New Dubbo Bridge

Urban Design Report and Landscape Character and Visual Impact Assessment

Roads and Maritime Services | February 2019
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Executive summary

Roads and Maritime Services is proposing to enhance the operation of the Newell Highway through Dubbo in order to provide greater reliability for the road network during flooding and to allow the operation of higher productivity PBS3A through Dubbo in line with the Transport for NSW (TfNSW) 2015 Newell Highway Corridor Strategy.

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

The concept design involves approximately 2.2 kilometre of carriageway, commencing at the intersection of Thompson Street and Newell Highway and extending north to the intersection of River Street and Newell Highway. Key features of the design include:

- Upgrading the Thompson Street / Victoria Street intersection on the Mitchell Highway to carry Performance Based Standard 3A (PBS 3A) heavy vehicles
- Replacing the existing T intersection at the Thompson Street / Whylandra Street (Newell Highway) intersection with a four way intersection with traffic lights that can accommodate heavy vehicles
  - Providing a high level flood detour road to the west of the existing Emile Serisier Bridge
- Construction of about 2.2 kilometres of new carriageway with a single lane in each direction between the Thompson Street / Whylandra Street (Newell Highway) intersection and the River Street / Bourke Street (Newell Highway) intersection, including:
  - Two 3.5 metres wide lanes
  - A one metre wide painted median
  - A two metre wide shoulder on both sides of the road
- Construction of a new 16 span high level bridge over the Macquarie River and Brisbane Street. The new bridge would be about 545 metres long and 13 metres wide and would generally include:
  - Two 3.5 metres wide lanes
  - A one metre wide painted median
  - Twin rail safety barriers
  - A minimum vertical clearance of 0.5 metres over the Macquarie River in the 100 year annual reoccurrence interval (ARI) flood event
  - Flood immunity up to the 50 year ARI flood event, determined by the eastern abutment
  - Vertical clearance of 5.3 metres over Brisbane Street
- Construction of around 55 metres of retaining wall structures along sections of River Street
- Upgrading the existing four leg intersection at River Street / Newell Highway (Bourke Street) to include traffic lights that can accommodate heavy vehicles
- Construction of a new intersection between Darling Street and Brisbane Street
- Adjustments to the Brisbane Street / River Street and the Darling Street / River Street intersections including removal of access from Darling Street into River Street
- Road widening and tie-in works
- Construction of a high level flood route west of the intersection between Thompson Street / Whylandra Street (Newell Highway). Widening of the intersection between Mitchell Highway and Thompson Street is provided as part of this flood detour route to facilitate heavy vehicle movements when the flood route is in operation
- Relocation and adjustments of utilities, services, drainage and streetlights
- Property acquisitions, leases and adjustments
• Landscaping
• Temporary construction facilities including construction compounds, stockpile sites, crane pads, access tracks, erosion and sedimentation measures.

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

• Road Design Guidelines
• Environmental Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment - EIA-N04
• Beyond the Pavement, Urban Design Policy, Procedures and Design Principles, Roads and Maritime January 2014
• Landscape Guidelines, Roads and Traffic Authority, April 2008
• Bridge Aesthetics - Design Guidelines to improve the aesthetics of bridges in NSW, 2012
• Noise wall design guideline Design guideline to improve the appearance of noise walls in NSW, Roads and Maritime, March 2016

Context
An understanding of the roads 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:

• Topography and Drainage
• Vegetation
• Land use
• Heritage.

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

Objective 1: Create a design that fits sensitively into the built, heritage and community environment of Dubbo.

Objective 2: Contribute to people’s access and connections across and alongside the river.

Objective 3: Contribute to the urban structure and the overall public domain quality for the community and other users.

As part of the proposal’s concept design development, the urban design strategy developed responds to the:

• Landscape treatment of the formation to fit sensitively within the landscape
• Surface treatment to paths, medians and bridge elements to achieve a consistent design language throughout the proposal
• The nature and placement of roadside furniture
• The planting design required to integrate the proposal into the local landscape.
Landscape Character and Visual Assessment

The landscape character assessment identified five character zones:

- Agricultural
- Industrial
- Residential
- Open Space/Recreation
- Commercial.

Findings

Landscape Character Assessment

Five landscape character units have been identified and assessed as part of the character study. Sensitivity was assessed as high for both rural and residential character zones with the remaining zones ranging from low to moderate. Magnitude of change varied significantly with the industrial and open space zones identified as experiencing high levels of change and residential and commercial experiencing negligible.

Overall character zones where an impact was identified ranged in impact from moderate to moderate to high.

Visual Impact Assessment

The overall magnitude of the proposal has been assessed as moderate. This reflects the establishment of a new alignment in relatively close proximity to an established community within an agricultural landscape. 13 viewpoints were assessed with four viewpoints identified as have moderate to high or high impacts, six as moderate and the remainder either low or low to moderate.

The locations with a high impact will require focused attention in order to moderate and enhance the overall project outcomes.

Mitigation

A number of key mitigation measures are summarised which will assist in mitigating the impacts. These impacts will be taken forward into the detailed design to ensure impacts are minimised. Mitigation measures adopted within the design include:

- Adoption of an alignment which incorporates a separate flood route avoiding need for significant earthworks and floodgates adjoining Emile Seisier Bridge
- A road formation which has adopted grades that have been eased on the floodplain to 1:6 providing a smooth flowing profile and avoiding abrupt changes in the landscape
- Bridge approach batters provide a transitional batter profile easing into steeper grades associated with the abutment
- A planting strategy that has been designed to reflect the native communities or cultural plantings according to context
- Bridge design reflects the requirements of the Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW, RMS, January 2012
- Piers and headstock design has responded to the existing bridge precedents of Dubbo
- Pier form integrates the headstock with the pier and responds to the scale of the structure reflecting either the floodplain or river crossing
• Pier adopts a rounded leading edge to soften the overall pier form and provide some consistency with other piers of Dubbo Bridges
• Retaining walls have adopted a strong textured form to act as an anti-graffiti deterrent
• Lighting design has minimised light spill consistent with the Dark Sky guidelines
• Lighting is to be spaced centrally on bridge spans, providing a structured solution to the bridge lighting
• Intersection design proposes gateway landscape treatments to provide connection to the Dubbo Street form and character.
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1. Introduction

1.1 Proposal identification

In June 2012 Dubbo Council released its “Road Transportation Strategy to 2045” outlining a future road strategy for Dubbo. The strategy provided Council’s response to growing development areas around Dubbo and included a proposed “freight way” ring road to provide an alternative heavy vehicle route away from Central Dubbo.

In 2015, a Newell Highway Corridor Strategy was published, outlining a future direction for the highway and where corridor improvements could be made. Within a Dubbo context, the two key goals from that strategy included allowing Performance Based Standards (PBS) class 3(a) vehicles along the entire Newell Highway, and providing increased flood immunity for Newell Highway traffic. In response to this, in consultation with Council, Roads and Maritime identified six corridor options to provide a high level crossing of the Macquarie River for further development. These are shown in Figure 1.1.

These six corridor options were subject to further analysis through traffic modelling (by GTA, November 2016), Preliminary Environmental Investigations (February 2017), and community consultation (May 2016).

In September 2016, in addition to the further analysis taking place, a value management workshop was carried out by Roads and Maritime with input from Council and major stakeholders. The workshop looked at the six corridor options, assessing the options qualitatively and reducing corridor options to three (Purvis Lane, River Street and LH Ford bridge duplication).

In May 2017, RMS identified the River Street option as the preferred option to be taken forward to Concept Design. The RMS Preferred Option Report notes that the recommendation arrived from VM workshop outcomes and investigations on shortlisted options (designing intersection options and testing for flood immunity). Shortly after, in June 2017, the preferred option was announced by the NSW Premier Gladys Berejiklian and Member for Dubbo Troy Grant.

The proposal includes the construction of around 2.2 kilometres of new highway and intersection upgrades between the Thompson Street/Whylandra Street intersection and the River Street/Bourke Street intersection.

The Newell Highway is the longest highway in NSW. This main north-south route runs through Dubbo, including crossing the Macquarie River over the Emile Serisier Bridge. This bridge crosses the river at a low level and is under water when the river floods, causing the bridge to close. When this occurs, long delays are experienced in the Dubbo town centre as all traffic is diverted across the LH Ford Bridge.

The LH Ford Bridge is a high-level bridge but cannot carry higher mass limit vehicles such as B-Triple road trains. Under normal conditions, all higher mass limit vehicles are required to travel via the Emile Serisier Bridge. During flood events, higher mass limit vehicles are required to make a significant detour to re-join the Newell Highway. The Dubbo region is also experiencing growth with a number of residential growth areas identified in Dubbo. These will lead to an increase in traffic volumes, which will worsen issues experienced when Emile Serisier Bridge is closed due to flooding. The need for another high-level bridge to lessen these issues has been identified.
Figure 1.1: Roads and Maritime Corridor Options
2. Description of the proposal

2.1 The proposal

The New Dubbo Bridge proposal is located in Dubbo, New South Wales. Dubbo sits at the cross roads of three major highways the Mitchell, Golden and Newell Highways, refer figure 2-1. The Newell Highway is the main thoroughfare for north south road freight between Brisbane and Melbourne. The road network capacity through Dubbo is generally adequate, but is severely affected during flooding of the Macquarie River, when the Emile Serisier Bridge on the Newell Highway becomes impassable. To provide greater reliability for the road network during flooding and to allow the operation of higher productivity PBS3A through Dubbo in line with the Transport for NSW (TfNSW) 2015 Newell Highway Corridor Strategy, an upgrade to the highway through Dubbo is required.

The concept design involves about 2.2 kilometres of highway, commencing at the intersection of Thompson Street and Newell Highway and extending north to the intersection of River Street and Newell Highway. Key features of the design include:

- Upgrading the Thompson Street / Victoria Street intersection on the Mitchell Highway to carry Performance Based Standard 3A (PBS 3A) heavy vehicles
- Replacing the existing T intersection at the Thompson Street / Whylandra Street (Newell Highway) intersection with a four way intersection with traffic lights that can accommodate heavy vehicles Providing a high level flood detour road to the west of the existing Emile Serisier Bridge
- Construction of about 2.2 kilometres of new carriageway with a single lane in each direction between the Thompson Street / Whylandra Street (Newell Highway) intersection and the River Street / Bourke Street (Newell Highway) intersection, including::
  - Two 3.5 metres wide lanes
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  - A two metre wide shoulder on both sides of the road
- Construction of a new 16 span high level bridge over the Macquarie River and Brisbane Street. The new bridge would be about 545 metres long and 13 metres wide and would generally include:
  - Two 3.5 metres wide lanes
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  - Twin rail safety barriers
  - A minimum vertical clearance of 0.5 metres over the Macquarie River in the 100 year annual reoccurrence interval (ARI) flood event
  - Flood immunity up to the 50 year ARI flood event, determined by the eastern abutment
  - Vertical clearance of 5.3 metres over Brisbane Street
- Construction of around 55 metres of retaining wall structures along sections of River Street
- Upgrading the existing four leg intersection at River Street / Newell Highway (Bourke Street) to include traffic lights that can accommodate heavy vehicles
- Construction of a new intersection between Darling Street and Brisbane Street
- Adjustments to the Brisbane Street / River Street and the Darling Street / River Street intersections including removal of access from Darling Street into River Street
- Road widening and tie-in works
- Construction of a high level flood route west of the intersection between Thompson Street / Whylandra Street (Newell Highway). Widening of the intersection between Mitchell Highway and Thompson Street is provided as part of this flood detour route to facilitate heavy vehicle movements when the flood route is in operation
• Relocation and adjustments of utilities, services, drainage and streetlights
• Property acquisitions, leases and adjustments
• Landscaping
• Temporary construction facilities including construction compounds, stockpile sites, crane pads, access tracks, erosion and sedimentation measures.
Figure 2.1: Regional Context Plan
Figure 2.2: The Proposal and Ancillary Sites (Jacobs, 2019)
2.2 The Proposal Objectives

The fundamental proposal objectives are to upgrade the Newell Highway between Thompson Street and River Street, Dubbo in a way that:

- Improves journey time and journey time reliability for road users travelling along the corridor
- Eases traffic congestion
- Is considerate of road function, local land use activity and access needs
- Is considerate of potential environmental impacts
- Improves connectivity to the wider road network for all road users and improves amenity
- Improves safety for all road users
- Fit for purpose design to meet the required design life for the identified need and that maximises the proposals “value for money”
- Design that meets WHS legislation and in particular is safe, efficient and practical for workers and those in the vicinity during temporary traffic arrangements
- Manages risk.

As part of these objectives the following performance outcomes are to be achieved:

- Provision of another river crossing in Dubbo and improve traffic flow during a 100 ARI flood event
- Provision of access from the north into Dubbo’s Central Business District (CBD) during a 100 ARI flood event
- Improve traffic flow in Dubbo and reduce average traffic delays
- Improve local and freight traffic access across the Macquarie River
- Provide access for future growth in north-west Dubbo
- Improve B-Triple road train access.

The design and environmental assessment must support the proposal objectives listed above by:

- Designing the proposals works to meet the environmental requirements in addition to avoiding and minimising adverse impacts to the environment while maximising the environmental benefits
- Satisfying the technical and procedural requirements of the RMS with respect to the design of the proposals works
- Optimising the design to ensure that the proposal can be practically and efficiently constructed, maintained and decommissioned while meeting all other proposal objectives
- Applying appropriate urban design, landscape and visual principles in the design of the proposals elements
- Designing all connections, modifications and improvements necessary to link the proposal to the existing road system
- Planning temporary arrangements that minimise disruption to local and through traffic and maintain access to adjacent properties during construction
- Developing, implementing and maintaining effective Quality Management Systems.

The overall proposals goal is to achieve the best possible result for each of the above objectives, both in isolation, and when considered together.
2.3 Purpose of report

Tract Consultants Pty Ltd has been commissioned by Jacobs to provide an Urban Design Report and Landscape Character and Visual Impact Assessment for the New Dubbo Bridge Newell Highway Upgrade. As part of this process, a review of the design is to be undertaken to identify the likely potential landscape character and visual impacts and urban design issues associated with the proposal 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.
3. Context

3.1 Location

The proposal is located in and around the NSW city of Dubbo, about 306 kilometres north-west of Sydney in central western NSW. The proposal area is located within the Dubbo Regional Council local government area (LGA; formerly known as Dubbo City Council).

Dubbo is the only city along the Newell Highway corridor, and is located at the junction of the Newell Highway, Mitchell Highway and Golden Highway.

Dubbo is located on the Macquarie River, which is crossed by two major Highway Bridges – the Emile Serisier Bridge on the Newell Highway and LH Ford Bridge on the Mitchell Highway. The Emile Serisier Bridge is impacted by floods smaller than the 10 year Average Recurrence Interval (ARI), which translates to an average of one to two days closure each year.

Figure 3.1 indicates the local context of the proposal and its relationship to Dubbo urban centre and surrounding road network. Figure 3.2 reflects the immediate environs of the proposal, including connections and landmarks.

The proposal is centred around the following roads:

- Thompson Street
- Emile Serisier Bridge
- Newell Highway
- River Street
- Darling Street
- Brisbane Street.

The study area surrounding the proposal includes a mix of residential, agricultural, recreational, industrial and transport related land uses. The main features of the proposal area and its surrounds include:

- Jehovah’s Witness Temple facility
- Dubbo rail bridge, a State and National heritage item
- Mount Olive, a National trust property on the western bank of the Macquarie River
- Items of aboriginal heritage interest
- Riverside Church Dubbo
- Businesses on the River Street / Newell Highway intersection
- Businesses along River Street
- Residential properties along Thompson Street.

The Macquarie River follows a north-south route through the centre of Dubbo. The Main Western railway line, NSW, is orientated west-east across the Macquarie River, to the south of the Emile Serisier Bridge.

The study area includes the north western area of Dubbo. The proposed alignment will mostly cross green fields west of the Macquarie River before heading to the east and crossing the river to align with River Street. The proposal is located to the north east of the town centre.
Figure 3.1: Local context plan
Figure 3.2: Project context plan
3.2 Vegetation

The overall alignment of the Macquarie River has been identified as of high biodiversity value within the Local Environmental Plan. Beyond the River corridor no other areas within the proposals alignment are considered to have significant biodiversity values.

As part of the Biodiversity Assessment, 2018, four vegetation communities were identified, refer Figure 3-3. These have been named based on the Plant Community Types consistent with their composition and include:

- **River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion**
- **Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion**
- **Derived grassland of the NSW South Western Slopes**
- **Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems**

**River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion** - comprises a narrow strip of vegetation along the river banks. Refer figure 3.4a. The vegetation composition is one of an open forest, dominated by River Red Gum (*Eucalyptus camaldulensis*) and to a lesser degree River Oak (*Casuarina cunninghamiana*). Its understorey is predominantly groundcovers including *Austrostipa verticillata* and *Cynodon dactylon* and other native grasses such as *Bothriochloa macra*, *Anthosachne scabra* (syn. *Elymus scaber*) and *Phragmites australis*.

**Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion** – this occurs as a small isolated occurrence on the north western river bank. Refer figure 3.4b. Canopy is dominated by Fuzzy Box (*Eucalyptus conica*) with *Eucalyptus camaldulensis* and *Casuarina cunninghamiana* occurring on the lower banks. With the mid storey comprising Western Rosewood (*Alectryon oleifolius*) and a shrub and derived grassland layer of *Maireana microphylla*, *Atriplex semibaccata*, *Enchylaena tomentosa*, *Einadia nutans*.

**Derived grassland of the NSW South Western Slopes** – this comprises a patch of derived grassland considered to have once supported *Eucalyptus conica* Woodland on the alluvial flats adjacent to the riverbank. Its composition includes small shrubs *Maireana microphylla* and *Einadia nutans* and groundcovers *Austrostipa verticillata* other native grasses such as *Bothriochloa macra*, *Austrostipa scabra*, *Anthosachne scabra* (syn. *Elymus scaber*).

**Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems** – this is Open grassland (dry wetland) in shallow water connected to river, dominated with *Phragmites australis* with occasional *Eucalyptus camaldulensis* near river edge.

The remaining communities are cultural landscapes comprising agricultural grasslands or exotic tree plantings associated with urban development. The urban design response reflects the differing communities and cultural plantings to ensure a design which is robust, integrated and appropriate to Dubbo.
3.3 Topography and Drainage

3.3.1 Landform

Dubbo lies in a transitional zone between the ranges and tablelands of the Great Dividing Range in the east, and the Darling Basin plains in the west Refer Figure 3.5. The Macquarie River flows south to north through Dubbo, across a low-lying alluvial plain. Refer Figure 3.6.
The river valley is crossed by two road bridges within the study area. The Emile Serisier Bridge which is subject to flood inundation and LH Ford Bridge which currently serves as the flood route through Dubbo. South of the LH Ford Bridge the western river bank rises steeply above the river and forms a localised high point. A similar narrowing and steepening of the river bank occurs at the rail crossing located just to the south of the Newell Highway and the Emile Serisier Bridge. Figure 3.7 depicts the Macquarie River.
Figure 3.7 Topography and drainage plan
3.3.2 Drainage

The Macquarie River flows south to north through Dubbo, across a low-lying alluvial plain. Flooding is experienced along the river valley. Thompson Street and Newell Highway Intersection on the approach to the Emile Serisier Bridge are subject to flooding and the proposals development needs to consider how this will be addressed. A view along the river to Emile Serisier Bridge is depicted in Figure 3.8.

The eastern bank adjoining Dubbo Town centre is also subject to inundation and requires a bridge to span this floodplain till a level of 265 metres above sea level. This requires a similar viaduct arrangement to the LH Ford Bridge.

The North Dubbo Weir, illustrated in Figure 3.9 is located just to the south of the proposed crossing at River Street.

![Figure 3.8 : View along the river to Emile Serisier Bridge](image1)

![Figure 3.9 : View of North Dubbo Weir](image2)
3.4 Land Zoning

The existing land use zoning is defined by the Dubbo Local Environmental Plan (LEP), 2011, refer to Figure 3.10.

The River Street corridor option connects from Thompson Street at its intersection with the Newell Highway, along a new road alignment travelling north along the western side of the Macquarie River, before crossing it to connect to the Bourke Street (Newell Highway) at its intersection with River Street.

The alignment can be divided into two sectors divided by the Macquarie River:

3.4.1 Western sector

The western sector of the corridor is approached passing through SP3 Tourism before crossing Thompson Street and briefly passing through existing parkland - Wiradjuri Park. This is zoned RE1, Public Recreation. Continuing north the land is zoned R2 Low Density Residential. The alignment then changes direction heading east to cross the river. Before crossing the river a small section of land zoned RE1, Public Recreation is crossed. This land zoning links through to the existing parkland adjoining Thompson Street, to the south.

R2 Low Residential

Located either side of the alignment, north of Thompson Street, this residential precinct forms part of the North-West Residential Urban Release Area, which is forecast to accommodate 2675 dwellings.

This zone has the following objectives as listed in the LEP:

- To provide for the housing needs of the community within a low density residential environment
- To enable other land uses that provides facilities or services to meet the day to day needs of residents
- To ensure development is consistent with the character of the immediate locality
- To encourage low density housing within a landscaped setting on the fringe of the Dubbo urban area.

Presently not developed this area will overlook the alignment. Access to the alignment would be limited from the development and so it is anticipated that development would back onto the alignment. The design response of the alignment should consider the screening of this development to provide its own definition and identity and address the potential impacts of the road on the subdivision and vice versa.

RE1 Public Recreation

Public recreation is focused along much of the Macquarie River corridor (both sides). This reflects its flood liability and the desire to retain access to the river front.

This zone has the following objectives as listed in the LEP are:

- To enable land to be used for public open space or recreational purposes
- To provide a range of recreational settings and activities and compatible land uses
- To protect and enhance the natural environment for recreational purposes
- To provide for facilities and amenities to enhance the use of public open space.

To the east of the river the space is largely focused on active recreation with sporting fields and courts present. The western edge zoning, apart from the existing Wiradjuri Park, does not appear to reflect the present land ownership and lot boundaries and as a result use with the land still subject to agricultural land uses. The extension of the parkland to the north of Wiradjuri Park as identified in the LEP would provide an appropriate setting for a recreational shared path network.
Figure 3.10 Land use zoning plan
Wiradjuri Park is located on the western side of the Macquarie River, immediately north of the Seriser Bridge. The park is approximately 3.3 hectares in area and is highly visible both from the Newell Highway and Thompson Street (connecting the Newell Highway with the Mitchell Highway). Refer Figure 3.11 and Figure 3.12

Its masterplan identifies the intent to develop Wiradjuri Park into an Aboriginal cultural park. This is seen as providing the local and broader Aboriginal community a place to gather, celebrate their culture, and acknowledge significant dates on their calendar. The proposed road alignment will significantly impact the ability to implement the masterplan in its present format.

![Figure 3.11: Wiradjuri Park at top of river bank including shelters and relics](image1)

![Figure 3.12: Wiradjuri Park with Thompson Street visible in the background](image2)
3.4.2 Eastern Sector

On the eastern side of the river the corridor passes through an area zoned E3, Environmental Management and a small strip of land zoned B6, Enterprise Corridor, where the route connects to the Newell Highway and River Street.

**E3 Environmental Management**

Comprising two distinct properties either side of the River Street road easement. The two properties operate small agricultural holdings and have a residential dwelling in relatively close proximity of the alignment.

This zone has the following objectives as listed in the LEP are:

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values
- To provide for a limited range of development that does not have an adverse effect on those values
- To ensure development is compatible with the flood hazard of the Macquarie and Talbragar Rivers
- To ensure development does not create outbreaks of saline lands or exacerbate the existence of existing saline lands.

**B6 Enterprise Corridor**

The proposed alignment passes through the centre of this corridor and is set within the River Street easement, refer Figure 3.13. This zone has the following objectives as listed in the LEP are:

- To promote businesses along main roads and to encourage a mix of compatible uses
- To provide a range of employment uses (including business, office, retail and light industrial uses)
- To maintain the economic strength of centres by limiting retailing activity
- To facilitate a mix of business and retail development on the Mitchell, Newell and Golden Highways that services the needs of the travelling public.

The current zoning of the land is reflected in the use as car yards and livestock goods sales.

![Figure 3.13: Intersection of River Street and Bourke Street](image-url)
3.5 Heritage

3.5.1 Aboriginal Heritage

Aboriginal occupation of the region appears to have been concentrated mainly along the Macquarie and Talbragar Rivers and their tributaries. The Macquarie River floodplain was a major Wiradjuri (and neighbouring group) Aboriginal resource area, and the focus of past Aboriginal occupation that extended over a broad region of the central tablelands, western slopes and plains region.

Early accounts of contact between Aboriginal people and European settlers in the region include a reference by surveyor George William Evans in 1815 which documented evidence of extensive Aboriginal occupation along the banks of the upper Macquarie and Lachlan Rivers. European settlement throughout the Macquarie Valley was swift and resulted in a dramatic loss of access to traditional land and eventually a loss of tradition. The first European exploration of the region occurred in 1818 when John Oxley passed along the Macquarie River and observed the agricultural potential of the area. In 1828 Charles Sturt travelled through the area. Soon after, the settler Robert Dulhunty, built a homestead on his property which he called “Dubbo”, the Aboriginal word for “red earth”.

The Proposal Area contains three insitu sites, two of which (DLGA-OS-11 and DLGA-IF-07) were previously recorded, and one of which (Bunglegumbie Road 01) was identified during this assessment (refer to Figure 3.14). Artefacts occur both on the ground surface and within the topsoil deposits to a maximum depth of approximately 200 millimetres.

The three sites within the footprint, and an additional site ‘SP-OS-05 (#36-1-0400)’ to the immediate south of the alignment are considered to form part of a site ‘complex’ that likely extends along the Macquarie River and provide physical remains related to the use of the Macquarie River by Aboriginal people.

3.5.2 European Heritage

The proposals alignment generally does not have any items identified as of heritage significance.

Two items have been identified in the general proximity of the alignment:

1. Dubbo Rail Bridge over the Macquarie River
New Dubbo Bridge – Newell Highway Dubbo

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**Dubbo Rail Bridge over the Macquarie River**

To the southern end of the corridor and crossing the alignment is the western rail line. To the east of the alignment the Dubbo Rail Bridge over the Macquarie River is located which is listed on the State Heritage Register, refer Figure 3.15.

The bridge is one of John Whitton’s single-track lattice bridges, which were typical of the period of construction and is of high significance to the state system. The viaduct leading to the bridge was originally timber but has been replaced by PWG steel. This bridge is a member of the most significant group of colonial bridges in NSW. Collectively, as items of railway infrastructure, they contributed significantly to the history and development of NSW. Each bridge is an imposing structure at its site. In terms of contemporary bridge technology, the wrought iron lattice bridge was among the best for major bridgeworks.

![Dubbo Rail Bridge over the Macquarie River](image)

**Mount Olive**

To the east beyond the alignment west of the Macquarie River one item is identified in the Council’s LEP. This is referred to as I62 and is known as ‘Mount Olive’. This item is listed as local significance and is identified as an old stone cottage built around 1870 with some remnants of former outbuildings and a large cellar. The cottage is an example of one of the earliest houses in the Dubbo area and is a rare example of period architecture from the 1860’s.

The proposals alignment cuts through the centre of the property, which is mostly pastureland with a clearly defined homestead compound consisting of a cottage and outbuildings built close to the riverbank. This is on its own lot within a larger holding. The alignment will sever the access driveway which leads down to it and isolate the building from its broader land holding. The Local Environmental Plan already considers the interruption of this dwellings relationship to its large land holding as this area is identified as the North West growth area.

Opportunities to interpret this building and its access within the overall alignment design should be considered.
4. Principles and Objectives

As part of the design process a number of principles and objectives have been developed to inform the design development of the corridor. These provide objectives which have been considered as part of the concept design process by all team members.

4.1 Urban Design Principles and Objectives

The following urban design objectives and principles were developed as part of the New Dubbo Bridge Options – Strategic Urban Design and Visual Impact Study (2016). These have been reviewed and modified to reflect the preferred route and the specific issues of the proposed alignment.

**Objective 1: Create a design that fits sensitively into the built, heritage and community environment of Dubbo**

*Design principles:*

- Work with physical constraints such as landform and vegetation in the planning and design of the new bridge and associated access ways to avoid adverse visual and landscape character impacts
- Ensure the design and character of the bridge and associated works are well-integrated with the adjoining urban areas, open spaces and natural settings
- Consider the opportunity to enhance the view from the bridge and associated roadworks and to create a progressive sequence of visual events along the road corridor
- Consider the design qualities of the bridge structure and minimise the scale of approach roads and associated intersections to achieve a good design outcome
- Minimise the impact on the heritage and cultural landscape, particularly any impacts on Aboriginal heritage sites
- Minimise any erosion of the quality of the built environment within Dubbo
- Integrate noise control into the design of the new bridge and associated access corridors where required
- Consider views to the bridge from surrounding areas in the design of the bridge and associated works.
- Ensure that the community “fabric” is preserved wherever possible
- Protect important view corridors and vista
- Provide a simple and attractive bridge design that is well-suited to the character of the area based on Roads and Maritime Bridge Urban Design Guidelines
- Provide a formation which addresses local flood events, while blending with the overall landscape setting.

**Objective 2: Contribute to people’s access and connections across and alongside the river**

*Design principles:*

- Provide safe cycle and pedestrian connections along the approach roads and to town
- Consider connectivity into and through surrounding environments for all, including vehicles, pedestrians and cyclists
- Facilitate effective freight movement to minimise impacts on where people want to cross the river and access alongside the riverfront corridor
• Consider where people may need to cross the bridge and/or the approach roads and the quality of crossing points
• Maintain and enhance safe and attractive pedestrian and cycle connections along the riverfront open space.

**Objective 3: Contribute to the urban structure and the overall public domain quality for the community and other users**

**Design principles:**

• Consider the role of the new bridge and associated access roads against the long term structure of access through and around Dubbo
• Ensure that the bridge design allows for the retention and/or creation of effective and attractive public open spaces
• Consider the potential uses of adjoining land and the opportunity for the new bridge and associated access corridors to activate areas within Dubbo
• Explore potential opportunities for the new bridge and associated access ways to reduce and/or minimise traffic volumes alongside residential areas
• Ensure streets and boulevards along access corridors contribute to the sense of place
• Improve the legibility of the road structure and help distinguish between different road functions and speed by differentiating their appearance.
5. Urban Design Concept

The design response for the proposal needs to reflect both the character of the landscape through which the proposals alignment passes, as well as the broader landscape, addressing environmental, visual and physical constraints as part of a holistic design solution.

The development of the urban design response needs to consider a number of guidelines (Figure 5.1) which inform the undertaking of the landscape character and visual assessment report as well as the development of the overall concept. These include:

- Road Design Guidelines
- Environmental Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment - EIA-N04
- Beyond the Pavement, Urban Design Policy, Procedures and Design Principles, Roads and Maritime January 2014
- Landscape Guidelines, Roads and Traffic Authority, April 2008
- Bridge Aesthetics - Design Guidelines to improve the aesthetics of bridges in NSW, 2012
- Noise wall design guideline Design guideline to improve the appearance of noise walls in NSW, Roads and Maritime, March 2016

![Figure 5.1: Guideline Covers](image-url)
5.1 Urban Design Strategy

In developing a design response for the Dubbo Bridge proposal, the fit of the road within its context needs to be considered. As part of the proposals concept design development the urban design strategy needs to develop responses to the form and alignment of the bridge; the landscape treatment of the formation; the nature and placement of roadside furniture; and the planting design required to integrate the proposal to achieve a contextually responsive design outcome.

As part of the development of the urban design for the proposal an overall Urban Design Strategy has been developed. The following Urban Design Strategy Plan, Figure 5.2, develops the proposal principles and objectives to define the detailed urban design response.

The strategy is then broken down in to its elements to outline the particular issues and responses adopted within the corridors design development. Elements discussed include:

- Grading
- Vegetation
- Bridges
- Lighting
- Safety Barrier and Fences
- Signage
- Intersections.
Figure 5.2: Urban Design Strategy Plan
5.1.1 Grading

Development of the design should seek to grade the batters of the formation to integrate and blend with the adjoining landform. The topography of the landscape is flat to undulating and so significant or abrupt changes in grade would create an awkward setting along the corridor. Consequently steep grades of 2H:1V should be avoided except with transitioning on to the bridge.

The typical grade of the alignment batters through the central section of the alignment, which traverses the floodplain west of the river, has adopted a maximum slope of 6H:1V in order to minimise the need for road barriers and to provide a smooth transition enabling the ground to flow over the alignment, refer Figure 5.3. This grade also enables water to be shed from the alignment and across the verge before entering the catch drain enhancing the management and use of water within the corridor.

![Figure 5.3: Typical section of proposed alignment between Ch 1000 and 2000 illustrating landscape response](image)

The approach of the embankment profile to the bridge abutment should adopt a variable transitional grade over an appropriate distance which steepens as you approach the abutment rather than changing abruptly over a short distance. This is reflected in the profile of the concept design as depicted in Figure 5.4 and Figure 5.5 below.

![Figure 5.4: Typical section of bridge approach illustrating landscape response](image)
5.1.2 Vegetation

The corridor has limited diversity of vegetation types having been heavily modified by urban and agricultural development.

The Macquarie River running adjacent and across the proposed alignment provides a lineal corridor of remnant vegetation which has the potential to form the spine of a web of linking vegetation reserves and communities enhancing fauna connectivity in what is a highly modified landscape setting.

The revegetation response for the proposal has been to relate the vegetation to the distribution of the various native vegetation communities. Using it to aid and assist in the spatial definition of the corridor and management of views.

Key concepts explored include:

- Re-establishment of the endemic vegetation communities associated with the Macquarie River and its floodplain – The River Red Gum Forest and Box Gum Woodland communities
- Vegetation across the floodplain to supplement and reinforce the riverine vegetation community present along the banks of the river
- Vegetation utilised to screen and define the western edge of the corridor in order that the future residential development is screened and a parkway character is provided to the overall alignment. Refer Figure 5-3
- Vegetation used as part of the treatment train for water from the road corridor in order to minimise need for basins and maximise growth of the corridor landscape
- Vegetation used to screen retaining walls from properties adjoining River Street mitigating impacts of the proposed bridge abutment, refer figure 5-6
- Cultural landscape patterns and plantings used to provide a connection to the Dubbo town-centre and its cultural identity. The adoption of a threshold treatment of a formal grid of River Red Gums to either side the floodplain bridge reflects this approach. Refer figure 5-7 for potential configuration of threshold treatment.
Similarly planting schemes which reflect the streetscape character of Bourke Street (Newell Highway) and Thompson Street reflects a similar approach of cultural planting to mark key events along the highway corridor.

Figure 5.6: Typical section of River Street Illustrating landscape response

Figure 5.7: Formal planting of River Red gum to create a strong lineal edge to the road corridor
Landscape Treatments

A variety of landscape treatments will be adopted to enable the implementation of the overall Urban Design Strategy.

- Landscape treatments need to be:
  - Robust and durable to minimise ongoing maintenance inputs
  - Cost effective
  - Maintainable meeting operational and safety needs

- Treatment types are to include:
  - Seeding by either Hydromulch or Direct seeding
  - “Hydraulic Mulch (Hydromulch) consists of various types of organic fibrous materials (eg – paper / wood pulp, wood fibre, straw fibre or milled cane fibre) mixed with water and sprayed onto the soil surface in slurry form that sets to provide a layer of temporary protection from wind and water erosion. “ (RMS 2015) This may include seed or seed may be applied prior to application of hydromulch
  - “Drill seeding involves seeding using a mechanical disc seeder towed by a tractor.” (RMS 2015) This seeding method is that used in broadscale cropping
  - Turfing is the application of grass rolls as a verge or broader landscape treatment. Typically turf will be used as the margins to streets or as the management zone between path and road
  - Planting can be undertaken as individual specimen plantings such as street tree and broad scale tree planting or as garden beds consisting of a prepared mulched bed and the mass planting of shrub and grass species.

Preparation of the ground profile is critical to the success of road side vegetation planting. Methods should reflect the reforestation practices adopted on farms including application of rip-line planting

5.1.3 Bridges

The design of the bridge has been undertaken in accordance with Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW, RMS, January 2012. The bridge is a simple structure which is subservient to its context. The design detail needs to address the following:

- Be simple and refined
- Barrier structures is to be integrated with the overall design composition
- Abutment design is to be integrate with the adjoining landform
- Substructure is to be slim and low profile, minimising height and maximising openness of the structure
- The treatment of piers and how their impact is to be minimised on the broader landscape.

Bridge form

The design of the bridge considers similar structures within the general context of the proposed bridge. Dubbo has three bridges crossing the Macquarie River within the township, refer to Figure 5.8 which provide precedents in terms of treatment and design responses which may enhance the overall aesthetic and integration of the proposed bridge within the landscape. These are:

- LH Ford Bridge
- Emile Serisier Bridge
- Dubbo Rail Bridge over Macquarie River.
Figure 5.8: Aerial view of the existing Macquarie River crossings in Dubbo (Source: Roads and Maritime Services)

**LH Ford Bridge**

Dubbo already has a flood viaduct in the form of the LH Ford Bridge on the Mitchell Highway. The bridge facilities two lanes of traffic (one in either direction) with pedestrian paths either side. The approach viaduct is a simple plank structure that cuts through the open space on the floodplain and transitions to a balanced cantilever as it crosses the river, as depicted in figures 5-9 to 5-10.

Its piers consist of a varying form but typically comprise a single ovoid column of variable width and height with an integral headstock that provides an open character to the underside of bridge. The piers have also provided the opportunity for cultural interpretation with aboriginal murals applied as both art and a means of graffiti management.

Figure 5.9: LH Ford Bridge viewed as it crosses the floodplain; Piers with aboriginal art; Balanced Cantilever Bridge across Macquarie River, Crossing of Macquarie River
**Emile Serisier Bridge**

The Emile Serisier Bridge currently carries the traffic using the Newell Highway and is subject to flooding. Its design is a concrete plank bridge supported by tapered blade piers with integral head stock, refer to Figure 5.10. The bridge provides for two lanes of traffic in either direction, a marked median and pedestrian path to the southern side. It is not flood immune and is submerged in a 1 in 5 year events.

![Emile Serisier Bridge from Floodplain](image)

**Dubbo Rail Bridge over Macquarie River**

The Dubbo Rail Bridge over Macquarie River, (Dubbo Lattice Railway Bridge) represents a completely different form. It is of steel construction and its form is described as wrought iron lattice truss bridge in the half-through form, refer to Figure 5.11. It is a heritage listed structure which dates from 1884.

The Dubbo Rail Bridge over Macquarie River, (Dubbo Lattice Railway Bridge) represents a completely different form. It is of steel construction and its form is described as wrought iron lattice truss bridge in the half-through form, refer to Figure 5.11. It is a heritage listed structure which dates from 1884.

![Dubbo Rail Bridge over Macquarie River](image)
Proposed Bridge

The bridge is straight in plan, and of about 550 metres in length. It comprises two travel lanes with shoulder (one in either direction), and a raised central median. The bridge is launched from an abutment wall at its eastern end reflecting the constrained nature of the River Street corridor and its more urban context. At its western end a spill through abutment is proposed on the western bank of the Macquarie River. The bridge rises along its length to the east at a nominal grade of 0.5%. Refer to Figure 5.12.

The bridge is proposed to use super ‘T’ girders with a span of 35 metres and girder depth of 1.5 metres.

Figure 5.12 : Elevation of bridge across floodplain and detailed enlargements of bridge and abutment

Piers and Headstock

The role of the pier plays an important role in the relationship of a bridge to the floodplain and has the ability to have a significant impact on the overall perception of the bridge. The existing Dubbo Bridges generally have a good relationship to the floodplain and enable the landscape to flow through under the bridge without too much disruption due to the limited number and scale of the piers.

The design of the piers should seek to achieve:

- An integrated appearance of headstock and pier - headstock where wider in section than pier should taper in to the width of the pier to provide an integrated appearance in elevation
- A slender form to maximise the sense of openness and transparency under the bridge
- Adopt a rounded leading edge to soften the overall pier form and provide some consistency with other piers of Dubbo Bridges.

Figure 5.13, Figure 5.14, and Figure 5.15 depicts the proposed response to the pier design. Two pier types are proposed to respond to the differing pier height and context.

Figure 5.13 depicts the river piers which are taller in length and adopt the trapezoidal form of the flood plan which transitions into a vertical blade to provide the additional height.
Figure 5.13: Concept of river crossing pier and headstock arrangements

Figure 5.14 depicts the floodplain pier which adopts a consistent form which varies marginally in height, depending on the undulations of the floodplain.

Figure 5.14: Concept showing floodplain pier and headstock arrangement
Both the LH Ford Bridge and Emile Serisier Bridge parapet is provided as a slim kerb/skirt to the edge of the bridge. This reflects the presence of a pedestrian path between road and bridge edge enabling the use of a lighter more transparent structure in the form of pedestrian rails. The LH Ford uses a red ochre colour to strong effect on its leading edge, refer to Figure 5.16.
The parapet of the proposed bridge will consist of bridge barrier comprising a double steel rail and low height kerb to meet bridge safety standards. The use of a double rail provides a sense of openness and transparency which a solid barrier would otherwise not achieve.

The form of the parapet will consist of the following attributes:

- A continuous uninterrupted face, extending the full length of the bridge with a generous overlap at the abutments
- The design will maximise the shadow cast on the girder and superstructure to accentuate and express their form
- The outer face will be a smooth single plane surface, slanted slightly outwards towards the bottom to better catch the sunlight
- The parapet will extend below the deck soffit to conceal drainage pipes and services.

**Retaining walls**

Retaining walls are proposed at the northern end of the alignment where the floodplain viaduct terminates and transitions to at grade where it intersects with River Street. This is an industrial precinct within Dubbo’s urban fabric and so needs to present a strong robust response to the context. Key considerations include the use of:

- A strong texture that acts as an anti-graffiti measure
- Durable materials such as concrete that are vandal resistant and require minimum maintenance
- A smooth top edge profile.

The design of the wall is a reinforced soil wall comprising precast panels. The ideal panel form would be a rectangular panel enabling joints be integrated with the vertical patterning. A vertical rib profile is proposed picking up the ribbing of corrugated steel sheds found within the precinct. Refer to Figure 5.17 and Figure 5.18.

![Figure 5.17 : Ribbing typical of the buildings and sheds adjoining River Street](image-url)
Landscape Adjoining Bridges

The landscape design at the bridges is responsive to the nature and context of the bridge, and has adopted these key strategies:

- Offset to meet/limit future maintenance of canopy
- Screening of structure to mitigate bulk
- CPTED issues in terms of ongoing surveillance.

5.1.4 Lighting

Lighting is proposed for the length of the alignment. Consideration in the lighting design has been given to light spill and its environmental impacts including potential impacts on the adjoining Mount Olive residence and its relationship to bridge form.

The design of lighting has been undertaken limiting upward spill, consistent with Dark Sky Guidelines. The performance requirement of the road does however introduce lighting into a section of the floodplain where previously it had not been used. Efforts to minimise the spill of this within the landscape as a whole should be made so that the overall feel of the environment is not changed.

Spacing of lighting on the bridge is proposed to be located centrally on the span. Alignment with the piers is not feasible due to the bridge joints. The light pole is to be fixed outside of the bridge rail on an independent support affixed to the bridge parapet centrally within the span. The proposal for lighting involves an alternating layout with lighting changing from side to side.

5.1.5 Safety Barriers and Fencing

Safety barriers have been provided where required along the main alignment to give protection from hazards including steep slopes, and physical hazards including non-frangible signs, street lighting columns, power poles, headwalls, and non-traversable table and catch drains. The overall design intent should be to limit requirements for safety barriers. Fencing is to be predominantly farm fencing reflecting the adjoining land use.
5.1.6 Signage

Signage is largely to be installed in accordance with the requirements of standards. Care needs to be taken to ensure the extent of signage is kept to a minimum and that the signage is integrated with the overall design of the alignment. The following strategies should be adopted:

- Avoidance of signage structures on the skyline by considering placement or incorporation landscape beyond
- Rationalise the number of signage structures.

5.1.7 Intersections

The proposed alignment intersects with the broader fabric of Dubbo at three distinct points. Two locations at the south – the continuation of Whylandra Street south of the railway bridge; and the intersection of Thompson Street / Whylandra Street and Wiradjuri Park; and one to the north at the intersection of River Street and Bourke Street.

At these locations it is important to provide both a strong identity and connection into the existing fabric. In all instances the enhancement of the streetscape character and identity are a key means of enhancing the overall visual outcome and connection of the proposal with the adjoining fabric.

*Whylandra Street south of the railway bridge*

The landscape response to the tie-in of the proposal, west of the Railway Bridge proposes to strengthen the existing street trees and provide an arrival gateway to the core of Dubbo. Planting is proposed to both verges and potentially within the median to assist in reducing the dominance of the Western Railway Line.

*Thompson Street / Whylandra Street and Wiradjuri Park*

To the north of the Western Railway Line Thompson Street and Whylandra Street intersect prior to crossing the Emile Serisier Bridge. To the north at this intersection the proposal is adjoined by the Wiradjuri Park. The design response provides definition to the park and continues the arrival sequence established to the south of the western railway bridge.
Figure 5.19: Thompson Street / Whylandra Street and Wiradjuri Park landscape concept plan

Figure 5.19 illustrates the deciduous trees that are proposed to provide definition to the road edge, emphasising the urban arrival and to differentiate from the natural system immediately adjacent to and lining the Macquarie River.

**River Street and Bourke Street (Newell Highway)**

Bourke Street has been planted with street trees which are relatively young and yet to establish a canopy and define the corridor. The relatively constrained nature of the River Street corridor and its verges limits the potential to continue street tree planting adjoining the proposed alignment. The proposal offers the opportunity to strengthen areas of the intersection which are presently not addressed by current plantings. This would predominantly apply to the northern leg of the intersection which currently only has planting to the eastern side of Bourke Street only. Within the western verge opportunities for planting within the verge are unlikely to impact existing truck parking and would enhance the streetscape. Figure 5.20 illustrates the landscape context plan for River Street and Bourke Street.
5.1.8 Flood Management

The context of the works is adjoining the Main Western Railway at the intersection of Newell Highway (Whylandra Street) and Thompson Street. The river edge is dominated by parkland and vegetation predominantly casuarina and eucalypt species.

This proposal retains the proposed bypass alignment but introduces a flood detour route above the flood level. This requires a link to be built which connects into the bypass from Thompson Street to the west of the proposed alignment. The detour would then travel along Thompson Street before connecting to the Mitchell Highway and then the Newell Highway to the south. This proposal limits its impact on the vegetated river reserve east of the proposed alignment however it further fragments the Wiradjuri Park as additional pavement is required as part of the detour route.

This flood bypass road could be integrated into the overall parkland character of this precinct. It is suggested that the flood route could provide the potential for access to Wiradjuri Park and off-street parking during non-flood event periods. A copse of natural canopy trees in a formal arrangement will both define the island of parkland between the two roads but also enhance the level of canopy cover in this part of town. The river’s edge should remain a passive open space and could continue to be developed along the concepts presented in the Wiradjuri Park Masterplan, (Moir Landscape Architecture, 2013). Figure 5.21 depicts the Wiradjuri Park landscape context plan.

Figure 5.20: River Street and Bourke Street (Newell Highway) Landscape Concept Plan
Figure 5.21: Wiradjuri Park Landscape Concept Plan
6. Assessment Methodology

This section of the report outlines the methodology used to review the proposal and assess the impacts and effects of the proposed road alignment on the road user (primarily motorists), and any potential properties with views to the road. The methodology adopted for this report is guided by policy and guidelines outlined in Beyond the Pavement (Roads and Maritime Urban Design Policy) and the Roads and Maritime Environmental Impact Assessment Practice Note Guideline for Landscape Character and Visual Impact Assessment, 2013.

6.1 Landscape character and impact assessment

To assess landscape character the local context of the site is divided into a number of units to assist in understanding the local context and the implications of the proposal. These include defining the landscape character zones (zones of similar spatial or character properties), and the analysis of 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.” (Roads and Maritime, 2013).

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

6.2 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:

Visibility

The view field of a corridor or object is composed of static receptors, i.e. those that adjoin the road corridor and mobile receptors which are those that travel along the corridor or adjacent to it. The impacts of the two groups are unique in that the time and frequency of the exposure differ. The extent from which views can be obtained is referred to as the 'view catchment'.

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 both the topography and vegetation and built structures of the corridor including noise walls, which adjoin the corridor.

Mobile Receptors

Mobile receptors are the users of the corridor; in this instance the vehicles, pedestrians and cyclists that travel along part or the whole alignment. Their experience of the space is short term. Mobile receptors constitute the main visual receptors of the proposed works.
6.3 Landscape character and visual assessment matrix

Landscape character and visual assessment are equally important. The 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. The 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

Sensitivity refers to the qualities of an area, the type number and type of receivers, and how sensitive the existing character of the setting is 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 (Roads and Maritime, 2013).

Table 6-1 summarises the ranking of the assessment of these two criteria and how they are combined to provide an overall impact assessment.

Table 6-1: Landscape Character and Visual Impact Assessment Matrix

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</table>
7. Landscape Character Assessment

7.1 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 alignment of the bypass and its context, and classified it into a number of differing character zones.

The landscape in the areas surrounding the proposed corridor can broadly be classified into five distinct character types that are defined by physical characteristics and development patterns. The landscape character types identified are:

- Agricultural
- Industrial
- Residential
- Open Space/Recreation
- Commercial.

Figure 7.1 illustrates the distribution of these character zones and their relationship to the proposal.
Figure 7.1: Landscape Character Zones Plan (Placeholder image from Strategy document)
7.2 Landscape Character Zone definitions

7.2.1 LCZ1 - Agriculture landscape

Within the study area, the dominant agricultural area is located to the north of Thompson Street and west of the Macquarie River, refer Figure 7.2. A small section of agricultural land straddles both sides of River Street and the proposal.

The area is characterised by open grazing lands which form part of the Western Plains, contain limited tree cover and only isolated dwellings. While currently dominated by pasturelands the area is identified for future residential development as part of the North West development area. The design response for this zone should consider both its present and future land use.

![View from Bunglegumbie Road towards the Macquarie River and Proposal](image)

**Figure 7.2 : View from Bunglegumbie Road towards the Macquarie River and Proposal**

**Sensitivity: High**

This landscape presents a relatively open landscape with a consistency of vegetation cover terminated by a backdrop of riverine vegetation. The open nature of the landscape provides limited potential for screening of a development and so is assessed to have a high sensitivity to change.

**Magnitude: Moderate**

The proposal divides this landscape and has the potential to create a significant change. The alignment however sits relatively easily within the landscape without creating significant cuttings and fills. The scale of change is considered moderate. This change however needs to be considered in relation to the changes planned within LEP and the shift of land use to residential.

**Summary: Moderate to High**
7.2.2 LCZ2 - Industrial landscape

Located in the precinct around River Street, the industrial areas of Dubbo are characterised by warehouses, caryards etc set within expansive paved areas and car parks, refer to Figure 7.3. The scale of buildings and structures varies but are limited up to three storeys. There is usually little to no vegetation or tree cover within the properties and verges.

Sensitivity: Low

Industrial land uses due to the nature and form of the development have been assessed to have a low sensitivity to change.

Magnitude: High

The proposal sees a widening of the road pavement as the bypass transitions from bridge to road necessitating property adjustments resulting in a wider street corridor. An intensification of traffic will also be experienced as a result of the changes. The magnitude of change associated with the proposal is consequently considered high.
7.2.3 LCZ3 - Residential landscape

The main residential area is located to the west of the proposal and extends from Thompson Street to the north, refer to Figure 7.4. This is proposed to expand as part of the North West growth area which runs along the western edge of the alignment from Thompson Street.

Figure 7.4 : Residential Precinct Intersection of Thompson Street and Chiefly Drive

Residential areas are characterised by existing 1-2 storey, suburban residential dwellings. The landscape consists of a mix of exotic and native plantings and verges consisting of wide grassed verges and regularly-spaced street trees.

**Sensitivity: High**

The residential precinct presents a character zone defined by its built form. The scale and bulk of which is relatively homogenous. Its road system consists of residential streets of two lane roads with a shoulder. The dwellings currently are not exposed to an arterial road. The overall sensitivity to change is high.

**Magnitude: Negligible**

The residential precinct has no immediate interface with the proposal located to the east of the existing residential development. Consequently the impact on Landscape character of the residential precinct is considered negligible.

**Summary: Negligible**
7.2.4 LCZ4 - Open Space/Recreation landscape

The open space network adjoining the proposal forms a linear network which runs along the Macquarie River. This landscape consists primarily of large, open and mown grass areas including sporting fields, depicted in Figure 7.5, and public recreation areas, cycle ways and footpaths such as the Tracker Riley Cycleway. The landscape consists predominantly of native trees with little or no understorey shrub planting. The topography to the west of the river is generally steeper than that to the east where the landscape has been formalised as ovals.

Figure 7.5 : View form Erskine Street across open space/ netball courts adjoining the Macquarie River

**Sensitivity: Moderate**

As a recreational precinct it has a moderate sensitivity to change. Its character is defined by landscape rather than built form and is open in character.

**Magnitude: High**

The proposed alignment passes through a section of land bounded by Thompson Street and Whylandra Street and the Macquarie River which is used as public open space, Wiradjuri Park. The general alignment of the proposal is located towards the western edge of the space fragmenting the space. The proposal for a flood route compounds this fragmentation. While presently impacted on its southern edge by an arterial road usage which defines the southern boundary the overall magnitude of impact of the space is considered high.

**Summary: Moderate to High**
7.2.5 LCZ5- Commercial landscape

Commercial areas in Dubbo are characterised by urban development including local shops and larger shopping centres. Overnight accommodation, such as hotels and motels, also form part of the commercial character of the areas near the commercial core. Signage, awnings, ornamental street trees and post top lighting are elements that help define the commercial character of the area. Adjoining the alignment there is a small section of commercial development along Whylandra Street at the southern end of the proposal, refer to Figure 7.6.

![Figure 7.6: Commercial and tourist area just south of the Railway Crossing on Whylandra Street](image)

**Sensitivity: Low**

Like the industrial precinct the commercial landscape has a low sensitivity to change, reflecting the current relationship to the highway corridor.

**Magnitude: Negligible**

The nature of works is minimal relating to the provision of the connection of Whylandra Street to the proposed alignment. Change is considered to be negligible.

**Summary: Negligible**

7.3 Landscape Character Assessment Summary

Five landscape character units have been identified and assessed as part of the character study.

Sensitivity was assessed as high for both rural and residential character zones with the remaining zones ranging from low to moderate. Magnitude of change varied significantly with the industrial and open space zones identified as experiencing high levels of change and residential and commercial experiencing negligible. In the industrial zone its magnitude has been assessed as high reflecting a need for acquisition and property adjustments as a result of an expansion of the road pavement extent and its interface with the bridge and associated retaining walls. The open space assessment similarly reflects the fragmentation of the space and acquisition along with the introduction of a highway within its environs.

Overall character zones where an impact was identified ranged in impact from moderate to moderate to high. A summary of the landscape character assessment is presented in Table 7-1.
It was noted however that changes were anticipated in terms of agricultural landscape areas within the LEP and that these changes would see residential development occur adjoining the alignment. The design response should consider this future constraint.

Table 7-1: Landscape Character Assessment Summary

<table>
<thead>
<tr>
<th>Character Definition</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Summary</th>
</tr>
</thead>
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<tr>
<td>LCZ1 – Agriculture Landscape</td>
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<td>High to moderate</td>
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<tr>
<td>LCZ2 – Industrial Landscape</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>LCZ3 – Residential Landscape</td>
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<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>LCZ4 – Open space/Recreational Landscape</td>
<td>Moderate</td>
<td>High</td>
<td>High to Moderate</td>
</tr>
<tr>
<td>LCZ5 – Commercial Landscape</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
8. Visual Impact Assessment

8.1 Viewers and viewpoints

The experience of the viewers varies according to the duration, field of view and nature of exposure to the proposal.

In assessing the visual impact, the visual range has been considered to be the effective distance where a viewer can be influenced by changes in traffic movement and discern individual details such as signage and planting elements. 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 200 metres.

Typically the viewpoints have considered the impact of those overlooking the proposal. Of the adjoining observers it is the residential and recreational users who would be the most sensitive to change. The assessment however considers all users including the road user. Where differences in sensitivities of viewers exists the worst case assessment is the stated value in terms of Sensitivity, Magnitude and overall visual impact. The specific rating of the individual viewers is stated as part of the detailed assessment in Section 8.4.

8.2 Visual Catchment

The visual catchment of the proposal is well defined due to the topography of the site and clear barriers to sightlines, including vegetation, built form etc.

8.3 View Points

A number of viewpoints have been identified which capture the key areas of potential visual impact associated with the proposal. These relate to key residential or public areas which overlook the corridor. Figure 8.1 shows the visual catchment and the viewpoints identified for the proposal.
Figure 8.1: Visual Catchment and viewpoints
8.4 Key Viewpoints

8.4.1 VP1 – Bunglegumbie Road

View: Looking east from Bunglegumbie Road down the driveway to Mount Olive, refer to Figure 8.2. The foreground is dominated by open pasture lands which are earmarked for residential subdivision. Vegetation along the Macquarie River terminates the view before the buildings of Dubbo come into view.

Figure 8.2: Looking east from Bunglegumbie Road

Sensitivity: Low

Viewer – combination of transitory motorist and residential properties set 720 metres from the proposed centre line of the alignment.

The landscape is a transitional landscape in which farm uses have declined and land has been zoned for residential subdivision. As such it is a landscape in which change is anticipated. Sensitivity has consequently been assessed as low.

Magnitude: Low

The height of the formation is approximately two metres above the existing landform with a slope of 6H:1V. The distance from the viewpoint is approximately 720 metres. The scale of change within this flat landscape at such a distance is considered to be low, as the road formation will be developed to blend with the surrounding land use.

The magnitude is considered to be low.

Summary: Low

The distance from the viewer combined with the scale of the formation and its form, and the transitional nature of the land use within the view has seen this viewpoint assessed as having a low impact. Within this view a site compound is identified to the north alignment. This is a temporary structure and like the permanent works is likely to have a low impact.
8.4.2 VP2 – Chifley Drive looking north east

View: View from within the residential subdivision serviced by Chiefly Drive looking to the north east, refer to Figure 8.3. The bend in Chiefly Road has a vacant block that adjoins the Kingdom Hall of the Jehovah Witnesses and its carpark, which facilitates the potential of views to the alignment.

Figure 8.3 : Looking north east from Chiefly Drive

**Sensitivity: Moderate**

The land-use of the site is a combination of residential properties and religious buildings which potentially look out over the proposal. The view is one of fences and a farm structure with a back drop of river bank vegetation. The sensitivity has been assessed as moderate reflecting the sensitivity of uses.

The view which these properties overlook is a transitional landscape with much of the land proposed as residential development. This development would dominate the foreground and restrict views to the proposal.

**Magnitude: Low**

The magnitude of change at this point has been assessed as low. This reflects the fact that the development overlooking the proposed corridor generally has fencing to 1.8 metres in height which restrict visibility beyond the boundary. The formation height is approximately 2 metres and is offset a minimum 100 metres from the boundaries. Vertical elements within the alignment such as lighting will be visible.

A view of the proposal will not be visible from the public domain.

**Summary: Low to Moderate**

The view point has been assessed as Low to Moderate reflecting the sensitive nature of the land use combined with a low impact of the scale of development proposed.
8.4.3 VP3 – Newell Highway looking north east

View: This view is shown in Figure 8.4, is from within the Tourist zoning of the southern approach into Dubbo. Land uses consist of a mix of commercial and accommodation facilities. The highway alignment dominates the photo comprising two lanes in both directions, and a median separator. Verges are evident either side of the alignment comprising grass, and to the east a shared path is evident. Within the distance the rail bridge crossing the existing highway alignment is visible with a back drop of the Macquarie River vegetation visible on the horizon.

Figure 8.4: Looking north east along Newell Highway

**Sensitivity: Low**

The dominant viewers from this location are a combination of through traffic and the adjacent commercial premises. The view is dominated by infrastructure and so is not considered sensitive to changes. Its sensitivity is consequently considered to be low.

**Magnitude: Low**

Road infrastructure is the dominant element of the view and this is not going to change. The upgrade of the Newell Highway Thompson Street intersection is 300 metres from the view point - beyond the rail bridge. Minor realignments to the eastern kerb line are proposed to occur within 150 metres of the viewpoint which would potentially see the removal of the young trees and regrading of the embankment to the east (right) of the view.

**Summary: Low**

The overall impact of the proposal on the approach to the Western Rail Bridge through the tourist precinct is considered to represent a low impact due to the nature of the approach and the limited scale of the works. Mitigation measures of street tree planting outline in the strategy would enhance the road alignment.
8.4.4 VP4 – Thompson Street

View: View is looking north east across the Wiradjuri Park where the proposed flood route diversion route connects to Thompson Street, refer to Figure 8.5. This presents an open landscape setting with the developed river bank section of the park visible in the background including shelters and the river line vegetation. To the mid-ground of the view the main alignment will connect to the existing Newell Highway alignment. The foreground is dominated by the flood route.

Figure 8.5: Looking north east from Thompson Street

**Sensitivity: Moderate**

The viewpoint represents that of a user of Thompson Street. It presents a parkland setting beyond the Thompson Street road alignment. The viewpoint provides a pleasant outlook over trees and grasslands which is considered to be moderately sensitive to changes.

**Magnitude: High**

The alignment of the flood route passes through the left of the photo adjacent the pump station. The main alignment passes in the mid-ground of the view connecting with the existing alignment at the Thompson Street intersection. The introduction of these elements results in the fragmentation of the parkland and introduces an infrastructure element within the landscape setting. The magnitude of these changes is considered high as the parklands become fragment and infrastructure becomes the dominant element.

**Summary: Moderate to High**

The overall impact of the proposal is considered to be moderate to high reflecting the impacts associated with the fragmentation of the parklands and scale of the proposal itself. The proposal for a combination of street tree planting and parkland planting would limit the visibility of road infrastructure in the course of time. A compound site is identified between the two road alignments. This would not change the overall impact of the proposal.
8.4.5 VP5– Riverside Church grounds

View: Viewpoint 5 (shown in Figure 8.6) is located north of Thompson Street from within the carpark of the Riverside Church. This overlooks the parkland of Wiradjuri Park and the adjoining agricultural lands and presents a grassland landscape that is terminated by the riverbank vegetation.

Figure 8.6: View from Riverside Church grounds looking south east

**Sensitivity: Moderate**

The view point overlooks an open landscape of grassland with trees along the river bank terminating the view to east. Farm buildings are evident in the mid-ground view to the north. The sensitivity of the view is considered moderate due to the varied nature of the elements within the view, and the nature of the use – a carpark.

**Magnitude: Moderate**

The proposed alignment passes through the parkland/grasslands of the view on a slightly elevated formation and will result in the removal of the farm buildings. The distance from viewer and the nature of the infrastructure proposed is considered to represent a moderate impact to the viewer.

**Summary: Moderate**

The overall impact of the proposal from viewpoint 5 is considered to be moderate reflecting both the open character and diversity of elements within the view and the scale and visibility of the formation within the overall setting.
8.4.6 VP6 – View looking west from picnic shelters top of river bank Wiradjuri Park

View: Looking west across the existing parklands to the proposed alignment, viewpoint 6, (shown in Figure 8.7) represents an open grassland setting with residential precinct and vegetation to the west terminating the view.

Sensitivity: High

As a parkland setting the overall spatial and landscape character elements of the park are key elements in its sense of place. The site is one of passive recreation and so its setting is instrumental in the way it is experienced. The sensitivity of the site is consequently considered high.

Magnitude: High

The proposal sees the main alignment of the new bypass located in the foreground of the view point and introduces a major infrastructure element into the parkland. This has the impact of fragmenting the space and altering the overall experience of the environment associated with the park.

Summary: High

The overall impact of the proposal on Wiradjari Park is considered to be high. This reflects the introduction of a major infrastructure element into the centre of a passive recreational space. Opportunities should be explored to enhance the environment associated with this passive space to continue the desirability of adjoining this section of the river bank and its facilities.
8.4.7 VP7 – Intersection of Thompson Street and Newell Highway

View: View from Whylandra Street (Newell Highway) looking north from next to the Railway overbridge, (refer to Figure 8.8). View captures the proposed location of the intersection of the proposed new alignment of the Newell Highway with Thompson Street and the flood route. The depth of views is limited by the topography and vegetation of the parklands.

![Figure 8.8: Looking North along Newell Highway to its intersection with Thompson Street](image)

**Sensitivity: Low**

The location represents that of a busy intersection where the Newell Highway meets Thompson Street and just north of the Western Rail Bridge. The view is dominated by pavement and largely experienced in a transitory way. The view however has a back drop of parklands which moderates the scale of infrastructure within the setting. The sensitivity of the view of this intersection is considered low.

**Magnitude: High**

The proposal introduces an additional leg to the intersection and a further leg connecting to Thompson Street in the form of the flood route 100 meters to the west. The intersection consequently increases in scale and reduces the definition provided by the parklands to the north. The scale of impact created by the proposal is consequently considered high.

**Summary: Moderate**

The combination of an existing busy intersection with the introduction of a number of additional traffic lanes entering from a new direction has seen the sensitivity of the view point assessed as low but the impact of the proposed built form assessed as high, reflecting the change in scale of the proposed intersection. Its impact is consequently assessed as moderate. A construction ancillary site is also identified at this location. While this will expand the foot print of the proposal, the impact of this has already been assessed as high and so its impact will remain moderate.
8.4.8 VP8 – North Dubbo Weir on the Macquarie River looking northwest

View: Viewpoint 8 from the weir on the Macquarie River looking northwest towards the proposed alignment of the bypass and bridge (shown in Figure 8.9). View is of scattered trees on the river bank.

Figure 8.9: North Dubbo Weir on the Macquarie River looking northwest

**Sensitivity: High**

Located in a secluded section of the river accessible by a dirt road section of River Street, the viewer is likely to be someone who has come to enjoy the river setting. The environment is a scenic view along the river defined by the river banks itself and presents scenic outlook. The sensitivity of the setting is considered high.

**Magnitude: High**

The proposal introduces a significant structure to the foreground of what is a naturalistic landscape. The impact on viewer at this location is high.

**Summary: High**

The combination of a scenic setting with the introduction of a built element set above the river sees both sensitivity and magnitude of the viewpoint assessed as high and consequently a visual impact which is assessed as high.
8.4.9 VP9 – Looking north along Brisbane Street

View: View looking north along Brisbane Street towards the proposed bridge, (refer to Figure 8.10). The view presents a largely rural context, across the floodplain with the built edge of town visible to the right of photo.

![Figure 8.10: Looking north along Brisbane Street to location of proposed bridge](image)

**Sensitivity: Moderate**

The view represents that of the passing traffic and recreational users of this corridor. The agricultural grassland character of the view to the west of the alignment contrasts with the industrial character of that lining the eastern side of the alignment. The presence of these contrasting land uses has seen the view assessed as moderately sensitive to change.

**Magnitude: Moderate**

Bridge will be elevated approximately 8m above ground level, and over 150 metres in the distance with trees as backdrop. Some of the trees in the foreground will be removed to facilitate construction. A recent planting of trees along Brisbane Street also provides the opportunity to provide new screening. While the proposal introduces a new built element into the landscape its distance and partial screening by existing vegetation mean that the impact has been assessed as moderate.

**Summary: Moderate**

The combination of a transitioning landscape between agricultural uses and industrial landscape sees the context assessed as of moderate sensitivity. The distance and scale of the built intervention of the bridge is also considered to be a change of moderate magnitude. The overall visual impact is assessed as moderate. An ancillary construction compound is proposed to be behind this house left of photo. This is a temporary construction impact which coincides with the project works, and consequently does not change the overall assessment.
8.4.10 VP10 – River Street

View: Looking west towards the Macquarie River along River Street (shown in Figure 8.11). The view reveals a dirt track which follows the proposed alignment of the bridge. Trees are evident to either of side of the corridor but may need to be removed as part of the construction. The dominant character is one of a cultural parkland landscape presenting a combination of exotic and native vegetation in a moderately open setting.

Figure 8.11 : Looking west along the alignment of River Street and proposal

**Sensitivity: Moderate**

As a cultural landscape of scattered groupings of trees which present a semi open and consistent character the view is of moderate sensitivity to change.

**Magnitude: High**

Location of the view point is under the proposed bridge resulting in significant change in character and sense of enclosure. The built form will dominate the foreground of the view and sense of openness will be removed. The magnitude of change is assessed as high.

**Summary: Moderate to High**

The combination of a naturalist setting of moderate sensitivity and the introduction of a new built form which will dominate the view has seen the impact assessed as moderate to high.
8.4.11 VP11 – Brisbane Street

View: View looking south along Brisbane Street towards River Street and the proposed alignment of the bridge (refer Figure 8.12). Vegetation to either side of Brisbane Street limits visibility to the proposed alignment. Along the eastern edge of Brisbane Street filtered views to the industrial edge of town are visible.

Figure 8.12: Looking south along Brisbane Street

**Sensitivity: Moderate**

The experience of the users of Brisbane Street is largely one associated with open space and agricultural lands, presenting a landscape dominated by grassland and punctuated by trees. As such it presents a view which is relatively harmonious and consistent. The proposal has been assessed as having a moderate impact on the sensitivity of the view.

**Magnitude: Moderate**

Bridge will be elevated in the distance with trees as backdrop and in foreground. The Bridge will be visible on the skyline where it crosses Brisbane Street, and parts of the retaining wall be visible as the alignment moves along River Street. Its magnitude of change is considered moderate.

**Summary: Moderate**

The proposal sits within a landscape of some aesthetic quality. It introduces a built form into a relatively naturalistic landscape. The sensitivity and magnitude of these changes have both been assessed as moderate. Impact of the proposal has consequently been assessed as moderate.
8.4.12 VP12 – River Street towards Brisbane Street intersection

View: View looking east along River Street towards Brisbane Street (refer to Figure 8.13). View reveals the edge of the industrial commercial development of this part of Dubbo. Buildings are set well back from the view and are predominantly shed type structures. The foreground is largely open in character with combination of grassland and hardstands present. The proposal follows the alignment of River Street.

Figure 8.13 : Looking east along River Street towards Brisbane Street Intersection

**Sensitivity: Low**

The view is of an industrial commercial precinct. The built form is inconsistent and devoid of architectural interest. Viewers are transitory and represent that of the motorist either passing along Brisbane Street or through River Street. The sensitivity to change is consequently considered low.

**Magnitude: High**

The view point coincides largely with the bridge abutment and consequently will result in significant change in character and sense of enclosure. The proposal introduces retaining walls and an elevated road platform which will block much of the view. The magnitude of change is consequently considered high.

**Summary: Moderate**

While the alignment will see a complete change in the overall outlook of this view point, a combination of low sensitivity combined with a high magnitude of change has seen this view point assessed as having a moderate impact.
8.4.13 VP13 – River Street Bourke Street Intersection

View: Intersection of Bourke Street and River Street looking west (refer to Figure 8.14). This reveals the commercial industrial frontages of this precinct dominated by car dealerships and agricultural supply businesses. The streetscape is largely defined by the built form of the land use with minimal landscape within the verge. The alignment of the road follows the landform and falls away from the intersection.

*Sensitivity: Low*

The view is of an industrial commercial precinct. The built form is inconsistent and devoid of architectural interest. Viewers are either transitory passing through the intersection or those of workers. The sensitivity to change is consequently considered low.

*Magnitude: High*

The proposal sees partial resumption of lands to facilitate the construction of the proposed works. This reduces the setback provided on the existing land uses and increases the dominance of the road as a result of the addition of two lanes. The verge is formalised and paved increasing the dominance of hard landscape elements within the view.

Its magnitude of change is considered high as the proposal would result in significant change in character and sense of enclosure.

*Summary: Moderate*

A combination of low sensitivity combined with a high magnitude of change has seen this view point assessed as having a moderate impact.

8.5 Visual Assessment Summary

A total of 13 viewpoints have been assessed in relation to the permanent works associated with the proposal.

A range of viewpoints has been considered reflecting the nature of land-use and the likely interaction that will occur in relation to the proposal and existing development. The viewpoints selected provide a range of
receptors including residents, road users, open space users which reflect a broad cross section of the community who will experience changes as a result of the proposal.

The overall magnitude of the proposal has been assessed as moderate. This reflects the establishment of a new alignment in relatively close proximity to an established community within an agricultural landscape.

Of the 13 viewpoints the range of visual impact ratings determined is as follows:

- Two viewpoints have been assessed as having a moderate to high visual impact
- One viewpoint as low to moderate visual impact
- Two viewpoints as high visual impact
- Two viewpoints as low visual impact
- Six viewpoints as moderate visual impact.

This assessment should however be balanced by the potential visual impact on future residences proposed for the north west sector. These dwelling would overlook the alignment and would have a high sensitivity to the proposal. Consideration needs to be given to the design response for these dwellings and the provision of adequate screening.

Table 8-1 below summarises these impacts.

**Table 8-1: Visual Assessment Summary**

<table>
<thead>
<tr>
<th>View Point</th>
<th>Sensitivity</th>
<th>Magnitude</th>
<th>Impact</th>
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<tr>
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</table>
9. Mitigation Measures

9.1 Mitigation Measures

Mitigation measures are treatments developed as part of an overall integrated design process that is recommended to reduce the impacts of a proposal. Mitigation measures are captured in the design to address environmental requirements such as protection of identified vegetation or fauna species; water quality issues; noise etc.

The mitigation measures discussed here address visual and landscape character impacts and those issues addressed as part of the overall urban design response. They may relate to specific viewpoints or address the overall impact of the proposal as a whole. Mitigation measures also aim to reduce impacts on the existing landscape character through consideration of existing site features, cultural and environmental heritage.

The urban design Objectives and Principles along with the overall landscape strategy identified in Chapter 3 incorporate a number of measures that are proposed and designed to reduce the impacts of the proposal. These have been followed through into the concept design and include:

- Adoption of an alignment which incorporates a separate flood route avoiding need for significant earthworks and floodgates adjoining Emile Seisier Bridge
- A road formation which has adopted grades that have been eased on the floodplain to 1:6 providing a smooth flowing profile and avoiding abrupt changes in the landscape
- Bridge approach batters provide a transitional batter profile easing into steeper grades associated with the abutment
- A planting strategy that has been designed to reflect the native communities or cultural plantings according to context
- Bridge design reflects the requirements of the Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW, RMS, January 2012
- Piers and head stock design has responded to the existing bridge precedents of Dubbo
- Pier form integrates the headstock with the pier and responds to the scale of the structure reflecting either the floodplain or river crossing
- Pier adopts a rounded leading edge to soften the overall pier form and provide some consistency with other piers of Dubbo Bridges
- Retaining walls have adopted a strong textured form to act as an anti-graffiti deterrent
- Lighting design has minimised light spill consistent with the Dark Sky guidelines
- Lighting is to be spaced centrally on bridge spans, providing a structured solution to the bridge lighting
- Intersection design proposes gateway landscape treatments to provide connection to the Dubbo Street form and character.

In addition to the elements incorporated within the design above, a number of key safeguards have been identified to be taken into the detailed design to ensure the intent of the concept design and the ongoing development of the design to mitigate its impacts. These safeguards are summarised below (refer to Table 9-1), and address both design and construction issues.
<table>
<thead>
<tr>
<th>Issue</th>
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<th>Recommendation</th>
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<td>Design Integration</td>
<td>Design</td>
<td>Ongoing integrated project development in the detail design phase will follow RMS integrated project development processes, and will include urban designers (selected from the RMS Registered Contractors Scheme) as part of the project team.</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Design development to reflect RMS Urban Design Policy and Guidelines to be used to guide future design Development</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Urban design principal and objectives and concept design strategy presented in this technical paper to form basis of future design development</td>
</tr>
<tr>
<td>Structures – limit visibility of built elements</td>
<td>Design</td>
<td>Further development of Bridge Design to ensure a simple, refined, integrated structure which sits comfortably within the landscape is adopted consistent with design guidelines, principles and concepts included in this report.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimise structural depth</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Minimise footprint and disruption to creek line</td>
</tr>
<tr>
<td>Earthworks</td>
<td>Design</td>
<td>Integrate with adjoining landform through adoption of appropriate grades, avoiding sharp transition in profile</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Stabilise/revegetate as works progress to limit erosion and visual impacts through early integration with surrounding vegetation</td>
</tr>
<tr>
<td>Retention of Existing vegetation</td>
<td>Design</td>
<td>Design the proposal to avoid impact to prominent trees and vegetation communities where possible Existing threatened species are to be retained and protected wherever possible Minimise clearance extent where possible</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Clearly define clearance limits and exclusion zones to protect vegetation cover</td>
</tr>
<tr>
<td>Revegetation</td>
<td>Design</td>
<td>Vegetation communities to respond to existing communities and landscape character Utilise local provenance material Provide screen planting within corridor to limit visibility of the proposal from adjoining residential properties</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Progressively implement revegetation works to limit erosion and to establish vegetation Utilise cleared material as part of revegetation works</td>
</tr>
<tr>
<td>Parkland reinstatement</td>
<td>Design</td>
<td>Ongoing development of the reinstatement strategies for parklands fragmented by the proposal to be undertaken in consultation with Council</td>
</tr>
<tr>
<td>Minimise road furniture and signage</td>
<td>Design</td>
<td>Provide minimum signage requirements and limit structural elements to provide and open and permeable setting</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Look for opportunities to minimise designed signage,</td>
</tr>
<tr>
<td>Lighting</td>
<td>Design</td>
<td>Limit extent of lighting and potential for light spill</td>
</tr>
<tr>
<td>Issue</td>
<td>Stage</td>
<td>Recommendation</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Construction</td>
<td>Limit night works and provide lighting which minimises spill</td>
<td></td>
</tr>
<tr>
<td>View management</td>
<td>Design</td>
<td>Provide visual screening within the road corridor to limit the visual impact of the proposal in areas identified as moderate or high impact Provide sense of space and openness associated with the agricultural landscape</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Retain vegetation beyond the footprint to retain any existing screening</td>
</tr>
<tr>
<td>Construction Compounds</td>
<td>Design</td>
<td>Set out compounds to limit impacts, consider screening and location of key structures which provide the greatest impact</td>
</tr>
</tbody>
</table>
|                         | Construction | Maintain compound in a tidy and well-presented manner. Provide and maintain screening  
Construction site compound areas will be returned to at least their pre-construction state, unless otherwise detailed in the project design, once construction activities are complete or will be progressively remediated throughout the construction program where possible |
10. Conclusion

The concept design involves about 2.2 kilometres of carriageway, commencing at the intersection of Thompson Street and Newell Highway and extending north to the intersection of River Street and Newell Highway. Key features of the design include:

- A new intersection between Thompson Street and Newell Highway
- A new Bridge over the Macquarie River
- A new intersection between River Street and Newell Highway (Bourke Street).

Developing an integrated design response for the proposal the development of urban design objectives and principles has occurred, which responds to the landscape character and visual context of the study area. These objectives define a response that creates a relationship between the proposal and the surrounding, agricultural, open woodland and urban areas.

The urban design concept has been developed to achieve an integrated outcome that helps fit the proposal as sensitively as possible into its context and to minimise the impacts of it on the future character of the area, through the incorporation of a number of mitigation measures.

The urban design would:

- Ensure attractive views into the broader landscape are maintained by revegetating disturbed areas along the road edges, while screening properties adversely affected by the proposal
- Incorporate materials and finishes for new road elements that are site appropriate and reduce their visual prominence
- Ensure there is a visually complementary relationship between the proposed bridge and its local context
- Include a planting design intended to reduce the scale of the proposed road infrastructure by the provision of appropriate tree species in the streetscapes of the urban areas of Dubbo
- Provide screening, through the use of native plant species, of the road infrastructure to residential areas/future residential areas.

Landscape Character Assessment

Five landscape character units have been identified and assessed as part of the character study.

Sensitivity was assessed as high for both rural and residential character zones with the remaining zones ranging from low to moderate. Magnitude of change varied significantly with the industrial and open space zones identified as experiencing high levels of change and residential and commercial experiencing negligible.

Overall character zones where an impact was identified ranged in impact from moderate to moderate to high. A summary of the landscape character assessment is presented Table 7-1.

It was noted however that changes were anticipated in terms of agricultural landscape areas within the LEP and that these changes would see residential development occur adjoining the alignment. The design response should consider this future constraint.

Visual Impact Assessment

The overall magnitude of the proposal has been assessed as moderate. This reflects the establishment of a new alignment in relatively close proximity to an established community within an agricultural landscape.

Of the 13 viewpoints the range of visual impact ratings determined is as follows:

- Two viewpoints have been assessed as having a moderate to high visual impact
One viewpoint as low to moderate visual impact
Two viewpoints as high visual impact
Two viewpoints as low visual impact
Six viewpoints as moderate visual impact.

This assessment should however be balanced by the potential visual impact on future residences proposed for the North West sector. These dwellings would overlook the alignment and would have a high sensitivity to the proposal. Consideration needs to be given to the design response for these dwellings and the provision of adequate screening.

**Mitigation**

The urban design response seeks to mitigate its impact on and integrate the proposal with its surrounding context. This defines an approach reduces the overall impacts of the proposal by identification of key impacts and a response to them. A number of key mitigation measures are summarised which will mitigate the impacts on landscape character and visual amenity. These measures and safeguards are to be taken forward into the detailed design to ensure impacts and minimised.
11. References

Cardno February 2017 Newell Highway, New Dubbo Bridge - Preliminary Environmental Investigation Report

Moir Landscape Architecture, April 2013, Wiradjuri Park, Dubbo Master Plan


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


Roads and Maritime Services, April 2015, Guideline for Batter Surface Stabilisation using vegetation,


Roads and Traffic Authority (RTA) (July 2005) NSW Bicycle Guidelines

Roads and Maritime Services, November 2016, New Dubbo Bridge Options – Strategic Urban Design and Visual Impact Study (Rev C)

Roads and Maritime Services, 2012, Bridge Technical Direction BTD2012/01 Provision of Safety Screens on Bridges


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

Websites

www.planningportal.nsw.gov.au