Dwelling
- Landmark
- Road Screening**
- Enclosed
- Filtered

Figure 47 – N2MS1 – Key Viewpoints Map 1 of 1 (Based on Open Street Map data, 2018)

6.1.1 VP1 – N2MS1

View: Looking south from Private Access entry at N2MS1 – CH 2180.000

Located at the southern end of N2MS1, this view, Figure 48, presents a tree lined section of the highway dominated by native cypress pine. Fire has impacted the western (right) side of the corridor. The proposal will see the road users existing restricted view to east significantly altered by the movement of the alignment to the east, and removal of vegetation along the eastern margins of the corridor.



Figure 48 – Looking south from Private Access entry at N2MS1 – CH 2180.000. Broad scale agricultural land use both sides of the corridor. Proposed highway upgrade runs diagonally from left to the right of the existing carriageways through the trees and grass verge on the left of image.

Sensitivity: Low

Residential receptors have the highest sensitivity however farmsteads in this segment are set back from the highway 1-2 kilometres with established plantings to their boundaries and in the intermediate landscape that provide effective screening of traffic. Residential receptors sensitivity is assessed as low at this view point.

Road users have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. Road user sensitivity is assessed as low.

Magnitude: Moderate

Most of the nearby farmsteads are set well back (1 to 2 kilometres) from the highway and proposed upgrade. The magnitude of impact for residential receptors has been assessed as low to moderate as the effective screening is proposed to be significantly reduced due to removal of screening vegetation along the eastern verge. This would result in an increased awareness of the highway traffic. In addition to this the location and layout of the residential access road interface with the highway would also have minor adjustments with existing trees no longer framing the entry.

Road users will have their view modified by the removal of vegetation and with this the sense of enclosure which is currently experienced. The magnitude of change is considered moderate.

Summary: Low to Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP1, based on the loss of existing screening trees mitigated by the significant distance from residential receptors.

Mitigation:

- Reinstate eastern verge with native cypress to recreate existing sense of enclosure and definition of the alignment

Implementation of mitigation measures once established would result in a low magnitude of change and consequently low visual impact.

6.1.2 VP2 – N2MS1

View: Looking south from Private Access entry at N2MS1 – CH 2980.000.

The image, Figure 49, presents a view of the existing highway, the adjoining railway and a setting of open woodland grassland landscape, which restricts the distance of the view. The road users existing semi-restricted views to east (left of photo) would be extended by removal of vegetation along eastern margins to left of image. Farmsteads located further to the left (east) of view may potentially have increased visibility of the highway.



Figure 49 – Looking south from Private Access entry at N2MS1 – CH 2980.000. Broad scale agricultural land use both sides of the corridor. Proposed highway upgrade runs to the left of the existing carriageways through to the centre of the image.

Sensitivity: Moderate

Residential receptors have highest sensitivity however these farmsteads are set back from highway 200-300 metres with established plantings to their boundaries providing some screening of traffic. Their sensitivity is assessed as moderate

The road users have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. The sensitivity of the road user is assessed as low.

Magnitude: Moderate

The magnitude of impact for residents assessed as low to moderate, as the carriageways become slightly closer to dwellings, effective screening may be reduced due to loss of existing vegetation, and the location and layout of the residential access road interface with the highway would have minor adjustments.

Road users would experience low magnitude of change in view as the highway corridor is typically broad and open.

Summary: Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP2, based on relatively close proximity of residential dwellings and loss of some existing screening vegetation. Road users would experience less of an impact.

Mitigation:

- Provide visual screening between adjacent farmsteads and alignment utilising endemic community

Implementation of mitigation measures once established would result in a low magnitude of change and consequently low to moderate visual impact.

6.1.3 VP 3 – N2MS1

View: Looking southeast to Private Farmstead from N2MS1 – CH 4780.000.

This view, Figure 50, presents a bend in the alignment which is to be straightened as part of the proposal. In the background a homestead and outbuildings is evident. To the right of the alignment the corridor is lined by trees. Road users existing view orientation to the northwest-southeast would change to the north-south with proposed realignment of highway. This will influence the outlook of or too the adjoining homestead.



Figure 50 – Looking southeast to Private Farmstead from N2MS1 – CH 4780.000. Proposed highway upgrade runs horizontally to the left of the existing carriageways through to the centre of the image.

Sensitivity: High

The residential receptor has a high sensitivity as the farmstead is set back from the highway only 200m with very limited vegetation to provide screening of traffic.

Road users at this location have a low sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character.

Magnitude: Moderate

The farmstead located to the east of highway, centre of view, would experience increased visibility of the highway due to closer proximity as the proposal moves the road alignment eastward. The residential receptor or farmstead is already exposed to the highway traffic and the overall magnitude of impact is assessed as moderate.

Road users will experience a reduced definition of the alignment as the road is moved away from the trees which flank the western edge of the alignment. The impact of this is considered moderate.

Summary: Moderate-High

The proposed highway upgrade would have an overall moderate to high visual impact at VP3 in relation to residential receptors. This reflects the closer proximity of the proposed alignment, increased visible extent of the highway within the view and removal of existing screen planting.

Mitigation:

- Alignment should be reinstated with grassland treatment reflecting the intensive agricultural landscape through which the road is now aligned.
- Planting should be used to limit impacts on the adjoining residence to the south east of the proposal.

The implementation of screening to adjoining residence would see the overall visual impact lowered to moderate once vegetation is established.

6.1.4 VP4 – N2MS1

View: Looking south from Murrumbilla Lane, N2MS1 – CH 6130.000

Figure 51 presents the intersection of Murrumbilla Lane, looking south. It reveals a combination of intensive agriculture to the east and the general broad scale grassland woodland landscape to the west. The road users existing view would change with the proposed realignment of highway to the east of the existing through the intensive agricultural landscape



Figure 51 – Looking south from Murrumbilla Lane, N2MS1 – CH 61300.000.
Proposed highway upgrade runs straight through over the rise at the centre of the image.

Sensitivity: Low

The experience of this view is from the road users, both those of the highway and Murrumbilla Lane. Their sensitivity is considered to be low due to their ephemeral experience of the highway, the ephemeral nature of the croplands and inherent expectation of intermittent changes in view and landscape character.

Magnitude: Moderate

Motorists will experience a straightening of the overall alignment and a reduction in the definition of it as the road is moved away from the trees which flank the western edge of the alignment. Changes in the geometry of Murrumbilla Lane will also be made increasing the extent of pavement. The magnitude of change is considered low- moderate due to the discernible changes in the landscape and alignment experience.

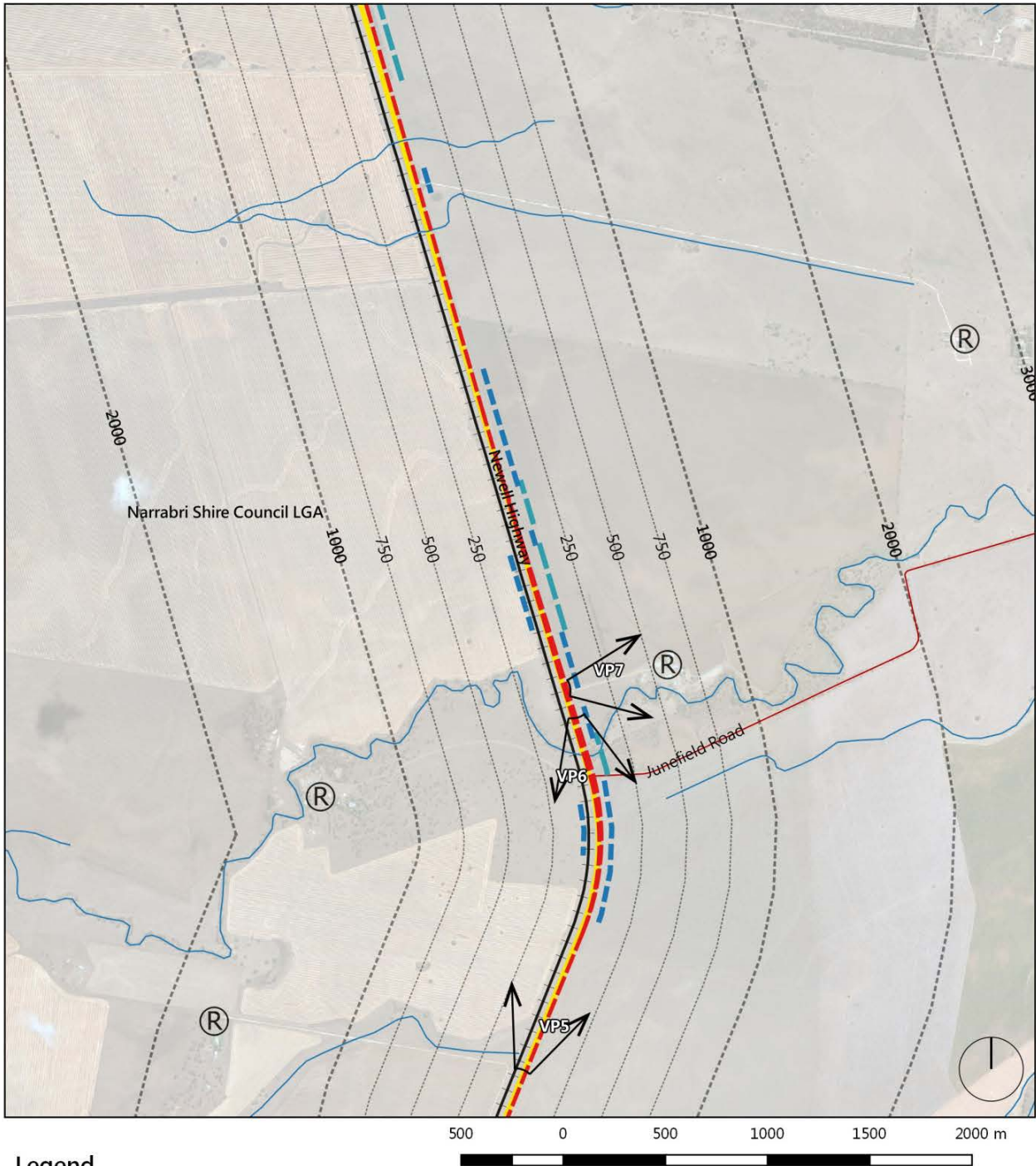
Summary: Low - Moderate

The proposed highway upgrade would have an overall low- moderate visual impact at VP4. This reflects the experiences of the road user in relation to changes to sense of enclosure and curvature of the road alignment.

Mitigation:

- Alignment should be reinstated with grassland treatment reflecting the intensive agricultural landscape through which the road is now aligned.
- Planting should be used to limit impacts on the adjoining residence to the south east of the proposal

Mitigation measures will not alter the overall visual assessment, although will improve the overall integration.



Legend

- NSW LGA Boundary
- Viewpoint Marker
- Preferred Option
- Distance Contours**
- Minor - 250m
- Major - 1000m

Transport

- Local Roads
- Newell Highway
- ++ Railway

Natural systems

- Creekline

Built Form

- R Rural Dwelling
- L Landmark

Road Screening

- Enclosed
- Filtered

Figure 52 – N2MS2 – Key Viewpoints Map 1 of 2 (Based on Open Street Map data, 2018)



Legend

- NSW LGA Boundary
- Viewpoint Marker
- Preferred Option
- Distance Contours**
- Minor - 250m
- Major - 1000m

- Transport**
- Local Roads
- Newell Highway
- Railway
- Natural systems**
- Creekline

- Built Form**
- Rural Dwelling
- Landmark
- Road Screening**
- Enclosed
- Filtered

Figure 53 – N2MS2 – Key Viewpoints Map 2 of 2 (Based on Open Street Map data, 2018)

6.1.5 VP5 – N2MS2

View: Looking north from CH 800.000

The existing view, figure 54, provides a semi enclosed experience with the road alignment passing through a grassland woodland landscape. The existing semi-restricted views to east would be slightly increased by removal of vegetation along eastern margins to left of image. Farmsteads located further to the west of view are too distant to have increased visibility of the highway or eastern views affected.



Figure 54 – Looking north from CH 800.000. Proposed carriageways situated to the right of existing potentially requiring the removal of the trees to right of image.

Sensitivity: Low

Residential receptors generally have the highest sensitivity, however in this instance the adjoining farmsteads are set back from highway approximately 1.5 to 2 kilometres with established plantings to their boundaries providing significant screening of the highway. Their views have consequently been assessed to have negligible sensitivity due to their distance to the highway and the elements located between the viewers and the highway.

Road users at this location have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. These have been assessed as low.

Magnitude: Low

The magnitude of change for residents has been assessed to be negligible over the distance and to only be perceptible from their private access road. The highway carriageways would be slightly further from dwellings, and the location and layout of residential access road interface with the highway would have minor adjustments. The magnitude of change for road users would be low, as the landscape is relatively homogenous grassland with no distinguishing elements.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP5, based on the significant distance of residential dwellings and minimal visual change to key views due to the loss of existing screening vegetation.

Mitigation:

- Reinstatement of grassland landscape east of the alignment to enhance views experienced from the road alignment.

Mitigation measures will not alter the overall visual assessment, although will improve the overall integration.

6.1.6 VP6 – N2MS2

View: Looking south from CH 2450.000 across Bobbiwaa Creek Bridge

The image, figure 55, shows the existing view of Bobbiwaa Creek Bridge and the associated roadside vegetation which defines the eastern edge of the corridor. The proposal has the potential to alter the road users existing restricted views to the east and Mt Kaputar increasing them slightly due to vegetation removal along eastern margins to left of highway in image.



Figure 55 – Looking south from CH 2450.000 across Bobbiwaa Creek Bridge. The proposed works would potentially require removal of existing screening trees along eastern verge along left side of highway beyond the bridge.

Sensitivity: Low

Residential receptors have highest sensitivity however the nearest farmstead is located 400 metres to the east of view is too enclosed by creek line vegetation to be affected by increased visibility of the highway or views to south towards highway affected, its sensitivity is assessed as negligible.

Road users at this location have a low sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character.

Magnitude: Moderate

The magnitude of change for residents has been assessed to be negligible and only perceptible from their access along Junefield Road. The residential users of Junefield Road (to the left beyond the bridge in image) would be more visibly exposed to highway traffic. The magnitude of change for road users would be low to moderate, as the loss of screening trees will significantly reduce the sense of enclosure and linearity of the corridor that leads the traffic around the bend. However, wider views to the east across the open intensive agricultural land beyond would be mostly unaffected.

Summary: Low to Moderate

The proposed highway upgrade would have an overall low to moderate visual impact at VP6, based on existing screening of the nearby farmstead to the northeast and moderate visual change to key views and sense of enclosure along the highway corridor due to loss of screening trees.

Mitigation:

- Reinstatement of vegetation to aid the reading of the highway alignment and to delineate its edge.

The implementation of these measures should see the overall impact reduced to low with the reestablishment of vegetation

6.1.7 VP7 – N2MS2

View: Looking east from CH 2700.000 to residential farmstead

Figure 56 illustrates the view to the adjoining farmstead, east of the highway and illustrates the distance from the corridor, some 400 metres, and the nature of the landscape beyond the road corridor. The road users existing intermittent views to the east and Mt Kaputar would be slightly increased by removal of vegetation along the eastern margins, also creating a slightly increased sense of exposure of the corridor.



Figure 56 – Looking east from CH 2700.000 to residential farmstead from entry to private access road. Proposed carriageways would be on-line at this location with some widening of embankments and upgraded BAL/BAR entry to private access road.

Sensitivity: Low

Residential receptors have highest sensitivity however the farmsteads located to the east of highway are generally too distant to have increased sense of the highway from the proposed changes to the highway margins. The farmstead shown in the above image, while visible from the highway, is situated approximately 400 metres from the carriageway and has established plantings along boundaries providing some intermediate screening of wider views of the highway and has been assessed as having moderate sensitivity.

Road users at this location have a lower sensitivity due to their ephemeral experience of the highway and the established expectation of frequent and intermittent changes in view and landscape character.

Magnitude: Low

The magnitude of change for the farmstead is assessed to be negligible given their distance and orientation to the alignment with changes only likely to be perceptible from their private access road. The highway carriageways would remain largely unchanged and the residential access road interface with the highway would have only minor adjustments. The magnitude of change for road users would be low, as the landscape is predominantly open grassland or cultivated fields with fragmented vegetative cover.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP7, based on the distance of residential dwellings and minimal visual change to key highway views due to minor loss of some existing vegetation along verges.

Mitigation:

- Reinstatement of grass land vegetation and investigate incorporation of low shrubs which may add screening of the highway corridor but not limit views from the corridor to the mountain ranges beyond.

Mitigation measures will not alter the overall visual assessment, although will improve the overall integration.

6.1.8 VP8 – N2MS2**View: Looking southeast from CH 6800.000 away from the Highway**

Figure 57 depicts the view to the adjoining farmstead looking southeast from highway. This illustrates the distance from the corridor of the farmstead and the nature of the landscape beyond the road corridor. The road users existing semi-restricted views to east and Mt Kaputar would be retained. Other farmsteads located further to the west of view are too distant to have increased visibility of the highway or eastern views affected. Changes to the access road configuration, visible centre right of image, would be required by the changes in highway alignment.



Figure 57 – Looking southeast from CH 6800.000. Proposed carriageways run left to right in the foreground potentially requiring the removal of the trees along the boundary in the foreground.

Sensitivity: Low

The farmstead is the highest sensitivity receptor in the vicinity. It is set back from highway approximately 200 metres with established plantings providing screening of the highway and therefore has been assessed to have moderate sensitivity.

Road users at this location have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. This is assessed as low.

Magnitude: Low

The residential property in this view would experience little change as the proposal retains the existing alignment. The realignment of the access road would however be required. The impact of this has been assessed as negligible due to the nature of change, distance of view, and the present level of view available to the property.

The magnitude of change for road users would be low with potential for isolated trees to be removed due to clear zone and formation requirements. The overall spatial proportions of the corridor and the wider landscape character however would remain unaffected due to the scattered and informal distribution of this vegetation.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP8. This reflects the minor nature of changes experienced by road and residential receptors.

Mitigation:

- Alter batters to limit vegetation clearance.

Mitigation would substantially alter the assessment and so is considered to remain low.

6.1.9 VP9 – N2MS2**View: Looking south from CH 10400.000.**

Figure 58 depicts the approach to Edgeroi from the north. At this point the highway is flanked by scattered trees and the grain silos, a dominant landmark in the landscape, begins to come into view. The road users existing views to the east and Mt Kaputar would be unchanged by the proposed works. Restricted views to west would be unchanged due to dense vegetation beyond the rail corridor. There would be potential loss of trees that currently provide partial screening of silos along western verge to right of image.



Figure 58 – Looking south from CH 10400.000. Proposed highway embankments potentially widened, requiring the removal of the trees along the western margins to the centre right of image.

Sensitivity: Low

Residential receptors have the highest sensitivity however the farmstead located approximately 400 metres to the east of view is obscured by vegetation and unlikely to have increased visibility of the highway.

Built elements begin to be observed within the landscape as the township comes into view for the road user and consequently provides a change in view from much of the alignment. The road users sensitivity within this landscape has been assessed as low due to the ephemeral nature of the road user and scale of elements within the corridor.

Magnitude: Moderate

The magnitude of change for residents would be negligible over the distance and only perceptible from their private access road. The highway carriageways would be slightly further from dwellings, and the location and layout of residential access road interface with the highway would have minor adjustments.

The road user would experience the potential loss of trees which currently frame the approach to Edgeroi and screen the imposing industrial structures. This would result in a noticeable change of character and sense of enclosure to the highway as it enters Edgeroi Village. The magnitude of change for road users is consequently considered moderate,

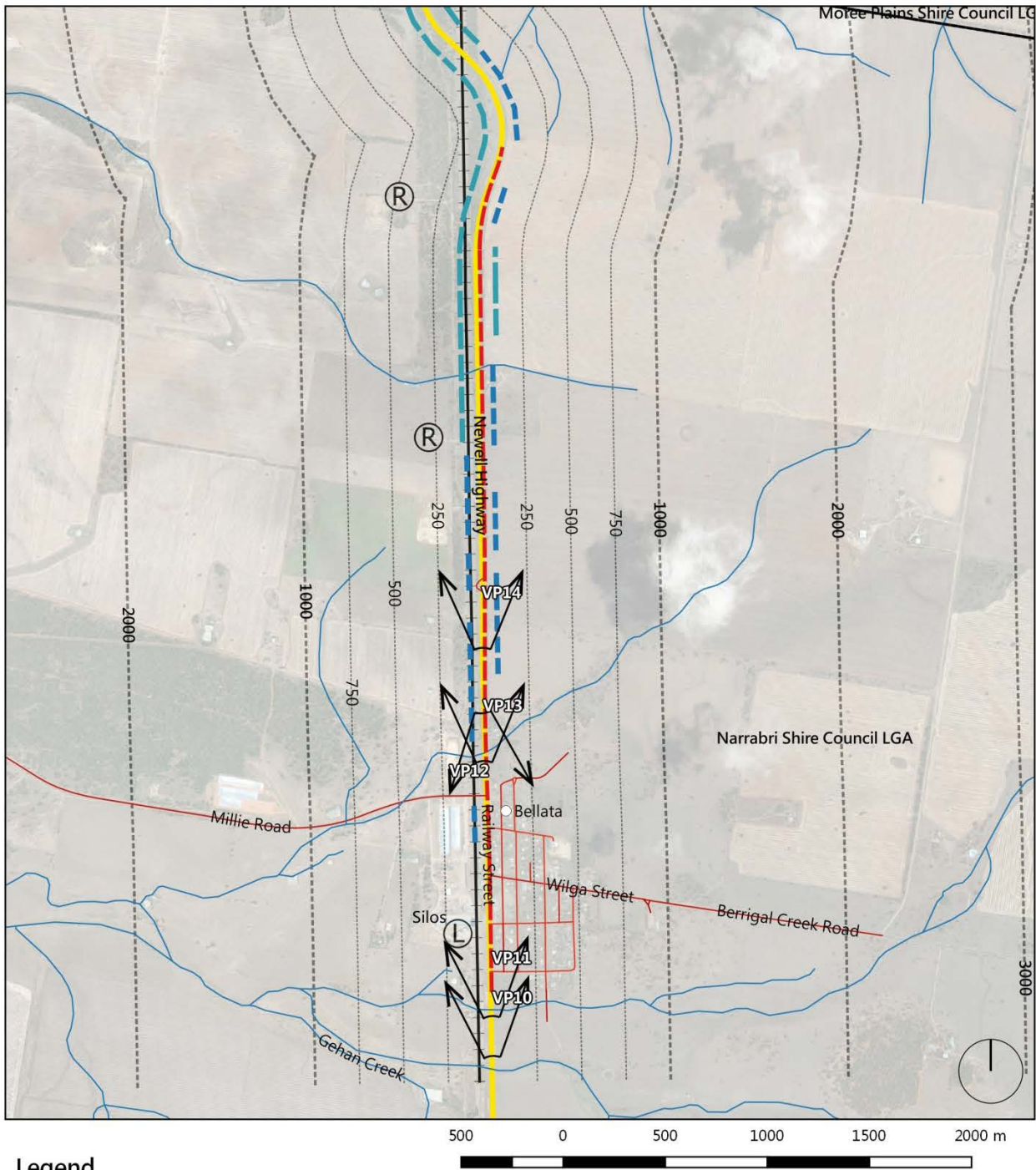
Summary: Low to Moderate

The proposed highway upgrade would have an overall low to moderate visual impact at VP9, based on negligible changes to experience of residential dwellings and moderate visual change to the experience of road users approaching Edgeroi.

Mitigation:

- Provide screen planting to mark the arrival into Edgeroi and frame the silos within the landscape
- Investigate opportunity to activate silos as part of a regional interpretation /tourism strategy

Mitigation, once vegetation is established, would see impacts reduced to low.



Legend

- NSW LGA Boundary
- Viewpoint Marker

Preferred Option

Distance Contours

- Minor - 250m
- Major - 1000m

Transport

- Local Roads
- Newell Highway
- Railway

Natural systems

- Creekline

Built Form

- Rural Dwelling
- Landmark

Road Screening

- Enclosed
- Filtered

Figure 59 – N2MS3 – Key Viewpoints Map 1 of 1 (Based on Open Street Map data, 2018)

6.1.10 VP10 – N2MS3

View: Looking north from CH 0000.000 N2MS3

The image, Figure 60, depicts the arrival to Bellata from the south, including the dominance of the silos within this landscape and the vegetation within the village of Bellata. The road users existing views to the east and Mt Kaputar would be unchanged by the proposed works. Views towards the west along the creek line and open grassland would also be unchanged. There would be potential loss of trees along western verge to centre left of image that provide a sense of separation of the highway corridor from the imposing silos and sense of arrival to the township of Bellata.



Figure 60 – Looking north from CH 0000.000. Proposed highway widens to accommodate right turning lane, requiring the removal of the avenue trees along the western margins to the centre left of image.

Sensitivity: Low

There are no residential receptors in close visual proximity of the proposal in this location. Road users at this location generally have a low sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. Views at this location are still dominated by the vast open vista to the Mt Kaputar range to the east however the focus of the road user begins to change back to the road corridor at this point, as vehicles cross the Myall Hollow Creek Bridge on approach to Bellata Village. The sensitivity of road receptors gradually increases on approach and the rural village character takes precedent.

Magnitude: Low

The magnitude of change for the road user in response to the loss of trees which currently frame the approach to Bellata and in part reduce the imposing industrial structures of the Silo's is considered low. This reflects the relatively distant nature of the views and the focus of the road user on the broader landscape which includes views across open grassland and cultivated fields to Mt Kaputar.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP10, based on the low relative visual change to the experience of road users approaching Bellata at this distance.

Mitigation:

- Reinststate screening trees to limit views from residential properties of silos
- Provide avenue tree planting to mark the arrival into Bellata
- Investigate opportunity to activate silos as part of a regional interpretation /tourism strategy.

Overall impact following mitigation works would remain low.

6.1.11 VP11 – N2MS3

View: Looking north from CH 300.000

The view, Figure 61, depicts the entrance in to Bellata, arriving from the south, dominated by an avenue of trees to the west of the alignment beyond which are the grain silos. Telegraph poles provide definition to the eastern edge of the corridor. The road users views are focussed along the road corridor approaching Bellata from the south. There would be potential loss of trees along western verge to left of image that provide a sense of separation of the highway corridor from the imposing silos and rail corridor to the west.



Figure 61 – Looking north from CH 300.000. Proposed highway widened to accommodate right turning lane, requiring the removal of the avenue trees along the western margins to the left of image.

Sensitivity: High

The residential receptors along the eastern side of the alignment adjoin the proposal in this location fronting onto the highway, and have a high sensitivity to change. While road users generally have a lower sensitivity due to their ephemeral experience of the highway, in this case an increase to moderate sensitivity has been assessed as the rural village character takes precedence.

Magnitude: High

The residential receptors along the eastern side of the alignment are in immediate proximity of the proposal in this location, and would experience a high magnitude of visual change from loss of an avenue tree planting that currently provides partially screening of the silos to the west and a slight increase in the overall highway footprint.

The focus of the road user is on the highway margins and its relationship to the surrounding rural village at this point as vehicles slow down on approach to Bellata Village.

The magnitude of change of the road users would be moderate to high as the loss of avenue tree planting would significantly change the spatial character of the highway and sense of scale and separation from imposing adjacent industrial structures and rail corridor.

Summary: High

The proposed highway upgrade would have an overall high visual impact at VP11, based on the distinct change in spatial quality of the highway and visibility of adjacent structures due to loss of existing avenue trees, altering the experience of road users entering or leaving Bellata.

Mitigation:

- Reinststate screening trees to limit views from residential properties of silos
- Provide avenue tree planting to mark the arrival into Bellata
- Investigate opportunity to activate silos as part of a regional interpretation /tourism strategy.

Mitigation would limit the overall magnitude of impact resulting in a moderate visual impact.

6.1.12 VP12 – N2MS3

View: Looking north from CH 1650.000.

The view leaving Bellata, Figure 62, heading north is defined by vegetation along the western verge with filtered view to the east. The road users existing restricted views to east would be slightly increased by removal of vegetation along both margins to left and right of image. Farmsteads located further to the east of view off Penneys Lane are likely too distant at 2-2.5 kilometres to have increased visibility of the highway if trees along the highway are removed. A residence located just out of view is located 30 metres east of the alignment at Ch1550.000.



Figure 62 – Looking north from CH 1650.000. Proposed highway embankments widened to accommodate swales along both verges, potentially requiring the removal of the trees along both margins, particularly on the eastern side to the right of image.

Sensitivity: Low

The adjacent residential receptor located 30 metres to the east of the carriageways at CH1550.000 has a high sensitivity to the highway however there is significant established planting along their boundaries which is unaffected by the proposed works providing significant screening of the highway to the north. Its sensitivity to impacts on this view has consequently been assessed as low.

Road users have a low sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. In this instance the highly fragmented vegetative patterns and orientation are away from Bellata.

Magnitude: Moderate

The magnitude of change for residents has been assessed to be negligible as the proposed works would not result in a change of visibility or character of the highway apart from some widening of the residential driveway entry and embankments.

The magnitude of change for road users would be low to moderate, as there would be a loss of existing trees and shrubs along the eastern verge, framing the carriageways to the right side of image. The existing landscape is predominantly open grassland to the east with fragmented vegetative cover, which reduces the visual impact of this loss of vegetation.

Summary: Low to Moderate

The proposed highway upgrade would have an overall low to moderate visual impact at VP12, based on existing screening of residential dwellings and minimal visual change to key views resulting from loss of existing screening vegetation along the highway margins.

Mitigation:

- Reinstall shrub and small tree planting to frame broader landscape views and meet clearance requirements to services and road alignment

Once established mitigation measures would result in the lower of the impacts of the project to a low order of impact.

6.1.13 VP13 – N2MS3

View: Looking south from CH 1750.000

The image, Figure 63, illustrates the arrival into the town of Bellata from the north and presents a tree lined entrance which limits the visibility of the village's silos. The road user's views to the east are increasingly screened by scattered trees. The grove of trees along the western verge, to the right of image, in association with the vegetation to the east frames the highway approach into Bellata Village. There would be a potential need for the removal of this screening vegetation along western margins for proposed works.



Figure 63 – Looking south from CH 1750.000. Proposed highway embankments widened to accommodate swales along both verges, potentially requiring the removal of the trees on the western side to the right of image.

Sensitivity: Moderate

The adjacent residential receptor located 30 metres to the east of the carriageways at CH1550.000 has highest sensitivity however there is significant established planting unaffected by the proposed works providing significant screening of the highway. Its sensitivity has consequently been assessed as moderate.

Road users generally have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. In this instance the sensitivity has been assessed as moderate due to the role landscape plays in defining the character and feel of Bellata Village.

Magnitude: Moderate

The residential dwelling located behind trees to the left side of image has been assessed as experiencing low magnitude of change as this screening is unaffected by the proposed works. The magnitude of change for road users would be moderate as there is potentially a loss of the existing trees and shrubs framing and screening along the western verge. This would create an increased sense of exposure and dominance of the industrial buildings and silos currently obscured.

Summary: Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP13, based on existing screening of residential dwellings being retained and moderate visual change for road users to key views resulting from loss of existing screening vegetation along the western verge.

Mitigation:

- Reinstatement of vegetation to limit the dominance of the built structures and to provide a sense of entry into the township of Bellata.

Mitigation measures once established would result in a low magnitude of change and consequently the visual impact would fall too low to moderate.

6.1.14 VP14 – N2MS3**View: Looking north from CH 2250.000 at Woolabrar Rest Area.**

View, Figure 64, taken from the rest area north of Bellata illustrating the opening views and the role vegetation plays in restricting views from the corridor. The road users partially restricted views to east would be slightly increased by removal of vegetation along eastern margins to right of image. Farmsteads located further to the east of view off Penneys Lane are too distant at 2-2.5 kilometres to have significantly increased visibility of the highway if trees along the highway are removed.



Figure 64 – Looking north from CH 2250.000 at Woolabrar Rest Area. Proposed highway embankments widened to accommodate swales along both verges, potentially requiring the removal of the trees along the eastern side to the right of image.

Sensitivity: Moderate

The users of the rest area have moderate sensitivity due to their immediate proximity to the highway and extended time to take in views. Road users at this location have a lower sensitivity due to their ephemeral experience of the highway and inherent expectation of intermittent changes in view and landscape character. This is primarily due to the highly fragmented vegetative patterns and orientation away from Bellata.

Magnitude: Low

The magnitude of change for rest stop users would be low as the proposed works would not result in a significant change of view or landscape character, or exposure to highway traffic.

The magnitude of change for road users would also be low as there would be a minor change to their experience of the highway from the loss of existing trees and shrubs along the eastern verge. The existing landscape is uninterrupted open crop fields to the east, which reduces the visual impact of this loss of vegetation.

Summary: Low to Moderate

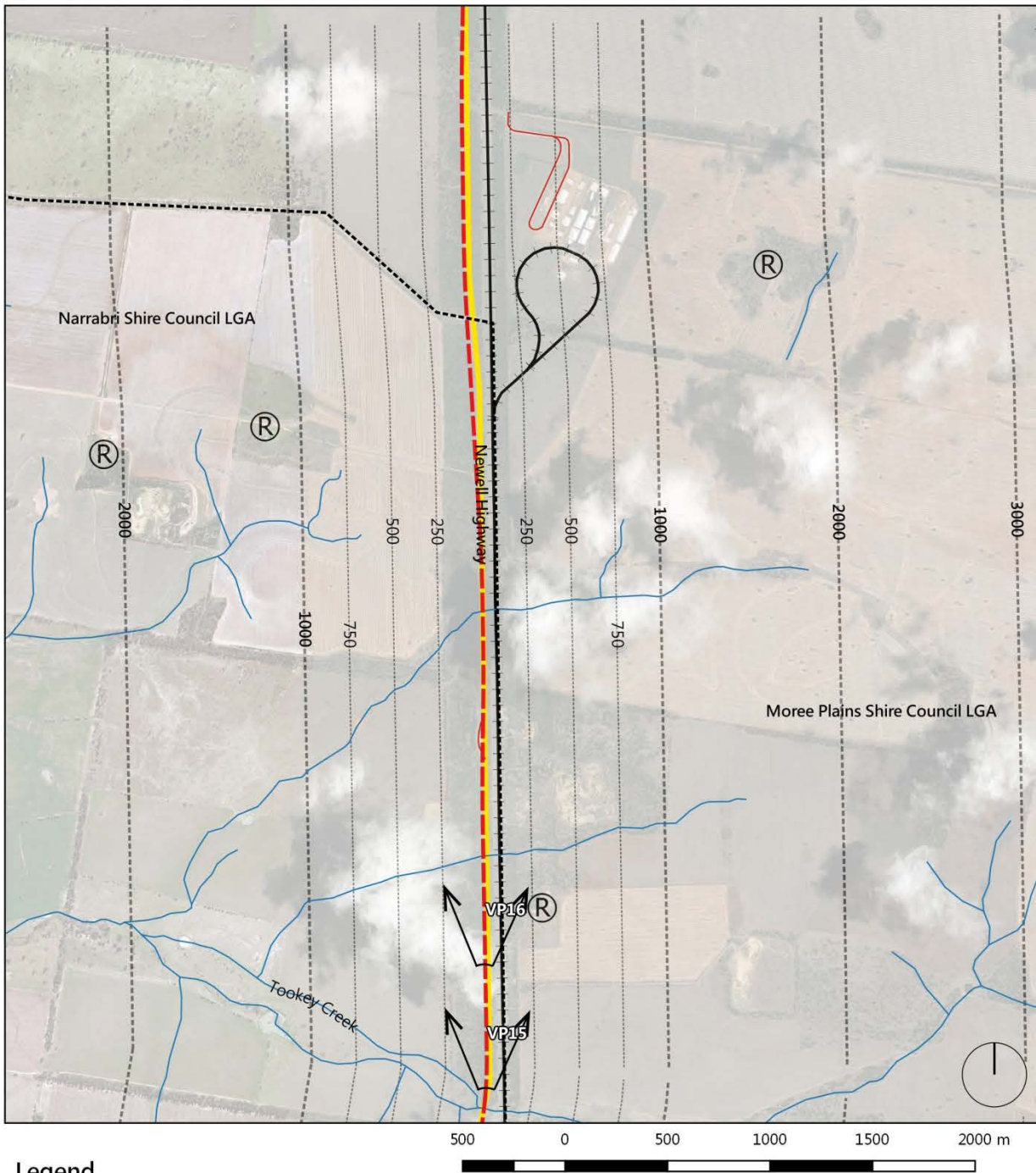
The proposed highway upgrade would have an overall low to moderate visual impact at VP14, based on minimal visual change to key views resulting from loss of existing screening

vegetation along the highway margins and a low to moderate change in spatial quality of the highway corridor.

Mitigation:

- Reinststate clusters of vegetation to frame views and break up the overall scale of the alignment. Planting is to be beyond clear zones retaining the sense of openness.

Mitigation measures will not alter the overall scale of impact although will enhance overall integration.



Legend

- NSW LGA Boundary
- Viewpoint Marker

Preferred Option

Distance Contours

- Minor - 250m
- Major - 1000m

Transport

- Local Roads
- Newell Highway
- Railway

Natural systems

- Creekline

Built Form

- R Rural Dwelling
- L Landmark

Road Screening

- Enclosed
- Filtered

Figure 65 – N2MS4 – Key Viewpoints Map 1 of 1 (Based on Open Street Map data, 2018)

6.1.15 VP15 – N2MS4

View: Looking north from CH 200.000 at Tookey Creek culvert

Filtered west views along the Tookey Creek margins, Figure 66, and glimpses east through to the rail corridor become increasingly restricted as road users experience an enclosed vegetated corridor with linear north-south views only along the highway. The adoption of the existing alignment limits the extent of changes which are largely limited to a widening of the verge road.



Figure 66 – Looking north from CH 200.000 at Tookey Creek culvert. Proposed highway alignment departs from existing and continues straight through existing vegetation at centre of image, requiring the removal of all trees along the western margin of the existing highway.

Sensitivity: Moderate

Road users at this location have a moderate sensitivity due to their existing unusually enclosed experience of the highway and limited variation in view and landscape character. Residential dwellings and land users along N2MS4 would typically have a higher sensitivity however are likely to be out of visual range of the proposed highway realignment. This applies both to the section as a whole and for this view point.

Magnitude: Low

The magnitude of impact for nearby residents would be negligible, as the existing alignment is retained with minor widening of the formation.

The magnitude of change for road users will be low as the highway formation is widened. Views will typically remain restricted to the corridor.

Summary: Low to Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP15, based on the existing specifically enclosed nature of corridor, obscured views from residential dwellings and significant widening of corridor clear zone and decrease in proximity of traffic to trees and sense of enclosure.

Mitigation:

- Reinstatement of woodland vegetation outside of clear zones of the new alignment to recreate sense of enclosure.

Mitigation would not result in a change in the overall visual impact.

6.1.16 VP16 – N2MS4

View: Looking north from CH 1150.000

View, Figure 67, reflects the undulating enclosed nature of the corridor in N2MS4. Road users experience an enclosed vegetated corridor with linear north-south views only along the highway. The nature of views along the highway would see only minor changes as the existing alignment is upgraded.



Figure 67 – Looking north from CH 1150.000. Proposed highway alignment located to the west, adjacent to existing carriageways. This would require significant widening of the corridor and the removal of trees visible to the left of image.

Sensitivity: Moderate

Road users at this location have a moderate sensitivity due to distinct and unusually enclosed experience of the highway which limits variation in view and provides a uniform landscape character. Residential dwellings and land users along N2MS4 would typically have a higher sensitivity however none are in visual range of the proposed highway realignment this has been assessed as negligible.

Magnitude: Low

The magnitude of impact for nearby residents has been assessed to be negligible, due to continuous tree cover remaining which effectively screens the carriageways, despite the carriageways moving slightly closer to dwellings, and loss of some existing vegetation.

The magnitude of change for road users will be low as the retains its existing alignment with a slight increase in footprint. Views will remain restricted to the corridor.

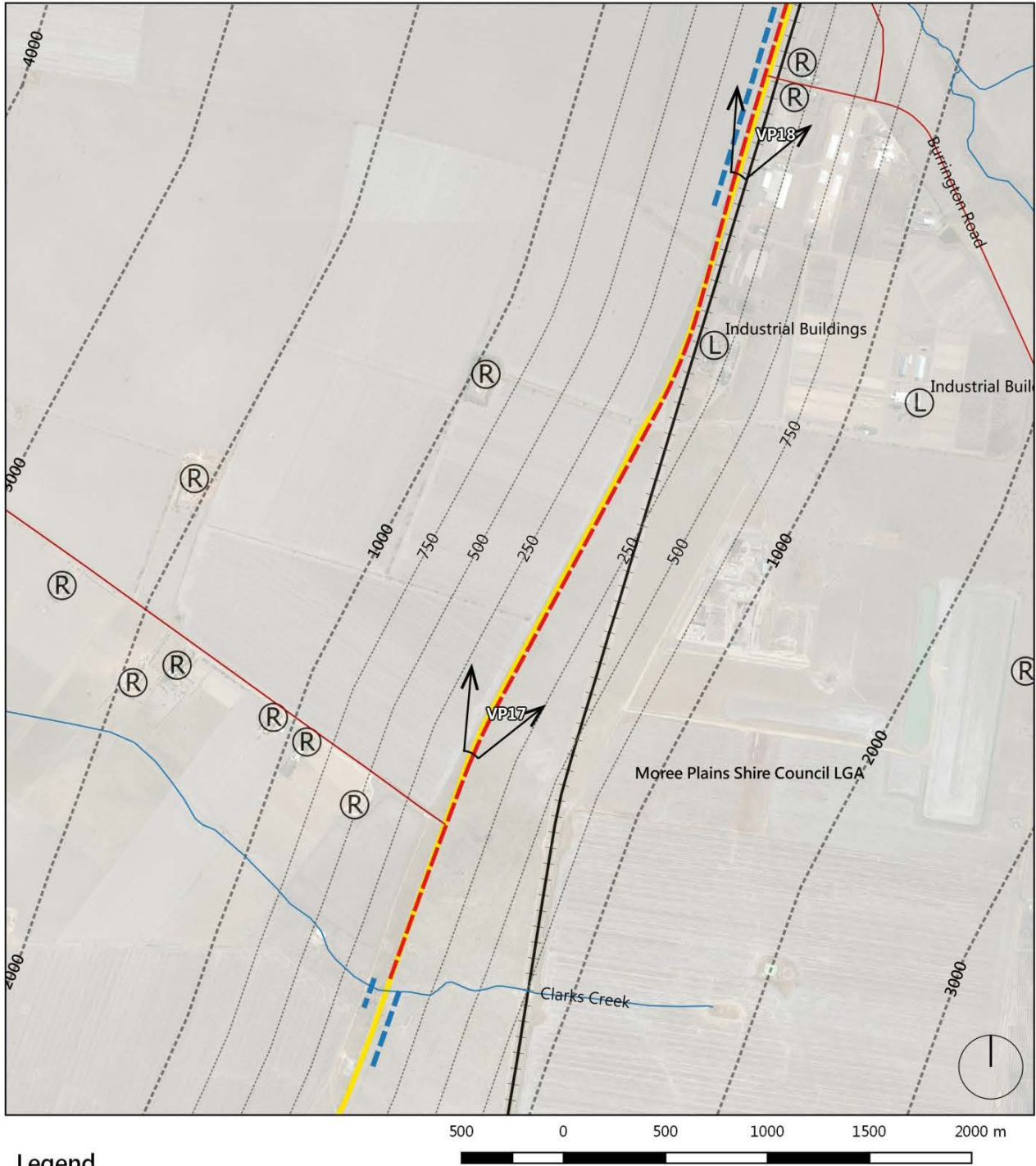
Summary: Low - Moderate

The proposed highway upgrade would have an overall low-moderate visual impact at VP16, based on the existing enclosed nature of corridor, obscured views from residential dwellings and significant widening of the corridors cleared zone and subsequent decrease in distance of traffic to trees and sense of enclosure.

Mitigation:

- Reinstatement of woodland vegetation outside of clear zones of the new alignment to recreate sense of enclosure.

Mitigation would not result in a change in the overall visual impact.



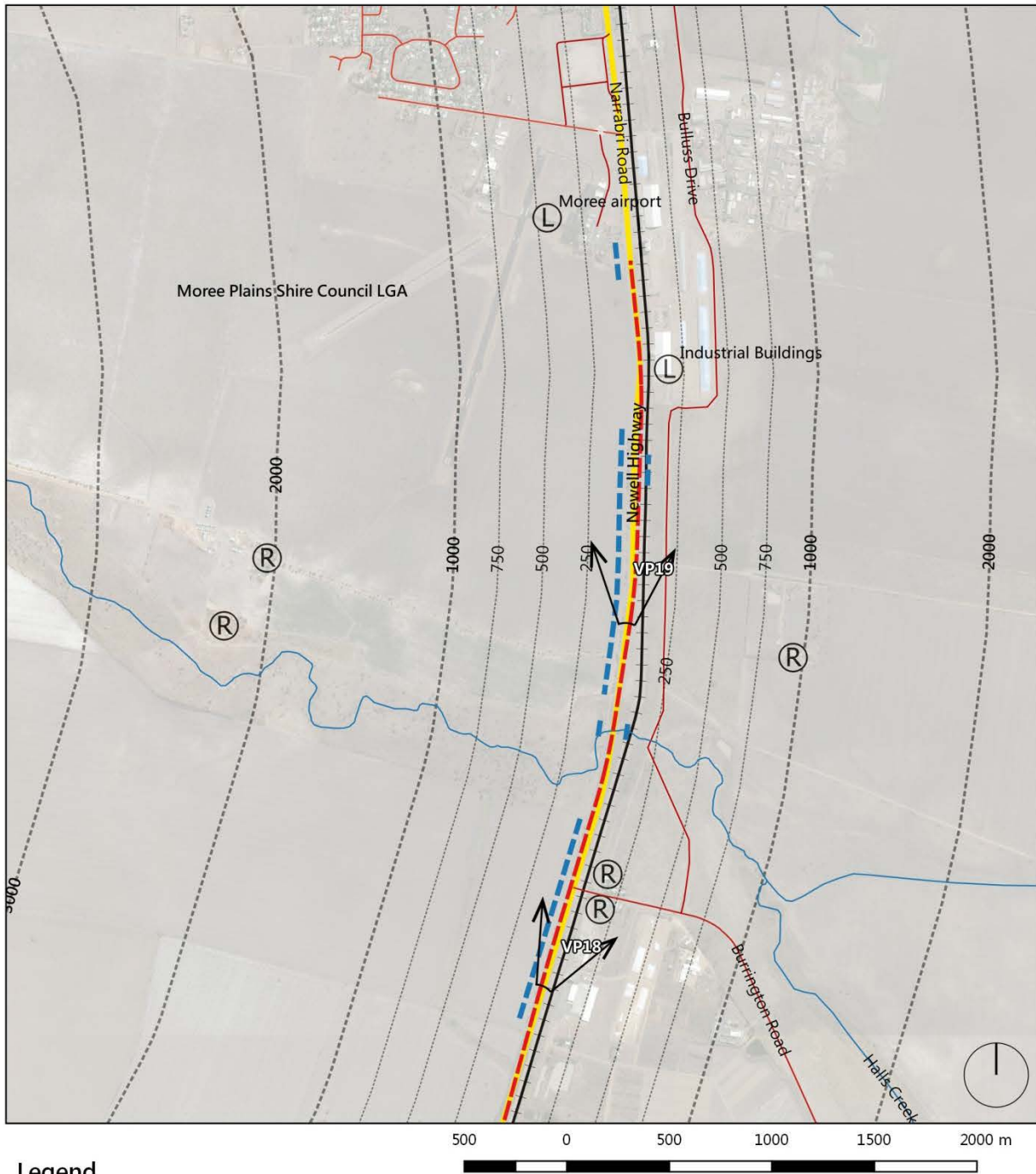
Legend

- NSW LGA Boundary
- Viewpoint Marker
- Preferred Option
- Distance Contours**
- Minor - 250m
- Major - 1000m

- Transport**
- Local Roads
- Newell Highway
- Railway
- Natural systems**
- Creekline

- Built Form**
- Rural Dwelling
- Landmark
- Road Screening**
- Enclosed
- Filtered

Figure 68 – N2MS5 – Key Viewpoints Map 1 of 2 (Based on Open Street Map data, 2018)



Legend

- NSW LGA Boundary
- Viewpoint Marker

--- Preferred Option

Distance Contours

- Minor - 250m
- Major - 1000m

Transport

- Local Roads
- Newell Highway
- Railway

Natural systems

- Creekline

Built Form

- R Rural Dwelling
- L Landmark

Road Screening

- Enclosed
- Filtered

Figure 69 – N2MS5 – Key Viewpoints Map 2 of 2 (Based on Open Street Map data, 2018)

6.1.17 VP17 – N2MS5

View: Looking north from CH 1250.000 just north of Wallanol Road intersection

Road users experience 360 degree open views, across flat crop fields to west and north and over broad scale agricultural land to the east. The view marks the arrival of the outskirts of Moree with the presence of advertising billboards set within private lands beyond the corridor, refer Figure 70.



Figure 70 – Looking north from CH 1250.000 just north of Wallanol Road intersection. Proposed highway alignment located to the eastern verge to the right side of image.

Sensitivity: Low

Residential receptors in this area have higher sensitivity however residences located to the west of highway are generally more than 400 metres away from the highway. These farmsteads typically have established plantings to their boundaries providing significant intermediate screening of wider views of the highway from dwellings so are assessed as of low sensitivity. Dwellings to the east of the highway are separated by the rail corridor and are generally located within the visual context of the surrounding industrial development.

Road users at this location have a low sensitivity due to their ephemeral experience of the highway and the established expectation of frequent and intermittent changes in view and increasing visual dominance of the industrial structures.

Magnitude: Low

The magnitude of change for residents has been assessed as negligible due to the distance over which the change is being observed. The magnitude of change for road users would be low, as the landscape is predominantly open grassland or cultivated fields with no significant screening at this location.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP17, based on significant distance of residential dwellings and negligible visual change to highway views or loss of existing vegetation.

Mitigation:

- Reinstatement of grassland interface.

Impact following implementation of mitigation works will be low to negligible.

6.1.18 VP18 – N2MS5

View: Looking north from CH 4000.000

Road users experience open views across flat crop lands to west and north and more limited views east and south across the rail corridor, through scattered trees and partially restricted by large industrial buildings emerging on the outskirts of Moree. Figure 71 depicts the view looking north with trees scattered along either edge of the alignment.



Figure 71 – Looking north from CH 4000.00. Proposed highway alignment deviates to the western verge from this point northwards, requiring removal of trees to the left side of image.

Sensitivity: Low

Residential receptors have a high sensitivity however residences located to the west of highway are generally too distant from the highway at 450 metres to 2 kilometres, to have an increased sense of the highway as a result of the proposed works. These farmsteads typically have established plantings to their boundaries providing significant intermediate screening of wider views of the highway from dwellings. Their sensitivity is consequently considered to be low.

Road users have been assessed as having a low sensitivity due to their ephemeral experience of the highway and the established expectation of frequent and intermittent changes in view and landscape character.

Magnitude: Low

The magnitude of change for adjacent landowners has been assessed as negligible with much of the vegetation to the west of the alignment retained maintaining screening. The magnitude of change for road users has been assessed as low to negligible, due to the impacts on the avenue trees which contribute to the sense of arrival to Moree and alter the scale of the highway corridor and its relationship with the vast open views beyond.

Summary: Low

The proposed highway upgrade has been assessed to have low to moderate visual impact at VP18, based on potential moderate visual change to definition of highway corridor and increased dominance of open vistas.

Mitigation:

- Reinstall scattered woodland planting to retain sense of scale of highway corridor and maintain views.

Adoption of mitigation measures would result in negligible change in the visual quality.

6.1.19 VP19 – N2MS5

View: Looking north from CH 6400.00.

The view, Figure 72 captures the arrival experience of road users as they head north into Moree. Large industrial buildings emerging on the outskirts of Moree to the north of view become increasingly dominant and reinforce a sense of arrival. Vegetation provides some balance in scale as it provides a foreground and context to these structures.



Figure 72 – Looking north from CH 6400.00. Proposed highway alignment deviates to the eastern verge from this point northwards, requiring removal of trees screening structures to the right side of image.

Sensitivity: Moderate

Road users at this location have been assessed to have a moderate sensitivity due to their transitioning experience of landscape character whether approaching or leaving the urban precinct of Moree. They become increasingly aware of this transition and more focused on the highway corridor as they approach Moree.

Magnitude: Moderate

The proposed highway alignment deviates to the eastern verge from this point northwards, requiring removal of the trees partially screening the large structures to the right side of image. The magnitude of change for road users would be moderate, as the landscape is becoming increasingly more urban and the trees to be removed contribute to the softening of the visual scale and impact of the structures and the sense of arrival to Moree. The trees within the alignment contribute to the moderation of the sense of scale of the highway corridor and its relationship with the vast open views beyond.

Summary: Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP19, based on the moderate sensitivity of road users due to their perceived sense of arrival, potential moderate visual change to the definition of highway corridor and visual mitigation of large built structures.

Mitigation:

- Reinstatement of vegetation to assist in the moderation of the adjoining built form and scale of the highway
- Planting to be used to assist in the provision of an arrival space to Moree.

Mitigation measures have the potential to moderate the magnitude of change reducing this too low. The assessment post mitigation has been assessed as moderate to low.

6.2 Visual Assessment Summary

The Table 4 below summarises the visual impact assessments findings.

Typically the viewers were assessed to have a low or moderate sensitivity to the changes. Where the exposure to the proposed changes is in particularly close proximity to a dwelling, more focused or for a longer duration, this has been assessed as lifting the sensitivity to High.

The magnitude has been assessed as predominantly moderate due to the typically open big sky nature of the intensive agricultural landscape, the existing heavy traffic use of the highway and typically long setback of farmsteads from the highway.

Generally it has been assessed that although the highway is to be realigned or formation widened, resulting in clearing of road side screening elements in several locations, the key vistas and broader landscape character will not be drastically altered from the perspective of land users, residents or highway traffic, and this is reflected in an overall low to moderate rating.

One location is identified as high which relates to the urban context of Bellata in which screen planting is proposed to be removed exposing to full view of road and residents alike the grain silos which present an over bearing presence.

Table 4 - Visual Assessment Summary

Segment	View point	Sensitivity	Magnitude	Impact	Impact Post Mitigation
N2MS1	VP1	Low	Moderate	Low to Moderate	Low
	VP2	Moderate	Moderate	Moderate	Low to moderate
	VP3	High	Moderate	Moderate to High	Moderate
	VP4	Low	Moderate	Low to Moderate	Low to moderate
N2MS2	VP5	Low	Low	Low	Low
	VP6	Low	Moderate	Low to Moderate	Low
	VP7	Low	Low	Low	Low
	VP8	Low	Low	Low	Low
	VP9	Low	Moderate	Low to Moderate	Low
N2MS3	VP10	Low	Low	Low	Low
	VP11	High	High	High	Moderate
	VP12	Low	Moderate	Low to Moderate	Low
	VP13	Moderate	Moderate	Moderate	Low to Moderate
	VP14	Moderate	Low	Low to Moderate	Low to Moderate
N2MS4	VP15	Moderate	Low	Low to Moderate	Low to Moderate
	VP16	Moderate	Low	Low to Moderate	Low
N2MS5	VP17	Low	Low	Low	Low
	VP18	Low	Low	Low	Negligible
	VP19	Moderate	Moderate	Moderate	Low to Moderate

7 MITIGATION

7.1 Mitigation Measures

Development of mitigation measures to further reduce the impacts of the proposal's road and associated structures and elements on areas adjoining the road corridor. This process aims to produce a design outcome that has high visual quality, whilst also satisfies technical requirements. In order to achieve this, a range of mitigation measures must be incorporated into the proposal. These measures, when considered in combination and when implemented at the various stages, provide a robust urban and landscape design solution that protects and enhances the existing landscape character and visual quality of the highway.

Mitigation measures are treatments that are recommended to reduce the impact of the proposal. They include ways to lessen the visual effect of the proposal itself and also to identify treatments near critical view areas to reduce the visual impacts of the proposal.

Mitigation measures also aim to reduce impacts on existing landscape character through consideration of existing site features, cultural and environmental heritage. These mitigation measures are also designed to improve environmental conditions or lessen the physical impacts on the environment. It is possible to implement these measures across all facets of the proposal, particularly road elements design, earthworks design and revegetation methodologies.

7.2 Mitigation Summary

The following provides a summary of the key mitigation measures identified as part of the Urban and Landscape Design Strategy (Chapter 3), within the Landscape Character (Chapter 5) and Visual Impact Assessment (Chapter 6). The measures have been grouped by type and are as follows:

7.2.1 Grading: - Integration of earthworks design with existing landform

- The potential visual impact of earthworks and associated structures can be minimised by careful design that integrates with adjoining landform. This would be achieved through rounding of the top of cut batters, tailing-off of cut batters and a gradual flattening of grades at ends of fill embankments in order to avoid sharp transitions.
- Flatter grades are generally better within the open landscape of the alignment, but should be steepened where vegetation impacts would occur.

7.2.2 Vegetation protection and Revegetation

Retention of existing vegetation

Due to the limited vegetation within the broader landscape there is high value associated with that of the corridor.

- Design the proposal to avoid impact to prominent trees and vegetation communities where possible.
- Impacts on threatened species are to be avoided and where identified should be retained and protected wherever possible
- Steepen batters to grades suitable for the proposed surface treatment in order to minimise the overall footprint of the proposal and thereby limit vegetation clearance
- Design water quality structures and drainage lines to avoid existing vegetation where possible.

Revegetation and planting methodologies and contingencies:

The proposal would involve areas of planting and revegetation.

- Utilise appropriate revegetation methodologies to ensure best outcomes in specific locations. Methodologies would consist of hydroseeding, hydromulching and direct seeding of landscape areas affected by the construction of the proposed road alignment.
- Strengthen vegetation along creek lines to emphasise these elements within the landscape.

7.2.3 Minimisation of road furniture and signage:

- Signage locations are to be coordinated with other roadside elements including structures, furniture, fencing and landscape treatments
- Barriers should adopt wire rope barriers to minimise visual impact of these structures in the landscape.

7.2.4 Use of “soft engineering” and well-integrated drainage facilities:

- Visible roadside channels would be vegetated
- Concrete lined channels would be avoided as much as possible. Where they are to be used, the concrete would be coloured and/or heavily roughened as-well-as rock lined.

7.2.5 Provide interest and experiences along the route

Retention of vistas and visual links between local landmarks and elements

- Revegetation undertaken to reflect the existing vegetation distribution and types will ensure that key views are retained. The long flat expanses of the plains adjoining the road along with the views to Mount Kaputar and associated ranges are key experiences of the journey.
- Landscape should be used to frame views.

Interpretation

- Investigate the opportunity to express the area’s history or identity through art along the highway
- Develop a focused urban and landscape design theme around the towns so that their function beyond that of a service centre of the road corridor is acknowledged and celebrated.

8 CONCLUSION

The Urban Design, Landscape Character and Visual Impact assessment reveals that the Newell Highway from Narrabri to Moree is a highly active freight corridor with a low level of development or amenity along the corridor, typically limited to open truck rest areas and broad vistas of the ranges of Mt Kaputar National Park.

The urban design landscape character and visual impact assessment provides an understanding the built, natural and community character of the existing, analyses the impacts that the road upgrades can make, identifies opportunities for mitigation and public space improvements, and outlines urban design objectives and principles in order to achieve an integrated design that best fits in with its context, complements the existing road setting, minimises the impacts and mitigates the impacts that are unavoidable.

Consisting of five segments the proposal from Narrabri to Moree upgrades the overall geometry and alignment of 36.2 kilometres of highway to enhance the overall safety and functionality of the route. The assessment found the following:

Landscape Character Assessment

N2MS1, N2MS2, N2MS3 and N2MS5 typically have a broad mixture of landscape character types as outlined in Chapter 5 of this report. Intensive agricultural landscape, broad scale grassland and industrial –airport precinct landscape character areas have been identified as having a low to moderate sensitivity to the proposed highway upgrade works.

Broad scale open woodland landscape generally has a moderate sensitivity to changes to the highway alignment and corridor. A product of the definition trees provide within the corridor.

N2MS4 has been determined to have the highest level of sensitivity as the highway margins are almost entirely vegetated and have been defined as an enclosed vegetated woodland corridor. Rural village character areas occurring in N2MS2 and N2MS3 are also determined to have a high sensitivity.

N2MS4 and a semi-enclosed vegetated section of N2MS1 are the only areas with an overall high rating of potential impacts to the landscape character.

Visual Impact Assessment

The overall visual impact of the proposal has generally been assessed as low to moderate due to the retention of existing separation and screening of residential receivers from the alignment, present low level of amenity currently provided by the road corridor and the low to moderate impact the proposed works would have on existing vegetation within the highway corridor.

One location is identified as high impact, which relates to the urban context of Bellata in which screen planting is proposed to be removed exposing to full view of road and residents alike the grain silos which present an over bearing presence. The proposed design should be reconsidered to avoid impacts to existing screening and avenue planting at Bellata to ensure existing views from residences are mitigated.

Mitigation

A number of Principles and Objectives have been defined to inform the urban and Landscape design response. From these a number of key mitigation strategies have been identified these include:

- Limiting vegetation loss - either through revisions to alignment or scale of proposed cross section
- Providing screening to properties which have been impacted by the proposal through the opening up of views to the proposed alignment
- Providing definition to the changing land uses associated with the townships through which the highway passes

- Providing interest to the motorist along their journey in an effort to breakdown the sense of distance and provide a sense of progression and connection to context.

From these details of the methods and ways these can be addressed are discussed. Both character and visual impact assessments have been assessed against the proposed approaches to mitigate impacts (refer to Section 7). This sees a reduction in the overall impacts.

For landscape character impacts the majority of impacts are considered low. One location has been assessed as high. This relates to N2MS1 and the clearance of an enclosed section of the highway corridor. The implementation of mitigation strategies sees this fall to moderate to high.

The visual impact assessments reflect a similar dominance of low visual impacts along the corridor. Two locations were assessed as having a high (N2MS3 VP11) or moderate to high (N2MS1 VP3) impact. With the implementation of mitigation strategies these both fall to moderate level of impact.

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