Transport
for NSW

New Dubbo Bridge - River Street West Stage 1 Intersection of Newell Highway and River Street West

Addendum review of environmental factors

April 2024

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

TfNSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

TfNSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

New Dubbo Bridge River Street West Stage one intersection of Newell Highway and River Street West Addendum Review of environmental factors

Prepared by Jacobs Pty Ltd and Transport for NSW.

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Executive summary

The proposed modification

Transport for New South Wales (TfNSW) proposes to modify the New Dubbo Bridge project (NDB project) to include a new four-way signalised intersection at the connection point of the future River Street West Stage 1 (RSWS1) alignment and the Newell Highway realignment (proposed modification). Where RSWS1 refers to the alignment between the Newell Highway realignment and Bunglegumbie Road.

The key design feature of the proposed modification is the inclusion of a new four-way signalised intersection to provide an efficient and safe future road connection with sufficient capacity for future vehicle movements (up to the year 2036) for the North-West Urban Release Area urban growth area.

There would be no substantial changes to the construction methodology, ancillary facilities, resources, equipment, public utilities, working hours, construction traffic management or project duration as discussed in the project REF (Jacobs, 2019), submission report (Jacobs,2019a) and Addendum REF No.1 (Jacobs,22).

Construction of the NDB project has commenced and is expected to open to traffic in early 2026. The proposed modification would be constructed concurrently with the Newell Highway realignment as part of the NDB project.

Background and need

Jacobs were engaged by TfNSW to prepare the detailed design documentation for the NDB project. The NDB project consists of a new bridge over the Macquarie River and construction of approximately 2.2 kilometres of new highway and intersection upgrades between the Thompson Street / Whylandra Street intersection and the River Street / Bourke Street intersection in Dubbo, NSW. The NDB Issued For Construction (IFC) design was completed on 30 May 2023 and the NDB project is currently under construction.

Dubbo Regional Council has secured funding from the State Government to construct the River Street West collector road, which will form the critical spine of what will become Dubbo's new North-West Urban Release Area. This development area will be residential land which will accommodate several thousand people.

As such a safe connection is required for future road users between RSWS1 and the future Newell Highway realignment. Hence the proposed modification is required to modify the NDB project design to include a new four-way signalised intersection at the connection point of the RSWS1 alignment and the Newell Highway realignment to facilitate access to the North-West Urban Release Area.

Proposal objectives

The key objectives for the proposed modification include:

- Provide a safe connection for road users between RSWS1 and the future Newell Highway realignment
- Provide sufficient traffic capacity for anticipated traffic movements from future development areas
- Provide an efficient connection that balances the needs of through traffic utilising the Newell Highway as a preferred route as well as access to the future development areas
- Reduce impacts to the NDB project construction program
- Develop a cost-effective solution.

Section 2.3 of the project REF identified the overall proposal objectives and development criteria that apply to the overall NDB project. The modified project would continue to support the objectives of the NDB project.

Statutory and planning framework

This addendum REF has been prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (*EP&A) Act and describes the level of impact that the proposed activity may have. It aims to address TfNSW's duty with respect to

considering the environmental impact of the proposed activity under Section 5.5 of the EP&A Act and clauses 170 and 171 of the Environmental Planning and Assessment Regulation 2021 (EPA&A Regulations).

A referral to the Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act is not required.

Community and stakeholder consultation

The Communications Engagement Plan (CEP) prepared for the NDB project would be applied to the proposed modification.

Ongoing consultation will be required by the construction contractor and TfNSW to update local property owners, road users and Dubbo Regional Council of the modified project.

Environmental impacts

This assessment compared the environmental impacts of the proposed modification to the NDB project as described in the project REF, submissions report and Addendum REF No.1

The proposed modification would result in additional operational noise and traffic impacts resulting from the inclusion of the new intersection and associated additional traffic volumes generated by the North-West Urban Release Area. The key impacts are as follows:

- Traffic and transport:
  - While the proposed modification may introduce additional light and heavy construction vehicles, the potential construction traffic impacts would be generally be consistent with the NDB project
  - Any additional construction impacts on existing pedestrian and cycle infrastructure are anticipated to be minimal and would be managed through diversions and the use of alternative existing and temporary paths, as per the project REF.
  - During operation, the proposed modification is not anticipated to add significantly more traffic impacts than originally assessed in the project REF. However, some movements would operate at or near capacity by 2036 at the Whylandra Street/Thompson Street and the River Street/Bourke Street intersections.
- Noise and vibration:
  - The noise and vibration impacts from the construction of the proposed modification are expected to be equal or less than the noise and vibration impacts of the NDB project.
  - During operation the proposed modification would introduce additional traffic noise impacts to the nearest three sensitive receivers. All three sensitive receivers are expected to meet the threshold for eligibility for consideration of mitigation.

It is expected that the proposed design refinements would not result in any changes to other environmental impacts described in the REF and Submissions Report. As a result, the amended proposal is considered to be in the public interest.

Justification and conclusion

The proposed modification may result in some additional, minor, adverse environmental impacts. These impacts would be managed in accordance with the mitigation and management measures summarised in this addendum REF.

The proposed modification and overall NDB project are considered justified as it would meet the project objectives, improve flood immunity, improve constructability, and provide additional long-term improvements for the New Dubbo Bridge and the associated proposed Newell Highway.

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1. Introduction

1.1 Proposed modification overview

Transport for New South Wales (TfNSW) proposes to modify the New Dubbo Bridge project (NDB project) to include a new four-way signalised intersection at the connection point of the future River Street West Stage 1 (RSWS1) alignment and the Newell Highway realignment (proposed modification). Where RSWS1 refers to the future alignment between the Newell Highway realignment and Bunglegumbie Road.

Key design features of the proposed modification comprise of the installation of four-way signalised intersection to provide an efficient and safe future road connection with sufficient capacity for future vehicle movements (up to 2036) for the North-West Urban Release Area urban growth area.

The location of the proposed modification is shown in **Figure 1-1** and the proposed modification is shown in Figure 1-2. **Section 3** describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the NDB project in May 2019 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 27 May 2019 and 28 June 2019 for community and stakeholder comment. A submissions report, dated December 2019, was prepared to respond to issues raised. The project REF was determined on 11 December 2019.

An Addendum REF (referred to in this addendum REF as Addendum REF No. 1) was prepared in February 2022 for refinements to the New Dubbo Bridge structure, layout of the Newell Highway and project intersections, as well as changes to retaining wall and drainage structures, shared path and public access arrangements and landscaping and finishing work.

The proposed modifications as described within the previous Addendum REF No. 1 constitutes the current approved NDB project.

Legend

- Modified project area
- Approved NDB project area
- Train station
- Bridge
- Main road
- Local road
- Waterway
- Open space

0 500 1000 m

1:30,000 at A3

Data sources

Jacobs 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Date: 4/17/2024 Path: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA182600\22 Spatial\GIS\Directory\Templates\Figures\AddendumREF_2\IA182600_AddendumREF2_v07.aprx
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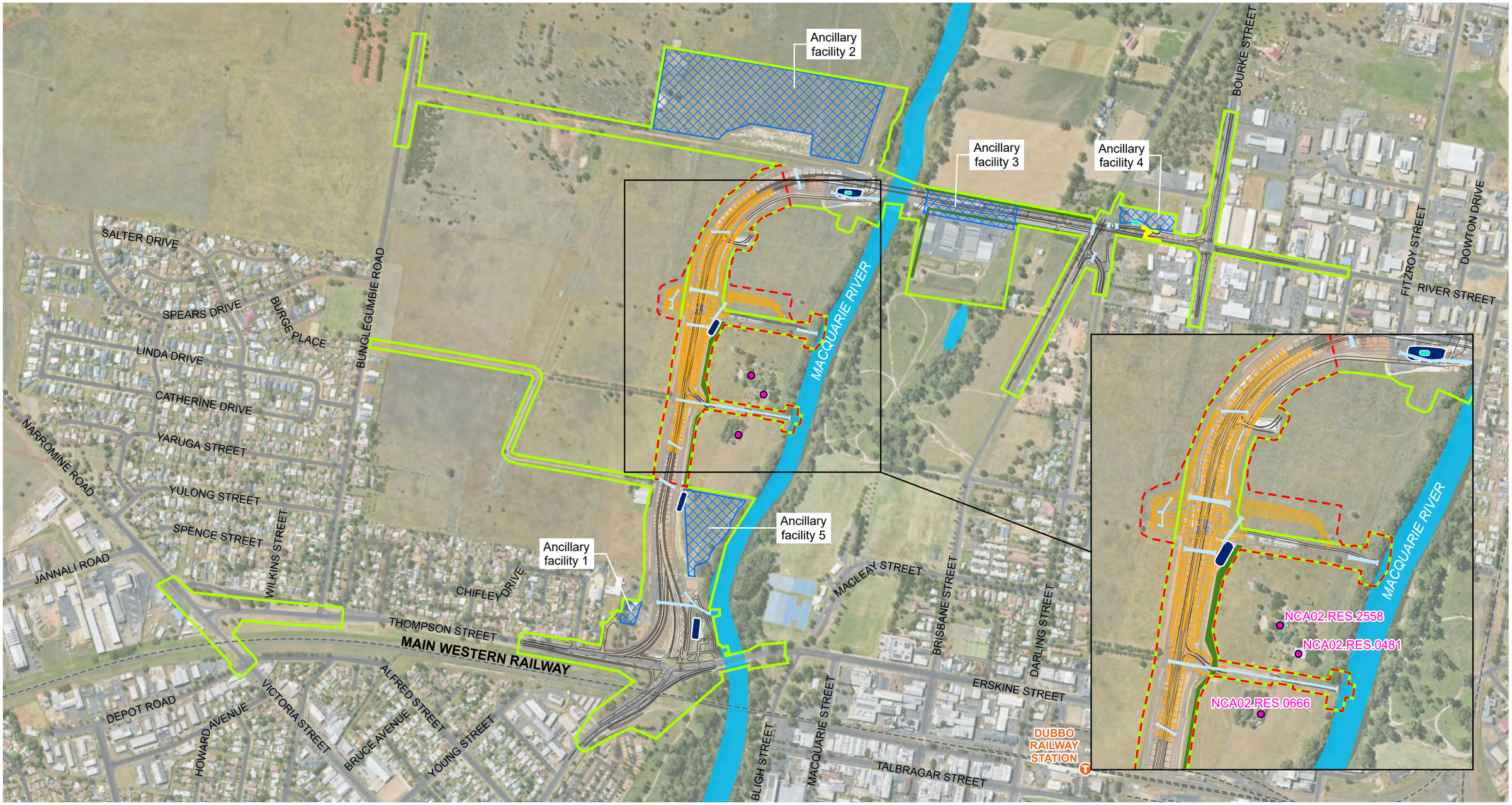
Figure 1-1 Location of the proposed modification



Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Residential receivers
- Culvert
- Retaining wall
- Tree plantings
- Sediment basin
- Operational basin
- Proposed ancillary facility
- Train station
- Road
- Railway
- Waterway

0 250 500 m

1:9,000 at A3

Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Figure 1-2 The proposed modification

Date: 4/17/2024 Path: \\Jacobs.com\ANZIE\Projects\04_Eastern\IA182600\22 Spatial\GIS\Directory\Templates\Figures\AddendumREF_ZIA182600_AddendumREF2_v07.aprx
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1.2 Purpose of the report

This addendum REF has been prepared by Jacobs on behalf of TfNSW Western Region. For the purposes of these works, TfNSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF, submissions report and Addendum REF No.1 as all of these documents form the approved NDB project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of section 171 of the Environmental Planning and Assessment Regulation 2021, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), *Roads and Road Related Facilities EIS Guideline* (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of Section 5.5 of the EP&A Act including that TfNSW examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Needs and options considered

2.1 Strategic need for the proposed modification

Jacobs were engaged by TfNSW to prepare the detailed design documentation for the NDB project. The NDB project consists of a new bridge over the Macquarie River and construction of approximately 2.2 kilometres of new highway and intersection upgrades between the Thompson Street / Whylandra Street intersection and the River Street / Bourke Street intersection in Dubbo, NSW. The NDB Issued For Construction (IFC) design was completed on 30 May 2023 and the NDB project is currently under construction.

Dubbo Regional Council has secured funding from the State Government to construct the River Street West collector road, which will form the critical spine of what will become Dubbo's new North-West Urban Release Area. The North-West Urban Release Area will be residential land and is planned to be fully developed by the year 2043 to accommodate several thousand people. The new collector road will be staged in construction and will ultimately connect with Westview Street, providing direct access for commuters to the Mitchell Highway (Narromine Road). These will form the critical spine of what is proposed to become Dubbo's new North-West Urban Release Area.

As such, a safe connection is required for future road uses between RSWS1 and the future Newell Highway realignment. Hence the proposed modification is required to modify the NDB project design to include a new four-way signalised intersection at the connection point of the RSWS1 alignment and the Newell Highway realignment to facilitate access to the North-West Urban Release Area.

2.2 Proposal objectives and development criteria

The key objectives for the proposed modification include:

- Provide a safe connection for road users between RSWS1 and the future Newell Highway realignment
- Provide sufficient traffic capacity for anticipated traffic movements from future development areas
- Provide an efficient connection that balances the needs of through traffic utilising the Newell Highway as a preferred route as well as access to the future development areas
- Reduce impacts to the NDB project construction program
- Develop a cost-effective solution
- Supports future active transport objectives for pedestrian and cyclist users.

Section 2.3 of the project REF identified the overall proposal objectives and development criteria that apply to the overall NDB project. The modified project would continue to support the objectives of the NDB project.

2.3 Alternatives and options considered

The progression of the detailed design from the concept design (as assessed in the project REF) has resulted in a number of design refinements across the project.

The options considered for the proposed modification in this addendum REF include:

- Option 1: Do nothing. The NDB project would not include the new intersection
- Option 2: Include the new intersection and extent of the project area in the NBD project design, to allow construction the intersection at the same time as the Newell Highway realignment.

2.4 Preferred option

The preferred option is Option 2 which will include the new intersection. This would meet the proposed modification objectives as outlined in **Section 2.2**.

3. Description of the proposed modification

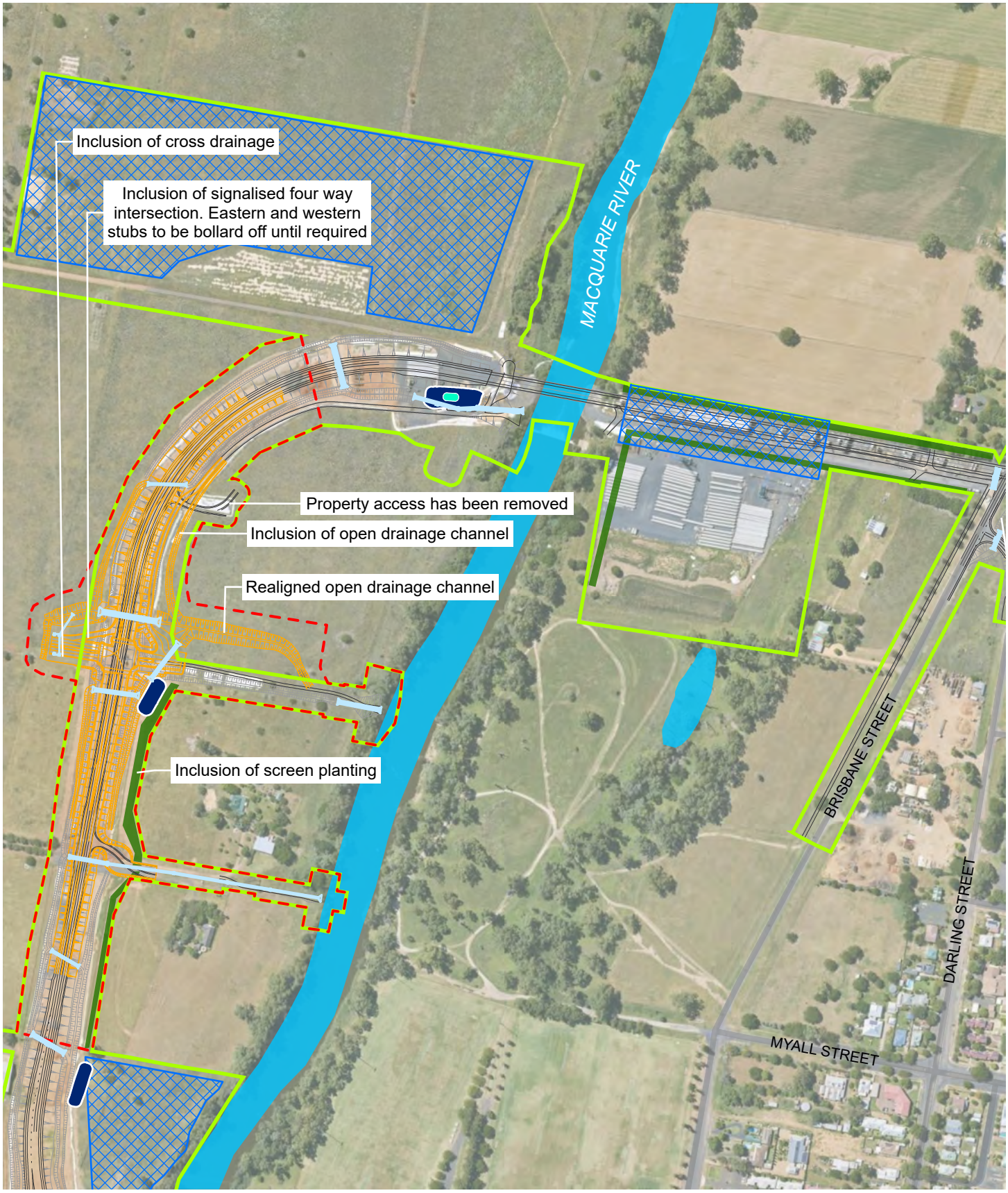
3.1 The proposed modification

TfNSW proposes to modify the NDB project to include a new four-way signalised intersection at the connection point of the RSWS1 alignment and the future Newell Highway realignment (proposed modification).

The proposed key features of the modification are shown **in Figure 3 1**.

Key design features of the proposed modification are:

- Design changes for the inclusion of a new four-way signalised intersection between the RSWS1 collector road and the NDB Newell Highway realignment. The eastern and western legs of the proposed intersection will be designed as 'stubs', to enable construction of the connecting roads in the future
- Adjustments to the NDB project area between approximately CH1250 and CH1900 to accommodate the new intersection including shared paths and additional lanes based on traffic modelling and vehicle turning path requirements at approximately CH1585
- Removal of the property access at CH1765 and extension of the maintenance access track to the RSWS1 eastern intersection leg.
- Environmental works such as the installation of trees, irrigation, and fencing along the frontages of neighbouring properties to improve the landscape character and reduce visual impacts to residents
- Amendment of the open channels to suit new culvert locations. This includes the relocation of the open channel at approximately CH1575 further north as the previous location clashes with the eastern leg of the intersection.



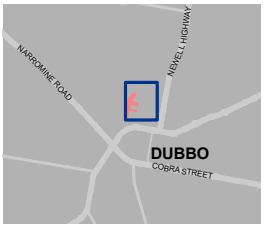
Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Culvert
- Swales
- Retaining wall
- Tree plantings
- Sediment basin
- Operational basin
- Proposed ancillary facility
- Road
- Railway
- Waterway

0 50 100 m

1:5,500 at A4

N



Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Figure 3-1 Indicative Project layout

3.2 Design

The intersection layout for the RSWS1/Newell Highway intersection is based on the 100% detailed design as described in the *River Street West Stage 1 Intersection of Newell Highway and River Street West Design Report* (Jacobs, 2024).

3.2.1 Main features of the modification

The new intersection would be a four-way signalised intersection between the RSWS1 collector road and the NDB Newell Highway realignment. The new intersection would cater for 12.5 metre single unit truck and 19 metre semi-trailer movements.

The southern approach to the intersection would include one exclusive left turn lane, one through lane and one exclusive right turn lane. The northern approach to the intersection comprises two exclusive right turn lanes, one through lane and one combined through and left turn lane. The western approach to the intersection comprises one high entry angle left turn slip lane, one combined through and right turn lane and one exclusive right turn lane. The eastern approach comprises one combined through, left and right turn lane. A signalised pedestrian crossing is provided on all four legs of the intersection.

The eastern and western legs of the proposed intersection will be designed as 'stubs', to enable construction of the connecting roads in the future. The intersection will include raised medians and lighting. No permanent safety barriers would be installed at the new intersection. However temporary barriers or similar will be required to prevent access to the eastern and western stubs in the interim, prior to the completion of these roads.

The pavement type for the Newell Highway, River Steet West (western leg) and Eastern Access Road (eastern leg) would be full depth asphalt pavement. While the pavement type for the maintenance access path on the eastern side of the Newell Highway would be granular unbound base with an unsealed surface.

Other additional features and changes at this location would include:

- Additional street lighting around the intersection
- A new capped water and sewer mains for future connection
- The relocation/extension of the NDB project culverts to accommodate the intersections
- A new culvert made up of three 750mm reinforced concrete piped under the eastern leg of the new intersection.
- Pits and pipes at the reinforced soil wall (RSW) sag point.

The following active transport provisions have been included as part of the proposed modification to connect in the NDB project:

- Provision for a future 3.5m wide shared path on the northern side of RSWS1
- Provision for a future 1.5m wide footpath on the southern side of RSWS1
- 3.5m wide shared path on the north-eastern corner of the intersection
- 3.5m wide shared path on the south-eastern corner of the intersection
- Provision for a 3.5m shared path on the southern side of the Eastern Access Road.

The intersection design drawings are provided in **Appendix A.**

3.3 Construction activities

3.3.1 Work methodology

There would be no substantial changes to the construction methodology, ancillary facilities, resources, equipment, public utilities, working hours, construction traffic management or project duration as discussed in Section 3.3 of the REF, Section 3.3 of submission report and Section 3.3 of the Addendum REF No.1.

Construction of the NDB project has commenced and is expected to take about 48 months to build. The proposed modification would be constructed concurrently with the Newell Highway realignment as part of the NDB project.

As per the project REF, construction activities would be guided by a construction environmental management plan (CEMP) to ensure work is carried out to TfNSW specifications within the specified work area.

3.4 Property acquisition

Additional land would be need ed to accommodate the larger footprint of the new intersection. The additional land area has been calculated by applying a five metre buffer on the proposed modification design. The signed memorandum of understanding (MOU) between Transport for NSW and Dubbo regional Council states for the new intersection states that Dubbo Regional Council are responsible for all costs associated with the new intersection, including costs and responsibility for gazettal of land.

Dubbo Regional Council already entirely owns all the additional land required for the new signalised intersection. What land is required public roads will be dedicated as public road by Dubbo Regional Council at the end of works. Dubbo Regional Council has provided Transport for NSW and its contractor with a signed access agreement and permit to enter to facilitate works.

Thus no further acquisitions would be required to commence and complete construction. The three lots effected by the proposed modification, are set out in set out in **Table 3-1** shown on **Figure 3-2**. The final boundary details and arrangements would be carried out in by Dubbo Regional Council and Transport for NSW following construction.

Any land occupied by construction work, but not required for the ongoing operation of the modified project, would be reinstated to its pre-construction use.

Table 3-1: Properties impacted by the new easement

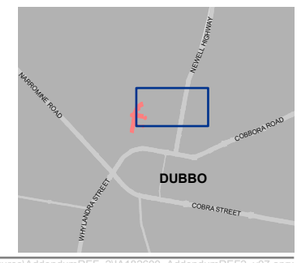
Lot and DP	Additional impact area (square metres)	Acquisition type	Current owner	Land use zone (LEP)
Lot16 DP1285243	278.2	Easement	Dubbo Regional Council	R2
Lot17 DP1285243	11,268.9	Easement	Dubbo Regional Council	R2
Lot18 DP1285243	6.7	Easement	Dubbo Regional Council	R2

Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Proposed ancillary facility
- Modified project easement area
- Property acquisition
- Easement area
- Leased area
- Road
- Railway
- Lot
- Waterway

0 100 200 m

1:4,500 at A3



Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Figure 3-2 Proposed property acquisition

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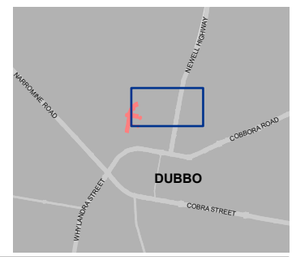
0 100 200 m

1:4,500 at A3



Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Figure 3-2 Proposed property acquisition

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Created by : ST | QA by : KD

Legend

- Modified project design
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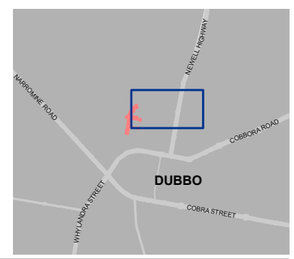
- Proposed ancillary facility
- Modified project easement area
- Property acquisition
- Easement area
- Leased area
- Road
- Railway
- Lot
- Waterway

0 100 200 m

1:4,500 at A3



Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

Figure 3-2 Proposed property acquisition

Date: 4/17/2024 Path: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA182600\22 Spatial\GIS\Directory\Templates\Figures\AddendumREF_2\IA182600_AddendumREF2_v07.aprx
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4. Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

The EP&A Act and its associated regulations provide the framework for assessing environmental impacts and determining planning approvals for developments and activities in NSW. The EP&A Act also establishes State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs) which may include provisions relevant to the proposal.

This addendum REF has been prepared under Division 5.1 of the EP&A Act and describes the level of impact that the proposed activity may have. It aims to address TfNSW's duty with respect to considering the environmental impact of the proposed activity under Section 5.5 of the EP&A Act and clauses 170 and 171 of the Environmental Planning and Assessment Regulation 2021 (EPA&A Regulations).

Other relevant requirements of the EP&A Act and the EP&A Regulations have been considered where relevant throughout Chapters 5 and 6 of this Addendum REF.

4.1.1 State Environmental Planning Policies

State Environmental Planning Policies

Chapter 2 (Infrastructure) of SEPP (Transport and Infrastructure) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.108 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and is to be carried out by TfNSW or on behalf of TfNSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from Council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in **Section 5.4**.

4.1.2 Local Environmental Plans

Dubbo Local Environmental Plan 2011

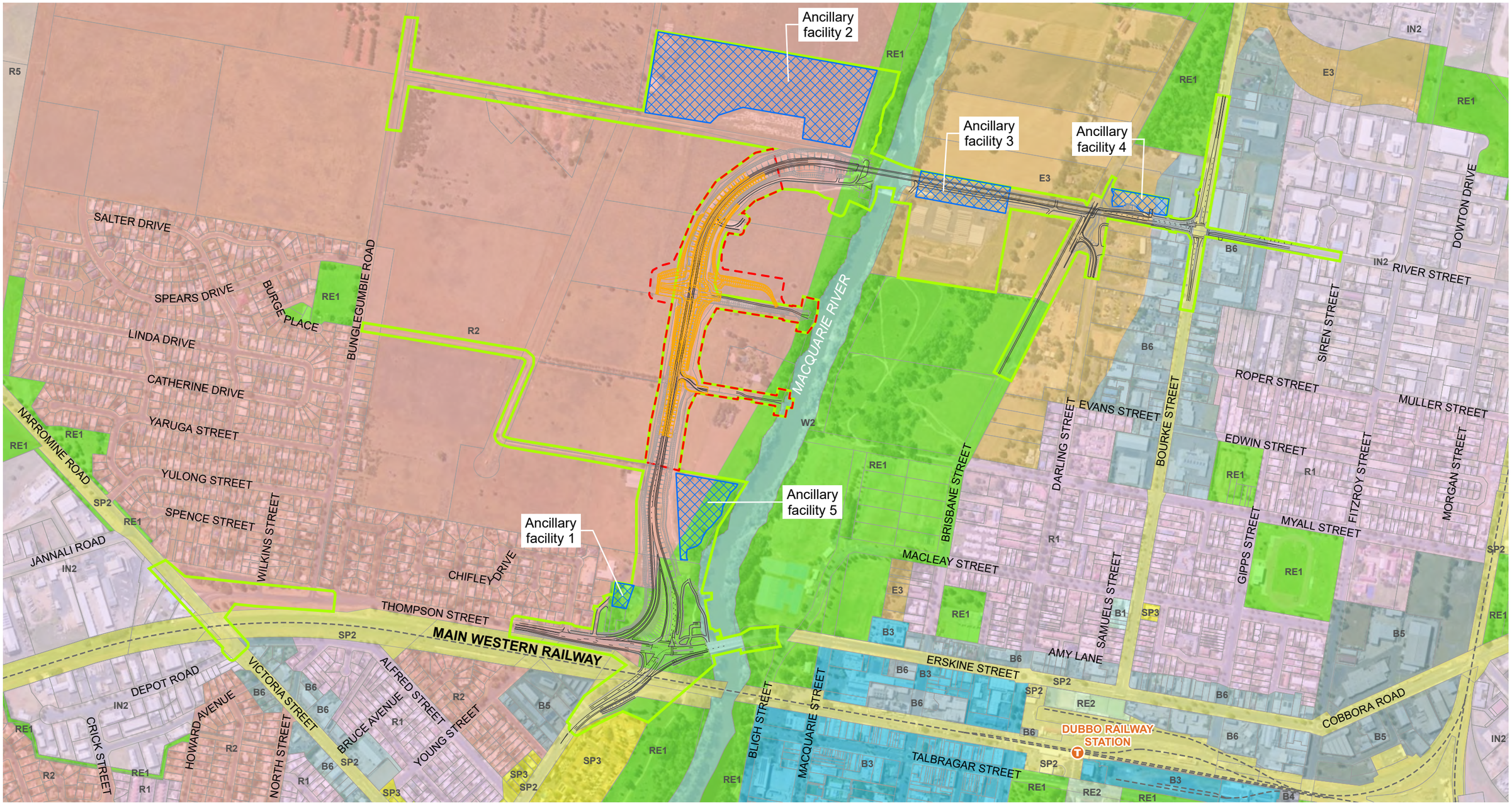
The proposed modification is located within the Dubbo local government area (LGA) and is primarily regulated by the Dubbo Local Environmental Plan 2011 (Dubbo LEP).

The land use objectives for zones under the LEP, and the proposed modifications consistency with those objectives, are detailed in **Table 4 1**.

Table 4 1 Dubbo LEP zone objectives

Zone	Objective	Consistency of the proposed modification with the zone objective
R2 Low Density Residential	• To provide for the housing needs of the community within a low density residential environment • To enable other land uses that provide 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	The proposed modification provides an efficient connection that balances the needs of through traffic utilising the Newell Highway as well as access to the future North-West Urban Release Area. This is consistent with the zone objectives.

The consent requirements of the Dubbo LEP would not apply to the proposed modification as, under the Transport and Infrastructure SEPP, the proposed modification is permitted without consent of council and may be determined under Division 5.1 of the EP&A Act. The land zoning which the proposed modification falls within is shown in **Figure 4-1**.



Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Train station
- Proposed ancillary facility
- Lot

Land zoning

B1	Neighbourhood Centre	R1	General Residential
B3	Commercial Core	R2	Low Density Residential
B4	Mixed Use	R5	Large Lot Residential
B5	Business Development	RE1	Public Recreation
B6	Enterprise Corridor	RE2	Private Recreation
E3	Environmental Management	SP2	Infrastructure
IN2	Light Industrial	SP3	Tourist
		W2	Recreational Waterways

0 250 500 m

1:9,000 at A3

Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

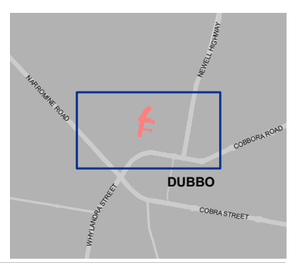


Figure 4-1 LEP Land zoning

4.2 Other relevant NSW legislation

Other relevant NSW legislation, including the following, would continue to apply to the proposed modification as described in Section 4.2 of the Addendum REF No 1:

- *Protection of the Environment Operations Act 1997*
- *Roads Act 1993*
- *Biodiversity Conservation Act 2016*
- *National Parks and Wildlife Act 1974*
- *Fisheries Management Act 1994*
- *Heritage Act 1977*
- *Water Management Act 2000*
- *Land Acquisition Act (Just Terms Compensation) Act 1991*
- *Crown Land Management Act 2016Biosecurity Act 2015*
- *Waste Avoidance and Resource Recovery Act 2001.*

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for *proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land'*. These are considered in **Appendix B** and **Chapter 6**.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to DCCEEW is not required.

4.3.2 Other relevant Commonwealth legislation

Native Title Act 1993

The main objective of the *Native Title Act 1993* is to recognise and protect native title. A successful native title claim results in the recognition of the particular rights, interests or uses claimed by the registered party.

If a native title claim is recognised under the Act, any actions by Government on that land must be consistent with the claim. Searches of the register maintained by the National Native Title Tribunal in March 2024 indicate there are no native title claims registered with respect to the land within the modified project area.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of a road and road infrastructure facilities and is being carried out by or on behalf of a public authority. Under section 2.109 of SEPP (Transport and Infrastructure) the proposed modification

is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

TfNSW is the determining authority for the modified project. This addendum REF fulfils TfNSW's obligation under section 5.5 of the EP&A Act to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

5.1 Consultation strategy

The consultation strategy for the proposed modification remains consistent with the strategy described in Section 5.1 of the project REF. The Communications Engagement Plan (CEP) prepared for the NDB project would be applied to the proposed modification.

5.2 Consultation outcomes

No specific community consultation regarding the proposed modification has been carried out to date. However ongoing consultation regarding the NDB project has been carried out.

Consultation with the following stakeholders occurred during the development of the detailed design (including the elements of the proposed modification):

- Dubbo Regional Council – regarding the access to the future development site northwest of Dubbo (the new intersection as part of the proposed modification) and to provide general project updates on benefits, features, design and funding
- North-West Urban Release Area Developer – regarding the new intersection design
- Residents and landowners – regarding:
  - Property adjustments and accesses
  - General project updates and progress
- Businesses – regarding property adjustment and accesses, and to provide general project updates and progress
- Utility providers – regarding required adjustments and potential impacts on the network during investigation activities
- Freight industry – regarding potential impacts on the road network during investigation activities
- Emergency services - regarding potential impacts on the road network during investigation activities
- Local community – regular project community updates displayed on the project website and in letterbox drop to local residents

5.3 Aboriginal community consultation

Consultation with the Aboriginal community has been carried out throughout the NDB project development process in accordance with the TfNSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) process.

A preliminary assessment (Stage 1) of the Procedure for Aboriginal cultural heritage consultation and investigation (PACHCI) was carried out for the proposed modification, refer to **Appendix C.** The findings of this assessment are summarised in **Section 6.1**.

5.4 Consultation under ISEPP

A Statutory consultation checklist has been completed for the modified project and is included in **Appendix D**. No further consultation is required under the SEPP (Transport and Infrastructure).

5.5 Ongoing or future consultation

Ongoing consultation will be required by the construction contractor and TfNSW to update local property owners, road users and Dubbo Regional Councils of the modified project.

Consultation activities will include:

- Project information provided through the project website:
  - https://www.rms.nsw.gov.au/projects/western-nsw/dubbo-bridge/index.html
- Consultation with Dubbo Regional Council, the freight industry and local bus companies will be ongoing in relation to staging plans, traffic management, and temporary road closures
- Property owners identified will continue to be consulted about property acquisition and adjustment requirements
- All directly affected property owners and freight providers/industry using the highway will be consulted before the start of construction and changes to access for private properties (if required)
- Start of construction notification will be carried out via letter box drop to a number of residents around the modified project a minimum of five days prior to the commencement of construction. Start of construction notification will also be provided to the local council and emergency services
- Notifications will be published online and on social media before the start of work detailing the likely timing of the modified project, potential changes to traffic conditions and project management contact details to open communication channels to provide further details or address complaints
- Variable message signs (VMS) will be used along the local road network around the modified project to inform motorists using this road of the work and potential disruption to the road. The VMSs will be deployed a minimum of five days prior to the start of construction
- Consultation with Dubbo Regional Council and Aboriginal community regarding Wiradjuri Park.

6. Environmental assessment

6.1 Preliminary environmental assessment

A preliminary environmental assessment has been undertaken and is presented in **Table 6-1**. This assessment compares the potential impacts of the proposed modification to the potential impacts of the NDB project and identifies where further detailed assessment is required. Where required, further detailed assessment is presented in the following sections.

Table 6-1: Preliminary environmental assessment

Environmental factor	Potential impacts of the NDB project	Potential impacts of proposed modification	**Additional assessment required?**
Traffic and transport	During construction there would be travel delays that would affect traffic. There may also be temporary restrictions on property access for residents and businesses. The proposal would divert through traffic from Dubbo town centre, reducing the overall traffic on Bourke Street and Erskine Street, especially heavy vehicles. However, the proposal may slightly increase travel times though Dubbo due to new traffic signals at the intersection of Thompson Street and Whylandra Street (Newell Highway). The NDB project would provide a third river crossing in Dubbo with improved flood immunity and would also improve access to future development in west Dubbo.	Operational traffic impacts are expected as the proposed modification would introduce a new intersection to the NDB project with associated additional traffic volumes generated by the North-West Urban Release. As such an updated traffic and transport impact assessment was carried for the proposed modification. Refer to **Section 6.2** and **Appendix E** for details.	Yes Refer to **Section 6.2** and **Appendix E** for details.
Noise and vibration	During construction, there would be noise and vibration impacts for some properties. Additionally, there are three heritage items within the safe working distance of construction works. These potential impacts would be temporary for the duration of the construction works. During operation, the noise assessment identified a number of buildings which could be considered for additional noise mitigation. At-property architectural treatments would be provided if feasible and reasonable to mitigate any operational noise impacts.	Additional operational noise impacts are expected as the proposed modification due to additional traffic volumes generated by the North-West Urban Release Area. As such a construction noise and vibration assessment has been carried out for the proposed modification. Refer to **Section 6.3** and **Appendix F** for details.	Yes Refer to **Section 6.3** and **Appendix F** for details.
Hydrology, surface water	Construction works have the potential to impact on surface water quality during construction. The main risk is from sediment-laden runoff caused by excavation, native vegetation removal and other surface work, particularly before or during periods of heavy rainfall. Erosion and sedimentation control measures are proposed to manage potential surface water quality issues. The proposal's influence on groundwater levels is expected to be limited to localised changes near bridge footings which would be beneath the	The potential impacts to hydrology and surface are expected to be consistent with those of the of the NDB project.	No

Environmental factor	Potential impacts of the NDB project	Potential impacts of proposed modification	**Additional assessment required?**
	water table. The groundwater changes would not be expected to affect the local groundwater flow system, alter groundwater / surface water exchange with the Macquarie River or impact surrounding bores.		
Flooding	Construction of the NDB project may result in increases in five per cent AEP flood levels as a result of the inclusion of temporary fill within the floodplain. No residential, commercial or industrial building would be affected by increases in flood levels. Operation of the modified project would have an improved immunity from a ten per cent AEP flood event to a two per cent AEP flood event.	The proposed modification is outside the flood extent of the Macquarie River. The potential impacts to flooding are expected to be consistent with those of the NDB project.	No
Aboriginal heritage	The Construction of the NBD project (as described in the previous Addendum REF) would result in direct impacts to a total of seven Aboriginal heritage sites. These consist of three artefact scatters, one artefact site, one isolated artefact and one scarred tree. Four sites of the seven sites would be totally impacted, and one site (an artefact scatter) would be partially impacted. The Terramungamine grinding grooves may remain in place and would be avoided during construction work. Operation of the modified project would not result in any further impacts to Aboriginal heritage.	The proposed modification requires minor amendments to the NDB project area. A stage 1 PACHI assessment was carried out for the proposed modification, refer to **Appendix D.** The Stage 1 PACHI identified that the modified project area contains landscape features that potentially indicate the presence of Aboriginal objects. However, the Stage 1 PACHCI concluded that historic land uses and construction activities are likely to have disturbed and heavily reduced the cultural heritage potential of the project area, and the proposed modification is permissible. Potential impacts to Aboriginal cultural heritage would be managed in accordance with the management procedures described in the previous Addendum REF.	No
Non-Aboriginal heritage	Construction of the NDB project may have potential impacts to the existing Dubbo rail bridge over Macquarie River (Dubbo Railway Bridge), as piling work would occur within the safe working distance buffer (five metres) of the heritage item. Safeguards and mitigation measures, which include vibration monitoring, would be adopted to avoid or mitigate potential impacts. Construction would also involve an additional operational drainage line along the Mount Olive heritage item curtilage. The presence of construction plant and equipment for the drainage line would temporarily impact views from the cottage. Archaeological deposits in this location have been deemed unlikely, therefore, impacts to archaeological significance of this heritage item are not anticipated as a result of the ground disturbance work.	The proposed modification would not result in any additional impacts to known non-Aboriginal heritage items. As a result, the non-Aboriginal heritage impacts of the proposed modification are not anticipated to be substantially different to those of the over NDB project. The unexpected finds procedure would continue to be followed if any item or material is uncovered during construction of the proposal.	No
Socio-economic	An assessment of social and economic factors undertaken for the REF identified that the proposal would have both wider regional and local benefits through improved road safety, new street trees and landscaping,	Socio-economic impacts associated with the project are generally associated with traffic delays and disruptions for motorists and other road users along the Newell Highway due to the implementation of	No

Environmental factor	Potential impacts of the NDB project	Potential impacts of proposed modification	**Additional assessment required?**
	revitalised business environments and the encouragement of physical activity. During construction, the community and businesses in the area would likely experience temporary traffic delays, noise, air quality and visual amenity impacts as well as temporary impacts to businesses. Further details are described in Section 6.6 of the REF.	traffic management measures, such as temporary lane closures or stoppages and reductions in speed limits. During construction, temporary adverse changes in local amenity may be experienced by communities and businesses near the proposed modification due to increased noise, dust and construction traffic. The proposed modification impacts are consistent with those identified in the project REF. Potential traffic, noise, air quality and visual amenity impacts are assessed separately in this table. The proposed modification would provide additional long-term operational benefits to the NDB project by providing an efficient connection that balances the needs of through traffic utilising the Newell Highway as well as access to the future North-West Urban Release Area. While the NDB project would improve the road safety on this section of the Newell Highway and provide a route that is less susceptible to flooding.	
Landscape character and visual impact	An assessment undertaken for the REF identified that during construction, there would be temporary impacts on visual amenity from the clearing of vegetation, generation of wastes and construction activities, including operation of ancillary facilities. Temporary lighting would be required at some of the ancillary facilities and in the modified project area when night work is required.	The proposed modification would have localised visual impacts impact for the nearest residences due to the introduction of a new intersection. However, the modified project would not alter the magnitude of impact identified for the NDB project in the project REF submission report and Addendum REF No.1. The proposed modification includes environmental management works within the private property adjacent to the road corridor aimed at improving landscape character and reducing visual impacts to the closest residents. This work will involve the installation of boundary fencing, planting of evergreen native trees and shrubs, as well as installation of an irrigation system and electrical connection for ongoing maintenance.	No
Biodiversity	The total native vegetation clearance for the project is 3.16 hectares. The impacted vegetation mostly includes River Red Gum Riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion.	The proposed modification requires minor amendments to the project area described in the previous Addendum REF. However, no additional native vegetation clearing is required as part of the proposed modification. The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act, FM Act or the EPBC Act.	No
Topography, geology and soils	An assessment carried out for the REF identified that during construction, the minor potential impacts to soil from construction activities would be	The potential impacts to soil and geology are expected to be consistent with those of the NDB project.	No

Environmental factor	Potential impacts of the NDB project	Potential impacts of proposed modification	**Additional assessment required?**
	primarily associated with soil loss from erosion of exposed soils and stockpiles and potential sedimentation of surrounding land and waterways. Once operational, the potential for soil erosion would be minimal. Further details are described in Section 6.9 of the REF.		
Air quality, climate change and greenhouse gas	An assessment undertaken for the REF identified that, during construction, minor air quality impacts would potentially occur surrounding the proposal area. During operation, near roadside concentrations of all air quality indicators, including carbon monoxide, nitrogen dioxide and particular matter, are predicted to decrease from existing.	The potential impacts to air quality, climate change and greenhouse gas are expected to be consistent with those of the NDB project.	No
Waste and resource management	An assessment undertaken for the REF identified that waste generated during construction of the proposal would be managed in accordance with relevant guidelines. Operational waste was not anticipated to change from existing levels. Further details are described in Section 6.11 of the REF.	The potential impacts to waste and resource management are expected to be consistent with those of the NDB project.	No
Cumulative impacts	Multiple construction activities in Dubbo would continue to have a cumulative impact on native vegetation clearing (including habitat clearing), fauna mortality, aquatic habitats and local Aboriginal heritage with the modified project.	The cumulative impacts of the proposed modification are not anticipated to be substantially different to those of the NDB project. Cumulative impact as a result of concurrent development would be managed according to safeguards outlined in **Section 7.2**	No

6.2 Traffic and transport

An updated traffic and transport impact assessment was carried out to assess any additional traffic and transport impacts resulting from the inclusion of the new intersection and associated additional traffic volumes generated by the North-West Urban Release Area.

Consistent with project REF, the traffic impact assessment has been undertaken for the 2036 design year which represents 10 years after the opening of the NDB project. The operational impacts have been modelled using SIDRA intersection modelling software.

The assessment is documented in the *New Dubbo Bridge Addendum 2 REF - Traffic and Transport Impact Assessment* prepared by Jacobs. This assessment is provided in **Appendix E** and summarised below.

6.2.1 Potential impacts

Construction

The construction of the new intersection would be carried out in conjunction with the NDB project main works and is not expected to add significant additional traffic and transport impacts. While the proposed modification may introduce additional light and heavy construction vehicles, the potential construction traffic impacts would be generally be consistent with the NDB project REF.

Any additional construction impacts on existing pedestrian and cycle infrastructure are anticipated to be minimal and would be managed through diversions and the use of alternative existing and temporary paths, as per the project REF.

The construction impacts of the proposed modification would be managed by the environmental safeguards and management measures provided in **Section 7.2**. No additional environmental safeguards and management measures for construction have been recommended.

Operation

In accordance with the *TfNSW Traffic Modelling Guidelines* , intersection performance of Level of Service (LOS) D or better was established as the target criteria for the proposed medication. This constitutes an average delay per vehicle at an intersection between 43 and 56 seconds and with the overall intersection considered to be operating at near capacity.

Under 2036 traffic conditions, the traffic modelling results indicate the following:

- River Street West/Newell Highway Intersection would perform at an average acceptable LOS B for the AM peak and LOS C (satisfactory) for the PM peak with average delays of 26 seconds in the AM peak and 29 seconds in the PM peak
- Whylandra Street/Thompson Street intersection would perform at an average acceptable LOS B for the AM peak and LOS C (satisfactory) for the PM peak. The average delays of 29 seconds in the AM peak and 35 seconds in the PM peak was observed. The northern approach in the PM peak would perform at LOS E (at capacity), likely due to additional traffic generated by the North-West Urban Release Area. However, the overall intersection performs at LOS C which is acceptable
- River Street/Bourke Street intersection would perform at a satisfactory level of LOS C for the AM peak and LOS D (near capacity) for the PM peak.

As indicated above although overall operational traffic performance of the Whylandra Street/Thompson Street and the River Street/Bourke Street intersections would be acceptable, some approaches to the intersections may operate at or near capacity by 2036. Therefore, it may be necessary to review performance in the future and undertake further improvements to these intersections taking into consideration the impact of the North-West Urban Release Area generated traffic in any further assessment.

No additional public transport impacts are anticipated resulting from the design change.

Dubbo regional Council would construct a shared path and footpath on either side of RSWS1 (western leg) in the future as part of the River Street West collector road project. As a result, the proposed medication will provide a positive impact to active transport connectivity in the area.

6.2.2 Safeguards and management measures

The proposed additional environmental safeguards and management measures are provided in **Table 6-2**. A complete list of the proposed safeguards and management measures for the modified project is provided in **Section 7.2**.

Table 6-2 Safeguards and management measures – traffic and transport

Impact	Environmental safeguards	Responsibility	Timing	Reference
Intersections reaching capacity by 2036	As some intersection approaches would operate at or near capacity by 2036 at the Whylandra Street/Thompson Street and the River Street/Bourke Street intersections. Therefore it may be necessary to review performance in the future and undertake further improvements to these intersections taking into consideration the impact of the North-West Urban Release Area generated traffic in any further assessment.	Dubbo Regional Council / West Urban Release Area Developer	***Prior to the commencement of the West Urban Release Area***	Additional safeguard

6.3 Noise and vibration

An updated noise and vibration impact assessment was carried out to assess the following:

- Potential construction noise and vibration impact assessment as the result of additional works required to construct the proposed modification
- Potential operational traffic noise impact as the result of the additional traffic introduced by the North-West Urban Release Area at the nearest sensitive receivers to the New Intersection.

The noise vibration assessment specifically addresses the potential impact nearest sensitive receivers to the proposed modification. These nearest sensitive receivers are listed below and shown in Figure **1-2**. One receiver (NCA02.RES.2558) has already been identified as been impacted by the NDB project.

- NCA02.RES.2558 Mt Olive Off Bunglegumbie
- NCA02.RES.0481 Mt Olive Off Bunglegumbie
- NCA02.RES.0666 The Willows' 6R Bunglegumbie Road.

At this stage, only traffic volume distributions for the new intersection are available. In the absence of traffic volume distributions of the design year for the NDB project road network, only the closest receivers to the proposed modification were considered in the noise and vibration assessment.

The noise and vibration assessment is documented in the *Addendum REF2 - Operational and Construction Noise and Vibration Impact Assessment* prepared by Jacobs. This assessment is provided in **Appendix F** and summarised below.

6.3.1 Potential impacts

Construction

The noise and vibration impacts from construction of the proposed modification are expected to be equal or less than the noise and vibration impacts of the NDB project.

The construction impacts of the proposed modification would be managed by the environmental safeguards and management measures provided in **Section 7.2**. No additional environmental safeguards and management measures for construction have been recommended.

Operation

During operation the additional traffic generated by the new North-West Urban Release Area would use the proposed modification to enter the road network at the new intersection, where RSWS1 joins the new Newell Highway alignment as part of the NDB project.

The results of the noise modelling from this increase in traffic noise due to the additional traffic generated by West Urban Release Area is summarised is **Table 6-3.**

Table 6-3 Updated traffic noise prediction for year 2036 as a result of the West Urban Release Area

Receiver ID	Noise Criteria Guideline (NCG) for the proposed modification dB(A)		Predicted traffic noise level, dB(A) (year 2036, with proposed modification)		Qualifies for consideration of mitigation?	
	Day	Night	Day	Night	With proposed modification as assessed in Addendum REF No. 1	With proposed modification
NCA02.RES.2558	49	42	51	47	Yes	Yes
NCA02.RES.0481	51	43	50	46	No	Yes
NCA02.RES.0666	53	44	52	48	No	Yes

As shown in **Table 6-3**, due to the anticipated increase of operational traffic noise from the West Urban Release Area urban growth area, the identified three sensitive receivers now are expected to meet the threshold for eligibility for consideration of mitigation.

These receivers are not considered as 'closely spaced', as defined in the *TfNSW Noise Mitigation Guideline* (NMG). Therefore, low noise pavements and noise barriers are not considered to be reasonable mitigation options for these receivers. However, these receivers should be considered for at-property treatment.

At this stage, traffic distribution due to the new North-West Urban Release Area on the entire surrounding road network is unknown. The noise impact assessment for this proposed modification is based on the forecast traffic volumes only for a section of the new Newell Highway alignment (extending south from the intersection of River Street West Stage 1 to the intersection with Thompson Street). Consequently, this assessment does not cover the potential noise impact on the entire road network resulting from the potential increase in traffic due to the new North-West Urban Release Area.

It is recommended that road traffic noise modelling be undertaken during the North-West Urban Release Area's future design stage based on the updated forecast traffic volumes at the design year for the entire road network. This would be carried out the by the West Urban Release Area Developer/ Dubbo regional Council.

6.3.2 Safeguards and management measures

The proposed additional environmental safeguards and management measures are provided in **Table 6-2**. Any additional wording to an existing mitigation measure has been included in ***bold and italicised font***. A complete list of the proposed safeguards and management measures for the modified project is provided in **Section 7.2**.

Table 6-4 Safeguards and management measures – noise and vibration

Impact	Environmental safeguards	Responsibility	Timing	Reference
Operational noise due to the West Urban Release Area	***Further assessment of individual dwellings and consultation with landowners will be required to identify the specific acoustic treatments to be applied to buildings identified as potentially requiring noise mitigation as a result of the new West Urban Release Area. This includes the two additional sensitive receivers (NCA02.RES.0481 and NCA02.RES.0666) that are now expected to meet the threshold for eligibility for consideration of mitigation***	***Dubbo Regional Council / North-West Urban Release Area Developer***	***Prior to the commencement of the West Urban Release Area***	***Additional safeguard***
Future road traffic noise as a result of the new West Urban Release Area	***Road traffic noise modelling will be carried out for the whole NDB project once the traffic volume distributions of the design year for the entire road network, including the additional traffic, is determined.***	***Dubbo Regional Council / North-West Urban Release Area Developer***	***Prior to the commencement of the West Urban Release Arean***	***Additional safeguard***

7. Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed and incorporated into the and the Contractors CEMP and applied during the construction and operation of the proposed modification.

7.2 Summary of environmental safeguards and management measures

Environmental safeguards and management measures for the NDB project are summarised in **Table 7-1**. Additional safeguards and management measures identified in this addendum REF are included in ***bold and italicised font***. The safeguards and management measures will be incorporated into the CEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement by the TfNSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.	Contractor/ TfNSW project manager	Pre-construction/ detailed design	Core standard safeguard GEN1
GEN2	General - notification	All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor/ TfNSW project manager	Pre-construction	Core standard safeguard GEN2
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings.	Contractor/ TfNSW project manager	Pre-construction/ detailed design	Core standard safeguard GEN3
GEN4	Utilities	Prior to the commencement of work: • The location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners If the scope or location of proposed utility relocation work falls outside of the assessed modified project ~~proposal~~ scope and footprint, further assessment will be undertaken.	Contractor	Pre-construction/ detailed design	Core standard safeguard U1
GEN5	Hazards and risk management	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials	Contractor	Pre-construction/ detailed design	Core standard safeguard HAZ1

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		• A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or Office of Environment and Heritage publications.			
GEN6	General – environmental awareness	Standard construction hours: • Monday to Friday 7am to 6pm • Saturdays 8am to 1pm • No construction on Sundays or Public Holidays. Works outside standard construction hours (including those detailed within this REF) will be undertaken in accordance with the management and mitigation measures detailed within the Noise and Vibration Management Plan.	Contractor	Construction	Core standard safeguard GEN4
GEN7	General – environmental awareness	The TfNSW Project Manager will notify the TfNSW Environment Manager at least five days prior to the commencement of the activity. The notification will include a copy of any local community notification undertaken (GEN2).	Contractor	Pre-construction/ detailed design	Additional safeguard
Traffic and Transport					
TT1	Traffic and transport	A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA Specification G10 Control of Traffic (Roads and Maritime, 2008). The TMP will include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic Monitoring, review and amendment mechanisms.	Contractor	Detailed design/Pre-construction	Section 4.8 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TT2	Property access - pre-construction	Requirements for any changes to local access arrangements will be confirmed during detailed design in consultation with the local road authority and any affected landowners.	TfNSW	Pre-construction/ detailed design	Additional safeguard
TT3	Pedestrian and cycle facilities	TfNSW will investigate the incorporation of pedestrian and cycle facilities for the modified project during detailed design.	TfNSW	Detailed design	Additional safeguard
TT4	Notifications to landowners	Disruptions to property access and traffic will be notified to landowners at least five days before starting the activity, in accordance with the relevant community consultation processes outlined in the TMP.	TfNSW and Contractor	Construction	Additional safeguard
TT5	Property access – during construction	Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the relevant local road authority.	TfNSW and Contractor	Construction	Additional safeguard
TT6	Reduce speeds, traffic delays and disruptions during construction	Road users, local communities and the freight industry will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	TfNSW and Contractor	Construction	Additional safeguard
TT7	Disruption to public transport, including school bus services	Access for public transport services, including school bus services, will be maintained. The requirements for any temporary changes will be confirmed following consultation with local bus operators and the community.	TfNSW and Contractor	Construction	Additional safeguard
TT8	Impacts of the regional road network	Where possible, the most disruptive work (such as work that requires lane closures) will be carried out at night to minimise potential impacts on the regional road network. This, combined with temporary effective traffic management, will assist in minimising impacts to traffic and transport using the local road network.	TfNSW and Contractor	Construction	Additional safeguard
TT9	Traffic impacts at Thompson Street and the Newell Highway	• Detailed construction traffic impacts of the modified project proposal will be further analysed during the detailed design phase following confirmation of construction staging • The construction staging plans will be modified, if required, to mitigate traffic impacts during construction.	TfNSW and Contractor	Pre-construction/ detailed design	Additional safeguard
TT10	***Intersections reaching capacity by 2036***	***As some intersection approaches would operate at or near capacity by 2036 at the Whylandra Street/Thompson Street and the River Street/Bourke Street intersections. Therefore it may be necessary to review performance in the future and undertake further improvements to these intersections taking into consideration the impact of the North-West Urban Release Area generated traffic in any further assessment.***	***Dubbo Regional Council* / West Urban Release Area Developer**	***Prior to the commencement of the West Urban Release Area***	***Additional safeguard***
Noise and Vibration					

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NV1	Noise and vibration	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented as part of the CEMP. The CNVMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify: • All potential significant noise and vibration generating activities associated with the activity • Feasible and reasonable mitigation measures to be implemented, taking into account Beyond the Pavement: urban design policy, process and principles (Roads and Maritime, 2014) • A monitoring program to assess performance against relevant noise and vibration criteria • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Detailed design/Pre-construction	Core standard safeguard Section 4.6 of QA *G36 Environment Protection*
NV2	Noise and vibration	All sensitive receivers (e.g. schools, local residents) likely to be affected will be notified at least five days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/Pre-construction	Core standard safeguard
NV3	Construction noise	• Additional noise mitigation measures specified in Appendix C of the NVG are to be applied where feasible and reasonable to do so. • The number of receivers identified as eligible to receive additional mitigation is indicated in Table 5-11 of Appendix D of Addendum REF No.1.	Contractor	During construction	Additional safeguard
NV4	Construction noise	Based on the construction noise impact assessment above, the following project specific noise mitigation measures will be implemented in addition to the standard mitigation measures where it is feasible and reasonable to do so: • Contain work predicted to generate noise impacts, to standard hours where feasible and reasonable • Notwithstanding the above, contain the use of any noise-intensive equipment (eg. rock breaking) to standard hours. The programming of these noise-intensive work should include periods of respite (as outlined in the ICNG) • Ensure vehicle engines are switched off when stationary or parked within ancillary facilities	Contractor	During construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		• Program noise-intensive work nearest to noise-sensitive receivers during their less sensitive times, e.g. work near schools should be scheduled for after-school hours, and piling and hammering for times when nearby residents are likely to be away from their home • Enclose or screen stationary noise sources such as pumps and compressors. This can reduce noise emissions by up to 15 dB(A) • Screen noise-intensive processes such as pneumatic hammering with mobile screens (e.g. acoustic screens mounted on trailers that can be moved to track the progress of work). Such screens can reduce noise levels from these activities by approximately 3-8 dB(A) where the line of sight to a receiver from the work is screened • Shield sensitive receivers from noisy construction processes by the judicious placement of structures (eg site sheds, fencing or signage) or use of site topography to screen plant Implementation of a noise monitoring program to ensure verification of predicted noise levels and ongoing noise monitoring for receivers identified as qualifying for the consideration of additional mitigation measures • Provision of respite periods, alternative accommodation and individual briefings for highly noise affected receivers and receivers exposed to out-of-hours work.			
NV5	Construction vibration	Specific measures to manage the potential for vibration impacts would be determined as part of the CNVMP developed during detailed design once the specific equipment schedule and localised geotechnical conditions are known. At that time, the CNVMP will consider the feasibility of implementing at least the following measures to minimise potential construction vibration impacts: • Use of lower vibration-generating plant and equipment, such as smaller capacity hydraulic hammers or concrete crushers/pulverisers in place of hammers • Suitably programming the hours of operation of major vibration generating plant and equipment • Minimising consecutive work in the same locality • Using dampened hammers • Carry out attended vibration monitoring where vibration-intensive work are to be undertaken within the safe working distances, with engineering advice being sought for monitoring historical structures • Where vibration reaches levels that may result in damage to historical structures within safe working distances, works should be ceased and revised to minimise impacts • Completing building condition surveys before and after vibration-intensive work to identify existing damage and any damage due to the work • Repairing any visual impacts resulting from the works to historical structures within safe working distances._	Contractor	Detailed design/Pre-construction	Additional safeguard
NV6	Operational noise ***due to the West***	Further assessment of individual dwellings and consultation with landowners will be required to identify the specific acoustic treatments to be applied to buildings identified as potentially requiring noise	***Dubbo Regional Council / North-***	***Prior to the commencement***	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
	Urban Release Area	mitigation ***as a result of the new West Urban Release Area. This includes the two additional sensitive receivers (NCA02.RES.0481 and NCA02.RES.0666) that are now expected to meet the threshold for eligibility for consideration of mitigation.***	***West Urban Release Area Developer***	***of the West Urban Release Area***	
NV7	***Future road traffic noise as a result of the new West Urban Release Area***	***Road traffic noise modelling will be carried out for the whole NDB project once the traffic volume distributions of the design year for the entire road network, including the additional traffic, is determined.***	***Dubbo Regional Council / North-West Urban Release Area Developer***	***Prior to the commencement of the West Urban Release Area***	***Additional safeguard***
Hydrology, surface water and flooding					
HSF1	Soil and water	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.	Contractor	Detailed design/Pre-construction	
HSF2	Contaminants entering receiving environments during construction	Control measures to minimise the risk of water pollution will be implemented including: • All fuels, chemicals, and liquids will be stored at least 40 metres away from the existing stormwater drainage system and stored in an impervious bunded area within the ancillary facilities • Plant and maintenance machinery will be refuelled in impervious bunded areas in the designated ancillary facilities • Vehicle wash downs and/or concrete truck washouts will be carried out within a designated bunded area of an impervious surface or carried out off-site • Regular visual water quality checks (for hydrocarbon spills/slicks and turbid plumes) will be carried out when working in or near the waterway.	Contractor	Construction	Additional safeguard
HSF3	Groundwater contamination	• Use of bores GW060611 and GW060613 and whether bores are in active use will be confirmed before construction • The water supply bores located close to the proposed bridge alignment (bores GW060611 and GW060613) will not be pumped during periods of pile construction until pile concrete has set.	Contractor	Construction	Additional safeguard
HSF4	Dewatering	No dewatering of groundwater is anticipated. However, if the groundwater is intercepted during construction, confirmation of whether or not a licence is required under the Water Management Act 2000 as defined under the Aquifer Interference Policy will be required prior to any dewatering activity commencing.	TfNSW / Contractor	Pre-construction/ Construction/Operation	Additional safeguard
HSF5	Changes to stormwater and drainage flows	Hydraulic and hydrologic assessment will be carried out to confirm that structures will not impact existing drainage and to identify any additional management or mitigation measures that may be required and included in the design.	TfNSW	Detailed design	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
HSF6	Changes to water quality	Design and implementation of a water quality monitoring program during pre-construction, construction and operation in accordance with the Roads and Maritime Guideline for Construction Water Quality Monitoring (RMS 2003).	TfNSW / Contractor	Pre-construction/ Construction/Operation	Additional safeguard
HSF7	Increase in pollutant generation and flow velocities	Operational water quality treatment and quantity of flows will be identified during the detailed design phase to minimise the impact to sensitive receiving environments and downstream waterways. The water quality controls will include: • Swales • Scour protection and control to reduce erosion and water quality impacts from increased sediment loads • Bridge pier designs to minimise changes to flow and velocity.	TfNSW	Detailed design	Additional safeguard
HSF8	Accidental spills	Operational phase accidental spill containment will be provided at critical location(s) to ensure that spills can be captured before reaching sensitive receiving environments.	TfNSW	Detailed design	Additional safeguard
HSF9	Recharge of groundwater	Should bores GW060611 and GW060613 be found to be active and used for water supply purposes, stormwater infrastructure will be designed to ensure runoff from the bridge/road does not recharge the groundwater system near bores.	TfNSW	Detailed design	Additional safeguard
HSF10	Flood impacts	• The flood mitigation option will be further refined at detailed design stage to optimise the flood level reductions • Additional flood management measures to be considered at detailed design stage will include: • Additional culvert capacity under the road embankment at River Street • Scour protection at culvert outlets.	TfNSW	Detailed design	Additional safeguard
HSF11	Impacts to building	Any residual flood impacts to properties after implementing feasible mitigation work will be quantified. Floor level survey data will be collected to quantify impacts to above-floor flooding of properties located along the modified project that may be impacted.	TfNSW	Detailed design	Additional safeguard
HSF12	Impacts to the operation of weir	Temporary work at the weir will be avoided and all channel construction activities for the New Dubbo Bridge will be outside of the operational area of the weir.	Construction contractor	Construction	Additional safeguard
HSF13	Ancillary facilities (Construction compounds)	• Appropriate management measures would be in place during construction to ensure minimal impact on the Macquarie River and its capacity to convey flows in the event of a flood, including minimising the extent of temporary in-channel work platforms • All ancillary facilities would include appropriate erosion and sediment control measures to minimise the sediment that could be transported into Macquarie River • Consideration will be given to reducing the size of the ancillary facility ~~2~~3 • Ancillary facility 3 will be partly raised to achieve five per cent AEP flood immunity	Contractor	Pre-construction/ Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		• The existing drainage flow path in ancillary facility 5 will be filled and appropriate site drainage provided.			
HSF14	Flooding	A flood management plan will be prepared to set out site management measures during the construction phase in order to minimise potential flood impacts.	Contractor	Detailed design	Additional safeguard
HSF15	Accidental spills	The risk of accidental spills would need to be determined at Detailed Design stage through a desktop risk assessment that identifies locations where the risk of a spill is higher, by taking into consideration the road geometry, the maximum road speed and any other potential hazards such as intersections.	Design contractor	Detailed design	Additional safeguard
HSF16	Scour impacts during construction	Appropriate bank and bed scour protection will be considered to minimise the scour risk and potential of the Macquarie River channel bed or banks as a result of the temporary in-river coffer dam and work platform.	Contractor	Construction	Additional safeguard
Aboriginal heritage					
AB1	Impacts to Aboriginal Heritage	An AHIP for harm to SP-OS-05 (36-1-0400), DLGA-ST-06 (36-1-0551), DLGA-OS-15 (36-1-0552), DLGA-IF-07 (36-1-0554), DLGA-IF-10 (36-1-0555), Bunglegumbie Road 01 (31-1-0751),TP-OS-03 (36-1-0301) (partial). The AHIP will be provided for the following: • Salvage of artefacts from recorded sites in the modified project area and reburial in a in a location agreed by RAPs and recorded on AHIMS • Harm without salvage for all objects identified within the modified project area • Retention of topsoils from an area of 100m^2 around the recorded Aboriginal sites to a designated conservation area near the ***NDB project*** ~~modified project~~ as agreed with RAPs.	TfNSW	Detailed design/Pre-construction	Additional safeguard
AB2	Aboriginal Heritage	Where impacts can be avoided (e.g. retention of Terramungamine Grinding Grooves within Wiradjuri Park or avoidance of majority of site TP-OS-03 (36-1-0301)) an exclusion zone/fencing will be installed to protect the site before construction. TfNSW will continue to consult with the RAPs.	Contractor	Pre-construction	Additional safeguard
AB3	Aboriginal Heritage	An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the Procedure for Aboriginal cultural heritage consultation and investigation (Roads and Maritime, 2012) and Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime, 2015) and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP will be prepared in consultation with all relevant Aboriginal groups.	Contractor	Detailed design/Pre-construction	Core standard safeguard AH1 Section 4.9 of QA G36 Environment Protection
AB4	Additional Aboriginal heritage impacts	Any further impacts proposed beyond those assessed in this addendum REF or beyond the modified project area must be subject to further assessment and consultation with Aboriginal stakeholders, consistent with the process in this report.	TfNSW	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
AB5	Minimise risks to Aboriginal cultural heritage during construction	All personnel working on site will receive a cultural heritage induction to ensure awareness of requirements of the AHMP and relevant statutory responsibilities. The induction will provide details on the following: • Overview of the nature and extent of archaeological materials within the modified project area • Broader cultural context of the site and its significance to Aboriginal people • Relevant legislation • AHIP • Salvage procedure.	Contractor	Detailed design/Pre-construction	Additional safeguard
Non-Aboriginal heritage					
NAH1	Non-Aboriginal heritage	A non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contactor	Detailed design/Pre-construction	Core standard safeguard H1 Section 4.10 of QA *G36 Environment Protection*
NAH2	Non-Aboriginal heritage	• The Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime, 2015) and Unexpected Heritage Finds Guideline (TfNSW, 2019) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered. • Work will only re-commence once the requirements of that Procedure have been satisfied.	Contactor	Detailed design/Pre-construction	Core standard safeguard H2 Section 4.10 of QA *G36 Environment Protection*
NAH3	Conservation strategy or policy	A Conservation Strategy or Policy is required before construction to mitigate impacts to the Dubbo Railway Bridge and Mount Olive. This Policy will be consistent with Heritage Council Guidelines for Conservation Strategies and Policies.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH4	Lighting and signage	The impact of the lighting and signage on the Dubbo Railway Bridge and Mount Olive Cottage will be considered and specifically addressed in the design documents and referenced in the Conservation Strategy and Policy.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH5	Vibration	It is not considered that the modified project-will result in significant impacts from construction vibration during construction. However, as a precautionary measure it is recommenced that impacts from vibration to the Dubbo Lattice Railway Bridge, Mount Olive Cottage and “Tantallon” residence are managed as part of the CEMP for the modified project including vibration monitoring and inspections by suitably qualified engineers as appropriate.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NAH6	Notification of NSW Heritage Council	Having consideration for the requirement for approval under s57 of the Heritage Act 1997. The NSW Heritage Council will be advised of the proposed work and the SOHI for future reference. This notification would be in writing. Specifically, advice regarding standard exemptions (Exemption 9) will be formerly sought prior to finalisation of the project design or before final project approval.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH7	Non-Aboriginal heritage	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel before construction to outline the identification of potential heritage items and associated procedures to be implemented in the event of the discovery of non-Aboriginal heritage materials, features or deposits (that is, unexpected finds), or the discovery of human remains.	Contractor	Pre-construction	Additional safeguard
NAH8	Non-Aboriginal heritage	The remnants of the house on 9 Brisbane Street would be located prior to construction commencing.	Contractor	Pre-construction	Additional safeguard
Socio-economic, property and land use					
SC1	Consultation	A Project Communications Plan (CP) will be prepared and implemented as part of the CEMP	Contractor	Detailed design/Pre-construction	Section 3.7 of QA G36 Environment Protection
SC2	Consultation	A CP will be prepared and implemented to help provide timely and accurate information to the community during consultation. The CP will include (as a minimum): • Mechanisms to provide details and timing of proposed activities to affected residents and businesses, including changed traffic and access conditions, including from work carried out at night • Contact name and number of complaints. The CEP will be prepared in accordance with the *Community Involvement and Communications Resource Manual (RTA, 2008)*.	TfNSW	Pre-construction and construction	Standard safeguard
SC3	Property acquisition	All property acquisition will be carried out in accordance with the *Land Acquisition Information Guide* (Roads and Maritime, 2012) and the *Land Acquisition (Just Terms Compensation) Act 1991*.	TfNSW project manager	Pre-construction and construction	Core standard safeguard PL1
SC4	Emergency vehicle access	Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	TfNSW and Contractor	Pre- construction/ Detailed design	Additional safeguard SE2
SC5	Consultation – property owners	Consultation will be carried out with all affected property owners prior to and during construction to develop and implement measures to mitigate impacts on their property. This includes (but is not limited to): • Businesses at Whylandra Street, River Street and Victoria Street • Riverside Church Dubbo Kingdom Hall Jehovah's Witness • Dubbo Regional Council (as managers of open space and recreation areas near the modified project) • Private properties affected by property acquisition/leases.	TfNSW/ Contractor	Pre-construction/ Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
SC6	Consultation – business and industry	Consultation will be carried out with business, industry, freight transport providers and managers of tourism related businesses about the timing and duration of construction activities.	TfNSW and Construction Contractor	Pre- construction/ Detailed design	Additional safeguard
SC7	Business impacts	• A business impact risk register will be maintained to identify and manage the specific impacts associated with construction related work for individual businesses • Access to existing businesses will be provided on a continuous basis throughout the construction of the modified project– Appropriate road signage will be provided in accordance with the TfNSW guidelines to provide guidance to passing patrons on access to shops and services in Dubbo town centre.	Contractor	Construction	Additional safeguard
SC8	Complaints	A complaints handling procedure and register will be included in the CEMP.	Construction contractor	Construction	Additional safeguard
Landscape character and visual					
LC1	Design integration	During detailed design, TfNSW integrated project development will be followed and it will include urban designers (selected from the TfNSW's Registered Contractors Scheme) as part of the project team.	TfNSW	Detailed design	Additional safeguard
LC2	Design integration	Design development will reflect TfNSW Urban Design Policy and Guidelines.	TfNSW	Detailed design	Additional safeguard
LC3	Design integration	Urban design principles and objectives, as well as the concept design strategy presented in the LCVIA (Appendix M of the project REF) are to form basis of future design development.	TfNSW	Detailed design	Additional safeguard
LC4	Visibility of built elements	Further development of the bridge design is to ensure that a simple, refined, integrated structure which sits comfortably within the landscape is adopted and consistent with design guidelines, principles and concepts included in the LCVIA (Appendix M of the project REF).	TfNSW	Detailed design	Additional safeguard
LC5	Visibility of built elements	Minimise structural depth, construction footprint and disruption to the Macquarie River.	Contractor	Construction	Additional safeguard
LC6	Visibility of built elements	Project work sites, including ancillary facilities will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	Construction	Core standard safeguard UD2
LC7	Landscape character and visual impact	An Urban Design and Landscape Strategy will be carried forward and further developed in the next phases of the project.	Design consultancy/ TfNSW	Detailed design	Additional safeguard
LC8	Vegetation and landscaping	A Landscape Management Plan to ensure cost effective and consistent management of landscape work will be developed in consultation with property owners, developers, and local council. The plan will be prepared in accordance with the Roads and Maritime (2008) Landscape Guideline.	TfNSW	Operation	Core standard safeguard UD6

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
LC9	Retention of existing vegetation	• The design will avoid impact to prominent trees and vegetation communities where possible • Existing threatened flora species are to be retained and protected wherever possible • Minimise vegetation clearance extent where possible.	TfNSW	Detailed design/Pre-construction	Additional safeguard
LC10	Retention of existing vegetation	Clearly define clearance limits and exclusion zones to protect vegetation cover.	Construction contractor	Construction	Additional safeguard
LC11	Revegetation	• Vegetation communities to reflect existing communities and landscape character • Utilise local provenance material • Provide screen planting within road corridor to limit visibility of the modified project from adjoining residential properties.	Design consultancy/ TfNSW	Detailed design	Additional safeguard
LC12	Revegetation	• Progressively implement revegetation work to limit erosion and to establish vegetation • Use cleared material as part of revegetation work.	Construction contractor	Construction	Additional safeguard
LC13	Visual impact of work sites	• Ancillary facilities will be decommissioned and the sites rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of work • Provide minimum signage requirements and limit structural elements to provide and open and permeable setting.	Construction contractor	Construction	Additional safeguard
LC14	Light spill from work sites	Temporary lighting will be sited and designed to avoid light spill into residential properties and identified sensitive receptors. Night work will be limited to minimise light spill.	Construction contractor	Construction	Additional safeguard
LC15	Visual impact	• The integration of the flood route into the overall parkland character will be investigated during detailed design. The flood route could provide the potential for access to Wiradjuri Park and off-street parking during non-flood event periods. The space between the Newell Highway and the flood route could be also developed to provide an active recreational facility west of the river. • Where feasible the Macquarie River will remain a passive open space and continue to be developed along the concepts presented in the Wiradjuri Park Masterplan (Moir Landscape Architecture, 2013).	TfNSW	Detailed design/Pre-construction	Additional safeguard
LC16	Visual impact	• Provide visual screening within the road corridor to limit the visual impact of the modified project in areas identified as moderate or high impact • Provide a sense of space and openness associated with the agricultural landscape	Construction contractor	Construction	Additional safeguard
LC17	Light impact on the night sky	To reduce the amount of light contributing the glow that is visible from the Siding Springs Observatory the following principles listed in Part 4 of The Dark Sky Planning Guidelines (DPE, 2016) will be consider including:	Design consultancy	Detailed design	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		• Eliminate upward light spill. In other words, there are to be no direct emissions above the horizontal plane • Direct light downwards not upwards • Use shielded fittings • Avoid over lighting • Avoid directing light towards reflective surfaces • Use warm colours (3,500K or less).			
LC18	Vegetation screening	During detailed design the landscape plan would be reviewed to consider opportunities for additional vegetation screening between the Riverside Church and the new permanent slip road.	TfNSW	Detailed design	Additional safeguard
LC19	***Visual impacts for residences around the new intersection***	• ***Expand the NDB project area into private land to allow for environmental management work to be conducted in private property adjacent to the road corridor. This work will involve the installation of boundary fencing, planting of evergreen native trees and shrubs, as well as installation of an irrigation system and electrical connection for ongoing maintenance.*** • ***Consultation will be carried out with all affected property owners with access agreements /permissions obtained with owners to be agreed upon before commencement of work in private property*** • ***The environmental management works would be for the full length of property boundaries as shown in Figure 3-1 at a minimum of 10 metres from the property boundary (owners' side) in order to access, install, and maintain*** **during construction period of the main works.**	***TfNSW***	***Detailed design***	***Additional safeguard***
Biodiversity					
B1	Biodiversity	A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime's Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Requirements set out in the Landscape Guideline (RTA, 2008) • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling • Procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) • Protocols to manage weeds and pathogens.	Contractor	Detailed design/Pre-construction	Section 4.8 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
B2	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design/Pre-construction	Core standard safeguard
B3	Removal of native vegetation	• Pre-clearing surveys will be carried out in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA,2011) • Vegetation and habitat removal will be carried out in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Native vegetation will be re-established in accordance with Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Exclusion zones will be set up at the limit of clearing (that is the edge of the impact area) in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • The hollow-bearing trees on the western boundary of ancillary facility 4 (shown on Figure 6-14 of the REF) will be retained and protected.	Contractor	Construction	Additional safeguard
B4	Removal of threatened species habitat and habitat features	• Habitat will be replaced or re-instated in accordance with Guide 5: Reuse of woody debris and bushrock and Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • The hollow-bearing trees on the western boundary of ancillary Facility 4 (shown on Figure 3-1 of Appendix N of the REF) will be retained and protected • The unexpected species find procedure is to be followed under Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the project site. This is particularly relevant given the likely loss of hollow-bearing trees from riparian habitat near the bridge location.	Contractor	Detailed design/Pre-construction	Additional safeguard
B5	Aquatic impacts	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the *Policy and guidelines for fish habitat conservation and management* Update 2013 (DPI (Fisheries NSW) 2013).	Contractor	Pre-construction/ Construction	Additional safeguard
B6	Injury and mortality of fauna	• Fauna will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Activities and areas which present a higher risk of impacting on the receiving waters will be outlined in the Soil and Water Quality Management Plan (PS271) (SWQMP), along with specific controls to reduce the risk of these impacts occurring. The SWQMP will be prepared as part of the overall CEMP. These	Contractor	Construction and operation	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
		management plans will specify mitigation measures in accordance with Best Management Practices (BMPs) set out in 'Soils and Construction: Managing Urban Stormwater' (Landcom 2009).			
B7	Invasion and spread of weeds	Weed species will be managed in accordance with: • Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Central West Regional Strategic Weed Management Plan 2017-2022.	Contractor	Construction	Additional safeguard
B8	Invasion and spread of pests	Pest species will be managed within the project site.	Contractor	Construction	Additional safeguard
B9	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).	Contractor	Construction	Additional safeguard
B10	Noise, light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Topography, geology, soils and contamination					
TC1	Contaminated land	A Contaminated Land Management Plan will be prepared in accordance with the *Guideline for the Management of Contamination* (Roads and Maritime, 2013) and implemented as part of the CEMP. The plan will include, but not be limited to: • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the detailed site investigation (Phase 2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction.	Contractor	Detailed design/Pre-construction	Core standard safeguard C1 Section 4.2 of QA G36 *Environment Protection*
TC2	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the TfNSW Environment Manager and/or EPA.	Contractor	Detailed design/Pre-construction	Core standard safeguard C2 Section 4.2 of QA G36 *Environment Protection*
TC3	Contaminated land	The construction contractor would carry out a visual inspection of the house at 6R Bunglegumbie Road Dubbo prior to demolition to check for any hazardous material such as asbestos and lead paint.	Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TC4	Stockpile management	Stockpiles will be designed, established, operated and decommissioned in accordance with the Roads and Maritimes' *Stockpile Site Management Guideline 2015*.	Contractor	Construction	Additional standard safeguard SW9
TC5	Soil stabilisation and restoration	The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: • Landcom's Managing Urban Stormwater: Soils and Construction series • Landscape Guideline (RTA, 2008) • Roads and Maritimes' Guideline for Batter Stabilisation Using Vegetation (2015).	Contractor	Construction	Additional standard safeguard SW15
TC6	Erosion and sedimentation	The SWMP will be implemented throughout the construction period. It will include the following safeguards: • Designated exclusion zones will be identified for the storage and use of construction plant and equipment. These zones will delineate traffic areas and restrict entry and exit points to construction sites • Areas of risk near the modified project, such as steep areas or highly erodible soils, will be identified and appropriate management controls implemented • Temporary or permanent diversion drains will be used to divert off-site runoff around or through the construction site to minimise the volume of flow that mixes with on-site runoff • Physical controls will be developed in line with the erosion and sediment control plan (ESCP), including sediment fences, sediment filters, rock check dams, level spreaders, and on-site diversion drains installed before construction and maintained during construction • Exposed batters will be lined, if required • A schedule for the ongoing maintenance and inspection of temporary erosion and sediment controls will be developed.	Contractor	Construction	Additional safeguard
TC7	Pollution from runoff	The ancillary facilities will be managed within the ESCP. The following measures will be included to limit sediment and other contaminations entering receiving waterways: • Chemicals will be stored within a sealed or bunded area • Appropriate controls will be in place where plant is stored • Runoff from ancillary facilities will be controlled and treated before discharging into downstream waterways • Vehicle movements will be restricted to designated pathways where feasible • Areas that will be exposed for extended periods, such as car parks and main access roads, will be stabilised where feasible.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TC8	Accidental spill	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the TfNSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including TfNSW and EPA officers). A fully equipped emergency spill kit will be kept on-site at all times.	Contractor	Detailed design/Pre-construction	Core standard safeguard C3 Section 4.3 of QA G36 *Environment Protection*
TC9	Contaminated land	Intrusive contamination investigations should be carried out in the vicinity of the modified project to quantify exposure risk to potential moderate risk AEIs.	Contractor	Detailed design/Pre-construction	Additional safeguard
TC10	Ground disturbance	During the establishment of ancillary facility 2, material will be laid down to create hard standing. Should any ground disturbance be required within this land parcel, it will be managed in accordance with the CEMP to minimise any potential risk.	Contractor	Construction	Additional safeguard
Air quality, climate change and greenhouse gas					
AQ1	Impacts on air quality during construction	An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to: • Potential sources of air pollution • Air quality management objectives consistent with any relevant published EPA and/or OEH guidelines • Mitigation and suppression measures to be implemented • Methods to manage work during strong winds or other adverse weather conditions • A progressive rehabilitation strategy for disturbed areas.	Contractor	Detailed design/Pre-construction	Section 4.4 of QA *G36 Environment Protection*
AQ2	Impacts on climate change during construction	During construction, the following measures will be considered and implemented where possible: • Plant and equipment will be switched off when not in use • Vehicles, plant and construction equipment will be appropriately sized for the task and properly maintained so as to achieve optimum fuel efficiency • Materials will be delivered with full loads and will come from local suppliers, where possible • Energy efficiency and related carbon emissions will be considered when selecting vehicles and equipment • Vegetation clearing will be reduced as much as feasible, and re-established in suitable areas when construction is completed • Waste will be reduced and recycled as a preference before disposing to landfill.	Contractor	Construction	Additional safeguard
AQ3	Climate change risks to construction	Environmental safeguards and management measures in the CEMP will be designed to accommodate and respond to the increased frequency and severity of rainfall events.	Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
Waste and resource management					
WR1	Generation of construction waste	A Waste Management Plan will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: • Measures to avoid and minimise waste associated with the modified project • Classification of wastes generated by the modified project and management options (reuse, recycle, stockpile, disposal) • Classification of wastes received from off-site for use in the modified project and management options • Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • Procedures for storage, transport and disposal • Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions. The Plan will be prepared taking into account the TfNSW *Environmental Procedure - Management of Wastes on Roads and Maritime TfNSW Services Land* and relevant TfNSW *Waste Fact Sheets*, as well as the adopting the Resources Management Hierarchy principles of the WARR Act.	Contractor	Pre-construction/ Detailed design	Section 4.2 of QA *G36 Environment Protection*
WR2	Existing condition of ancillary facilities	Prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) a pre-construction land assessment will be carried out to identify the presence of any pre-existing wastes.	Contractor	Pre-construction/ Detailed design	Core standard safeguard W2
WR3	Final condition of ancillary facilities	A post-construction land assessment will be carried out of land that was used for ancillary construction purposes (compounds, storage, parking, etc.) to determine the suitability for hand-back to the landowner.	Contractor	Post construction/ Operation	Additional standard W12
Cumulative impacts					
C1	Cumulative impacts from construction of multiple projects	The CEMP will be updated as required to address cumulative impacts as other projects/activities begin. This will include a process to review and update mitigation measures as new work begins or if complaints are received.	Contractor	Pre-construction and Construction	Additional safeguard

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed to construct/operate the NDB project including the proposed modification and when they need to be obtained are listed in **Table 7-2**. Additional or changed licenses and approval requirements identified in this addendum REF are indicated by underlined and/or struck out font.

Table 7-2: Summary of licensing and approval required

Instrument	Requirement	Timing
Roads Act 1993	Section 138 – Road Occupancy License will need to be obtained as necessary under section 138 of the *Roads Act 1993*.	Prior to start of activity
National Parks and Wildlife Act 1974	Section 90 – An AHIP for the entire modified project area will be obtained under section 90 of the *National Parks and Wildlife Act 1974*.	Prior to start of activity
Water Management Act 2000	Section 304 – Notice to the Minister for Planning and Public Spaces to exercise functions in special areas within the catchment area.	14 days prior to exercising functions
Crown Land Management Act 2016	Licence to occupy areas of Crown land. A Community Engagement Strategy which has been exhibited for at least 28 days and approved by the Minister (Lands and Forestry) is required for any action affecting Crown land use including licences and leases.	Prior to start of activity
Heritage Act 1977	Section 57 – Exemption notification for 'Standard Exemption 9: Change of Use' for work next to an item on the State Heritage Register from the Director Heritage NSW.	Prior to start of activity
Fisheries Management Act 1994	Section 199 – Written notification to the Minister for Planning and Public Spaces prior to any dredging and reclamation work.	Prior to start of activity
	Section 220ZW – A permit will be required to be obtained under section 220ZW of the *Fisheries Management Act 1994* as the activity is likely to result in 'harm to a threatened species, population or ecological community.	
Permission from private landowners and residents	Section 199 - Written notification to the Minister for Planning and Public Spaces prior to any dredging and reclamation work.	Before accessing any private property

8. Conclusion

8.1 Justification

The progression of the detailed design from the concept design (as assessed in the project REF, Submissions Report and previous Addendum REF No 1) and ongoing stakeholder consultation has resulted in a number of design refinements across the New Dubbo Bridge project. These design refinements (described in **Section 3.2**) have been assessed as the proposed modification in this addendum REF.

The proposed modification would provide additional long-term operational benefits to the NDB project by providing an efficient connection that balances the needs of through traffic utilising the Newell Highway as well as access to the future North-West Urban Release Area. While the overall NDB project would improve the road safety on this section of the Newell Highway and provide a route that is less susceptible to flooding.

The proposed modification would result in additional operational noise and traffic impacts resulting from the inclusion of the new intersection and associated additional traffic volumes generated by the North-West Urban Release Area. These impacts would be managed with the safeguards and mitigation measures listed **Table 7-1**.

Overall, the proposed modification is considered to be justified. It has been developed to best meet the proposal objectives, whilst minimising the construction impacts.

8.2 Objects of the EP&A Act

A description of how the proposal is consistent with or furthers the objects of the EP&A Act is listed in **Table 8-1**.

Table 8-1: Evaluation of the proposed modification with regard to the objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The modified project would improve the social and economic welfare of the community by providing an efficient connection that balances the needs of through traffic utilising the Newell Highway as well as access to the future North-West Urban Release Area. While the overall NDB project would improve the road safety on this section of the Newell Highway and providing a route that is less susceptible to flooding.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The potential economic, environmental and social impacts of the proposed modification changes have been fully assessed in this addendum REF and are neutral compared with the overall NDB project.
1.3(c) To promote the orderly and economic use and development of land.	Not relevant to the proposed modification.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposed modification.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The proposed modification does not introduce any additional impacts to threatened species, ecological communities and their habitats as no additional clearing is required. Impacts related to threatened species, ecological communities and their habitats would remain the same as those assessed in Addendum REF No 1. Safeguards and management measures would be implemented to manage impacts to biodiversity and cleared areas would be appropriately revegetated at the completion of work.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The potential heritage impacts of the proposed modification are unchanged to those described in Addendum REF No.1.
1.3(g) To promote good design and amenity of the built environment.	The proposed modification has been designed in accordance with the urban design objectives and principles as outlined in Section 2.3.2 of the project REF.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposed modification.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposed modification.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	The proposal development process has involved consultation with relevant stakeholders. Consultation carried out to date and proposed for the future is outlined in **Chapter 5**.

8.3 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives but would still result in some noise and traffic impacts on the nearest sensitive receivers. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also provide an efficient connection that balances the needs of through traffic utilising the Newell Highway as well as access to the future North-West Urban Release Area. While the overall project would improve the road safety on this section of the Newell Highway and provide a route that is less susceptible to flooding. On balance the proposed modification is considered justified, and the following conclusions are made.

8.3.1 Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF, Submissions Report, Addendum REF No.1 and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

8.3.2 Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to DCCEEW is not required.

9. Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.

Tina Donovan

Senior Associate Environmental Scientist

Jacobs

Date:

I have examined this addendum review of environmental factors and accept it on behalf of TfNSW.

Luke Brodie

Position title: Project Contract Manager New Dubbo Bridge

Company name TfNSW

Date: 18/04/2024

10. EP&A Regulation publication requirement

Drafting guidance

This section is to be completed by either the Environment and Sustainability Officer or Senior Manager Environment and Sustainability. Complete the REF publication decision checklist located within the document control pages of this template.

Respondent	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

11. Terms and acronyms used in this addendum REF

Term /acronym	Description
Addendum REF no. 1	The New Dubbo Bridge – Addendum Review of Environmental Factors, prepared for TfNSW in 2022. This addendum REF was prepared to modify the New Dubbo Bridge project (NDB project) including refinements to the New Dubbo Bridge structure, layout of the Newell Highway and project intersections, as well as changes to retaining wall and drainage structures, shared path and public access arrangements and landscaping and finishing work
BC Act	*Biodiversity Conservation Act 2016 (NSW).*
CEMP	Construction / Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
MNES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NDB Project	The New Dubbo Bridge project as described in the project REF, submissions report and Addendum REF No.1. These documents form the approved NDB project.
NPW Act	National Parks and Wildlife Act 1974 (NSW)
Proposed modification	100% IFC design for the New Dubbo Bridge - RSWS1 Intersection of Newell Highway and River Street West and the subject of this addendum REF
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by TfNSW
RSWS1	River Street West Stage 1. This is a future alignment which will be staged in construction and will ultimately connect with Westview Street, providing direct access for commuters to the Mitchell Highway (Narromine Road). Stage 1 of the River Street West collector road refers to the alignment between the Newell Highway realignment as part of the NBD project and Bunglegumbie Road.
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.

Term /acronym	Description
The NDB project	The New Dubbo Bridge project consists of a new bridge over the Macquarie River and construction of approximately 2.2 kilometres of new highway and intersection upgrades between the Thompson Street / Whylandra Street intersection and the River Street / Bourke Street intersection in Dubbo, NSW. The NDB project is currently under construction.
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021

12. References

Jacobs, 2024., *River Street West Stage 1 Intersection of Newell Highway and River Street West Design Report,* prepared for TfNSW.

Jacobs 2022, *New Dubbo Bridge – Addendum Review of Environmental Factors*, prepared for TfNSW.

Jacobs 2022a. *Addendum Construction Noise and Vibration Assessment* prepared for TfNSW.

Jacobs 2019, *New Dubbo Bridge – Review of Environmental Factors*, prepared for TfNSW.

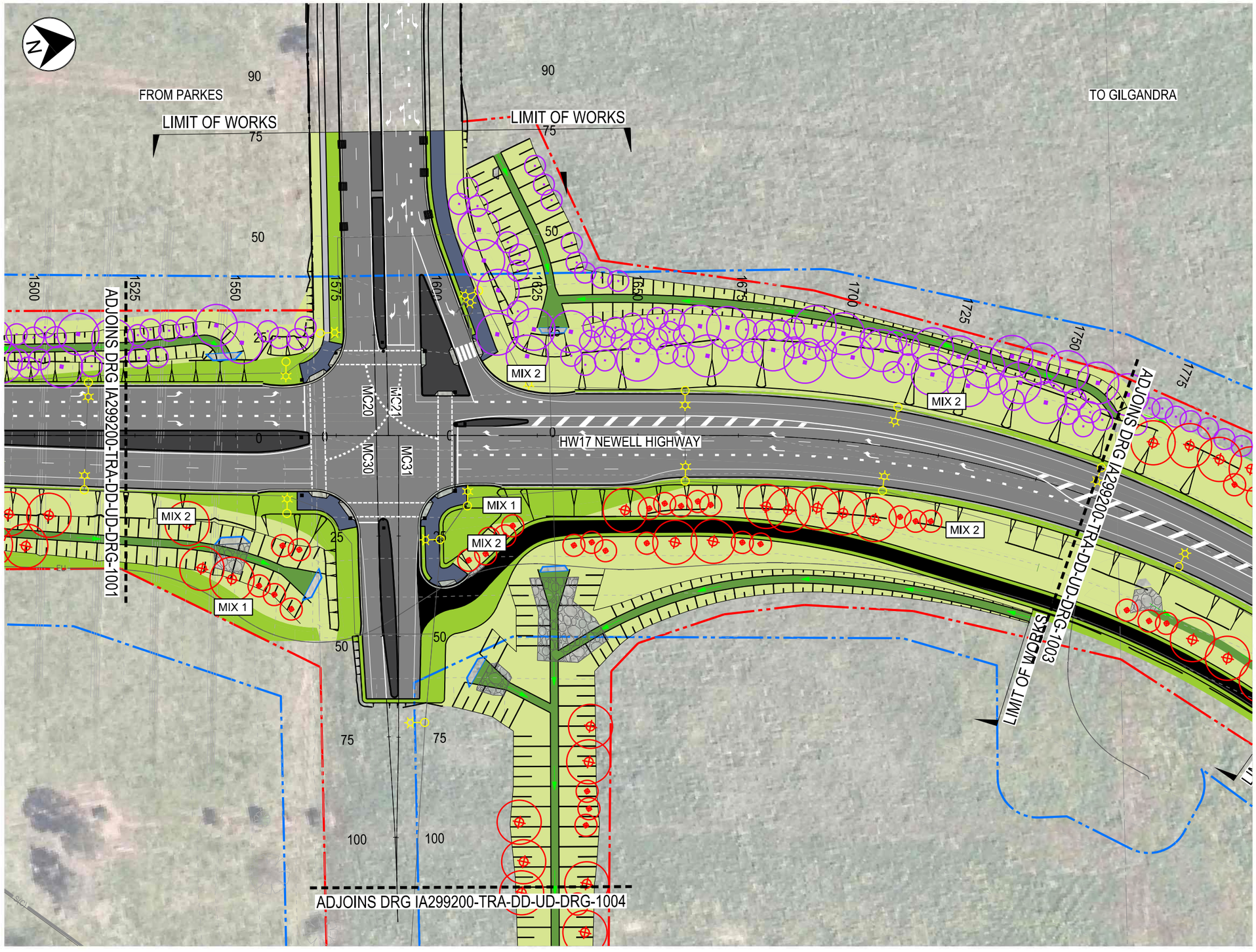
Jacobs 2019a, *New Dubbo Bridge – Review of Environmental Factors*, prepared for TfNSW.

Jacobs 2019ba, *New Dubbo Bridge – Response to submissions Report*, prepared for TfNSW.

Renzo Tonin & Associates 2021 Operational Traffic Noise Assessment report prepared for TfNSW.

Appendix A

Design drawings



LEGEND

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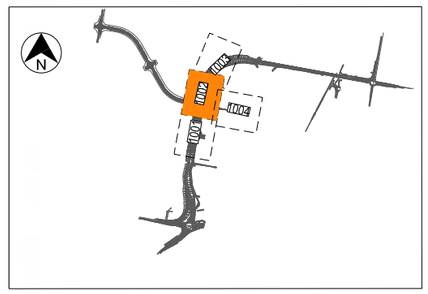
- NDB ACQUISITION BOUNDARY
- NDB PROJECT APPROVAL BOUNDARY
- EXISTING TREES TO BE RETAINED
- LIGHTING

TREE PLANTING

- FEATURE - CORYMBIA CITRIODORA
- WOODLAND CANOPY - EUCALYPTUS LARGIFLORENS / EUCALYTPUS MELLIODORA / EUCALYPTUS MICROCARPA
- RIVERINE CANOPY - EUCALYPTUS CAMALDULENSIS / CASUARINA CUNNINGHAMIANA

LANDSCAPE SEED MIXES
HYDROMULCH OVER
150mm AMELIORATED TOPSOIL OVER
200mm CULTIVATED SUBGRADE

- MIX 1 - GRASSLAND
- MIX 2 - WOODLAND
- MIX 3 - VEGETATED SWALE
  HYDROMULCH OVER
  JUTE WEBBING OVER
  50mm AMELIORATED TOPSOIL OVER
  SCARIFIED SUBGRADE



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0	01.09.23	ISSUED FOR 20% DETAILED DESIGN	F. NAPOLITANO
1	31.10.23	ISSUED FOR 80% DETAILED DESIGN	F. NAPOLITANO

PROJECT BREAKDOWN STRUCTURE

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JACOBS DOCUMENT NUMBER
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DRAWINGS / DESIGN PREPARED BY

landscape architects & urban designers
Tract

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DRG CHECK	M. EASTON	31.10.23
DESIGN	M. NENADIC	31.10.23
DESIGN CHECK	M. EASTON	31.10.23
DESIGN MNGR	R. WAUGH	31.10.23
PROJECT MNGR	F. NAPOLITANO	31.10.23

CLIENT
DUBBO REGIONAL COUNCIL

PREPARED FOR
DUBBO REGIONAL COUNCIL

REGION OF DUBBO
HW17 NEWELL HIGHWAY
NEWELL HIGHWAY AND RIVER STREET WEST INTERSECTION
LANDSCAPE & URBAN DESIGN
GENERAL ARRANGEMENT
SHEET 2 OF 4

A3

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PART 8

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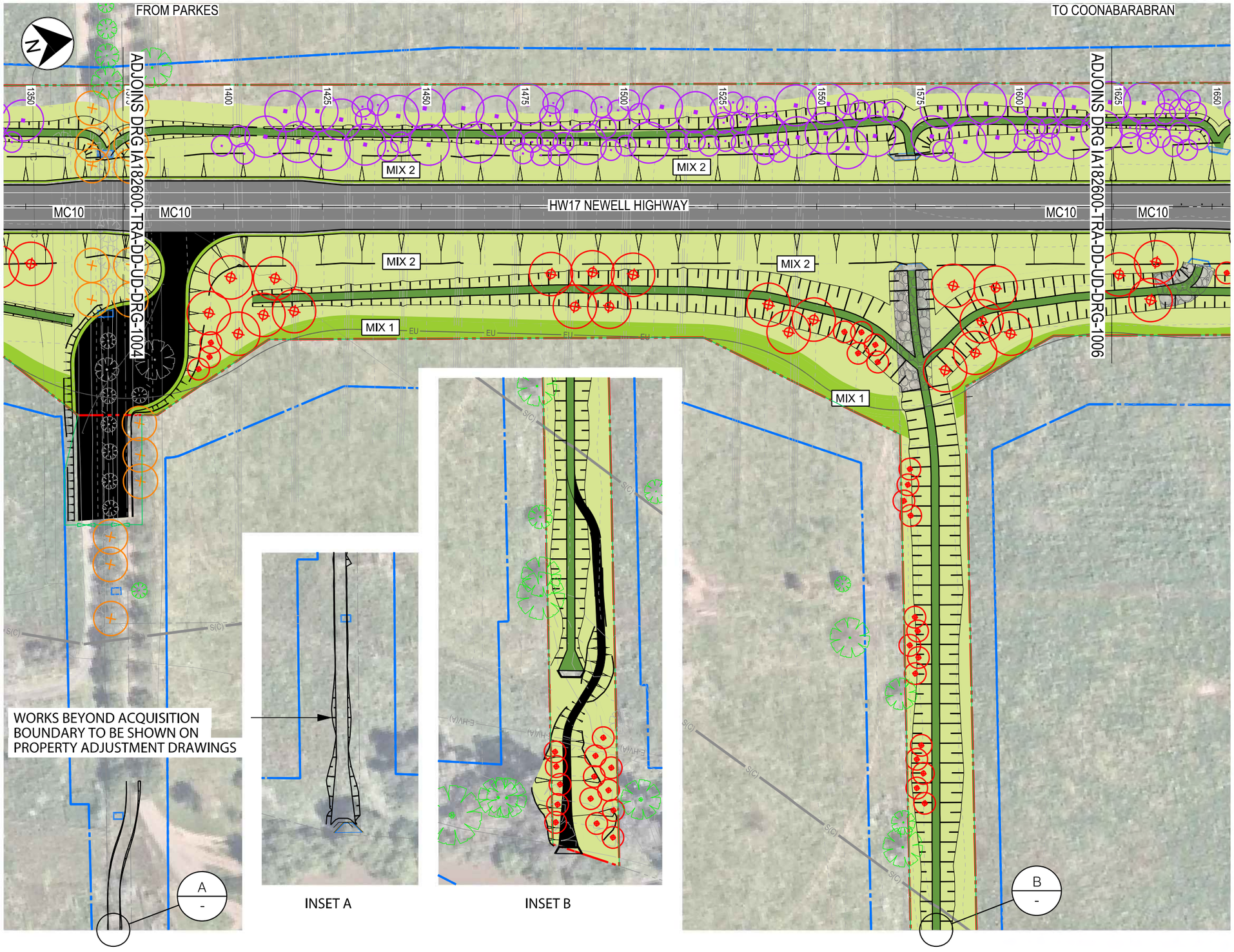
REV 1



INSET A

INSET B

LEGEND

GENERAL

- ACQUISITION BOUNDARY
- PROJECT APPROVAL BOUNDARY
- EASEMENT BOUNDARY

TREE PLANTING

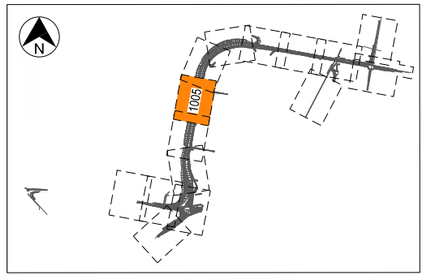
- FEATURE - CORYMBIA CITRIODORA
- WOODLAND CANOPY - EUCALYPTUS LARGIFLORENS / EUCALYPTUS MELLIODORA / EUCALYPTUS MICROCARPA
- RIVERINE CANOPY - EUCALYPTUS CAMALDULENSIS / CASUARINA CUNNINGHAMIANA
- PLANTING ON EMBANKMENT - CALLISTEMON VIMINALIS

LANDSCAPE SEED MIXES
HYDROMULCH OVER
150mm AMELIORATED TOPSOIL OVER
200mm CULTIVATED SUBGRADE

- MIX 1 - GRASSLAND
- MIX 1b - RIVERINE GRASSLAND
- MIX 2 - WOODLAND
- MIX 2b - RIVERINE WOODLAND
- GRINDING GROOVES
- MIX 3 - VEGETATED SWALE HYDROMULCH OVER JUTE WEBBING OVER 50mm AMELIORATED TOPSOIL OVER SCARIFIED SUBGRADE
- MIX 4 - WHYLANDRA STEEP SLOPE

LANDSCAPE PLANTING

- BASIN PLANTING JUTE WEBBING OVER 50mm AMELIORATED TOPSOIL OVER 200mm CULTIVATED SUBGRADE
- TURF (EUREKA KIKUYU) 100mm TOPSOIL OVER 200mm CULTIVATED SUBGRADE



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REGION OF DUBBO
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HIGHWAY REALIGNMENT FOR NEW DUBBO BRIDGE
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LANDSCAPE & URBAN DESIGN
GENERAL ARRANGEMENT
SHEET 5 OF 15

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HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
landscape architects & urban designers
Tract

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DRG CHECK	M. EASTON	09.06.23
DESIGN	M. EASTON	09.06.23
DESIGN CHECK	M. EASTON	09.06.23
DESIGN MNGR	M. SILVESTRI	09.06.23
PROJECT MNGR	D. SPRING	09.06.23

PREPARED FOR
TRANSPORT FOR NSW
INFRASTRUCTURE AND PLACE
REGIONAL PROJECT DELIVERY (WEST)

TINSW REGISTRATION No. DS2018/000706

PART 10

ISSUE STATUS: ISSUED FOR CONSTRUCTION

EDMS No.

SHEET No. UD-1005

REV A

Appendix B

Consideration of section 171(2) factors and matters of National Environmental Significance and Commonwealth land

Section 171(2) checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
Any environmental impact on a community? The proposed modification would result in some short-term amenity-related impacts during construction to the nearest receivers. These impacts are expected to be consistent with the NDB project. Operation of the NBD project would provide better access and connectivity throughout the New Dubbo Bridge alignment and improve flooding impacts to surrounding land. Overall, the modified project would provide additional long term positive impacts on the community, by not only providing an alternative access route during a flood but also by providing better connectivity throughout the region.	Short-term, minor, negative. Long-term positive
Any transformation of a locality? The proposed modification would impact the existing locality due to the addition of the new intersection. However, the impacts are expected to be consistent with the NDB project. Overall, the NDB project would continue to transform locality as it would introduce a new bridge and road to existing cleared agricultural lands.	Short-term, minor, negative. Long-term, negative.
Any environmental impact on the ecosystems of the locality? The proposed modification is not expected to further impact on the ecosystems of the locality as no additional native vegetation clearing or, in waterway works would be required. The NDB project would impact on a section of the Macquarie River which has been identified as having potential value as an aquatic ecosystem, however this impact is not expected to be significant.	Long-term, minor, negative.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposed modification would impact the overall aesthetic quality of the locality as a result of the temporary construction work. However, the impacts are expected to be consistent with the not anticipated to additional impacts to locality from the overall NDB project. Impacts would be minimised as far as practicable through the implementation of safeguards outlined in **Chapter 7**. No recreational or scientific qualities of the locality are anticipated to be impacted during operation of the NDB project.	Short-term, minor, negative.
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposed modification is not expected to impact on any additional Aboriginal or non-Aboriginal heritage items. The unexpected finds procedure would continue to be followed if any item or material is uncovered during construction of the NDB project. As a result, the over NDB project would not result in any additional impacts a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value from those described in the REF, submission report and Addendum REF No. 1.	Short-term, minor, negative.
Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? No additional native vegetation clearing is required as part of the proposed modification. The modified project would impact 3.16 hectares of native vegetation that provide potential habitat to threatened species. However, the primary work of the project are likely to avoid	Long term, minor, negative.

Factor	Impact
most of the known areas of high biodiversity values such as large trees and hollow bearing trees where possible. The NDB project is not likely to significantly impact threatened species, populations or ecological communities or their habitats.	
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The NDB project including this modification is not expected to endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air as no additional clearing or waterway works would be required.	Nil
Any long-term effects on the environment? The proposed modification is expected to result in some local traffic and noise impacts on the nearest receivers. While these impacts are expected to be consistent with the NDB project, additional mitigation measures have been included for impacts to the nearest receivers. The proposal modification would not require any additional native vegetation clearing. The NDB project would have an overall minor negative long term impact on the existing environment through permanent clearance of up to 3.16 hectares of native vegetation and direct impacts to five Aboriginal sites. The NDB project would have positive long-term effects on the community through improved flood impacts on the surrounding land and better access and road safety throughout the New Dubbo Bridge alignment. Overall, the NDB project would continue to increase flood immunity and route reliability, to reduce congestion and to improve access along the entire Newell highway.	Long-term, minor, negative. Long-term, moderate, negative.
Any degradation of the quality of the environment? The proposed modification would impact on the local amenity (such as traffic, noise and visual impacts) for the nearest three residences due to the introduction of a new intersection. These three sensitive receivers are expected to meet the threshold for eligibility for consideration of noise mitigation. To help minimise visual impacts to the near residents to the new intersection additional mitigation measures such as the included of environmental management works adjacent to the road corridor would be implemented, refer to **Section 7.2**. The NDB project would continue to require removal of native vegetation for it's construction. The NDB project area would be rehabilitated far as practicable after construction, which would reduce the risk of long-term degradation to the environment. Safeguards would be implemented during construction including measures to prevent the spread of noxious weeds. This would have the potential to degrade the quality of the environment in the long-term.	Short-term, minor, negative.
Any risk to the safety of the environment? Construction of the NDB project would continue to have the potential to temporarily decrease safety on the Newell Highway, River Street, Thompson Street and other local roads within the NDB project area due to construction work.	Short-term, minor, negative.
Any reduction in the range of beneficial uses of the environment? The NDB project is located across areas of public recreation, low density residential and environmental management zoned land. Although the modified project would permanently acquire some parts on these zoned lands, the overall operation of the modified project would support the beneficial uses of these lands.	Short-term, minor, negative. Long-term, positive.
Any pollution of the environment? Construction of the NDB project and this modification would continue to have some minor water pollution risks from sediments, soil nutrients, waste, and spillage of fuels and chemicals. Construction of the NDB project and this modification may also continue to	Short-term, minor, negative.

Factor	Impact
contribute to minor noise, lighting and air quality impacts (dust and exhaust emissions). Management of noise lighting and air quality impacts would be carried out in accordance with the safeguards and management measures summarised in **Section 7.2**.	
Any environmental problems associated with the disposal of waste? Waste associated with the NDB project and this modification would be managed in accordance with the *Waste Avoidance and Resource Recovery Act 2001* and recycled where possible. Issues associated with the disposal of waste are not expected	Nil
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? No substantial increase in demands of material is expected and therefore resources are not likely to become in short supply as a result of the proposed modification.	
Any cumulative environmental effect with other existing or likely future activities? The cumulative impacts of the NDB project and this modification are not anticipated to be substantially different to those described for the of the NDB project. As multiple construction activities in Dubbo would continue to have a cumulative impact on native vegetation clearing (including habitat clearing), fauna mortality, aquatic habitats and local Aboriginal heritage with the modified project. Cumulative impact as a result of concurrent development would be managed according to safeguards outlined in **Section 7.2**	Short term, minor, negative.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The NDB project is not located within a coastal area and would not result in any impact on coastal processes and coastal hazards.	Nil
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1. Dubbo Regional Council adopted the Development Control Plan for North-West Urban Release Area, on the 28 September 2023. The proposal modification is required to connect the RSWS1 alignment and the Newell Highway to facilitate access to the North-West Urban Release Area.	Long term benefit
Other relevant environmental factors	In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to **Chapter 6** of this assessment.

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to DCCEEW.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	Nil
Any impact on a National Heritage place?	Nil
Any impact on a wetland of international importance?	Nil
Any impact on a listed threatened species or communities?	Nil
Any impacts on listed migratory species?	Nil
Any impact on a Commonwealth marine area?	Nil
Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

Appendix C

PACHI clearance letter

Bikek Bhattarai
Project Support Manager

19/12/2023

Dear Bikek

Preliminary assessment results for the NEW DUBBO BRIDGE Addendum Site Locations NDB PACHI Stage 1 - Site Walk for Council Intersection Area. Based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI), on this day 03/11/2023.

The project, Addendum sites was assessed as being unlikely to have an impact on Aboriginal cultural heritage. See attached map 2 locations for sites .

The assessment was based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate, moderate to high concentrations of Aboriginal objects and places **inside the study area.** Ref AHIMS Search
- The study does contain landscape features that indicated the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure.
- The cultural heritage potential of the study area appears to be heavily reduced due to past disturbance. (Previous Construction Activities)

Safe Guards: The described activities must be restricted to the areas assessed (if there are any changes to the methodology, please contact the ACHO in Western Region,
Please be vigilant for potential Aboriginal objects when construction/ works commences.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

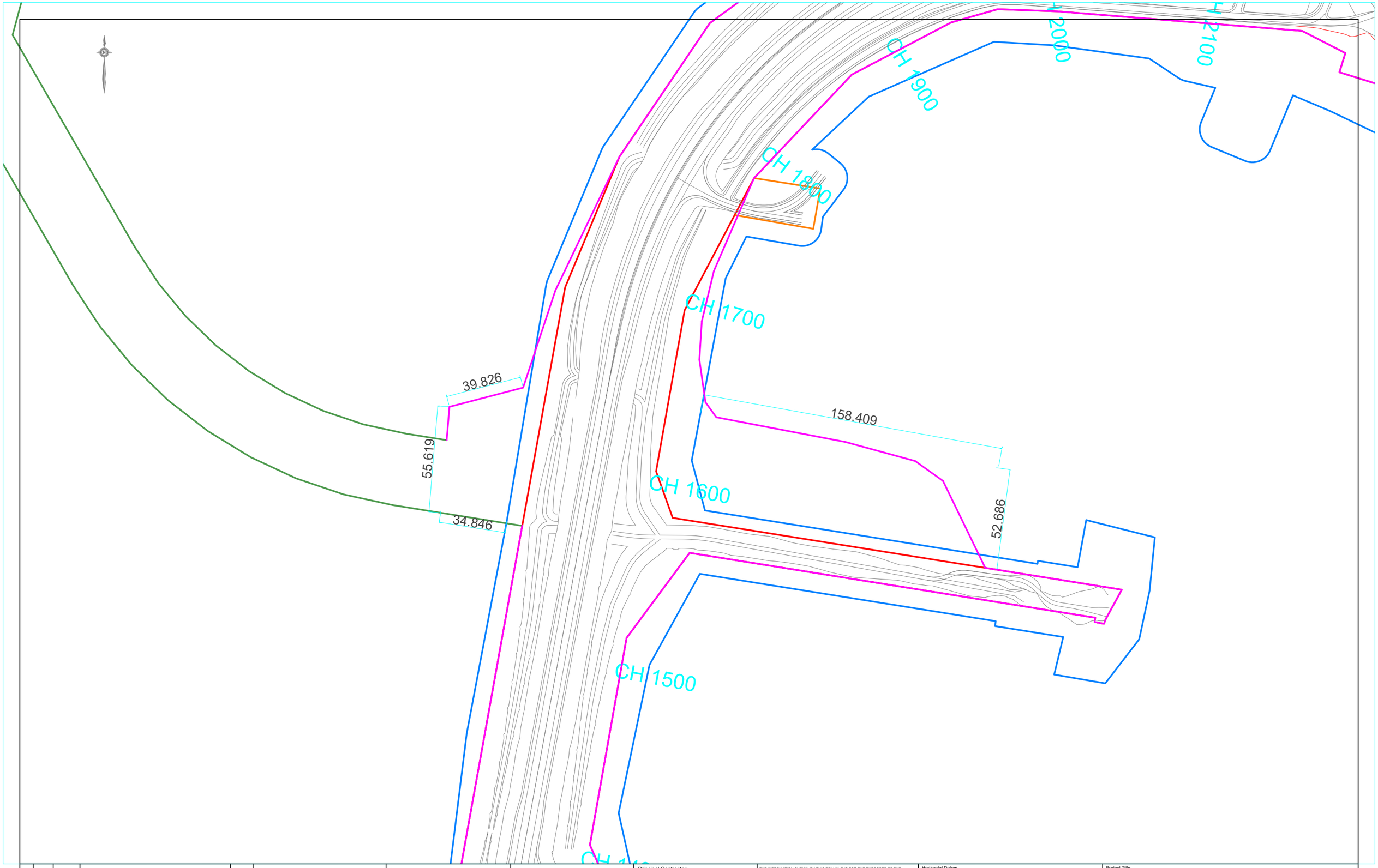
If the scope of your project changes, you must contact me and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' **Unexpected Heritage Item Procedure**.

For further assistance in this matter do not hesitate to contact me.
Yours sincerely

Aboriginal Cultural Heritage Advisor – Western Region

Transport for NSW
Level 1, 51-55 Currajong Street Parkes NSW 2870 | PO Box 21 Parkes NSW 2870
T 02 68611658 | F 02 68611414 | E Jeffery.charlton@transport.nsw.gov.au ABN 18 804 239 602



No.	BY	DATE	DESCRIPTION	APPD

Plot Fri Dec 15 13:04:41 2023

SCALE: HZ 1:1750 @ A3

Notes

Sub Contractor

Principal Contractor

NSW GOVERNMENT Transport for NSW

THE INFORMATION SHOWN ON THIS DRAWING IS FOR THE PURPOSES OF THE NDB PROJECT ONLY. NO WARRANTY IS GIVEN OR IMPLIED AS TO ITS SUITABILITY FOR ANY OTHER PURPOSE

	PREPARED	CHECKED
REP. ENGINEER		
DRAFTING		

Sheet 1 of

Horizontal Datum: GDA 2020

Height Datum: AHD

Date of Survey | Surveyed By

DATE:

Project Title: NEW DUBBO BRIDGE

Drawing Title: EXTENSION TO ROAD BOUNDARY

Status | Drg No. | Rev.

Appendix D

Statutory consultation checklists

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Car park	Does the project include a car park intended for the use by commuters using regular bus services?	No	-	Section 2.110
Bus depots	Does the project propose a bus depot?	No	-	Section 2.110
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No	-	Section 2.110

Development within the Coastal Zone

Issue	Description	Yes / No / N/A	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No	-	Section 2.14

Note: See interactive map Coastal management - (nsw.gov.au). Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program.

Council related infrastructure or services

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No	Dubbo Regional Council	Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No	Dubbo Regional Council	Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No	Dubbo Regional Council	Section 2.10
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No	Dubbo Regional Council	Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause	No	Dubbo Regional Council	Section 2.10

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
	more than a minor or inconsequential disruption to pedestrian or vehicular flow?			
Road and footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No	Dubbo Regional Council	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No	Dubbo Regional Council	Section 2.11

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No	Dubbo Regional Council	Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No	State Emergency Services	Section 2.13

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	Environment and Heritage branch of the NSW Department of Climate Change, Energy, the Environment and Water (formerly the Department of Planning and Environment)	Section 2.15
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No		Section 2.15
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No	Department of Industry	Section 2.15
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?	No	Sydney Harbour Foreshore Authority	Section 2.15
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	Section 2.15
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	Section 2.15
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	Section 2.15

Appendix E

Traffic assessment

New Dubbo Bridge Addendum 2 REF - Traffic and Transport Impact Assessment

Date: 15 April 2024
Project name: New Dubbo Bridge
Prepared by: Roy Conrad, Ashish Babu
Reviewed by: Miliss Mansour
Revision no: 01

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1. Introduction

Transport for NSW (TfNSW)proposes to modify the New Dubbo Bridge project (NDB project) to include a new four-way signalised intersection (RSWS1 intersection) at the connection point of the future River Street West Stage 1 (RSWS1) alignment and the Newell Highway realignment (proposed modification), refer to Figure 1.

Key design features of the proposed modification comprise of the installation of four-way signalised intersection to provide an efficient and safe future road connection with sufficient capacity for future vehicle movements (up to the year 2036) for the North-West Urban Release Area urban growth area (NWURA).

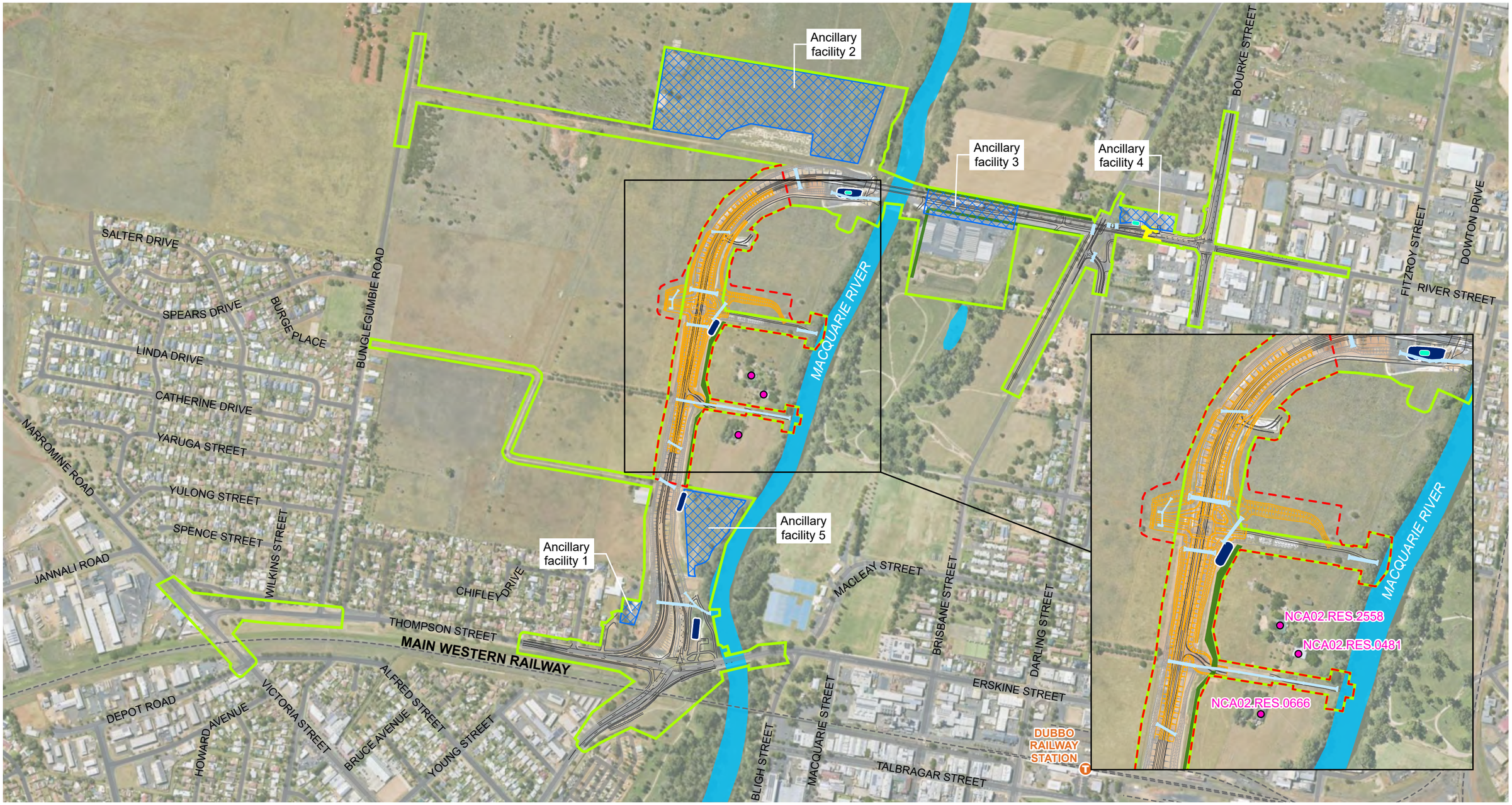
Construction of the approved NDB project has commence and is expected to open to traffic in early 2026. The proposed modification would be constructed concurrently with the Newell Highway realignment as part of the NDB project.

There would be no substantial changes to the construction methodology, ancillary facilities, resources, equipment, public utilities, working hours, construction traffic management or project duration as discussed in the project REF (Jacobs, 2019), submission report (Jacobs,2019a) and Addendum REF No.1 (Jacobs,22).

Jacobs has been by) to prepare an Addendum Review of Environmental Factors (AREF2) to assess the proposed modification . The purpose of this technical memorandum is inform the AREF2 and assess any additional traffic and transport impacts resulting from the inclusion of the RSWS1 intersection and associated additional traffic volumes generated by the NWURA. Thus, this memorandum should be read in conjunction with the following reports:

- New Dubbo Bridge Traffic and Transport Assessment Report, Jacobs (15 February 2019)
- New Dubbo Bridge Traffic and Transport Assessment Report, Jacobs (18 October 2021)
- River Street West Stage 1 Intersection of Newell Highway and River Street West - Traffic Impact Assessment (Draft version), Jacobs (March 2024). It is to be noted that this assessment was undertaken to support the design development of the River Street West Stage 1 Intersection and was a separate project to NDB.

It should be noted that, given the land use assumptions have changed/been updated since REF stage, previous REF assessment results are not directly comparable to results of this assessment. This technical memorandum presents a standalone assessment of impacts of the proposed design changes in accordance with relevant standards and guidelines



Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Residential receivers
- Culvert
- Retaining wall
- Tree plantings
- Sediment basin
- Operational basin
- Proposed ancillary facility
- Train station
- Road
- Railway
- Waterway

0 250 500 m

1:9,000 at A3

Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

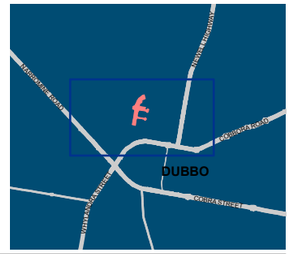


Figure 1 The proposed modification

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1.1 Overview of the approved New Dubbo Bridge project

The NDB project consists of a new bridge over the Macquarie River and construction of approximately 2.2 kilometres of new highway and intersection upgrades between the Thompson Street / Whylandra Street intersection and the River Street / Bourke Street intersection in Dubbo, NSW. The NDB Issued For Construction (IFC) design was completed on 30 May 2023 and the NDB project is currently under construction.

1.2 Overview of the design changes

Dubbo Regional Council has secured funding from the State to construct the RSWS1, which will form the critical spine of what will become Dubbo's new North-West Urban Release Area. The North-West Urban Release Area will be residential land and is planned to be fully developed by the year 2043 to accommodate several thousand people. RSWS1 will be staged in construction and will ultimately connect with Westview Street, providing direct access for commuters to the Mitchell Highway (Narromine Road). The new collector road would be staged in construction and would ultimately connect with Westview Street, providing direct access for commuters to the Mitchell Highway (Narromine Road). The concept design of RSWS1 is shown in Figure 2.

As such a safe connection is required for future road uses between RSWS1 and the future Newell Highway realignment. Hence the proposed modification is required to modify the NDB project design to include a new four-way signalised intersection at the connection point of the RSWS1 alignment and the Newell Highway realignment to facilitate access to the North-West Urban Release Area.

It should be noted that the impact assessment of the NWURA will be subject to the official traffic impact assessment for the particular development. The new collector road will be staged in construction and will ultimately connect with Westview Street, providing direct access for commuters to the Mitchell Highway (Narromine Road).

Figure 2: Proposed River Street West Stage 1 Collector Road

1.3 Purpose of report

This technical memorandum is one of several technical papers that inform and form part of the AREF 2. The purpose of this technical memorandum is to document an updated traffic and transport impact assessment to assess any additional traffic and transport impacts resulting from the inclusion of the RSWS1 intersection and associated additional traffic volumes generated by the NWURA. Thus, this memorandum should be read in conjunction with the following reports:

- New Dubbo Bridge Traffic and Transport Assessment Report, Jacobs (15 February 2019)
- New Dubbo Bridge Traffic and Transport Assessment Report, Jacobs (18 October 2021)
- River Street West Stage 1 Intersection of Newell Highway and River Street West - Traffic Impact Assessment (Draft version), Jacobs (March 2024). It is to be noted that this assessment was undertaken to support the design development of the River Street West Stage 1 Intersection and was a separate project to NDB.

It should be noted that, given the land use assumptions have changed/been updated since REF stage, previous REF assessment results are not directly comparable to results of this assessment. This technical memorandum presents a standalone assessment of impacts of the proposed design changes in accordance with relevant standards and guidelines.

Based on the assessed impacts, potential management measures have been identified.

2. Methodology

2.1 General assessment approach

The traffic and transport assessment of the updated design comprised of:

- Quantitate assessment supported by traffic modelling to identify and assess any potential impacts of the additional intersection and associated traffic volumes at the following intersections
  - Whylandra Street/Thompson Street
  - River Street/Bourke Street
  - RSWS1 Collector Road/Newell Highway (new alignment)
- Qualitative assessment of the impacts of the updated design on property access, pedestrians, cycling and active transport infrastructure
- Qualitative assessment of traffic impacts from construction works
- Review and identification of additional or revised project environmental safeguards and management measures compared to the approved project.

The approach to traffic modelling was generally consistent with that described in Section 6.1.1 of the project REF. The following sections provide a summary of modelling inputs and assumptions.

2.2 Study area

Consistent with the project REF assessment, the traffic modelling includes assessment the following intersections (refer to Figure 3 for geographic locations):

- I-1: RSWS1 intersection with the new Newell Highway alignment (part of the design change which triggered this AREF 2)
- I-2: Whylandra Street/Thompson Street (being upgraded to traffic signals as part of the NDB project)
- I-3: River Street/Bourke Street (being upgraded to traffic signals as part of the NDB project).

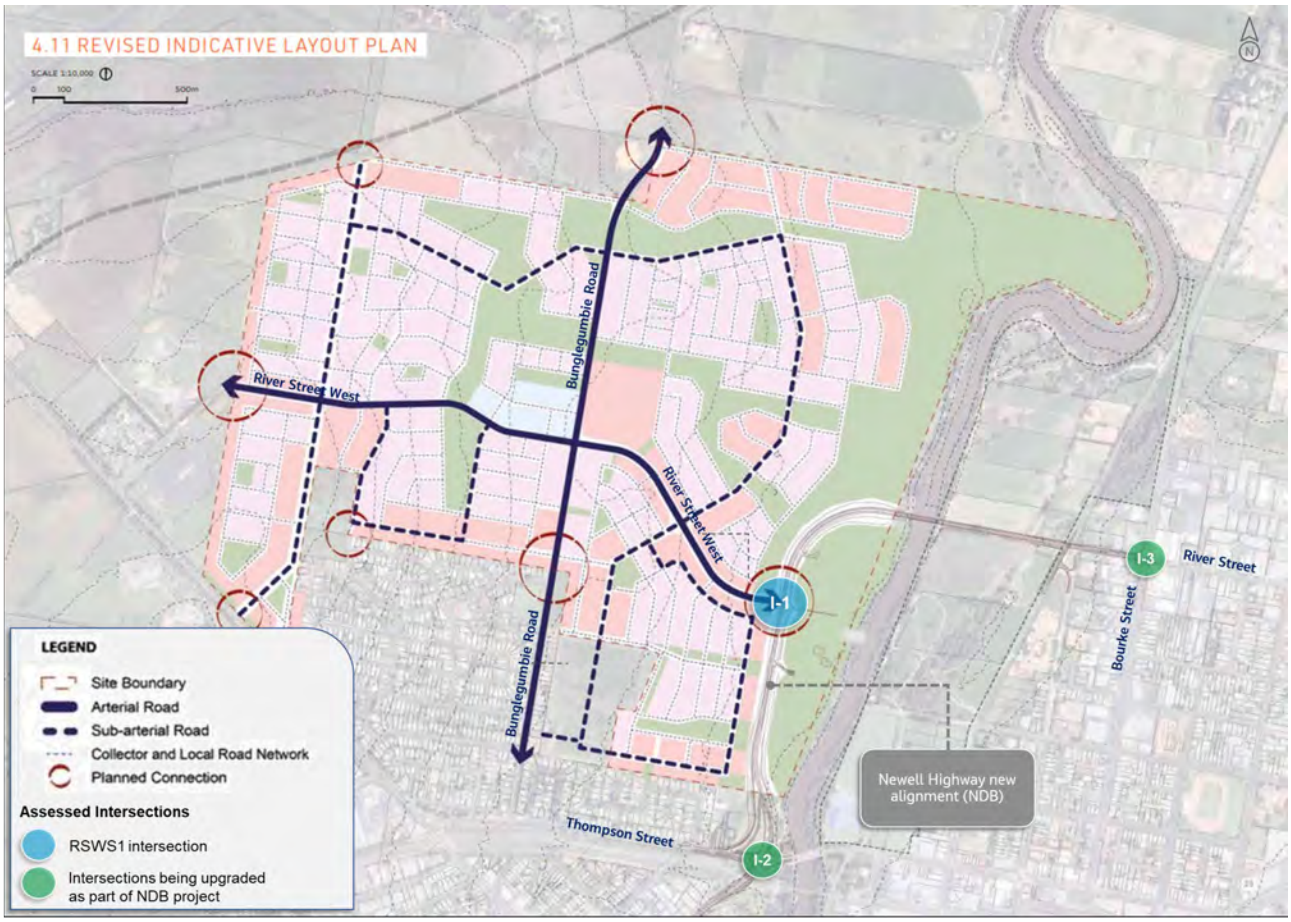

Figure 3: Traffic Modelling Intersections (Source: North-West Urban Release Area Development Control Plan – Masterplan, DRC, September 2023 [Rev H])

2.3 Modelled Scenarios

Consistent with project REF, the traffic impact assessment has been undertaken for the 2036 design year which represents 10 years after the opening of the NDB project.

Traffic modelling peak hours are consistent with project REF assessments (8:00AM to 9:00AM & 4:30PM to 5:30PM).

2.4 Inputs and other key assumptions

- 2036 morning and evening peak hour traffic volumes for the RSWS1 intersection, Whylandra Street/Thompson Street intersection and the River Street/Bourke Street has been provided by Dubbo Regional Council (DRC) sourced from the Dubbo Strategic Traffic Model. Traffic volumes were provided via email dated 28 February 2024 and accompanied by a brief memorandum documenting general assumptions used
- The traffic volumes provided by DRC comprised of number of total vehicles and did not indicate heavy vehicle split. Heavy vehicle proportions have therefore been based on proportions adopted from the NDB project REF traffic assessment (Jacobs, October 2021)
- Traffic models for the Whylandra Street/Thompson Street intersection and the River Street/Bourke Street intersections were adopted from the project REF work
- Traffic model for the RSWS1/Newell Highway intersection was adopted from the RSWS1 design development work

- Traffic modelling was undertaken using SIDRA intersection modelling software version 9.1 (latest version at the time of writing)
- Intersection layout for the RSWS1/Newell Highway intersection is based on the 100% detailed design (River Street West Stage 1 Intersection of Newell Highway and River Street West Design Report, Jacobs, March 2024).

3. Existing conditions

The existing environment of the updated project remains as described in Section 6.1.2 of the project REF and summarised below.

Dubbo serves as an important transport and freight hub, being located at the junction of the Newell Highway, Golden Highway and Mitchell Highways. The average daily traffic volume across the Emile Serisier Bridge is in the order of 18,500 vehicles per day, with a large number of heavy vehicles using the Newell Highway. All intersections within the study area during morning and evening peak periods operate with acceptable Level of Service (LoS) B or better, except the intersection of Thompson Street and Whylandra Street (Newell Highway), which operates at a LoS F during the evening peak hour.

The proposed modification location is currently a greenfield site.

4. Potential impacts

4.1 Construction

The construction of the RSWS1 intersection will be performed alongside the main NDB works and is not expected to add significant additional traffic and transport impacts. Therefore, although design changes may introduce additional light and heavy construction vehicles, potential construction traffic impacts of the design changes would be generally absorbed by management measure described in the project REF.

Particularly, appropriate measures would be introduced through a Traffic Management Plan (TMP) in order to manage additional impacts. Additional construction impacts on existing pedestrian and cycle infrastructure are anticipated to be minimal and would be managed through diversions and the use of alternative existing and temporary paths, as per the project REF.

4.2 Operational

Operational impacts have been modelled using SIDRA intersection modelling software. Operational impacts are presented for a 2036 design year.

4.2.1 Assessment criteria

Table 1 below shows average delay and LoS criteria used for reporting performance. LoS is reported in accordance with the *TfNSW Traffic Modelling Guidelines*. For traffic signals, LoS criteria is related to the average intersection delay, measured in seconds per vehicle.

Table 1: **LoS criteria for intersections**

LoS	Average Delay per Vehicle (secs/veh)	Traffic Signals	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity

LoS	Average Delay per Vehicle (secs/veh)	Traffic Signals	Give Way & Stop Signs
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity, at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Source: TfNSW Traffic Modelling Guidelines, Version 1.0, February 2013.

In accordance with the guidelines, intersection performance of LoS D or better was established as the target criteria. This constitutes an average delay per vehicle at an intersection between 43 and 56 seconds and with the overall intersection considered to be operating at near capacity.

4.2.2 Future traffic volumes

The future traffic volumes used for the SIDRA modelling are provided in tables below for the horizon year 2036.

Table 2: River Street West/Newell Highway (I-1) 2036 volumes

Approach	Turn*	AM Volumes	PM Volumes
River Street West (western approach)	L	454	159
	T	4	5
	R	299	190
Newell Highway (southern approach)	L	45	253
	T	246	116
	R	2	2
River Street West (eastern approach)	L	2	2
	T	4	5
	R	2	2
Newell Highway (northern approach)	L	2	2
	T	108	210
	R	176	266

*Note: L – Left turn movement, T – Through movement and R – Right turn movement.

Table 3: Thompson Street/Whylandra Street 2036 (I-2) volumes

Approach	Turn*	AM Volumes	PM Volumes
Thompson Street (western approach)	T	917	469
	R	20	22
Newell Highway (southern approach)	L	73	47
	T	173	166
	R	372	284
Whylandra Street (eastern approach)	L	451	552
	T	433	703
	R	36	180
Newell Highway (northern approach)	L	246	143
	T	136	230
	R	25	27

*Note: L – Left turn movement, T – Through movement and R – Right turn movement.

Table 4: River Street/Bourke Street 2036 (I-3) volumes

Approach	Turn*	AM Volumes	PM Volumes
Thompson Street (western approach)	L	169	97
	T	426	146
	R	105	33
Newell Highway (southern approach)	L	35	59
	T	136	192
	R	35	21
Whylandra Street (eastern approach)	L	42	16
	T	157	268
	R	47	33
Newell Highway (northern approach)	L	31	45
	T	199	148
	R	92	148

*Note: L – Left turn movement, T – Through movement and R – Right turn movement.

4.2.3 Modelling results

The traffic impact is reported in terms of average intersection delay, LoS and queue lengths. Table 5 presents results for the River Street West/Newell Highway Intersection for the AM and PM peak periods. Table 6 and Table 7 presents results for the NBD intersections I-2 and I-3 for the AM and PM peak periods. SIDRA modelling results and phasing summaries are included in Appendix A.

Table 5: River Street West/Newell Highway (I-1) intersection modelling results

Intersection	Approach	AM Peak				PM Peak			
		Volume	Delay (s)	LoS	Queue (m)	Volume	Delay (s)	LoS	Queue (m)
I-1: River Street West/Newell Highway Intersection		**Traffic signals**				**Traffic signals**			
	River Street West (western approach)	800	21	B	46	370	26	B	29
	Newell Highway (southern approach)	310	26	B	73	390	27	B	55
	River Street West (eastern approach)	10	36	C	2	10	30	C	2
	Newell Highway (northern approach)	300	37	C	28	500	33	C	65
	Average intersection delay		**26**	**B**			**29**	**C**	

Table 6: Thompson Street/Whylandra Street (I-2) intersection modelling results

Intersection	Approach	AM Peak				PM Peak			
		Volume	Delay (s)	LoS	Queue (m)	Volume	Delay (s)	LoS	Queue (m)
I-2: Thompson Street/Whylandra Street intersection		**Traffic signals**				**Traffic signals**			
	Thompson Street (western approach)	990	34	C	152	520	22	B	86
	Newell Highway (southern approach)	650	22	B	47	520	35	C	67
	Whylandra Street (eastern approach)	970	19	B	87	1510	30	C	259
	Newell Highway (northern approach)	430	44	D	94	420	62	E	108
	Average intersection delay		**28**	**B**			**34**	**C**	

T

able 7: River Street/Bourke Street (I-3) intersection modelling results

Intersection	Approach	AM Peak				PM Peak			
		Volume	Delay (s)	LoS	Queue (m)	Volume	Delay (s)	LoS	Queue (m)
I-3: River Street/Bourke Street intersection		**Traffic signals**				**Traffic signals**			
	River Street (western approach)	740	32	C	133	290	32	C	41
	Bourke Street (southern approach)	220	37	C	49	290	50	D	103
	River Street (eastern approach)	260	47	D	85	330	46	D	125
	Bourke Street (northern approach)	340	44	D	76	360	52	D	112
	Average intersection delay		**38**	**C**			**45**	**D**	

Note: Modelled queues represent 95th percentile queues. Approach volumes have been rounded to the nearest ten vehicles and approach queues have been rounded to the nearest five metres.

Under 2036 traffic conditions, the traffic modelling results indicate the following:

- River Street West/Newell Highway Intersection (I-1) would perform at an average acceptable LoS B for the AM peak and LoS C for the PM peak with average delays of 26 seconds in the AM peak and 29 seconds in the PM peak
- Whylandra Street/Thompson Street intersection (I-2) would perform at an average acceptable LoS B for the AM peak and LoS C for the PM peak. The average delays of 29 seconds in the AM peak and 35 seconds in the PM peak was observed. The northern approach in the PM peak performs at LoS E, likely due to additional traffic generated by the NWURA. However, the overall intersection performs at LoS C which is acceptable
- River Street/Bourke Street intersection (I-3) would perform at a satisfactory level of LoS C for the AM peak and LoS D (near capacity) for the PM peak.

4.2.4 Public transport impacts

DRC has advised that the River Street West collector road will become a bus route in the future. No additional public transport impacts are anticipated resulting from the design change.

4.2.5 Active transport impacts

The following active transport provisions have been included in design of the RSWS1 intersection:

- 3.5m wide shared path on the north-eastern corner of the intersection
- 3.5m wide shared path on the south-eastern corner of the intersection
- Provision for a 3.5m shared path on the southern side of the Eastern Access Road.

DRC will construct a shared path and footpath on either side of RSWS1 (western leg) in the future as part of the River Street West collector road project. As a result, the additional design change will provide a positive impact to active transport connectivity in the area.

5. Conclusion

An updated traffic and transport impact assessment was undertaken to assess any additional traffic and transport impacts to the NDB project resulting from the inclusion of the RSWS1 intersection and associated additional traffic volumes generated by the NWURA.

The assessment results (shown in Section 4.2.3) indicate that, although overall operational traffic performance of the Whylandra Street/Thompson Street and the River Street/Bourke Street intersections would be acceptable, some approaches to the intersections may operate at or near capacity by 2036. Therefore, it may be necessary to review performance in the future and undertake further improvements to these intersections taking into consideration the impact of the NWURA generated traffic in any further assessment.

In general, any additional impacts during construction are expected to be able to be managed in accordance with the mitigation and management measures provided in the project REF.

Appendix A – Detailed SIDRA Modelling Results

MOVEMENT SUMMARY

Site: 01 [River St West _2036_AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection (Signals)

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Newell Hwy															
12	L2	All MCs	47	4.1	47	4.1	0.052	16.5	LOS B	0.9	6.8	0.54	0.68	0.54	41.4
11	T1	All MCs	259	19.0	259	19.0	* 0.568	28.2	LOS B	9.0	73.1	0.92	0.77	0.92	36.3
10	R2	All MCs	2	0.0	2	0.0	* 0.004	17.9	LOS B	0.0	0.3	0.68	0.60	0.68	28.6
Approach			308	16.6	308	16.6	0.568	26.4	LOS B	9.0	73.1	0.86	0.76	0.86	37.0
East: River St West															
9	L2	All MCs	2	0.0	2	0.0	0.037	30.4	LOS C	0.3	2.1	0.90	0.63	0.90	19.3
8	T1	All MCs	4	0.0	4	0.0	0.037	36.8	LOS C	0.3	2.1	0.90	0.63	0.90	29.7
7	R2	All MCs	2	0.0	2	0.0	0.037	41.3	LOS C	0.3	2.1	0.90	0.63	0.90	28.8
Approach			8	0.0	8	0.0	0.037	36.3	LOS C	0.3	2.1	0.90	0.63	0.90	27.3
North: Newell Hwy															
6	L2	All MCs	2	0.0	2	0.0	* 0.205	20.0	LOS B	3.2	28.2	0.74	0.61	0.74	35.2
5	T1	All MCs	114	32.8	114	32.8	0.205	30.0	LOS C	3.2	28.2	0.74	0.61	0.74	39.1
4	R2	All MCs	185	10.1	185	10.1	0.329	42.0	LOS C	3.3	25.3	0.93	0.77	0.93	35.6
Approach			301	18.6	301	18.6	0.329	37.3	LOS C	3.3	28.2	0.85	0.71	0.85	34.9
West: River St West															
3	L2	All MCs	478	3.9	478	3.9	0.402	8.5	LOS A	5.3	38.7	0.42	0.69	0.42	50.9
2	T1	All MCs	4	0.0	4	0.0	* 0.565	36.0	LOS C	6.0	45.6	0.97	0.80	0.97	28.4
1	R2	All MCs	315	10.0	315	10.0	0.565	40.7	LOS C	6.0	45.6	0.97	0.80	0.97	29.7
Approach			797	6.3	797	6.3	0.565	21.3	LOS B	6.0	45.6	0.64	0.73	0.64	41.5

All Vehicles	1415	11.1	1415	11.1	0.568	25.9	LOS B	9.0	73.1	0.73	0.73	0.73	38.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Newell Hwy												
P4	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
East: River St West												
P1	Full	10	11	28.1	LOS C	0.0	0.0	0.84	0.84	43.5	20.0	0.46
North: Newell Hwy												
P2	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
West: River St West												
P3	Full	10	11	30.6	LOS D	0.0	0.0	0.88	0.88	46.0	20.0	0.43
All Pedestrians		40	42	31.8	LOS D	0.0	0.0	0.89	0.89	47.2	20.0	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 01 [River St West _2036_PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection (Signals)

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Newell Hwy															
12	L2	All MCs	266	4.1	266	4.1	0.381	24.7	LOS B	7.5	54.5	0.76	0.78	0.76	36.6
11	T1	All MCs	122	19.0	122	19.0	0.402	32.7	LOS C	4.4	35.8	0.93	0.74	0.93	34.1
10	R2	All MCs	2	0.0	2	0.0	*0.005	20.8	LOS B	0.0	0.3	0.77	0.61	0.77	26.6
Approach			391	8.7	391	8.7	0.402	27.2	LOS B	7.5	54.5	0.82	0.77	0.82	35.7
East: River St West															
9	L2	All MCs	2	0.0	2	0.0	0.026	24.9	LOS B	0.3	2.1	0.83	0.61	0.83	21.6
8	T1	All MCs	5	0.0	5	0.0	0.026	30.1	LOS C	0.3	2.1	0.83	0.61	0.83	32.5
7	R2	All MCs	2	0.0	2	0.0	0.026	34.6	LOS C	0.3	2.1	0.83	0.61	0.83	31.4
Approach			9	0.0	9	0.0	0.026	29.9	LOS C	0.3	2.1	0.83	0.61	0.83	30.3
North: Newell Hwy															
6	L2	All MCs	2	0.0	2	0.0	*0.462	13.2	LOS A	7.2	64.6	0.86	0.73	0.86	32.8
5	T1	All MCs	221	32.8	221	32.8	*0.462	28.3	LOS B	7.2	64.6	0.86	0.73	0.86	36.5
4	R2	All MCs	280	10.1	280	10.1	0.404	36.6	LOS C	4.9	37.4	0.92	0.79	0.92	36.4
Approach			503	20.0	503	20.0	0.462	32.9	LOS C	7.2	64.6	0.89	0.76	0.89	36.4
West: River St West															
3	L2	All MCs	167	3.9	167	3.9	0.125	6.7	LOS A	0.9	6.5	0.23	0.61	0.23	52.2
2	T1	All MCs	5	0.0	5	0.0	*0.429	36.9	LOS C	3.9	29.3	0.96	0.78	0.96	28.1
1	R2	All MCs	200	10.0	200	10.0	0.429	41.6	LOS C	3.9	29.3	0.96	0.78	0.96	29.4
Approach			373	7.2	373	7.2	0.429	25.8	LOS B	3.9	29.3	0.63	0.70	0.63	38.4

All Vehicles	1276	12.7	1276	12.7	0.462	29.1	LOS C	7.5	64.6	0.79	0.75	0.79	36.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Newell Hwy												
P4	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
East: River St West												
P1	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
North: Newell Hwy												
P2	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
West: River St West												
P3	Full	10	11	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
All Pedestrians		40	42	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 3 [Thompson St & Whylandra St-2036AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Option15

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Newell Hwy															
9	L2	All MCs	77	25.0	77	25.0	0.314	8.4	LOS A	4.9	47.0	0.54	0.52	0.54	50.2
8	T1	All MCs	182	52.9	182	52.9	0.314	9.3	LOS A	4.9	47.0	0.54	0.52	0.54	52.5
7	R2	All MCs	392	4.6	392	4.6	*0.772	30.4	LOS C	5.7	41.7	1.00	0.87	1.19	38.6
Approach			651	20.6	651	20.6	0.772	21.9	LOS B	5.7	47.0	0.82	0.73	0.93	43.3
East: Whylandra St															
6	L2	All MCs	475	9.1	475	9.1	0.406	12.5	LOS A	8.8	66.6	0.49	0.70	0.49	48.1
5	T1	All MCs	456	6.4	456	6.4	0.508	22.5	LOS B	11.7	86.6	0.84	0.72	0.84	41.1
4	R2	All MCs	38	0.0	38	0.0	0.508	61.5	LOS E	4.9	35.6	0.95	0.77	0.95	34.3
Approach			968	7.5	968	7.5	0.508	19.1	LOS B	11.7	86.6	0.67	0.71	0.67	44.1
North: New Leg															
3	L2	All MCs	259	15.8	259	15.8	*0.824	48.3	LOS D	11.8	93.5	1.00	0.96	1.24	30.6
2	T1	All MCs	143	28.6	143	28.6	0.462	34.2	LOS C	5.5	47.7	0.94	0.76	0.94	39.8
1	R2	All MCs	26	41.8	26	41.8	0.261	49.9	LOS D	1.1	10.7	0.98	0.72	0.98	31.7
Approach			428	21.7	428	21.7	0.824	43.7	LOS D	11.8	93.5	0.98	0.88	1.12	33.7
West: Thompson St															
11	T1	All MCs	965	0.7	965	0.7	0.810	32.9	LOS C	21.6	152.0	0.97	0.93	1.09	37.9
10	R2	All MCs	21	88.9	21	88.9	*0.810	69.3	LOS E	19.3	140.4	0.99	0.95	1.12	37.5
Approach			986	2.5	986	2.5	0.810	33.7	LOS C	21.6	152.0	0.97	0.93	1.09	36.8

All Vehicles	3034	10.7	3034	10.7	0.824	27.9	LOS B	21.6	152.0	0.84	0.81	0.92	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Whylandra St												
P2	Full	30	32	36.8	LOS D	0.1	0.1	0.93	0.93	52.1	20.0	0.38
P2S	Slip/Bypass	30	32	29.7	LOS C	0.1	0.1	0.84	0.84	45.1	20.0	0.44
North: New Leg												
P3	Full	30	32	32.3	LOS D	0.1	0.1	0.87	0.87	47.6	20.0	0.42
P3S	Slip/Bypass	30	32	10.4	LOS B	0.0	0.0	0.49	0.49	25.8	20.0	0.78
All Pedestrians		120	126	27.3	LOS C	0.1	0.1	0.78	0.78	42.7	20.0	0.47

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 3 [Thompson St & Whylandra St-2036PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Option15

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 115 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Newell Hwy															
9	L2	All MCs	49	16.7	49	16.7	0.357	12.2	LOS A	7.6	67.4	0.67	0.61	0.67	45.5
8	T1	All MCs	175	35.8	175	35.8	0.357	19.6	LOS B	7.6	67.4	0.67	0.61	0.67	47.2
7	R2	All MCs	299	8.9	299	8.9	*0.757	47.9	LOS D	6.9	51.7	1.00	0.89	1.15	32.4
Approach			523	18.7	523	18.7	0.757	35.0	LOS C	7.6	67.4	0.86	0.77	0.94	37.7
East: Whylandra St															
6	L2	All MCs	581	3.9	581	3.9	0.406	9.5	LOS A	9.8	71.0	0.33	0.65	0.33	50.2
5	T1	All MCs	740	4.4	740	4.4	0.828	32.1	LOS C	35.7	259.0	0.89	0.84	0.93	40.6
4	R2	All MCs	189	12.5	189	12.5	*0.905	81.7	LOS F	13.3	102.9	1.00	1.07	1.42	24.4
Approach			1511	5.2	1511	5.2	0.905	29.6	LOS C	35.7	259.0	0.69	0.80	0.76	38.6
North: New Leg															
3	L2	All MCs	151	0.0	151	0.0	0.583	57.0	LOS E	8.1	57.0	0.99	0.80	0.99	28.4
2	T1	All MCs	242	0.0	242	0.0	*0.892	64.2	LOS E	15.4	108.0	1.00	1.04	1.31	30.7
1	R2	All MCs	28	54.2	28	54.2	0.305	65.0	LOS E	1.6	16.7	0.98	0.73	0.98	27.9
Approach			421	3.7	421	3.7	0.892	61.7	LOS E	15.4	108.0	0.99	0.94	1.17	29.8
West: Thompson St															
11	T1	All MCs	494	4.7	494	4.7	0.364	17.6	LOS B	11.8	85.6	0.66	0.57	0.66	43.5
10	R2	All MCs	23	59.4	23	59.4	0.364	97.2	LOS F	6.2	48.8	0.86	0.72	0.86	36.3
Approach			517	7.1	517	7.1	0.364	21.2	LOS B	11.8	85.6	0.67	0.57	0.67	43.0

All Vehicles	2972	7.7	2972	7.7	0.905	33.7	LOS C	35.7	259.0	0.76	0.77	0.84	37.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Whylandra St												
P2	Full	20	21	51.7	LOS E	0.1	0.1	0.95	0.95	67.1	20.0	0.30
P2S	Slip/Bypass	20	21	46.2	LOS E	0.1	0.1	0.90	0.90	61.6	20.0	0.32
North: New Leg												
P3	Full	20	21	23.2	LOS C	0.0	0.0	0.64	0.64	38.6	20.0	0.52
P3S	Slip/Bypass	20	21	7.0	LOS A	0.0	0.0	0.35	0.35	22.3	20.0	0.89
All Pedestrians		80	84	32.0	LOS D	0.1	0.1	0.71	0.71	47.4	20.0	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 05 [River St & Bourke St-2036AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection (Signals)

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke St															
9	L2	All MCs	37	30.0	37	30.0	0.580	15.6	LOS B	6.2	49.3	0.96	0.83	0.96	36.8
8	T1	All MCs	143	11.1	143	11.1	0.580	39.3	LOS C	6.2	49.3	0.96	0.83	0.96	38.4
7	R2	All MCs	37	30.0	37	30.0	0.321	47.0	LOS D	1.5	13.1	0.98	0.73	0.98	31.9
Approach			217	17.5	217	17.5	0.580	36.6	LOS C	6.2	49.3	0.97	0.81	0.97	36.9
East: River St															
6	L2	All MCs	44	0.0	44	0.0	*0.832	30.7	LOS C	10.9	84.6	1.00	1.02	1.27	32.2
5	T1	All MCs	165	20.0	165	20.0	*0.832	49.3	LOS D	10.9	84.6	1.00	1.02	1.27	33.0
4	R2	All MCs	49	0.0	49	0.0	0.832	54.9	LOS D	10.9	84.6	1.00	1.02	1.27	32.2
Approach			259	12.8	259	12.8	0.832	47.2	LOS D	10.9	84.6	1.00	1.02	1.27	32.7
North: Bourke St															
3	L2	All MCs	33	5.7	33	5.7	0.764	27.9	LOS B	9.9	75.9	1.00	0.92	1.16	35.2
2	T1	All MCs	209	12.1	209	12.1	*0.764	39.8	LOS C	9.9	75.9	1.00	0.92	1.16	36.9
1	R2	All MCs	97	38.2	97	38.2	0.885	57.4	LOS E	4.6	42.6	1.00	1.04	1.61	29.9
Approach			339	19.0	339	19.0	0.885	43.6	LOS D	9.9	75.9	1.00	0.96	1.29	34.4
West: River St															
12	L2	All MCs	178	28.1	178	28.1	0.271	22.1	LOS B	4.5	39.5	0.69	0.74	0.69	42.4
11	T1	All MCs	448	0.5	448	0.5	*0.843	36.6	LOS C	18.9	133.1	1.00	1.00	1.20	37.0
10	R2	All MCs	111	21.4	111	21.4	0.249	31.0	LOS C	3.4	28.4	0.82	0.76	0.82	38.4
Approach			737	10.3	737	10.3	0.843	32.2	LOS C	18.9	133.1	0.90	0.90	1.02	38.3

All Vehicles	1552	13.6	1552	13.6	0.885	37.8	LOS C	18.9	133.1	0.95	0.92	1.11	36.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke St												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	49.7	20.0	0.40
East: River St												
P2	Full	50	53	33.4	LOS D	0.1	0.1	0.91	0.91	48.8	20.0	0.41
North: Bourke St												
P3	Full	50	53	27.3	LOS C	0.1	0.1	0.83	0.83	42.7	20.0	0.47
West: River St												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	49.7	20.0	0.40
P4S	Slip/Bypass	50	53	29.0	LOS C	0.1	0.1	0.85	0.85	44.3	20.0	0.45
All Pedestrians		250	263	31.6	LOS D	0.1	0.1	0.89	0.89	47.0	20.0	0.43

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 05 [River St & Bourke St-2036PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-way intersection (Signals)

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke St															
9	L2	All MCs	62	83.3	62	83.3	*0.898	34.3	LOS C	12.1	102.8	1.00	1.12	1.45	31.1
8	T1	All MCs	202	7.1	202	7.1	*0.898	55.7	LOS D	12.1	102.8	1.00	1.12	1.45	33.2
7	R2	All MCs	22	2.6	22	2.6	0.081	37.8	LOS C	0.8	5.4	0.89	0.70	0.89	35.3
Approach			286	23.3	286	23.3	0.898	49.7	LOS D	12.1	102.8	0.99	1.09	1.40	32.8
East: River St															
6	L2	All MCs	17	0.0	17	0.0	*0.871	28.1	LOS B	15.1	124.8	1.00	1.08	1.32	32.5
5	T1	All MCs	282	25.0	282	25.0	*0.871	46.6	LOS D	15.1	124.8	1.00	1.08	1.32	33.3
4	R2	All MCs	35	0.0	35	0.0	0.871	52.2	LOS D	15.1	124.8	1.00	1.08	1.32	32.5
Approach			334	21.1	334	21.1	0.871	46.3	LOS D	15.1	124.8	1.00	1.08	1.32	33.2
North: Bourke St															
3	L2	All MCs	47	38.8	47	38.8	0.703	25.0	LOS B	8.0	69.9	0.99	0.88	1.09	35.0
2	T1	All MCs	156	25.0	156	25.0	0.703	40.9	LOS C	8.0	69.9	0.99	0.88	1.09	37.4
1	R2	All MCs	155	100.0	155	100.0	0.951	70.7	LOS F	8.6	111.7	1.00	1.20	1.80	26.2
Approach			358	59.3	358	59.3	0.951	51.7	LOS D	8.6	111.7	0.99	1.01	1.40	31.3
West: River St															
12	L2	All MCs	102	35.5	102	35.5	0.184	24.2	LOS B	2.7	24.7	0.71	0.73	0.71	41.3
11	T1	All MCs	154	0.9	154	0.9	0.528	35.2	LOS C	5.8	40.7	0.97	0.78	0.97	37.4
10	R2	All MCs	35	100.0	35	100.0	0.214	41.0	LOS C	1.3	16.5	0.91	0.74	0.91	33.2
Approach			291	24.9	291	24.9	0.528	32.0	LOS C	5.8	40.7	0.87	0.76	0.87	38.1

All Vehicles	1268	33.2	1268	33.2	0.951	45.3	LOS D	15.1	124.8	0.97	0.99	1.26	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke St												
P1	Full	50	53	30.7	LOS D	0.1	0.1	0.88	0.88	46.1	20.0	0.43
East: River St												
P2	Full	50	53	33.4	LOS D	0.1	0.1	0.91	0.91	48.8	20.0	0.41
North: Bourke St												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	49.7	20.0	0.40
West: River St												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	49.7	20.0	0.40
P4S	Slip/Bypass	50	53	29.0	LOS C	0.1	0.1	0.85	0.85	44.3	20.0	0.45
All Pedestrians		250	263	32.3	LOS D	0.1	0.1	0.90	0.90	47.7	20.0	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix F

Noise and vibration assessment

Addendum REF2 - Operational and Construction Noise and Vibration Impact Assessment

Date:	15 April 2024
Project name:	New Dubbo Bridge - RSWS1 Intersection
Project no:	IA182600
Company:	Transport for NSW
Prepared by:	Ali Ahmadi
Reviewed by:	Dave Davis
Document no:	IA182600- AREF2NV
Revision no:	01

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1. Introduction

Transport for NSW proposes to modify the New Dubbo Bridge project (NDB project) to include a new four-way signalised intersection at the connection point of the future River Street West Stage 1 (RSWS1) alignment and the Newell Highway realignment (proposed modification). Where RSWS1refers to the alignment between the Newell Highway realignment and Bunglegumbie Road.

Key design features of the proposed modification comprise of the installation of four-way signalised intersection to provide an efficient and safe future road connection with sufficient capacity for future vehicle movements (up to the year 2036) for the New development urban growth area (new development), refer to **Figure 1**.

Construction of the approved NDB project has commence and is expected to open to traffic in early 2026. The proposed modification would be constructed concurrently with the Newell Highway realignment as part of the NDB project.

There would be no substantial changes to the construction methodology, ancillary facilities, resources, equipment, public utilities, working hours, construction traffic management or project duration as discussed in the project REF (Jacobs, 2019), submission report (Jacobs,2019a) and Addendum REF No.1 (Jacobs,22).

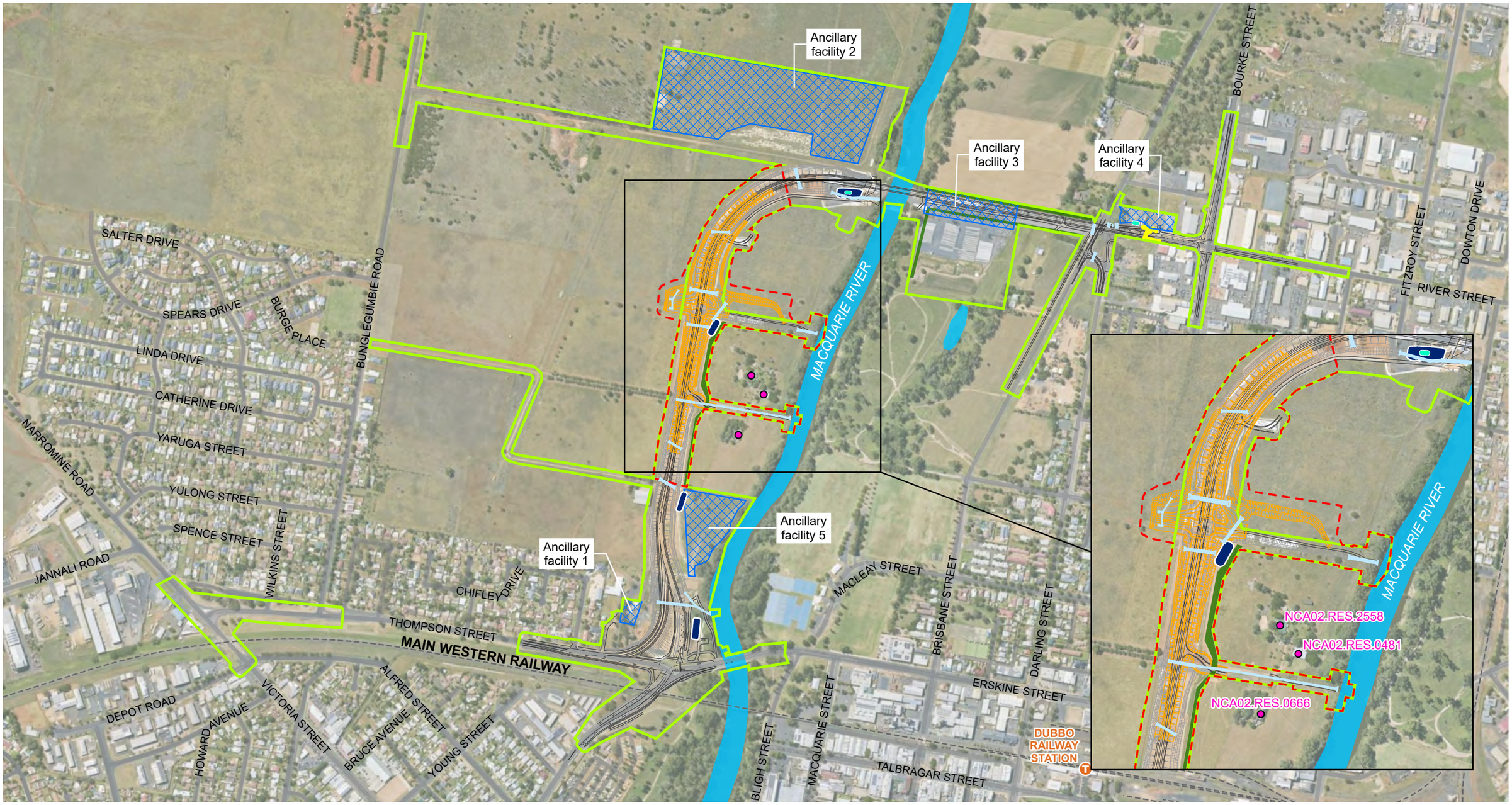
Jacobs has been commissioned to prepare an Addendum Review of Environmental Factors (AREF2) to incorporate proposed design changes to the NDB project. This Memo's objective is to provide inputs to the AREF2 regarding noise and vibration from construction and operation of the proposed modification. This assessment will address the following:

- Potential operational traffic noise impact as the result of the additional traffic introduced by Dubbo's new development at the nearest sensitive receivers to the proposed modification
- Potential construction noise and vibration impact assessment as the result of additional works required to construct the proposed modification.

The noise and vibration assessment provides updates for the assessments previously reported in the following documents:

OTNAR-2021: The Operation Noise and Vibration Impact Assessment presented in Section 3 of this document must be considered as an addendum to the *Operational Traffic Noise Assessment* report prepared by Renzo Tonin & Associates (TL122-02F03 OTNAR (r4), dated 3 December 2021).

ACNVAR-2022: The Construction Noise and Vibration Impact Assessment presented in Section 4 of this document must be considered an addendum to the *Addendum Construction Noise and Vibration Assessment* report prepared by Jacobs (IA182600_NDB_v2, dated 7 February 2022).



Legend

- Modified project design
- Project design (as per Addendum REF No.1)
- Modified project area
- Approved NDB project area
- Residential receivers
- Culvert
- Retaining wall
- Tree plantings
- Sediment basin
- Operational basin
- Proposed ancillary facility
- Train station
- Road
- Railway
- Waterway

0 250 500 m

1:9,000 at A3

Data sources

Jacobs 2021
Metromap (Aerometrex) 2021
NSW Spatial Services 2021

GDA2020 MGA Zone 55

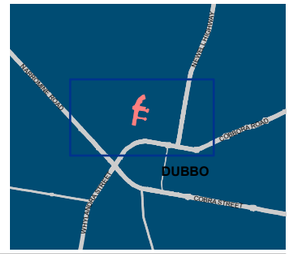


Figure 1 The proposed modification

Date: 4/17/2024 Path: \\Jacobs.com\ANZIE\Projects\04_Eastern\IA182600\22 Spatial\GIS\Directory\Templates\Figures\AddendumREF_ZIA182600_AddendumREF2_v07.aprx
Created by : ST | QA by : KD

2. Noise and vibration sensitive receivers

The nearest sensitive receivers to the proposed modification are identified in **Table 1** and shown in **Figure 1**.

Table 1. Nearest sensitive receivers to the proposed modification

Receiver ID[1]	Address	Distance from the centre of the new RSWS1 intersection
NCA02.RES.2558	Mt Olive Off Bunglegumbie	
NCA02.RES.0481	Mt Olive Off Bunglegumbie	
NCA02.RES.0666	The Willows' 6R Bunglegumbie Road	

1- consistent with both OTNAR-2021 and ACNVAR-2022

3. Operational noise impact assessment & management

OTNAR-2021 has provided the operational noise and vibration impact assessment for the 100% Concept Design of the entire New Dubbo Bridge (NDB) project, prior to the proposed design change addressed in this AREF2.

The project's design change includes the introduction of traffic generated by new development into the road network through the new intersection.

The following operational noise assessment specifically addresses the potential traffic noise impact at the nearby receivers identified in **Table 1** as the result of the additional traffic on the new Newell Highway alignment generated by the New development.

3.1 Noise targets

The road traffic noise criteria for residential receivers have been initially allocated in the OTNAR-2021 and reproduced in **Table 2** for the receivers identified in **Section 2**.

Table 2. Road traffic noise assessment criteria for residential land uses

Receiver ID	Existing resident affected by noise from new freeway/arterial/sub-arterial road corridors – dB(A)		Existing residences affected by increases in traffic noise of 12 dB(A) or more from new freeway / arterial / sub-arterial roads	
	Day (7:00am-10:00pm)	Night (10:00pm-7:00am)	Day (7:00am-10:00pm)	Night (10:00pm-7:00am)
NCA02.RES.2558	$L_{Aeq,(15\ hour)}$ 55 (external)	$L_{Aeq,(9\ hour)}$ 50 (external)	Existing $L_{Aeq,(15\ hour)}$ (external) + 12 dB(A) [capped at 55 dB(A)]	Existing $L_{Aeq,(15\ hour)}$ (external) + 12 dB(A) [capped at 50 dB(A)]
NCA02.RES.0481				
NCA02.RES.0666				

3.2 Evaluation of noise mitigation measures

At this stage, only traffic volume distributions for the new intersection are available. In the absence of traffic volume distributions of the design year for the entire approved project road network, only the closest receivers to the proposed modification are considered for this assessment.

The guidance provided in the OTNAR-2021 is applied in this report for reviewing the potential changes in the recommended noise mitigation measures at the receivers identified in **Section 2**.

3.3 Noise modelling methodology

For the purpose of estimating the increase in traffic noise due to additional traffic generated by the new development, a correction factor has been calculated using the Calculation of Road Traffic Noise (CoRTN) method. The calculations have been based on traffic volumes provided to Jacobs for the new development and the traffic volumes used for the 100% Concept Design presented in OTNAR-2021. The estimated correction factors were then applied as adjustments to the noise levels presented in OTNAR-2021 for the receivers identified in **Section 2**. The revised traffic noise predictions were then assessed against the relevant noise criteria to determine any potential changes in noise impacts and possible eligibility for noise mitigation measures.

3.4 Noise Model Assumptions

Based on the traffic data currently available at this stage, Jacobs have estimated the additional traffic compared to OTNAR-2021 that the new Development will generate in the design year 2036 on the segment of the new Newell Highway alignment adjacent to the receivers identified in **Section 2**. The following assumptions are used to generate the forecasted traffic volumes due to the new Development:

- The volumes are forecasted for a section of the new Newell Highway alignment, which is located south of the new intersection
- Daily traffic volumes have been estimated based on peak hour volumes provided by Council (based on the general assumption that peak hour accounts for approximately 10% of the 24-hour daily volumes)
- Night volume is assumed to be 20% of total daily volumes
- Volumes rounded to the nearest 100 vehicles
- A typical 2% heavy vehicle composition is applied.

Table 3 provides the traffic volumes forecast for the new Newell Highway alignment presented in OTNAR-2021 as well as additional traffic volumes due to the new Development.

Table 3. Build year 2036 traffic forecast (approved project compared to AREF 2)

Road	Time	Direction	Build year 2036 without new Development[1,2] (hourly average)		Build year 2036 additional traffic forecast[3] (hourly average)	
			Light Vehicles (LV)	Heavy vehicles (HV)	LV	HV
New Newell Highway Alignment	Day (7am –10pm)	Northbound	49	22	78	2
		Southbound	28	9	125	3
	Night (10pm- 7am)	Northbound	6	3	33	1
		Southbound	3	0	52	1

Note: 1 - Based on OTNAR-2021.

2 - New development.

3 - Additional traffic due to the new Development (New development) only.

3.5 Noise assessment results and mitigation measures

Based on the anticipated increase in traffic volumes generated by the new Development, correction factors for both the Day and Night periods have been calculated for the relevant segment of the new Newell Highway alignment. **Table 4** shows the calculated correction value to be applied as adjustments to the OTNAR-2021 predicted cumulative 2036 traffic noise levels for the appropriate road segment.

Table 4. Estimated correction to new Newell Highway alignment road traffic noise due to the new Development and the new RSWS1 intersection

Road segment	Change in noise level due to additional traffic on new Newell H'way alignment from new RSWS1 intersection, $L_{Aeq(Day\ or\ Night)}$, dB(A)	
	Day	Night
New Newell Highway alignment south of new RSWS1 intersection	+1.4 dB(A)	+4.6 dB(A)

It should be emphasised that the noise increase corrections shown in **Table 4** only apply to a section of the new Newell Highway alignment which is located between the new RSWS1 intersection and the intersection with Thompson Street.

Based on the correction factors shown in **Table 4**, the OTNAR-2021 traffic noise levels at the relevant receivers have been updated to include the traffic volumes that are forecast to be generated by the new Development. **Table 5** summarises the updated operational traffic noise prediction for Build year 2036 (including the new Development). Additionally, this table presents a comparison between the prior eligibility for mitigation consideration (per OTNAR-2021) and the anticipated increase in traffic noise levels as the result of this study.

Table 5. Updated operational traffic noise prediction for year 2036

Receiver ID	NCG criteria*		Predicted traffic noise level, dB(A) (year 2036, with new Development)		Qualifies for consideration of mitigation?	
	Day	Night	Day	Night	OTNAR-2021 (without new Development)	AREF2 (with new Development)
NCA02.RES.2558	49	42	51	47	Yes	Yes
NCA02.RES.0481	51	43	50	46	No	Yes
NCA02.RES.0666	53	44	52	48	No	Yes

Notes: * - OTNAR-2021 presents the residential initial NCG criteria only (i.e. LAeq 55 dB(A) and LAeq 50 for Day and Night respectively). Where, there is a difference of more than 12 dB between No Build and Build, the [No Build $L_{Aeq,\ Day/\ Night}$] + 12 dB(A) is selected as the relevant NCG criteria.

The OTNAR-2021 identified only one receiver: NCA02.RES.2558 for consideration of mitigation. As shown in **Table 5,** due to the anticipated increase of operational traffic noise from the new Development, all the receivers identified in **Section 2**, **Table 1** are expected to meet the threshold for eligibility for consideration of mitigation.

The identified closest receivers to the proposed modification are not considered as 'closely spaced', as defined in the TfNSW *Noise Mitigation Guideline* (NMG). Therefore, low noise pavements and noise barriers are not considered to be reasonable mitigation options for these receivers. However, these receivers should be considered for at-property treatment. For guidance on the level of treatment required in relation to the exceedance above the TfNSW *Noise Criteria Guideline* (NCG) external assessment criteria refer to OTNAR-2021 and the *Noise Treatment Guideline*[1].

4. Construction noise and vibration impact assessment & management

4.1 Construction works

ACNVAR-2022 has provided a construction noise and vibration impact assessment for the entire New Dubbo Bridge (NDB) project. This section addresses the noise impact resulting from the construction of the proposed modification.

There would be no substantial changes to the construction methodology, ancillary facilities, resources, equipment, public utilities, working hours, construction traffic management or project duration from the approved project. The proposed modification's construction noise scenarios and assumed equipment will be the same as those assessed in ACNVAR-2022.

4.2 Construction noise & vibration assessment

Based on comparison of the proposed modification construction works against the construction works assessed in ACNVAR-2022, noise and vibration impacts from construction of the proposed modification are expected to be equal or less than the noise and vibration impacts previously assessed in ACNVAR-2022.

As a result, the assessment results and recommended mitigation measures for construction noise and vibration impacts that were presented in ACNVAR-2022 also apply to the proposed modification construction works and no further assessment is required.

5. Conclusion, limitations and Future Work

Prediction of the operational traffic noise increase due to the additional traffic introduced by Dubbo's new development have been carried out. The OTNAR-2021 predicted traffic noise levels at the relevant receivers for the year 2036 have been updated to include the traffic volumes that are forecast to be generated by the new development in the design year 2036. Due to the anticipated increase in operational traffic noise from the new development, all identified receivers in this study (**Section 2**) are expected to meet the threshold for at-property treatment.

It is expected that the construction of the proposed modification will have an insignificant impact on noise and vibration predictions and assessments provided previously (ACNVAR-2022). Consequently, the worst-case construction noise and vibration impact assessment outlined in ACNVAR-2022 is expected to remain largely unchanged.

At this stage, traffic distribution due to the new development on the entire surrounding road network is unknown. The noise impact assessment provided in this addendum is based on the forecast traffic volumes only for a section of the new Newell Highway alignment (extending south from the new intersection to the

[1] Transport for NSW, 'At-Receiver Noise Treatment Guideline', June 2017

intersection with Thompson Street). Consequently, this study does not cover the potential noise impact on the entire road network resulting from the potential increase in traffic due to the new development.

It is recommended that road traffic noise modelling, including the effect of traffic signals, be undertaken once the traffic volume distributions of the design year for the entire road network, including the additional traffic, is determined.

Appendix A. Predicted operational noise levels

Receiver ID	Previous[1] Predicted noise level dB(A) – No Build 2036		Previous[1] Predicted noise level dB(A) – Build 2036		Updated[2] Predicted noise level dB(A) – Build 2036		NCG criteria[3]		Acute?		Exceeds cumulative limit?		Increase of more than 2.0 dB(A)?		Qualifies for consideration of mitigation?	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	OTNAR -2021	AREF2
NCA02.RES.2558	37	30	50	42	51	47	49	42	-	-	-	-	Yes	Yes	Yes	Yes
NCA02.RES.0481	39	31	49	41	50	46	51	43	-	-	-	-	Yes	Yes	-	Yes
NCA02.RES.0666	41	32	51	43	52	48	53	44	-	-	-	-	Yes	Yes	-	Yes

Notes: 1- produced from Appendix C in the OTNAR-2021

2- including the traffic increase due to the new Development (this assessment)

3 - OTNAR-2021 presents the residential initial NCG criteria only (i.e. LAeq 55 dB(A) and LAeq 50 for Day and Night respectively). Where, there is a difference of more than 12 dB between No Build and Build, the [No Build $L_{Aeq, Day/ Night}$] + 12 dB(A) is selected as the relevant NCG criteria.