Executive Summary

Roads and Maritime Services (Roads and Maritime) proposes to carry out major pavement upgrades to three segments of the Newell Highway (the highway) north of Moree in north west NSW. The proposal is in the 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.

Key features of the proposal include:

- Upgrade and resurface three segments of the existing highway north of 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
- Upgrade numerous existing intersections along the highway to include channelised right hand turn with an auxiliary lane turn treatments
- Provision of three metre wide shoulders for 30 metres on either side of property accesses
- Improve the Newell 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 of ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures as required.

The proposal would be delivered in three segments with a combined length of 30 kilometres of upgrades along the highway, north of 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

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 was 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 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.

Findings

Generally, landscape character impacts were in the low too low to moderate range. Areas of highest sensitivity identified related to Rural Residential and Remnant Woodlands which were rated as moderate. This sensitivity has seen the overall Impact of these locations assessed as at the higher impacts ranging from low to moderate prior to mitigation. The focus on development should be in these locations.

Visual impact assessment assessed 14 viewpoints. Typically impacts were assessed as low or low to moderate. Like landscape character areas of highest sensitivity related to rural residential or remnant woodland locations which are limited within the corridor.

The highest sensitivity was for viewpoint (VP) 1 which was a rural residential view. This in turn returned the highest overall impact of Moderate to high. Typically, the high impacts were moderate with the majority low to negligible. Post mitigation all impacts were reduced to moderate or less.
Contents

1 Introduction 1
   1.1 Background 1
   1.2 Proposal Description 1
   1.3 Purpose of report 4
   1.4 Background Documents 4

2 Context 6
   2.1 Location 6
   2.2 Land Zoning 8
      2.2.1 RU – 1 Primary Production 8
      2.2.2 Zone R5 Large Lot Residential 9
   2.3 Heritage 9
      2.3.1 Aboriginal Heritage 9
      2.3.2 Non-Aboriginal Heritage 10
   2.3.3 European Explorers 10
   2.4 Vegetation 10
   2.5 Topography and Drainage 12
      2.5.1 Landform 12
      2.5.2 Drainage 12

3 Design Strategy 14
   3.1 Introduction 14
   3.2 Urban and Landscape Design Principles and Objectives 14
      3.2.1 Principle 1 - Contribute to the overall landscape structure and revitalisation of the region 14
      3.2.2 Principle 2 – Respect the land uses and built form of the corridor 14
      3.2.3 Principle 3 – Connecting modes and communities 14
      3.2.4 Principle 4 – Fit the landform of the corridor 15
      3.2.5 Principle 5 - Responding to natural pattern 15
      3.2.6 Principle 6 - Protect and enhance the heritage and cultural values of the corridor 15
      3.2.7 Principle 7 - Designing an experience in movement 15
      3.2.8 Principle 8 - Creating self-explaining road environments 15
      3.2.9 Principle 9 - Achieving integrated and minimal maintenance design 15
   3.3 Proposal 16
   3.4 Key Urban and Landscape Design Strategies 16
      3.4.1 Specific Landscape Strategies for each Project Section 16
   3.4.2 Grading 17
   3.4.3 Vegetation 17
   3.4.4 Road barriers 17
   3.4.5 Signage 18
   3.4.6 Interpretation 18
4 Assessment Methodology

4.1 Introduction
4.2 Landscape Character and Impact Assessment
4.3 Visual Impact Assessment
4.3.1 Visibility
4.3.2 Static Receptors
4.3.3 Mobile Receptors
4.4 Landscape Character and Visual Assessment Matrix

5 Landscape Character Assessment

5.1 Landscape Character Assessment
5.2 Landscape Character Zone Definitions
5.2.1 Intensive Agriculture
5.2.2 Broad Scale Agriculture - Open Woodland
5.2.3 Broad Scale Agriculture - Grassland
5.2.4 Remnant Woodland or Screening Vegetation
5.2.5 Rural Residential
5.3 Landscape Character Zones
5.3.1 Landscape Character Zone – NMS1
5.3.2 Landscape Character Zone - NMS2
5.3.3 Landscape Character Zone – NMS3
5.4 Landscape Character Assessment Summary

6 Visual Impact Assessment

6.1 Key Viewpoints
6.1.1 VP1 – NMS1
6.1.2 VP2 – NMS1
6.1.3 VP3 – NMS1
6.1.4 VP4 – NMS1
6.1.5 VP 5 – NMS2
6.1.6 VP 6 – NMS2
6.1.7 VP 7 – NMS2
6.1.8 VP 8 – NMS2
6.1.9 VP 9 – NMS3
6.1.10 VP 10 – NMS3
6.1.11 VP 11 – NMS3
6.1.12 VP 12 – NMS3
6.1.13 VP 13 – NMS3
6.1.14 VP 14 – NMS3
6.2 Visual Assessment Summary

7 Mitigation

7.1 Mitigation Measures
7.2 Mitigation Summary
7.2.1 Grading: - Integration of earthworks design with existing landform
7.2.2 Vegetation protection and Revegetation
7.2.3 Minimisation of road furniture and signage:
7.2.4 Use of "soft engineering" and well-integrated drainage facilities:
7.2.5 Provide interest and experiences along the route

8 Conclusion
9 Bibliography
List of Figures

Figure 1 – Regional Context Plan, A39 Newell Highway – North Moree (Based on Open Street Map data, 2018) 3

Figure 2 – Guideline Covers 5

Figure 3 – Local Context Plan, A39 Newell Highway – North Moree (Based on Open Street Map data, 2018) 7

Figures 4a and 3b – Intensive agricultural land use 8

Figure 5 – Broad scale agricultural land use 8

Figure 6 – Large Lot Residential on the outskirts of Moree. View looking east from Newell Highway/Moree Bypass interchange. (Image: Google 2015) 9

Figure 7 a) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions. b) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion 12

Figure 8 – Approach to Marshalls Pond Creek - Vegetation delineates the creek line 13

Figure 9 – Stage Coach – Spring Hill and Waiting for the Coach part of the Shadows of the Past installation 18

Figure 10 – Typical Intensive Agriculture Character - Looking east from Stirton Road at Moree end of NMS1 Newell Highway is located to left of image. 22

Figure 11 – Typical Broad Scale Agriculture Open Woodland Character. Looking northwest along Milo Road at NMS2 CH5850.000. 22

Figure 12 – Typical Broad Scale Agriculture Open Woodland Character. Looking east from Rest Area to south of Bogamildi Road at NMS2 CH3400.000. 23

Figure 13 – Typical Broad Scale Agriculture Grassland Character – NMS3 Looking north along highway at CH 7000.000 23

Figure 14 – Typical Highway Rail Corridor Grassland Character – NMS1 Looking south to rail corridor at CH 3250.000 24

Figure 15 – Typical Remnant Woodland or Screening Vegetation – NMS2 Looking north along enclosed highway corridor from CH9300.000 south of Croppa Moree Road. 24

Figure 16 – Typical Rural Residential Property frontage – NMS1 25

Figure 17 – Rural Residential Highway Corridor Landscape Character. NMS1 – Looking south from CH800.00. 26

Figure 18 – NMS1 – Landscape Character Map 1 of 1 (Based on Open Street Map data, 2018) 27

Figure 19 – Broad Scale Agricultural Landscape Character. NMS1 – Looking northwest across grazing land from CH950.000. 28

Figure 20 – Typical Intensive Agriculture Character - Looking east from Stirton Road at Moree end of NMS1. Newell Highway is located to left of image. 29

Figure 21 – Intensive Agricultural Landscape Character with Big Sky views. NMS2 – Looking north from Private Access Road at CH 7700.000. 30
Figure 22 – NMS2 – Landscape Character Map 1 of 2 (Based on Open Street Map data, 2018)

Figure 23 – NMS2 – Landscape Character Map 2 of 2 (Based on Open Street Map data, 2018)

Figure 24 – Remnant Woodland Highway Corridor Landscape Character. NMS2 – Looking north from CH 8660.000.

Figure 25 – Broad Scale Agricultural Open Woodland Landscape Character. NMS2 – Looking west along Milo Road from CH 5850.000.

Figure 26 – Intensive Agricultural Landscape Character. NMS3 – Looking west from highway at CH 7600.

Figure 27 – NMS3 – Landscape Character Map 1 of 3 (Based on Open Street Map data, 2018)

Figure 28 – NMS 3 – Landscape Character Map 2 of 3 (Based on Open Street Map data, 2018)

Figure 29 – NMS3 – Landscape Character Map 3 of 3 (Based on Open Street Map data, 2018)

Figure 30 – Broad Scale Agricultural Grassland Landscape Character. NMS3 – Looking north along highway corridor from CH3600.000.

Figure 31 – Broad Scale Agricultural Open Woodland Landscape Character. NMS3 – Looking southeast from Rest Area at CH3450.000.

Figure 32 – Remnant Woodland of the Highway Corridor Landscape Character. NMS3 – Looking north along highway from CH750.000.

Figure 33 – NMS1 – Key Viewpoints Map 1 of 1 (Based on Open Street Map data, 2018)

Figure 34 – Looking south to Private Rural Residence entry at NMS1 – CH 275.000.

Figure 35 – Looking north from highway at NMS1 – CH 900.000. Rural residential development adjoins both sides of the corridor.

Figure 36 – Looking north to Moree TAFE Agricultural Skills Centre from NMS1 – CH 2600.000.

Figure 37 – TAFE Agricultural Skills Centre Campus, looking west from highway at NMS1 – CH 2900.

Figure 38 – Looking north from culvert at NMS1 – CH 4150.000.

Figure 39 – NMS2 – Key Viewpoints Map 1 of 2 (Based on Open Street Map data, 2018)

Figure 40 – NMS2 – Key Viewpoints Map 2 of 2 (Based on Open Street Map data, 2018)

Figure 41 – Looking north towards Newport Road intersection from NMS2 – CH 2500.000.

Figure 42 – Looking north along highway towards Milo Road intersection from NMS2 – CH 4900.000.

Figure 43 – Looking north along highway from NMS2 – CH 6600.000.

Figure 44 – Looking east from NMS2 – CH 7700000.

Figure 45 – NMS3 – Key Viewpoints Map 1 of 3 (Based on Open Street Map data, 2018)
Figure 46 – NMS3 – Key Viewpoints Map 2 of 3 (Based on Open Street Map data, 2018)

Figure 47 – NMS3 – Key Viewpoints Map 3 of 3 (Based on Open Street Map data, 2018)

Figure 48 – Looking north from NMS3 – CH 2100.000.

Figure 49 – Looking north from NMS3 – CH 3200.000.

Figure 50 – Looking east from NMS3 – CH 3450.000.

Figure 51 – Looking north from NMS3 – CH 4300.000.

Figure 52 – Looking north from NMS3 – CH 5400.000.

Figure 53 – Looking east across rest area to highway at NMS3 – CH 5550.000.

Figure 54 – Looking north along highway from NMS3 – CH 7900.000.

Figure 55 – Looking north along highway from NMS3 – CH 13900.000.

List of Tables

Table 1 - Proposal Segment Summary

Table 2 – Landscape Character and Visual Impact Assessment Matrix

Table 3 – Landscape Character Assessment Summary

Table 4 - Visual Impact Assessment Summary
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 three segments of the highway north of Moree in north west NSW (the proposal). The proposal is in the Moree Plains Local Government Area (LGA) 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 three segments of the existing highway north of 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
- Upgrade numerous existing intersections along the highway to include channelised right hand turn with an auxiliary lane turn treatments
- Provision of three metre wide shoulders for 30 metres on either side of property access
- Improve the Newell 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 of ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures as required.
The proposal would be delivered in three segments with a combined length of 30 kilometres of upgrades along the highway, north of Moree. The three segments and indicative work locations are described in Table 1.

Table 1 - Proposal Segment Summary

<table>
<thead>
<tr>
<th>Reference</th>
<th>Location</th>
<th>Proposed works</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Moree Segment 1</td>
<td>4.2 kilometres to 9.2</td>
<td>Upgrading 5 km of the Newell Highway</td>
</tr>
<tr>
<td>(NMS1)</td>
<td>kilometres north of Moree</td>
<td>(heavy duty pavement)</td>
</tr>
<tr>
<td>North Moree Segment 2</td>
<td>17.6 kilometres to 27.4</td>
<td>Upgrading of 9.8 km of the Newell</td>
</tr>
<tr>
<td>(NMS2)</td>
<td>kilometres north of Moree</td>
<td>Highway (heavy duty pavement)</td>
</tr>
<tr>
<td>North Moree Segment 3</td>
<td>36.9 kilometres to 53.0</td>
<td>Upgrading 16.1 km of the Newell</td>
</tr>
<tr>
<td>(NMS3)</td>
<td>kilometres north of Moree</td>
<td>Highway (heavy duty pavement)</td>
</tr>
</tbody>
</table>

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. The three segments of the proposal do not pass through any townships and so speed limits do not change within the proposal extents.

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

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, A39 Newell Highway – North 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 of the proposed 30.2 kilometres segmented upgrade of the A39 Newell Highway, north from Moree. As part of this process a review of the design is to be undertaken and recommendations made as to its integration within the road corridor.

This assessment and recommendations will 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
Figure 2 – Guideline Covers
2 CONTEXT

2.1 Location

The Newell Highway 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 Moree and Tulloona, (refer Figure 3 – Local Context Plan), and crosses the local government area of Moree Plains Shire Council. It is located west of the Great Dividing Range in the north west of NSW. Moree is situated 630 kilometres north west of Sydney via the Kamilaroi and Newell Highways and 475 kilometres south west of Brisbane via the Warrego, Gore and Newell Highways. Moree located on the Macintyre River is 120 kilometres south of the Queensland border.

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 Newell Highway – North Moree (Based on Open Street Map data, 2018)
2.2 Land Zoning

The proposal comprising NMS1 to NMS3 passes through the local government area of Moree Plains Shire and is subject to the Moree Plains Local Environmental Plan 2011.

2.2.1 RU – 1 Primary Production

Zoning within segments NMS1 to NMS3 of the proposal comprises the dominant land use of the area being zoned RU – 1 Primary Production. RU – 1 Primary Production zoning has the following Objectives:

- 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 flat 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.

![Figures 4a and 3b – Intensive agricultural land use](image1)

- a) View looking north from private access road west of Newell Highway, NMS22 at CH 8350.000.
- b) View looking east towards Marshall Ponds Creek from Newell Highway, north of NMS2 at CH 125.000

![Figure 5 – Broad scale agricultural land use](image2)

- a) View looking west along private access road from Newell Highway, south of Success Park Road near NSM3.
- b) View looking south along Newell Highway north of Croppa Moree Road at north end of NSM3.
2.2.2 Zone R5 Large Lot Residential

Large Lot Residential zoning is typically located in association with the regional centres, in this case the north-eastern outskirts of Moree (and occurring in NMS1) and further to the north along the Gwydir River to the west of the proposal. It is typified by large residential lots with open woodland, grassland or orchards with open frontages and dwellings set well back from boundaries and frontages refer Figure 6. The Objectives of this zone are:

- To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.
- To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.
- To ensure that development in the area does not unreasonably increase the demand for public services or public facilities.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To permit rural uses and rural industries compatible with the character, land use and lot size patterns of the neighbourhood.

Properties zoned as such typically reflect those seeking the amenity of a larger holding with the benefits of being close to town. This land use is likely to be sensitive to changes associated with the road corridor.

2.3 Heritage

2.3.1 Aboriginal Heritage

The original occupants of the region were the Kamilaroi Tribe (also Gamilaraay). 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 as 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.

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 two known Aboriginal heritage sites located along the existing highway corridor within the project works area. These sites are described as Aboriginal culturally modified trees on an undulating alluvial plain, on the...
bank of an ephemeral minor watercourse, within a highly-modified woodland environment. OzArk Environmental & Heritage Management, 2017)

Specific management recommendations apply to these sites to ensure no direct or indirect harm arises from the Proposal. The design of the highway should respond to these constraints. As part of the urban design the opportunity to interpret these connections should be explored.

2.3.2 Non-Aboriginal Heritage
The heritage of the highway in this section of the corridor between Moree and Boggabilla is linked to the development of Moree and the region at large. The town of Moree was laid out in 1860 and an additional court was established there in 1862, although a courthouse building was not built until 1874.

Bores form a key element of Moree’s history with the first bore sunk into the Great Artesian Basin in 1895. Moree’s hot artesian water initially sustained a wool-scouring industry and continues to be exploited as a tourist attraction.

One heritage item listed on the Moree LEP is located approximately 500 metres east of NMS3: Dwelling house – “Terlings” (I026) and is not visible from the highway corridor being separated by terrain and vegetation.

2.3.3 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 the Boggabri area in the north of Narrabri Shire from 1826-1831.

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 plant community types, two of which are 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 7 including:

- Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland (Critically Endangered – EPBC Act)
- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (Endangered – BC Act) also includes Weeping Myall Woodlands (Endangered – EPBC 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).

A further five 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:
- Koala (Vulnerable EPBC Act and 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.

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.

2.5.2 Drainage

The study area for North Moree falls within the catchment of the Gwydir River (NMS1 and 2) and Border Rivers (NMS3). Both catchments flow in a westerly direction from the Great Dividing Range and form part of the Murray Darling Basin.

The hydrology of each section has its own drainage network:

- NMS1 is not traversed by any watercourses although is located in close proximity to the Gwydir River which passes within 1.3 km to the north of the alignment.
- NMS2 traverses two major intermittent watercourses—Marshalls Ponds Creek and Wallon Creek—and one minor ephemeral watercourse
- NMS3 traverses two major intermittent watercourses—Gil Gil Creek and Nee Nee Creek—and two minor ephemeral tributaries of these creeks.

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.

These creek lines are often associated with remnant vegetation and form a strong visual element within the landscape.
The agricultural land adjoining the highway has been developed to channel and funnel water around the respective properties. From the highway significant drainage berms and channels are visible.
3 DESIGN STRATEGY

3.1 Introduction

The character of the Newell Highway is a product of the context (i.e., 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 corridors), 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 corridor 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 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 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 residential properties, and the townships the highway connects.
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 corridor to limit impacts to adjoining vegetation communities and farm holdings.
- Provide a formation which improves flood immunity.

3.2.5 Principle 5 - Responding to natural pattern

Objectives:
- The route 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.
- 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 endless plains to the east and west.
- Use landscape features 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 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 project. 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:
3.3 Proposal

The proposal would be delivered in three segments with a combined length of about 30.8 kilometres of upgrades along the Newell Highway north of Moree.

Key features of the proposal include:

- Upgrading and resurfacing three segments of the existing highway north of 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 medians
- Upgrade numerous existing intersections along the Newell Highway to include auxiliary lane turn treatments and / or channelised turn treatments
- 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
- Utility relocations as required
- Property acquisitions as required
- Temporary construction of ancillary facilities, including construction compounds, stockpile sites and erosion and sedimentation measures 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; and
- 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.

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.

NMS1

- Retain visual screening to rural residential properties fronting the highway
Use vegetation in scattered copses of trees to frame and direct views across the plains

- Retain broad open views across the plains

NMS2
- Provide woodland revegetation reflecting the remnant community through which the highway passes
- Utilise vegetation to reinforce the alignment by defining edges of bends
- Retain broad open views across the plains
- Reinforce the vegetation of creek lines and watercourses which cross the alignment.

NMS3
- Retain broad open views across the plains
- Retain sense of enclosure within woodland areas
- Reinforce the vegetation of creek lines and watercourses which cross the alignment.

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 two protected vegetation communities listed under the both the Biodiversity Conservation Act 2016 and the Environment Protection and Biodiversity Conservation Act 1999. The corridor provides a network of vegetation which links vegetation reserves and communities and enhances fauna connectivity in what is a highly modified and cleared landscape setting.

The revegetation strategy should relate to the distribution of the various vegetation communities and reinstate these where removed or modified by the proposal. 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 potentially 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.

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 it passes have a rich cultural overlay that could be explored as part of an overlay to the proposal.

It is suggested that a strategy be adopted to provide a greater understanding of the context of the highway by exploring the rich heritage and predominant land use along the corridor. Such a project would be similar to that developed by the Southern Midlands Council. Southern Midlands Council commissioned “Shadows of the Past” a project which interprets the heritage of the region through which the Heritage Highway passes. The designs by local artists Folko Kooper and Maureen Craig utilises silhouettes within the landscape, refer Figure 9, whose themes are derived from colonial records of the region.

![Figure 9 – Stage Coach – Spring Hill and Waiting for the Coach part of the Shadows of the Past installation](https://www.southernmidlands.tas.gov.au/Shadows_of_the_Past/)

This type of installation could enlighten and entertain travellers along this inland highway, assist in the promotion of tourism and the promotion of 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 views 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 prospectors 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 viewpoint. 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

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>High Impact</th>
<th>High - Moderate</th>
<th>Moderate</th>
<th>Negligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High Impact</td>
<td>High - Moderate</td>
<td>Moderate</td>
<td>Negligible</td>
</tr>
<tr>
<td>Moderate</td>
<td>High - Moderate</td>
<td>Moderate</td>
<td>Moderate – Negligible</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
<td>Moderate – low</td>
<td>Low</td>
<td>Negligible</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
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
Five character zone types have been defined for the North Moree study area. These are:

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

5.2.1 Intensive Agriculture
Intensive agricultural land use is highly ephemeral and managed; refer Figure 10, 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.
5.2.2 Broad Scale Agriculture - Open Woodland

Broad Scale Agriculture - Open Woodland, depicted Figure 11 and 12, 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.
5.2.3 Broad Scale Agriculture - Grassland

Broad Scale Agriculture - Open Grassland, refer Figure 13 and 14, 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 12 – Typical Broad Scale Agriculture Open Woodland Character. Looking east from Rest Area to south of Bogambil Road at NMS2 CH3400.000.
5.2.4 Remnant Woodland or Screening Vegetation

Remnant Woodland or Screening Vegetation, refer Figure 15, 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 has a 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.

5.2.5 Rural Residential

Rural residential is primarily located at the southern limits of the corridor. While a prescribed land use zoning a similar development pattern has developed independent of the land use zoning in which smaller farm properties have clustered together presenting a higher frequency of entry gates to the highway and a high level of vegetation screening, as illustrated Figure 16.
These properties generally have been assessed as having a high sensitivity to the highway as amenity is a key driver of the development form.

- Generally fenced from highway with feature gates at entrance
- Strong vegetated highway frontage with limited views beyond corridor.

![Figure 16 – Typical Rural Residential Property frontage – NMS1](image)

5.3 Landscape Character Zones

5.3.1 Landscape Character Zone – NMS1

NMS1 is the southern-most section of the proposal area, extending from the intersection with Stirton Road on the outskirts of Moree, northwards for 5 kilometres to the rest area near Boolooroo Weir Road. The extents of the differing landscape character zones through which this section passes are illustrated in Figure 18.

**Rural Residential**

A section of NMS1 on the outskirts of Moree between near Gwydirfield Road intersection has a distinct rural residential character, created by an increased density of urban elements within close proximity to the corridor, refer to Figure 17. These include features such as a higher number and more ornamental entrance gates to private driveways, billboards and more structured screen plantings along frontages.

To the east despite this increase in urban details intensively managed agricultural landscape can be discerned through the boundary plantings.
Sensitivity: Moderate

The character zone has well established and highly managed vegetation structure screening adjacent private land from traffic, as well as defining the corridor. Vegetation consists of a combination of trees and smaller shrubs to the frontages, framing local and regional views. The distinct vegetation character makes this zone susceptible to changes in alignment and form of the highway with a moderate sensitivity.

Magnitude: Low

The proposal is for the highway to be widened to the western side of the corridor closer to the rural residential properties. The proposal is for these works to occur within the existing highway corridor which should limit overall impact to the adjoining vegetation, and the character that it provides the corridor. Localised impacts could occur resulting in a slight thinning of the vegetation defining the corridor. The overall impact of this on the corridor is considered to be low.

Summary: Low to Moderate

There would typically be a Low to Moderate level of impact on the rural residential character of this landscape based on its moderate sensitivity to changes in highway alignment and potential minor loss of some existing screening trees in close proximity to the carriageways.

Mitigation:

- Reinstate vegetation to reflect existing composition structure, ensuring provision of screen planting to residential properties which have lost vegetation cover.

Mitigation measures will not alter the overall impact of the proposal which will remain low to moderate.
Figure 18 – NMS1 – Landscape Character Map 1 of 1 (Based on Open Street Map data, 2018)
Broad Scale Agricultural – Woodland and Grasslands

The wider landscape throughout NMS1 is primarily intensively developed and managed agricultural land. Broad scale agricultural land uses are generally confined to creek lines, the highway verges which it shares with the rail corridor (located to its’ east) and are typically comprised of grasslands with scattered remnant vegetation. The density of canopy trees varies. The visual impact of the rail corridor on the highway corridor is generally low. This however varies as the density of groundcover (grasses) and the effectiveness at screening is determined by seasonal influences and maintenance regimes.

West of the highway from CH170.000 to CH5200.000, the landscape is a mixture of grazing and open grassland surrounded by pockets of rural residential lots, concentrated along the highway, refer Figure 19. This links with areas of scattered tree cover becoming increasingly dense further northwest towards the Gwydir River. To the east of the highway, low intensity grazing is only present in isolated pockets and marginal areas northwards through to the Gwydir River Bridge.

Figure 19 – Broad Scale Agricultural Landscape Character. NMS1 – Looking northwest across grazing land from CH950.000.

Sensitivity: Low

The general openness and lack of defining vegetative structure of grassland throughout the wider highway corridor with scattered open woodland becoming established further away from the highway makes this character zone low sensitivity.

Magnitude: Low

The proposed minor widening of the carriageways and embankments within this character zone, particularly along the eastern verge next to the rail corridor, will not impose a significant change in vegetation structure, view or spatial quality.

Summary: Low

There would be 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 relative distance and current fragmentation of existing trees.
Mitigation:

- Reinstate grassland vegetation to reflect existing composition structure and retain broadscale views.

Mitigation measures will not alter the overall impact of the proposal which will remain low.

Intensive Agricultural

There are broad views of intensive agriculture land use throughout NMS1. The eastern side of the alignment is predominantly intensive agricultural production, Figure 20, from CH00.000 northwards and typically consisting of intensive crops such as wheat. From the Gwydirfield Road Intersection, this landscape continues on both sides of the highway. Views typically extend uninterrupted to the horizon with little or no foreground elements, giving a sense of heightened exposure.

Figure 20 – Typical Intensive Agriculture Character- Looking east from Stirton Road at Moree end of NMS1. Newell Highway is located to left of image.

Sensitivity: Low

The very intensively managed crop lands and uninterrupted views to the horizons have a very low sensitivity to the proposed changes. This reflects the highly variable and managed nature of the landscape and the relatively minor changes proposed as a result of straightening and re-profiling the alignment.

Magnitude: Low

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

Summary: Low

There would be typically be a low level of impact on the character of the intensively managed agricultural landscape in NMS1 based on its low sensitivity to changes in highway alignment and relative absence of existing canopy vegetation.
Mitigation:

- Reinstate vegetation to broadscale open views over intensively managed farmland.

Mitigation measures will not alter the overall impact of the proposal which will remain low.

5.3.2 Landscape Character Zone - NMS2

NMS2 forms the middle section of the Project site area, extending from north of Marshall Ponds Creek about 17.5 kilometres north of Moree, northwards for 9.8 kilometres to Croppa Moree Road, and is illustrated in Figures 22 and 23.

Intensive Agricultural

Much of NMS2, just beyond the road corridor to the east and west is characterised and dominated by vast tracts of intensive agricultural crop fields, bisected by the highway and interrupted in places by vegetated creek lines, canals and pockets of grassland and open woodland, refer to Figure 21.

![Figure 21 – Intensive Agricultural Landscape Character with Big Sky views. NMS2 – Looking north from Private Access Road at CH 7700.000.](image)

Sensitivity: Low

The very intensively managed crop fields are constantly changing in appearance based on seasonal influences, types of crop and management patterns. These factors combined with the mostly uninterrupted long distance views throughout this character zone, to have the sensitivity assessed as low in relation to the types of changes proposed by the highway.

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 despite its realignment. This reflects the horizontal and low profile nature of the proposed works and the ability of the landscape to absorb such structures.

Summary: Low

There would be typically be a low level of impact on the character of intensively managed agricultural landscape in NMS2 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 measures will not alter the overall impact of the proposal which will remain low.
Figure 23 – NMS2 – Landscape Character Map 2 of 2 (Based on Open Street Map data, 2018)
Remnant Woodland or Screening Vegetation -

A limited section of NMS2 highway between CH 7700.000 and Croppa Moree Road at the northern end of the section has an increased sense of enclosure. This is created by scattered trees which increase in density along both sides of the corridor, creating a strongly defined and lineal edge this contrasts strongly with the remainder of NMS2 further south, refer Figure 24.

![Figure 24 – Remnant Woodland Highway Corridor Landscape Character. NMS2 – Looking north from CH 8660.000.](image)

**Sensitivity: Moderate**

The section of highway has a well-established and fairly consistent density of vegetation structure defining the corridor, and screening the adjacent lands. This combined with the wide even verges and relatively consistent proportions see this area determined as having a moderate sensitivity to change.

**Magnitude: Low**

The semi-enclosed woodland character and linear spatial quality of the alignment is largely retained within the proposed alignment adopting the existing general geometry but with a slightly widened footprint. An existing wide verge ensures clearance requirements a minimised. The magnitude of change is consequently considered low.

**Summary: Low to Moderate**

There would typically be a low to moderate level of impact on the semi-enclosed woodland character of this landscape as a result of the scale of the works and sensitivity of the viewer as a result of changes in highway alignment, loss of existing screening trees in close proximity to the carriageways and the resultant scale of cleared corridor.

**Mitigation:**

- Reinstatement disturbed margins of woodland vegetation to retain sense of enclosure

Mitigation measures have the potential to lower the level of impact further to low.
Broad Scale Agricultural

The highway corridor within NMS2 reads as strip of broad scale agricultural grassland, bisecting a vast expanse of intensively developed crop fields, refer to Figure 25. This is contained to the south by the meandering path of Marshall Ponds and its associated vegetation which links with a large crescent of undeveloped grazing land to the north opposite Croppa Moree Road.

Figure 25 – Broad Scale Agricultural Open Woodland Landscape Character. NMS2 – Looking west along Milo Road from CH 5850.000.

Sensitivity: Low

The general openness and lack of defining vegetative structure of grassland throughout the wider highway corridor sees this character zone assessed as of low sensitivity.

Magnitude: Low

The proposed minor widening of the highway and its embankments within this character zone, particularly along the eastern verge next to the rail corridor, will not impose a significant change in vegetation structure or spatial quality. The magnitude of is 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. This is based on the low sensitivity and magnitude of change as a result of the proposed highway alignment.

Mitigation:

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

Mitigation measures will not alter the overall impact of the proposal which will remain low.

5.3.3 Landscape Character Zone – NMS3

The following chapter defines the landscape character zones of NMS3 the extents of which are illustrated in Figures 27, 28 and 29.

Intensive Agricultural

The landscape immediately beyond the highway corridor of NMS3 is dominated by vast tracts of intensive agricultural land use, Figure 26. This character zone provides a stark contrast with the
areas of open grassland and woodland that typically meander along creek lines and are compressed along highway margins. The flatness of these vast areas creates a heightened sense of exposure and isolation.

Figure 26 – Intensive Agricultural Landscape Character. NMS3 – Looking west from highway at CH 7600.

Sensitivity: Low

The intensively managed crop fields are constantly changing in appearance based on seasonal influences, types of crop and management patterns. These factors combined with the mostly uninterrupted long distance views throughout this character zone, see the landscape as having a low sensitivity to changes in the highway landscape.

Magnitude: Low

The general absence of screening vegetation and dominance of regional vistas would not experience changes in quality as a result of the proposal. Consequently, the magnitude of these changes has been assessed as low.

Summary: Low

Based on the low sensitivity to changes and low magnitude of changes proposed the proposal has been assessed to have a low level of impact on the character of these intensively managed agricultural landscape.

Mitigation:

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

Mitigation measures will not alter the overall impact of the proposal which will remain low.
Figure 27 – NMS3 – Landscape Character Map 1 of 3 (Based on Open Street Map data, 2018)
Figure 28 – NMS 3 – Landscape Character Map 2 of 3 (Based on Open Street Map data, 2018)
Figure 29 – NMS3 – Landscape Character Map 3 of 3 (Based on Open Street Map data, 2018)
Broad Scale Agricultural

The highway corridor within NMS3 reads as strip of broad scale agricultural grassland and open woodland, refer to Figure 30. Denser areas of closed canopy woodland, occur along the western side near Bogamildi Road, and have been addressed within this section of the report as Remnant Woodland or Screening Vegetation, refer to Figure 31

This strip of broad scale agricultural character bisects a vast expanse of intensively developed crop fields to east and west and links the partially vegetated major creek lines of Bunna Bunna Creek, Gil Gil Creek and Nee Nee Creek flowing east to west. The highway carriageways are located to the eastern side of this corridor within the south section of NMS3, shifting further to the western side north of Bogamildi Road.

Figure 30 – Broad Scale Agricultural Grassland Landscape Character. NMS3 – Looking north along highway corridor from CH13600.000.

Figure 31 – Broad Scale Agricultural Open Woodland Landscape Character. NMS3 – Looking southeast from Rest Area at CH3450.000.
Sensitivity: Low

The general openness and lack of defining vegetative structure of grassland throughout the wider highway corridor with scattered open woodland becoming established further away from the highway makes this character zone low sensitivity.

Magnitude: Low

The proposed minor widening of the carriageways and embankments within this character zone, particularly along the eastern verge next to the rail corridor, will not impose a significant change in vegetation structure or spatial quality.

Summary: Low

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

Mitigation:

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

Mitigation measures will not alter the overall impact of the proposal which will remain low.

Remnant Woodland

The southern section of NMS3 between CH0.000 and CH1900.000 provides a strong sense of enclosure and linearity created by trees screening views along both highway margins, refer to Figure 32. Woodland vegetation becomes gradually denser further north, particularly to the west of the highway until Bogamildi Road.

Figure 32 – Remnant Woodland of the Highway Corridor Landscape Character. NMS3 – Looking north along highway from CH750.000.
Sensitivity: Moderate

The section of highway has well established and continuous vegetation structure screening adjacent lands from traffic, as well as defining the corridor. A generous grass verge provides a level of adaptability. This creates a character zone which has a moderate sensitivity to changes as a result of strong spatial definition both in relation to the highway corridor but also the broader landscape.

Magnitude: Low

The proposal adopts the existing alignment through much of this zone with some widening of the overall formation as a result of widen verges, drainage etc. The semi-enclosed woodland character and linear spatial quality of the highway would be retained. The magnitude of change is assessed as low.

Summary: Moderate to Low

There would be a moderate to low level of impact on the semi-enclosed woodland character of this landscape. This reflects the adoption of the existing alignment with some widening on the edges.

Mitigation:
- Reinstatement woodland vegetation canopy where disturbed with a grassland verge adjacent carriage way.

Mitigation measures have the potential to lower the impact further resulting in a low impact on landscape character.

5.4 Landscape Character Assessment Summary

There are a limited range of landscape character zones occurring throughout the proposal area and these are generally similar throughout NMS1 to NMS 3. These character areas have been defined as follows:

- Intensive Agricultural
- Broad Scale Agriculture – Open Woodland
- Broad Scale Agriculture – Grassland
- Remnant Woodland or Screening Vegetation
- Rural Residential

Table 3 - Landscape character and Assessment Summary, summarises the findings of the Landscape Character Assessment. In most instances these character zones have been identified as having a low sensitivity to the proposed highway upgrade works, including areas of intensive agricultural, broad scale grassland and open woodland areas.

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 the extent at which the carriageway is to be realigned.

Remnant woodland landscapes generally have been identified as of moderate sensitivity to changes to the highway alignment, reflecting increased density and sense of enclosure provided by the existing landscape and the potential to discern changes.

Rural residential character areas identified in NMS1 are also determined to have a moderate sensitivity to change in character.

Both zones had an overall Landscape character impact of low to moderate.
### Table 3 – Landscape Character Assessment Summary

<table>
<thead>
<tr>
<th>Segment</th>
<th>Character Definition</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Impact Summary</th>
<th>Post Mitigation Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMS1</td>
<td>Rural Residential</td>
<td>Moderate</td>
<td>Low</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td></td>
<td>Broad Scale Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Intensive Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NMS2</td>
<td>Intensive Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Remnant Woodland</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Broad Scale Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NMS3</td>
<td>Intensive Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Broad Scale Agriculture</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Remnant Woodland</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate to Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
6 VISUAL IMPACT ASSESSMENT

6.1 Key Viewpoints

The visual catchment of the proposal varies significantly along its length. NMS1 and NMS2 have the broadest variety of views and visual character from enclosed highway and rail corridor views to rural residential frontages, to regional big sky horizon views.

NMS3 has the most restricted visual envelope with scattered broad scale open woodland throughout many areas or dense woodland lining both sides of the highway along much of its length. This contrasts strongly with NMS1, which predominantly demonstrates a transition from rural properties on the outskirts of Moree to open big sky vistas.

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 typically made up by local commuters and visitors.

Of the adjoining observers it is the residential users who would be most sensitive to change. However potential residential impacts are typically well mitigated by existing screening. There are some exceptions in NMS1 where a few residential buildings are visible from 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.

Views have been selected based on the proposed changes to the highway alignment and their ability to illustrate a variety of interfaces and scenarios. By addressing a number of differing conditions an understanding as to the level of change and its ability to be mitigated can be assessed.

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

- NMS1 Figure 33
- NMS2 Figure 39 and 40
- NMS3 Figure 46, 47 and 48.
Figure 33 – NMS1 – Key Viewpoints Map 1 of 1 (Based on Open Street Map data, 2018)
6.1.1 VP1 – NMS1

View:

VP1 presents a tree lined section along the western side of the highway dominated by screen planting and entrances to rural residential properties, Figure 34. In this instance filtered views to the residence, set less than 50 metres from the highway are possible. Open intensive agricultural views typically extend to the east.

Figure 34 – Looking south to Private Rural Residence entry at NMS1 – CH 275.000.

Sensitivity: High

Residential receptors generally have highest sensitivity and the residences in this segment are set relatively close, (less than 50 metres), from the highway frontage. Generally, well established screen plantings have been established to their boundaries and in the intermediate landscape, providing an effective screen to passing traffic. The sensitivity of these residences is assessed as high due to their close proximity to the proposed works.

Road users have been assessed as having 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 impact for residents has been assessed as moderate as the effective screening is potentially reduced due to removal of vegetation along the western verge between CH 200 and CH 800. These impacts are a result of the need to meet clear zone requirements and accommodate swales within the verges of the widened highway footprint. This may result in a potential increase in the visibility of the highway and its users. The location and extent of driveway interface with the highway would have minor changes with the introduction of swale culverts.

The proposal will not see the overall visual character for road user’s change along either side of the corridor. The removal of a significant tree within the western verge is readily absorbed as this tree currently reads as an extension of wider screening vegetation within private properties. The magnitude of change is for the road user is consequently considered low.

Summary: Moderate-High

The proposed highway upgrade would have an overall moderate to high visual impact at VP1, based on the close proximity of residential dwellings and potential loss of screening trees within the corridor.

The overall experience of the road user would be low.

Mitigation:

- Minimise clearing along frontage of rural residential properties.
- Reinstate screen planting to properties.

Implementation of mitigation measures once established would result in a slight reduction in magnitude and an overall visual impact of moderate.

6.1.2 VP2 – NMS1

View:

VP2, Figure 35, presents a view of the existing highway within the context of rural residential properties on the northern outskirts of Moree. This semi-restricted view along the highway corridor would be slightly eroded by the removal of vegetation along its eastern margins (right of image). Residences located further to the east of view (and not visible within photo) may potentially have increased visibility of the highway. Those to the west are impacted by the proposal.

Figure 35 – Looking north from highway at NMS1 – CH 900.000. Rural residential development adjoins both sides of the corridor.

Sensitivity: Moderate

Residential receptors have the highest sensitivity to change however in this location they are typically set back from highway over 200 metres with established plantings to their boundaries providing effective screening of traffic. Their sensitivity is assessed as moderate.

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. Sensitivity is assessed as low.

Magnitude: Moderate

The magnitude of the impact on residents is assessed as moderate, as the carriageway is moved slightly closer to dwellings, effective screening may be reduced due to loss of existing vegetation, and the location and layout of the residential driveway interface with the highway would have minor adjustments.

Road users would experience low magnitude of change in their view as the existing highway corridor is typically broad with only partial screening of wider views while moving along the highway.
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 have a low overall impact.

Mitigation:

- Reinstate eastern verge 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 to moderate visual impact.

6.1.3 VP3 – NMS1

View:

VP3 presents a broad open and relatively expansive view on approach to the Moree TAFE campus. This facility is partially visible to the left of image, Figure 36. As part of the proposal the highway is to be widened to accommodate a southbound right turning bay enhancing safety on entry into the campus.

Figure 36 – Looking north to Moree TAFE Agricultural Skills Centre from NMS1 – CH 2600.000.
Sensitivity: Moderate

The TAFE facility has been assessed as having a moderate sensitivity as a receptor due to its role as an education facility. This reflects a set back from the highway about 100 metres, and the presence of well-established vegetation providing partial screening of traffic from the facilities, Figure 37.

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. Their sensitivity has been assessed as low.

Magnitude: Low

The view for the TAFE campus is currently partially concealed from highway traffic, (Figure 36), by vegetation along the verge boundary. The proposed widening and additional turning lane is not likely to result in a noticeable increase in visibility of traffic or carriageways and the overall magnitude of impact is assessed as low.

Road users will experience a widening of the carriageways and increased definition of the edges of the alignment. Surrounding vegetation will be retained and the overall impact of change on road users at this location is considered low.

Summary: Low to Moderate

The proposed highway upgrade would have an overall low to moderate visual impact at VP3, based on the moderate sensitivity of nearby receptors and widening of the proposed alignment. The road user’s impact is considered low.

Mitigation:

- Provide screen planting in agreement with TAFE.

Implementation of mitigation measures would not result in a change in overall visual impact.
6.1.4 VP4 – NMS1

View:

The view (VPT4) looking north taken from a culvert crossing presents an expansive view with a road margin of scrubby vegetation comprised predominantly of shrubs and grasses, refer Figure 38. This vegetation partially contains views to the corridor, with intermittent wider views of the intensive agriculture landscape to the east and west. A woodland canopy associated with the Gwydir River terminates the view in the background.

![Figure 38 – Looking north from culvert at NMS1 – CH 4150.000.](image)

Sensitivity: Low

The experience of this view is from the road user’s perspective. Their sensitivity is considered to be low due to their ephemeral experience of the highway, the ephemeral nature of the croplands, absence of distinctive landmarks or signature vegetation and inherent expectation of intermittent changes in view and landscape character.

Magnitude: Low

Road users will experience some reduction in the definition of the alignment due to the removal of vegetation along the western margin. This vegetation however is predominantly low and loosely distributed. The impact of this is considered low.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP4. This reflects the motorist as the dominant receptor, poorly defined vegetation structure and surrounding wide scale intensive land use adjacent the highway.

Mitigation:

- Reinstate vegetation to retain broadscale views across the plain
- Plant shrub vegetation to provide some delineation of the alignment.

Implementation of mitigation measures would not alter overall visual impact.
Figure 39 – NMS2 – Key Viewpoints Map 1 of 2 (Based on Open Street Map data, 2018)
Figure 40 – NMS2 – Key Viewpoints Map 2 of 2 (Based on Open Street Map data, 2018)
6.1.5 VP 5 – NMS2

View:

Figure 41 shows the existing view (VP5) looking north to Newport Road intersection, and highlights the lack of defining vegetation or screening with weedy grassland margins extending along both sides. The earth bunds are visible to the west and extend into the distance.

Figure 41 – Looking north towards Newport Road intersection from NMS2 – CH 2500.000.

Sensitivity: Low

There are no residential receptors within visual range of this view.

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

Magnitude: Low

The magnitude of change for road users would be low, as the proposed alignment is on-line with existing and the addition of a southbound right turning lane at Newport Road intersection would not require significant widening of the carriageways. There is no substantial vegetation to be affected by the proposed works. Views to the east across the open intensive agricultural land beyond would be unaffected.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP6, based on low sensitivity of receptors and relatively insignificant visual change to the highway and key views.

Mitigation:

- Reinstate vegetation to retain broadscale views across the plain.

Implementation of mitigation measures would not alter overall visual impact.
6.1.6 VP 6 – NMS2

View:

Figure 42 shows the existing view (VP6) looking north to Newport Road intersection. The view displays a broad and loosely defined vegetated corridor with the existing carriageways flanked by grasses and low shrubs. The edges are defined by woodland canopy which terminates the view to either side of the alignment.

![Figure 42 – Looking north along highway towards Milo Road intersection from NMS2 – CH 4900.000.](image)

Sensitivity: Low

There are no residential receptors within visual range of this view.

Road users at this location have been assessed to have 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. The presence of a defining canopy and backdrop enable changes to be readily absorbed within the landscape.

Magnitude: Low

The proposal maintains the current alignment with a minor expansion in overall footprint. These changes in spatial character are considered to present a low change to the road user. This reflects the use of the current alignment of the highway minimal extents of vegetation (tree removal).

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP6, based on the well-defined spatial quality of the corridor and low degree of change to the road user’s experience.

Mitigation:

- Reinstate of existing vegetation cover reflecting the grass verge with a low tree cover to edge beyond the immediate verge environs either side of the highway

Mitigation measures will not alter the overall impact of the proposal which will remain low to moderate.
6.1.7 VP 7 – NMS2

View:

VP7 illustrates the existing view (Figure 43) looking north from CH6600.000. The view displays a generally flat and loosely defined vegetated corridor with the existing carriageway making a gentle curve to the east. Woodland vegetation defines the middle and background views. The proposal will result in a minor increase in overall formation width.

![Figure 43 – Looking north along highway from NMS2 – CH 6600.000.](image)

Sensitivity: Low

There are no residential receptors within visual range of this view.

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

Magnitude: Low

The proposal will retain the present slightly curved alignment of the existing highway. The magnitude of change for road users would be low, reflecting the retention of the existing spatial character.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP7, based on the retention of the highway alignment and the resultant minimisation in vegetation loss.

Mitigation:

- Reinstate verge with grassland species and where required reinstate trees lost as a result of the construction process.
- Implementation of mitigation measures would not alter overall visual impact.
6.1.8 VP 8 – NMS2

View:

Looking east from a private access road at CH7200.000 (VP8 - Figure 44) where the proposal departs from the existing alignment, moves to the west and is proposed to run parallel to the fence line resulting in the loss of vegetation (centre of image). The interface of the private access road with the proposal would be formalised to meet current safety standards, resulting in an increase in scale of road.

Sensitivity: Low

The residential receptor using this access road is located approximately 1.5 kilometres to the west beyond visual range of the proposal. The experience of the arrival and departure from the property pictured would be changed as a result of the highways realignment and changes to the verge along the frontage. These changes would result in the greater exposure of the highway to the property as the majority of screening vegetation would be removed. However, there would likely be negligible direct visual connection to dwellings. Their sensitivity is assessed as low.

Road users at this location generally the viewer will 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. Their sensitivity is consequently considered low.

Magnitude: Low

The highway corridor currently has a changing spatial character and the view currently has poor symmetry and random distribution of elements in the landscape. The proposal has adopted the existing alignment, centred off-line of the highway. The impacts on adjoining vegetation are minimised with vegetation cover largely retained. The impacts have been assessed as low.

The magnitude of change for both private access road and highway users would be low, as views remain largely unchanged.

Summary: Low to Moderate

The proposed highway upgrade would have an overall low visual impact at VP8, based on the proposed loss of vegetation and potential deviation of the road, impacting wider views.

Mitigation:

- Reinstate vegetation community where cleared in order to recreate the existing sense of enclosure and definition of the alignment.

Implementation of mitigation measures once established would result in minimal changes in overall appearance.
Figure 45 – NMS3 – Key Viewpoints Map 1 of 3 (Based on Open Street Map data, 2018)
Figure 46 – NMS3 – Key Viewpoints Map 2 of 3 (Based on Open Street Map data, 2018)
6.1.9 VP 9 – NMS3

View:

Figure 48 shows the existing view at CH2100.000 (VP9) looking towards Murrays Road intersection a kilometre to the north. The view displays a broad and loosely defined vegetated corridor with the existing carriageway located centrally within a broad scale grassland margin that extends to the defining tree line.

Figure 48 – Looking north from NMS3 – CH 2100.000.

Sensitivity: Low

There are no residential receptors within visual range of this view.

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 landscape character.

Magnitude: Negligible

The proposal maintains the alignment of the existing carriageways with a slight expansion in footprint and would not alter the spatial qualities of the alignment. The magnitude of change for road users would be negligible, as the spatial character of the corridor would remain unchanged.

Summary: Negligible

The proposed highway upgrade would have an overall negligible visual impact at VP9. The spatial quality of the corridor is retained and its verges while expanded will visually be very similar.

Mitigation:

- Reinstate verges with grassland landscape.

Implementation of mitigation measures will result in no change to the overall visual impact.
6.1.10 VP 10 – NMS3

View:

The images depict the existing view at CH3200.000 (Figure 49) and CH3450.000 (Figure 50) looking to and from the rest area located between Murrays Road and Bogamildi Road. Figure 49 displays a broad and loosely defined vegetated corridor with the existing carriageway and rest area located within broad scale grassland margins extending in to the nearby scattered trees.

Figure 49 – Looking north from NMS3 – CH 3200.000.

Figure 50 – Looking east from NMS3 – CH 3450.000.
Sensitivity: Moderate

There are no residential receptors within visual range of this view.

*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 landscape character.

*Rest area users* have a higher sensitivity due to the desire to achieve some respite from their journey and their tendency to linger for a period of time. Their sensitivity is considered *moderate*.

Magnitude: Moderate

The proposal is located largely on-line with widening and introduces northbound and southbound right turning lanes to the carriageway. This would widen the road by an additional lane width and extends pavement further into verges to accommodate broader embankments and swales. This however is unlikely to require the removal of existing trees.

The magnitude of change for *road users* would be *low*, as the spatial character and vegetation structure of the corridor would not change significantly.

*Rest area users* would experience the movement of the road closer to the facility and the loss of verge buffering. The impact is considered *moderate* due to the limited separation that exists at present.

Summary: Moderate

The impact on the rest area at VP10 is considered *moderate* due to the increase in scale and proximity of the road to users of the facility.

The experience of the road user is considered to have a low visual impact at VP10, reflecting the preservation of spatial quality of the corridor.

Mitigation:

- Reinstate verges with grassland landscape
- Provide a degree of visual separation from the highway at rest areas without screening.
- Provide shade trees to rest area.

Implementation of mitigation measures will result in no change to the overall visual impact although will enhance the overall amenity of the rest area.

6.1.11 VP 11 – NMS3

View:

VP11 - Figure 51 illustrates the existing view north from CH4300.000. The view displays a broad and evenly defined vegetated corridor with a denser tree cover and narrower grass verges than VP9 and VP10.
Sensitivity: Low

There is a residential receptor located about 350 metres to the west of the highway with limited views of the traffic. This is assessed as having a moderate sensitivity due to its setback from the highway and established vegetation in the intermediate landscape.

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 landscape character.

Magnitude: Low

The nearby residential receptor would likely experience negligible visual change as a result of the proposal as the alignment remains largely unchanged and would not impact existing screen vegetation.

The magnitude of change for road users would be low, as the highway corridor has a defined spatial character and the view currently has a symmetry and balanced distribution in the landscape. The proposal retains the existing alignment with a slight expansion in footprint. The spatial quality of the corridor would be unaffected due to the minor changes in formation.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP11, based on the low sensitivity of the road user and low magnitude of change as a result of the retention of the existing alignment.

The overall impact on the residential receptor is negligible.

Mitigation:

- Reinstate verges with grassland landscape.

Implementation of mitigation measures will result in no change to the overall visual impact.

6.1.12 VP 12 – NMS3

View:

VP12 - the existing view at CH 5400.000 looking towards the rest area located at Ch5550.000. The view displays a corridor partially screened on both sides, with scattered trees on the wider western verge allowing filtered views to intensive agricultural land and denser screening vegetation containing views to the east. In the mid ground, Figure 52, a rest area is located along the western edge.
Figure 52 – Looking north from NMS3 – CH 5400.000.

Figure 53 – Looking east across rest area to highway at NMS3 – CH 5550.000.

Sensitivity: Moderate

There are no residential receptors within visual range of this view.

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 landscape character.
Users of the rest area have been assessed to have a moderate sensitivity to impacts from the proposal at this location due to their close proximity (40 metres) to the carriageway, and the purpose of the stop being to gain respite.

Magnitude: Moderate

The proposal is located on the alignment of the existing carriageways. As part of the proposal a widened footprint would extend the formation further into verges to accommodate broader embankments and swales, requiring the removal of some scattered trees within the western verge.

The magnitude of change for road users would be low, as the spatial character and vegetation structure of the corridor would not change significantly.

Magnitude of change for the rest area users would be moderate, reflecting loss of vegetation and movement of the alignment closer to the rest area.

Summary: Moderate

The proposed highway upgrade would have an overall moderate visual impact at VP12. This reflects the impact on the rest area user, the reduced separation from the highway and loss of vegetation screening.

The road user would have an overall low impact reflecting the scale of the corridor and the changeability of the landscape.

Mitigation:

- Provide visual screening to rest area which provides a degree of separation but does not impact passive surveillance of the site.

Implementation of mitigation measures would not alter overall visual impact.

6.1.13 VP 13 – NMS3

View:

Figure 54 shows the existing view at CH 7900.000 (VP13) looking north. The view displays a broad and loosely defined corridor with predominantly scrubby vegetation scattered along both margins and merging with areas of open woodland. The existing carriageway is located closer to the western side of the open grassland verges extending to the boundary with the surrounding intensive agriculture.
Figure 54 – Looking north along highway from NMS3 – CH 7900.000.

Sensitivity: Low

There are no residential receptors within visual range of this view. 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 landscape character. The lack of significant and consistent canopy vegetation also provides a level of robustness to accommodate vegetation clearance.

Magnitude: Negligible

The proposal is located on the alignment of the existing carriageways with a slight widening of the footprint. The magnitude of change for road users would be negligible, as the spatial character of the corridor would not change. Views to the east would not change as existing screening vegetation would not be affected.

Summary: Low

The proposed highway upgrade would have an overall negligible visual impact at VP13, based on the proposed minor changes to spatial quality of the corridor and low impact to the road user’s experience.

Mitigation:

- Reinstate verge to retain broadscale views.

Implementation of mitigation measures would not alter overall visual impact.

6.1.14 VP 14 – NMS3

View:

Figure 55 shows the existing view at CH 13900.000 (VP14) looking north. The highway passes through a broad scale agricultural landscape, and bisects an area of open woodland at this location, creating a broad and loosely defined corridor with a subtle sense of enclosure. The scattered trees extend into the distance to the east. Intensive agricultural crop fields are visible to the west through open sections of the highway verge.
Sensitivity: Low

There are no residential receptors within visual range of this view.

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 landscape character.

Magnitude: Low

The proposal is located on the alignment of the existing carriageway with minor widening to the formation. It may require the removal of some trees along the immediate western verge where they fall within clear zones. This would not affect the perspective of the road user or alter the intermittent views or spatial quality of the highway. The magnitude of change for road users would be low.

Summary: Low

The proposed highway upgrade would have an overall low visual impact at VP14, based on the proposed minor changes to alignment of the proposal and potentially low impact to the spatial quality and road user’s experience.

Mitigation:

- Reinstate verges with grassland landscape.

Implementation of mitigation measures will result in no change to the overall visual impact.

6.2 Visual Assessment Summary

Table 4 – Visual Impact Assessment Summary summarises the overall findings of the visual impact assessment.

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 of high sensitivity as is the case for VP 1.

The magnitude has been assessed as predominantly Low due to the typically open big sky nature of the intensive agricultural landscape, the existing heavy traffic use of the highway and the typically fragmented vegetation and loosely defined corridor. Moderate changes to visual quality typically occur more through NMS1 and NMS3 due to the more defined vegetation structure and potential loss of screening or residential properties in close proximity to the highway.

Generally, it has been assessed that the key vistas and broader landscape character will not be drastically altered from the perspective of land users, residents or road user, and this is reflected in an overall low to moderate rating. Moderate to high rating is identified in NMS1 where rural residential properties are overlooking the corridor and some screening vegetation is likely to be cleared.

The undertaking of mitigation measures has been assessed as lowering the overall impacts so that none are greater than moderate with the majority being low.

Table 4 - Visual Impact Assessment Summary

<table>
<thead>
<tr>
<th>Segment</th>
<th>View point</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Impact</th>
<th>Impact Post Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMS1</td>
<td>VP1</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate to High</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>VP2</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td></td>
<td>VP3</td>
<td>Moderate</td>
<td>Low</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td></td>
<td>VP4</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>VP5</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>VP6</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>VP7</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>VP8</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NMS2</td>
<td>VP9</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>VP10</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>VP11</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>VP12</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>VP13</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td>VP14</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
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 lesson 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.
- 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.
The visual assessment reveals that the Newell Highway from Moree, north to near Kiga Bore Rest Area is a highly active freight corridor with a low level of development or amenity along the corridor, typically limited to open truck rest areas, open woodland and broad vistas of the highly modified agricultural landscape.

NMS1 and 2 typically have broader views and exposure to the intensive agriculture landscape and its wide open vistas. NMS3 is typically more enclosed with the highway generally more contained within broad scale grassland and open woodland landscapes that alternate between the western and eastern margins of the highway corridor.

Landscape Character Assessment

Intensive agricultural landscape and broad scale grassland 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 low to moderate sensitivity to changes. Sensitivity to the highway alignment and corridor increases with closer proximity to the carriageways.

Remnant Woodlands and Rural residential character zones have been determined as having the highest level of sensitivity. This reflects the relative uniqueness of the sense of enclosure provided by vegetation along the highway corridor or the presence of rural residential properties in close proximity to carriageways on the outskirts of Moree.

Rural residential character areas are determined to generally have a high sensitivity due to the presence of entrance features, avenue trees, signature trees and cultural plantings, which reflect both the cultural focus of the occupant but also their concern for the overall amenity of their living environment.

There are no areas identified as having an overall high rating of potential impacts to the landscape character.

Mitigation measures reduce all impacts to low or low to moderate.

Visual Impact Assessment

The overall visual impact of the proposal has generally been assessed as low to moderate due to the present low level of amenity provided by the road corridor and the low to moderate impact the proposed works would have on existing vegetation within the highway corridor.

There are no areas of the proposal identified as having an overall high visual impact on the key receptors or viewpoints identified in this report. With the implementation of mitigation measures the highest impact is moderate with the majority low or negligible.

Mitigation

The alignment generally can be integrated within the broader landscape through the adoption of a number of mitigation strategies.

Key areas of mitigation will be:

- the management of batter slopes to further limit footprint impacts and blend with the surrounding landscape.
- The adoption of appropriate revegetation strategies to reinstate lost vegetation, frame and enhance views, and to screen residential dwellings from views to the highway.

The opportunity to provide greater interest within the corridor is also proposed through the adoption of an interpretation strategy.
NEWELL HIGHWAY, HD PAVEMENTS NORTH MOREE

9 BIBLIOGRAPHY

Jacobs (May 2018) Newell Highway Heavy Duty Pavements, North Moree - Biodiversity Assessment


Roads and Maritime Services - Centre for Urban Design (July 2012) Bridge Aesthetics Design guideline to improve the appearance of bridges in NSW.


Transport for New South Wales (December 2012) NSW Long Term Transport Master Plan

Transport for New South Wales (November 2013) NSW Freight and Ports Strategy

Websites

www.planningportal.nsw.gov.au

Moree Plains Shire Local Environmental Plan 2011

www.southernmidlands.tas.gov.au

Shadows of the Past