Transport for NSW

Townson Road Upgrade between Jersey Road and Burdekin Road – Stage 2

Submissions report

January 2024

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

Transport for NSW 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.

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

Executive summary

The proposal

Transport for NSW (Transport) has developed a proposal to construct a four-lane divided road along Townson Road and Burdekin Road, linking Richmond Road, Marsden Park in the west to Burdekin Road and Schofields in the east. The proposal forms Stage 2 of the overall upgrade program and involves the construction of a new four-lane road between the Stage 1 tie-in at Jersey Road and Burdekin Road. The total length of the upgrade program is about 3.6 kilometres.

Key features of the proposal include:

- construction of a new 2.0 kilometre four-lane road (two lanes in each direction) with a central median connecting Townson Road Stage 1 in the west (at Jersey Road) with Burdekin Road in the east
- new signalised intersection at Aerodrome Drive (formerly known as Veron Road) with pedestrian crossing facilities
- new 2.5-metre wide shared path for pedestrians and cyclists on the southern side of Townson Road up to Aerodrome Drive and then a 1.5-metre footpath to Burdekin Road
- new 1.5-metre wide footpath on the northern side of Townson Road along the entire length of Stage 2
- removing the vehicle connection between Burdekin Road and Railway Terrace and constructing a cul-de-sac at the end of Railway Terrace located near Stoke Street
- construction of a 300-metre long bridge over Eastern Creek
- new bridge over the T1 Western Rail Line (Blacktown to Richmond Railway Line) for motorists and pedestrians, linking Townson Road to Burdekin Road.

Display of the Review of Environmental Factors

Transport prepared a Review of Environmental Factors (REF) for the Townson Road upgrade, Stage 2 between Jersey Road and Burdekin Road to assess the potential environmental impacts of the proposal. The REF was publicly displayed for 42 days between Monday 12 September and Monday 24 October 2022.

The REF was published on the Transport website and made available for download at https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/townson-burdekin-road.html. The details about the public display were made available to the public through various community involvement activities that were carried out during the public display period to give the community the chance to learn more about the project, ask questions and 'have their say'.

Consultation with the local community was provided through a drop-in event held at Schofields Public School on Saturday 17 September 2022. Another drop-in event was planned for Thursday 22 September 2022 which had to be moved to an online event due to the national day of mourning public holiday. The community were notified of this change via letterbox drop, email and social media. The online community information session carried out on Wednesday 21 September 2022 at 1pm.

Other community involvement activities included:

- community update distributed through letterbox drops
- animated flythrough video on the webpage
- website updates
- emails to the stakeholder database
- social media postings
- door knocking local residents
- media releases.

Summary of issues and responses

Public display of the REF and the supporting consultation resulted in a total of 35 submissions, of which 33 were from the general community, one was from Blacktown City Council and one was from Endeavour Energy.

Of these submissions, one was in support of the proposal and four objected to the proposal. The remaining 30 submissions offered no position on whether they supported or objected to the proposal.

The main issues raised and a summary of the responses to those issues are summarised below.

Need and options considered

Concern was raised regarding the need for the proposal and further detail was requested on the justification for the preferred alignment.

- The proposed corridor is located within the Blacktown City Council Local Government Area (LGA), which has a high projected population growth rate each year of 2.49 per cent. This growth rate is driven through the rezoning and development of a number of precincts within the North West Growth Area.
- The REF stated that over the next ten years, 33,000 new homes will be provided in the North West Growth Area, and once fully developed, the area could potentially accommodate around 90 000 homes and around 250 000 people. However, since the display of the REF the former Department of Planning and Environment (now Department of Planning, Housing and Infrastructure) announced changes to some of the 16 precincts within the North West Growth Area. The Hawkesbury – Nepean Valley Flood Evacuation Modelling to Inform Flood Risk Management Planning report (May 2023), which was publicly released in late October 2023, indicates that flood related risk to life and property may be greater than previously known. As a result, there are changes to parts of the North West Growth Area within the vicinity of the proposal, including the rezoning of the Marsden Park North precinct, the West Schofields precinct, and the Riverstone Town Centre precinct. The report states that a maximum of 2,300 homes will be allowed to continue to be constructed in the West Schofields and Riverstone Town Centre and 4100 in the Marsden Park North precinct, of the original 12,700 which were originally proposed. Despite the proposed changes, the Townson Road Upgrade between Jersey Road and Burdekin Road - Stage 2 proposal would continue to provide a vital east-west connection in the North West Growth Area, allowing for a much needed third grade separated crossing over the T1 Western Rail Line (Blacktown to Richmond Railway Line) for both current and future traffic demands. Strategically, the Townson Road corridor is a key link in Transport's proposed road network and plays an important role in managing congestion in the northwest.
- With one in 13 Sydneysiders already residing in Blacktown City, daily congestion on the road network demonstrates infrastructure has not kept pace with the population growth. Blacktown City population today is already larger than the City of Sydney, with far fewer transport options and significantly higher car use. Blacktown City land mass is almost nine times the size of City of Sydney LGA. In 10 years, the Blacktown City population is projected to be double what City of Sydney is in 2022. Around 50 per cent of the Blacktown City population will live in the North West Growth Area by 2041. In 20 years, the North West Growth Area population itself will be larger than the City of Sydney projected population in 2031.
- The corridor and alignment for the Townson Road Upgrade were identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017). The alignment was further refined by Transport in 2019. The design development process assessed a number of factors which influenced the final alignment including impacts to property, constructability, road safety, presence of utilities and other physical constraints such as environmental and geotechnical issues. The preferred option provided the best overall outcome for the proposal. Unfortunately, not all impacts, including impacts to property, could be entirely avoided by any of the options available.

Description of the proposal

Further detail was requested regarding the timing of works and suggestions were received for changes to the design of the proposal.

- For the purpose of the REF assessment, construction of the proposal was estimated to start in 2026, opening to traffic in 2028. Once construction commences, it is anticipated to take approximately 78 weeks to complete. However, there is currently no funding allocated for future development of the proposal so the timing of construction commencement may be later than estimated.
- The design of the proposal will be further refined in the detailed design stage.

Traffic and transport

Issues were raised regarding increased traffic, the new cul-de-sac at Railway Terrace and alternatives to the proposed road bridge over the rail corridor.

- Existing roads within the North West Growth Area will be required to support significant increases in travel demand associated with the population, land use and economic growth forecast for the region. The corridor and alignment for the Townson Road Upgrade was identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017). Despite the proposed changes, to the North West Growth Area since display of the REF, the Townson Road Stage 2 proposal would provide a vital east-west connection in the North West Growth area, allowing for a much needed third grade separated crossing over the T1 Western Rail Line (Blacktown to Richmond Railway Line) for both current and future traffic demands. Strategically, the Townson Road corridor is a key link in Transport's proposed road network and plays an important role in managing congestion in the northwest.
- Transport investigated three alternate routes from Railway Terrace to the proposal, unfortunately these were not found to be feasible. The existing connection with Railway Terrace cannot be maintained due to traffic safety and associated geometric and level constraints.
- Additional assessment was undertaken in 2023 by Transport which shows the predicted maximum increase in travel time due to the closure of Railway Terrace is just over two minutes. The network traffic model would be reviewed at the detailed design stage to confirm and update the network capacity and flow assumptions for an accurate representation of network performance.

Hydrology and flooding

Concerns were raised about the risk from flood events and evacuation routes.

- The proposal would not alter the opportunity for evacuation to higher ground during either a local or regional flood. Other routes that could be used for evacuation would not be affected. As Townson Road is not a designated flood evacuation route, it does not have the same requirements as other State designated flood evacuation routes.
- Stage 1 of the Townson Road Upgrade project has been designed to a 0.2 per cent annual exceedance probability (1 in 500-year event). This will provide residents residing between Bells Creek and Eastern Creek an evacuation route to Richmond Road, which is currently identified as a flood evacuation route. The hydrology assessment for Stage 2 shows that flood levels for the one per cent annual exceedance probability (1 in 100-year event) could increase by up to 0.13 metres over the study area. Townson Road has been designed to remain trafficable for the 1 in 100-year event.

Noise and vibration

Concerns were raised relating to impacts from noise during construction and operation and mitigation measures that will be provided to impacted residents.

- Exceedances in noise level criteria have been predicted through noise impact modelling. In accordance with Noise Mitigation Guideline (Roads and Maritime, 2015), noise mitigation has been considered the following order of preference: low-noise road pavement surfaces, noise mounds and walls and at-property treatments.
- The potential need for noise barriers along the eastbound alignment and along the westbound alignment was identified within the REF. Further analysis will be completed during detailed design, to determine the specific details of the mitigation. This includes aesthetics of the sound barrier treatment and the specific height required.
- A Noise and Vibration Management Plan will be prepared and implemented during construction. Noise and vibration control measures will be developed for construction machinery, construction traffic, and what works can be carried out outside of daytime construction hours. All affected residents will be notified at least seven days prior to commencement of any work associated with activities that may have adverse noise or vibration impacts.

Landscape character and visual amenity

Request for further details on the landscape plan and measures for privacy.

- An urban design strategy was prepared to inform the concept design. The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the new road and new bridge structures sensitively into the natural and suburban setting.
- The concern relating to privacy has been noted and would be considered further at detailed design. Opportunities to mitigate the potential privacy impacts to residential properties on Alcorn Street and Anson Street would be investigated.

Changes to the proposal

No changes are proposed for the proposal.

Additional assessment

Additional traffic modelling was carried out to determine the potential impact on journey times from the closure of Railway Terrace. This assessment is outlined in Section Figure 3.1 and predicts that the worst-case scenario using an alternate route would add an extra two-minute travel time.

A business impact assessment was carried out in 2022 (HillPDA Consulting, 2022). This study analysed the Schofields town centre trade catchment and considered the impact from severing the connection between Railway Terrace and Burdekin Road. When compared to the existing trade environment, the estimated impact resulting from proposed road changes is an initial 7.2 per cent impact (reduction) on potential sales in 2026. As such, the potential loss in trade from the proposal is in the low to moderate range. l. Potential trading levels are expected to increase, due to population growth, by 47.0 per cent over five years from 2021 to 2026, excluding the immediate impact of the roadwork.

Next steps

Transport as the determining authority will consider the information in the REF and this submissions report and decide whether or not to proceed with determination of the proposal.

Transport will inform the community and stakeholders of this decision. Where a decision is made to proceed to construction in the future, consultation will continue with the community and stakeholders prior to and during the construction phase.

Table of contents

Tables

Figures

1. Introduction and background

1.1 The proposal

Transport for NSW (Transport) has developed a proposal to construct a four-lane divided road along the Townson Road and Burdekin Road corridor, linking Richmond Road, Marsden Park in the west and Burdekin Road, Schofields in the east. The proposal forms Stage 2 of the overall upgrade program and is about two kilometres in length involving the construction of a new road between the Stage 1 tie-in and Burdekin Road. The length of the overall program of work is about 3.6 kilometres and consists of two stages:

- Stage 1 involves an upgrade of about 1.6 kilometres of Townson Road and Meadow Road, extending from Richmond Road to the end of Durham Road.
- Stage 2 is about two kilometres in length involving the construction of a new road between the Stage 1 tie-in and Burdekin Road (referred to as 'the proposal' for the purposes of this report). Refer to Figure 1.1.

Stage 1 is subject to a separate planning approval and was determined on 24 September 2021.

Key features of the Stage 2 proposal as shown in Figure 1.2 include:

- Construction of a new four-lane road (two lanes in each direction) with a central median connecting Townson Road Stage 1 in the west with Burdekin Road in the east.
- New signalised intersection at Aerodrome Drive (formerly known as Veron Road) with pedestrian crossing facilities.
- New 2.5-metre wide shared path for pedestrians and cyclists on the southern side of Townson Road up to Aerodrome Drive and then a 1.5 metre footpath to Burdekin Road.
- New 1.5-metre wide footpath on the northern side of Townson Road along the entire length of Stage 2.
- Severing the connection of Burdekin Road and Railway Terrace and constructing a cul-de-sac at the end of Railway Terrace. The cul-de-sac will be located near Stoke Street.
- Construction of a 300 metre long bridge over Eastern Creek.
- New bridge over the T1 Western Line for motorists and pedestrians, linking Townson Road to Burdekin Road.

A more detailed description of the proposal is found in the Townson Road Upgrade between Jersey Road and Burdekin Road – Stage 2 Review of Environmental Factors prepared by Transport in May 2022.

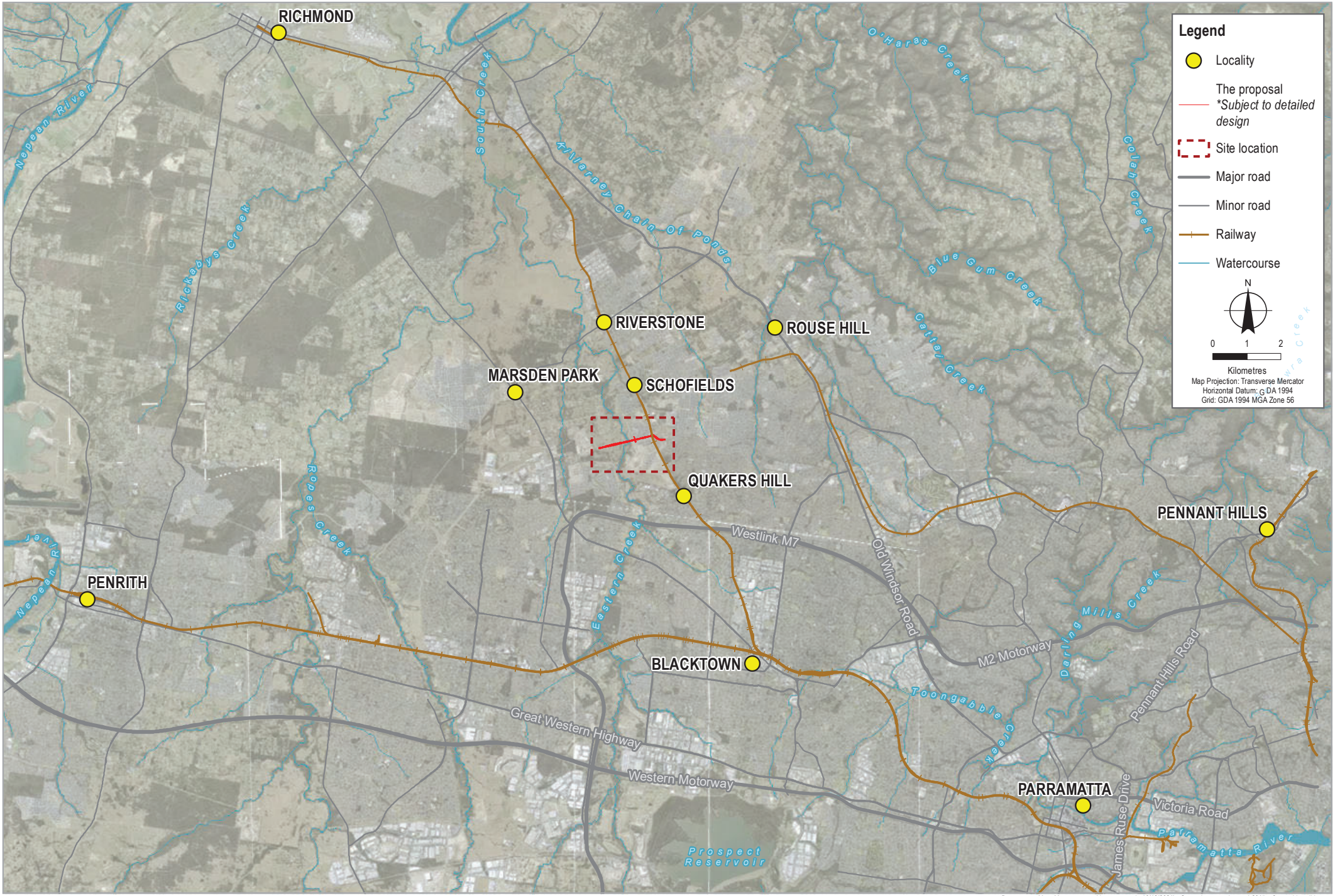

Figure 1.1 Regional context of the proposal

Data source: MetroMap Imagery (date extracted: 16/12/2021). General topography LPI 2015 . Created by: eibbertson
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1.2 REF display

Transport prepared a REF to assess the potential environmental impacts of the proposal. The REF was publicly displayed for 42 days between 12 September 2022 and 24 October 2022 on the Transport for NSW project website **http://nswroads.work/townson-burdekinrd** and was made available for download.

The public consultation period was made known to the community by various means of community activities including community information sessions both in person and online, community update distributed through letterbox drops, animated flythrough video, website updates, emails, social media, doorknocking, and media releases.

1.3 Purpose of this report

This submissions report relates to the REF prepared for the Townson Road Upgrade between Jersey Road and Burdekin Road – Stage 2 and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Transport. This submissions report summarises the issues raised and provides responses to each issue (Section 2). It details investigations carried out since finalisation of the REF (Section 3).

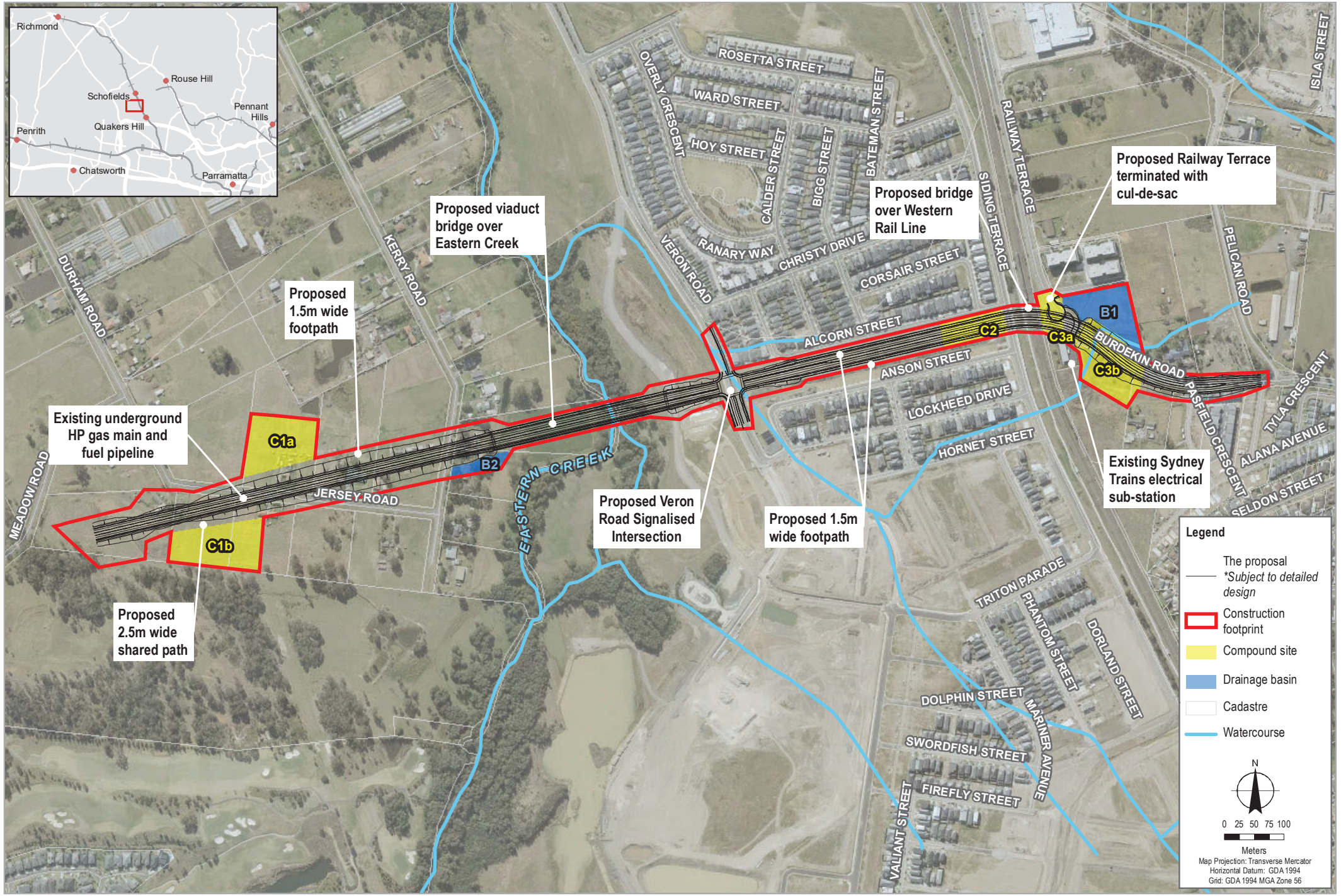

Figure 1.2 The Stage 2 overview and key features

Data source: MetroMap - Imagery (date extracted: 26/10/2021) . General topography - DPI 2015. Roads - DSFI 2019. . Created by: eibbertson
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2. Response to issues

Transport received 35 submissions to public consultation on the REF, accepted until 24 October 2022. Table 2.1 lists the respondents and each respondent's allocated submission number. The table also indicates where the issues from each submission have been addressed in Section 2 of this report.

Table 2.1: Respondents

Respondent	Submission No.	Section number where issues are addressed
Community member: Individual	1	2.6.2
Community member: Individual	2	2.6.2, 2.7.2, 2.7.4
Community member: Individual	3	2.14.1
Community member: Individual	4	2.14.1
Community member: Individual	5	2.6.2
Community member: Individual	6	2.6.2
Endeavour Energy	7	2.3
Community member: Individual	8	2.6.2
Community member: Individual	9	2.4.2, 2.9.3
Community member: Individual	10	2.6.2
Community member: Individual	11	2.6.2
Community member: Individual	12	2.7.2, 2.14.1
Community member: Individual	13	2.6.2
Community member: Individual	14	2.6.2
Community member: Individual	15	2.6.2
Community member: Individual	16	2.7.1, 2.14.2
Community member: Individual	17	2.8
Community member: Individual	18	No comment provided
Community member: Individual	19	2.6.2
Community member: Individual	20	2.5.2, 2.14.2
Community member: Individual	21	2.8
Community member: Individual	22	2.5.1, 2.8
Community member: Individual	23	2.9.3
Community member: Individual	24	2.7.2, 2.7.4
Community member: Individual	25	2.7.2
Community member: Individual	26	2.4.1, 2.4.2, 2.7.4, 2.9.2, 2.14.1
Community member: Individual	27	2.7.2
Community member: Individual	28	2.7.2, 2.14.1

Respondent	Submission No.	Section number where issues are addressed
Community member: Individual	29	2.5.1, 2.14.1
Community member: Individual	30	2.5.2
Community member: Individual	31	2.4.1, 2.4.2, 2.7.2, 2.7.3, 2.7.4, 2.14.1
Community member: Individual	32	2.5.1, 2.5.2, 2.9.3, 2.12
Resident Representative Group 52 signatures.	33	2.4.2, 2.5.2, 2.6.1, 2.6.2, 2.7.2, 2.8, 2.9.1, 2.9.2, 2.9.3, 2.10, 2.11, 2.12, 2.13
Community member: Individual	34	2.6.1, 2.6.2, 2.12
Blacktown City Council	35	2.2

2.1 Overview of issues raised

A total of 35 submissions were received in response to the display of the REF. The 35 responses included submissions from Blacktown City Council, Endeavour Energy and 33 from the community.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses have been provided. Where similar issues have been raised in different submissions, only one response has been provided. The issues raised and Transport's response to these issues forms the basis of this chapter.

One submission was received in support and four submissions were received opposing the proposal or parts of the proposal with another 30 submissions requesting further information, providing suggestions or requesting to be added to the mailing list.

Section 2.2 outline the issues raised by Blacktown City Council and the response from Transport. The main issues can be summarised as:

- traffic and transport issues
- road and bridge designs
- landscaping details
- noise and vibration impacts
- stormwater and flooding issues
- surface water and groundwater impacts
- management of the construction of Stages 1 and 2 and classification of Townson Road.

Section 2.3 outlines the issue raised by Endeavour Energy who requested consultation on the provision of utilities within the road corridor.

Sections 2.4 to 2.14 outline the issues raised by the community and the response from Transport. The issues can be summarised as:

- needs and options considered
- description of the proposal
- consultation
- traffic and transport
- hydrology and flooding
- noise and vibration

- air quality
- property and land use
- socio-economic
- landscape character and visual amenity
- resource use and waste
- out of scope.

2.2 Blacktown City Council

The issues raised by Blacktown City Council (submission 35) in response to the exhibition of the REF are summarised below.

Table 2.2: Blacktown City Council

No.	Issue raised	Response
1	**Stage 1 Key issues remain unresolved following previous consultation** • Traffic management concerns: – The proposed intersection of Townson Road with Richmond Road should be fully upgraded and widened as part of Stage 1. – The proposed traffic lights at Victory Road and Jersey Road should be provided with Stage 1.	The main objective of the proposal is to improve capacity along Townson Road between Jersey Road and Burdekin Road. The area of concern falls outside the study area of Stage 2. Several other projects are currently being completed or planned for Richmond Road. Details of other projects on Richmond Road can be found on the Transport website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/richmond-road-upgrade.html
2	• Roads and drainage concerns: – request for plans showing the batter slopes extending into private properties and strategies proposed to deal with the encroachment into private properties – details relating to cycleway/pedestrian paths – standards relating to road design and drainage strategy.	The concept design for the proposal has been developed by Transport on behalf of Blacktown City Council, who are the proponent of the project. Council has been consulted throughout the proposal development and will be provided with all concept design data and drawings to continue with the detailed design. These drawings include the alignment in relation to private properties. Council has been provided with all Stage 2 Concept Plans and all other project documents requested, that were available. All project documentation, including drawings, reports, estimates etc. will made available to Council upon completion of the project. Relevant standard and guidelines have been adopted to the proposal for a safe, effective, well-planned and easily maintained design.. The concept design was prepared in accordance with the requirements of a design management system certified under AS/NZS ISO 9001:2008 Quality Management Systems and with reference to relevant standards, guidelines, and specifications. Relevant standards relating to cycleway/pedestrian facilities used in the development of the concept design include: • Austroads Guide to Road Design Part 3 • Austroads Guide to Road Design Part 6A.

No.	Issue raised	Response
		All drainage requirements have been designed in accordance with relevant guidelines and standards and relevant Australian Rainfall and Runoff data. All property acquisition will be carried out in accordance with Blacktown City Council policy and the *Land Acquisition (Just Terms Compensation) Act 1991*. At detailed design, property access arrangements for properties impacted by the proposal, will be reviewed and revised to accommodate the built environment at that time. Property adjustment plans would be developed in consultation with affected property owners.
3	• Landscaping concerns: – Landscape design plans must be prepared and submitted to Blacktown City's Design Review Panel for approval. – Details related to planting species. – Details related to batter slopes gradients and extent of rock rip rap treatment and allow for more planting.	The concept design for the proposal has been developed by Transport on behalf of Blacktown City Council, who are the proponent. Council has been consulted throughout the proposal development and will be provided with all concept design data and drawings, including all landscape designs plans and schedules to enable Council to continue with the detailed design. Council has been provided with all Stage 2 Concept Plans and all other project documents requested, that were available. All project documentation, including drawings, landscape plans, reports, estimates etc will made available to Council upon completion of the project.
4	• Construction concerns: – Townson Road must remain open throughout the construction period for local traffic. A temporary road is to be constructed early in the construction phase, adjacent to the northern boundary of Townson Road between Richmond Road and Victory Road.	This issue is out of scope as it pertains to the Stage 1 Project. Further detail was presented in the Stage 1 Submissions Report (Sept 2022) available from the Transport for NSW website here: https://www.transport.nsw.gov.au/projects/current-projects/townson-burdekin-road-upgrade-north-west-growth-area
5	• Noise and vibration impact assessment review: – Suggested additional assessment may be required, as well as further consideration and validation of noise mitigation treatments. • Construction noise and vibration impacts: – Requested an Addendum Noise and Vibration Assessment to be prepared to capture any newly constructed residential properties. – Provision of a Construction Noise and Vibration Management Plan will need to be prepared, including Construction Traffic Noise Assessment on haul routes.	An additional Noise and Vibration Impact Assessment will be undertaken during the detailed design phase of the proposal in accordance with Transport's Noise Mitigation Guideline. This will include a noise barrier analysis. The analysis will consider whether the barrier is considered reasonable and feasible as well as details such as its location and design height. The analysis will also consider the effectiveness of using low-noise pavement surfaces. Sensitive receivers with residual noise impacts eligible for at-property treatments would also be confirmed at this stage. The additional Noise and Vibration Impact Assessment will also capture any newly constructed residential developments since this publication of this report, for inclusion in the assessment and consideration for mitigation treatments where required. This applies to structures impacted by the proposal, that have been constructed or approved prior to determination (approval) of the proposal. A Noise and Vibration Management Plan (NVMP) will be prepared prior to construction and implemented as part of the CEMP. This will include consideration of the traffic haulage routes once these are selected. The NVMP will follow the approach in the *Interim Construction Noise Guideline* (DECC, 2009).

No.	Issue raised	Response
6.1	• Operational noise impacts: – A Post Construction Noise Monitoring Program should be prepared to confirm noise level targets are achieved. – Audio tactile devices.	A post-construction noise monitoring program will be undertaken to check that noise level targets for the project are achieved. This will accord with the requirements of the *Noise Mitigation Guideline* (Roads and Maritime, 2015). This will include audio tactile devices installed for the proposal.
6.2	• Surface water and groundwater impact assessment: – If groundwater is encountered during the construction phase, then excavations need to be minimised and closed as soon as possible. – Surface water used during construction needs to be assessed for potential contamination prior to reuse. – Waste Classification sampling and assessment should be undertaken during the proposed construction works for all materials to be disposed of off-site. – Groundwater management plan is required.	Several safeguards and management measures have been identified in the REF to minimise adverse environmental impacts. This would include a CEMP that will be prepared prior to construction and will be reviewed and certified by Future Delivery Agency prior to the commencement of any on-site work. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the following Transport specifications or the appropriate Future Delivery Agency Environmental Protection Management System and Water Management System: • QA Specification G36 – Environmental Protection (Management System) • QA Specification G38 – Soil and Water Management (Soil and Water Plan). The CEMP will outline safeguards to protect water resources and will include management plans to enable compliance. The soil and water management plan will address management of groundwater. Waste Classification sampling and assessment will be undertaken during the proposed construction works for all materials to be disposed of off-site.
7.1	**Blacktown City does not propose to manage construction of Stages 1 and 2** • Due to the complexity and risk of building over the rail corridor. The plans should be revised to remove the notation that Blacktown will supervise construction. We recommend the Department undertakes an open Tender for the construction of Stages 1 and 2.	Transport will consult with the Department of Planning, Housing and Infrastructure (DPHI) regarding this matter. Transport has concluded the development activities in line with the terms of agreement with DPHI. Progression of the proposal into delivery is not determined. It is anticipated that the Agency which receives funding for the proposal will supervise construction.
7.2	• The limited traffic modelling undertaken does not provide an adequate assessment of the future impact on Blacktown's road network, especially the impact on Burdekin Road and Townson Road.	A prediction of construction and operation traffic volumes is provided in the Traffic Assessment in the REF. The expected volume of construction personnel trips is low and is not expected to impact the operation of the adjoining road network. The increases in traffic movements are low and fall within typical daily fluctuations. Heavy vehicle movements are not expected to impact the operation of the adjoining road network. The traffic modelling of the operational phase demonstrated that while the four-lane Townson Road would accommodate the predicted traffic by the forecast year 2036, additional capacity is likely required at Townson Road and Aerodrome Drive (Veron Road) intersection. Additional high-level assessment was undertaken in March 2021 of the proposed closure of Railway Terrace. The analysis indicated that during peak periods (two hours) in 2036 up to 1,500 vehicles would be redistributed from Railway Terrace to the local network, mainly on to Aerodrome Drive (Veron Road), Grima Street, Alex Avenue and

No.	Issue raised	Response
		Hambledon Road. The redistribution would be monitored by Transport. It is acknowledged that upon closure of the connection between Railway Terrace and Burdekin Road there would be a redistribution of traffic throughout the network which includes local roads. Additional traffic assessment was carried out in 2023 by Transport to analyse the increase in travel time due to the closure of Railway Terrace. This assessment is outlined in Section 3 and predicts that the worst-case scenario using an alternate route would add an extra two-minute travel time. The additional assessment indicated that there are four viable methods for community members and commercial vehicles to access the northern side of the closed Railway Terrace: 1. Pelican Road 2. Alex Avenue 3. Schofields Road (perhaps entering further north on Windsor Road). 4. Hambeldon Road. This would affect a number of catchments, particularly those who enter from Stanhope Parkway. It should be noted that for residents who want to access the Schofields retail centre, there are many other retail facilities in the area, including Woolworths the Ponds and Coles Stanhope Gardens. So the impact on travel time to the supermarket is a small subset of affected customers, who already reside within a small radii to these attractions. In terms of access to train stations, the area is supported by both the Metro and Schofields train station. Both facilities would need to be accessed from Schofields Road. The road closure therefore only presents impacts to a small section of the community and network, it does not (from an Origin to Destination perspective) affect the wider road network users. Upon implementation of the project, Transport would monitor the network and determine if additional upgrades or changes are required. Transport's network traffic model would be reviewed at the detailed design stage to confirm and update the network capacity and flow assumptions for an accurate representation of network performance.
7.3	• The suggested piecemeal staging of the proposed infrastructure can be expected to create additional traffic congestion and delays, on an already heavily congested Richmond Road. Issues include: – Temporary closure of Townson Road – Impacts on Pelican Road.	Transport has completed the Final Business Case for the proposal which will be used to assist in obtaining funding for construction of the overall program of works. There is no timeline however, as to when this funding may become available. The request to change the Stage 1 project to keep Townson Road open during construction has already been included in the Stage 1 design and is discussed in issue 4 above. Additional transport modelling (refer to Section 3) indicates that vehicles travelling from Burdekin Road to Railway Terrace whose destination is not Schofields Village, Schofields Train Station or the Schofields Woolworths will either continue west along the proposal, or use an existing route, such as Hambledon Road. The Alex Avenue Precinct Plan 2010 (DPIE, 2020), indicates that Pelican Road will continue north to the intersection of Schofields Road and Junction Road. Pelican Road is a Council-owned roadway and therefore Transport does not have any control over the timing of the development and construction of these roadways.

No.	Issue raised	Response
7.4	• Stormwater and flooding concerns with the current design plans.	The flooding and hydrology report undertaken for the proposal indicated that the design would increase the flooding of the western flood plain of Eastern Creek. However, at the time of the study the design levels (the future ground surface) for the proposed development adjacent to the site were not available. Further coordination during the concept design stage has indicated that the design levels of the adjacent development areas are considerably higher than existing, thus potentially changing the flood levels at this location compared to what was modelled based on information available at the time of the study. Further flood modelling and coordination with the developer would be undertaken during the detailed design phase to assess the potential flooding impacts. East of Aerodrome Drive (Veron Road) there would be drainage flow conveyed along both the north and south sides of Townson Road. The flow on the south side would be managed by an open channel and culverts under Aerodrome Drive. Flows from the north side of Townson Road are currently conveyed to this open channel via an existing stormwater drainage line which conveys stormwater flows from Alcorn Street to the open channel and which would pass under Townson Road. The need to augment and strengthen this drainage line would be investigated during the detailed design phase. On the eastern project extent, flooding would be mitigated at detailed design stage. At this location the proposed drainage basin would undergo detailed design of the basin and outlet details. The impact of increased runoff to minor drainage lines would also be investigated further as part of the detailed design phase and appropriate mitigation measures would be incorporated into the design if required.
7.5	• Roads and bridges require further work to meet Council's requirements.	Relevant standard and guidelines have been adopted to the proposal for a safe, effective, well-planned and easily maintained design.. The concept design was prepared in accordance with the requirements of a design management system certified under AS/NZS ISO 9001:2008 Quality Management Systems and with reference to relevant standards, guidelines, and specifications. Transport have worked with Blacktown City Council during the concept design development to agree on a number of design elements to the bridges. The outcomes of discussions with Blacktown City Council have been documented in the concept design report, and consultation with Council will continue during the detailed design phase
8	**We propose that Transport for NSW be requested to:** • Undertake broader traffic modelling to assess the impact along the full length of Stage 1 and Stage 2 • Urgently upgrade Richmond Road • Review the proposed staging of construction to ensure that Townson Road remains open to traffic. • Prepare a construction environmental management plan to assist with the waste, groundwater management, dewatering and unexpected finds protocols.	Transport is not currently proposing to carry out further traffic modelling. The network traffic model would be reviewed at the detailed design stage to confirm and update the network capacity and flow assumptions for an accurate representation of network performance. Several other projects are currently being completed or planned for Richmond Road. Details of other projects on Richmond Road can be found on the Transport website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/richmond-road-upgrade.html. The change to the Stage 1 project to keep Townson Road open during construction is discussed in issue 4 above. A construction environmental management plan will be prepared prior to construction activities. This measure was already included in the REF and within the mitigation measures discussed in Section 4.1.

No.	Issue raised	Response
9	**Townson Road extension to Burdekin Road must be reclassified as a State Classified Road under the responsibility of Transport** • The proposed upgrade and extension will create a 4-lane sub-arterial road from Richmond Road to Old Windsor Road, which will function as a significant sub-arterial link between State classified roads of Richmond Road and Sunnyholt Road.	Townson Road is currently an unclassified roadway and Transport has no intent to change the classification. The corridor has been designed in consultation with Blacktown City Council. It is noted that the draft Local Environmental Plan had indicated that certain sections of the roadway would be converted to classified roadway, however this has been since removed from the Blacktown Local Environmental Plan 2015.

2.3 Endeavour Energy

The issues raised by Endeavour Energy (submission 7) in response to the exhibition of the REF are summarised below.

Table 2.3: Endeavour Energy

No.	Issue raised	Response
1	Endeavour Energy notes that there is predicted growth in the area including and between Aerodrome and Townson Road precincts and there are currently very few corridors between Schofields and South Marsden Park for services. Endeavour Energy indicates they will be seeking installation of four to six 125 mm ducts in the bridge over the railway and two to three 125 mm ducts along whole road development.	Transport and Endeavour Energy will discuss the proposed installation of ducts along the bridge and through the whole road development during the detailed design phase. Transport will continue to consult with Endeavour Energy during future stages of road design.

2.4 Issue 1: Need and options considered

2.4.1 Justification of the proposal

Submission number(s)

26, 31

Issue description

- Request clarification for why the proposal is needed, as there is already a crossing of the railway at Schofields Road.
- Disagrees with Stage 1 being completed before Stage 2 as this would increase traffic on inadequate local roads.
- Concern about the need for the proposal and its value for money.

Response

With 1 in 13 Sydneysiders already residing in Blacktown City, daily congestion on the road network demonstrates infrastructure has not kept pace with the population growth. Blacktown City population today is already larger than the City of Sydney, with far fewer transport options and significantly higher car use. Blacktown City land mass is almost nine times the size of City of Sydney. In 10 years, the Blacktown City population was projected to be double what City of Sydney was in 2022. Around 50 per cent of the Blacktown City population will live in the North West Growth Area by 2041. In 20 years, the North West Growth Area population itself will be larger than the City of Sydney projected population in 2031.

In response to the forecast growth of this Area, Transport in association with the Department of Planning, Housing and Infrastructure (DPHI) (formerly NSW Department of Planning and Environment) developed the North-West Growth Centre Road Network Strategy 2014. The proposal aligns with Transport's long-term network strategy and the road network has been designed to accommodate this proposed change. This strategy has become embedded within the precinct development plans for the Area and its objectives are to:

- Address safety issues on the existing road network.
- Upgrade existing flood evacuation routes.
- Connect community and enable delivery of housing and development of attractive town centres.
- Provide equitable access to the corridor for all users by providing footpaths, shared-paths, bus stops and bus priority infrastructure.
- Improve freight performance.
- Provide best practice road facilities for the existing and growing population.

A key element of the strategy development was the identification of the lack of east-west connectivity across the North West Growth Area, and the need for upgrades to a select number of corridors to address this short-coming, including:

- Garfield Road
- Schofields Road
- Bandon Road
- Townson / Burdekin Road.

The REF stated that over the next ten years, 33 000 new homes will be provided in the North West Growth Area, and once fully developed, the area could potentially accommodate around 90 000 homes and around 250 000 people. However, since the display of the REF DPHI announced changes to some of the 16 precincts within the North West Growth Area. The Hawkesbury – Nepean Valley Flood Evacuation Modelling to Inform Flood Risk Management Planning report (May 2023), which was publicly released in late October 2023, indicates that flood related risk to life and property may be greater than previously known. As a result, there are changes to parts of the North West Growth Area within the vicinity of the proposal, including the rezoning of the Marsden Park North precinct, the West Schofields precinct, and the Riverstone Town Centre precinct. The report states that a maximum of 2,300 homes will be allowed to continue to be constructed in the West Schofields and Riverstone Town Centre and 4100 in the Marsden Park North precinct, of the original 12,700 which were originally proposed. Despite the proposed changes, the Townson Road Upgrade between Jersey Road and Burdekin Road - Stage 2 proposal would continue to provide a vital east-west connection in the North West Growth Area, allowing for a much needed third grade separated crossing over the T1 Western Rail Line (Blacktown to Richmond Railway Line) for both current and future traffic demands. Strategically, the Townson Road corridor is a key link in Transport's proposed road network and plays an important role in managing congestion in the northwest.

In regard to Townson Road and Burdekin Road, currently there is no direct connection between these two roads. Townson Road is a 0.7 kilometre, two-lane local road that joins Richmond Road in the west and connects to the low density residential and industrial developments of Marsden Park in the east. Burdekin Road is located to the east of Eastern Creek and the T1 Western Rail Line, running parallel to it, before heading east and connecting to Stanhope Parkway, Sunnyholt Road and Old Windsor Road.

The proposal will provide an alternative to Schofields Road for vehicles wishing to cross the T1 Western Rail Line. Other than the Westminster Street bridge crossing, there are currently no other grade-separated rail crossings over the T1 Western Rail Line in the vicinity. The Burdekin and Townson Road link will also provide traffic relief to the congestion already experienced along Schofields Road and allow for an alternative route for emergency services vehicles to cross the T1 Western Rail Line as well as Eastern Creek.

The feasibility of the Stage 1 and Stage 2 investment combined and its economic merit to society were assessed through a cost benefit analysis (CBA): a comparison of the relative costs and benefits of the Project Case in comparison to a Base Case scenario. This analysis determined the project as economically feasible and identified a number of non-standard benefits associated with the project and its ability to support residential and commercial development in the immediately surrounding localities (e.g. Land Value Uplift).

Stage 1 was progressed first to provide a connection between the new residential developments in that location and Richmond Road, as requested by DPHI . Transport has completed the Final Business Case for the proposal which will be used to assist in requesting funding for construction of the overall program of works. There is no timeline however, as to when this funding may become approved and available.

2.4.2 Alternatives and options considered

Submission number(s)

9, 26, 31, 33

Issue description

- Requests a justification for the project and questions why an alternative route through a connecting road to Nirimba Education Precinct / Quakers Hill Road was not proposed.
- This would have provided a straight road to join the roundabout at Burdekin Road and Alex Avenue.
- Suggestion for an alternate option of a tunnel under the railway line instead of a flyover.
- The following are suggested alternatives for the project:
  - to connect Aerodrome Drive to Quakers Hill Parkway for Stage 2 instead of Burdekin Road
  - to align the current road at the centre of both Alcorn and Anson Streets to maintain the existing green space at Alcorn Street
  - single lane bridge to ensure low traffic density and will be shorter in length as to not have a massive wall in front of Alcorn Street
  - underpass rather than a bridge to not increase noise.
- Suggest the road bridge over the rail line should be linked to Railway Terrace.

Response

The corridor and alignment for the Townson Road Upgrade were identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017). The alignment was further refined by Transport during an optioneering process in 2019.

The optioneering process assessed a number of factors which influenced the final alignment including impacts to property, constructability, road safety, presence of utilities and physical constraints such as environmental and geotechnical issues. One key constraint for this proposal was a suitable crossing point over the rail line. The selected alignment provided the best overall outcome for the project. Unfortunately, not all impacts, including impacts to property, could be entirely avoided by any option considered.

A range of options were considered to mitigate impacts and maximise the benefits of the proposal. Selection of the preferred option considered how each of the options satisfied the need for the proposal as well as its performance against the objectives and development criteria.

A road bridge over the rail line was preferred to a tunnel for the following reasons:

1. There is currently a natural watercourse running parallel to Burdekin Road that runs from Alex Avenue Precinct towards Eastern Creek. Multiple drainage dams and proposed development basins exist along this natural watercourse. Lowering the roadway into a tunnel would not be feasible as it would need to be considerably lower than the water upstream. Additionally, as the natural grade between Aerodrome Road and the Siding Terrace is less than one per cent, the depth required to cross under the rail line would potentially create a low point (or sag in the alignment) at the rail line crossing. This would result in a tunnel prone to flooding, and potentially be impacted by flood events from Eastern Creek.

2. The height of land to the east of the rail crossing is higher in level, and therefore a tunnelled section would tie in further east than a bridge section, not allowing for possible at-grade connections at the Pelican Road or Alana Avenue intersection.
3. Impact to rail services would be greater with a tunnelled section as this would most likely require a complete closure of the rail line, whereas the overpass would allow for minimal impact to train services.
4. Tunnelling under the existing rail line would require the road to be placed at a substantial depth underneath for rail operation requirements and therefore the tie in points to the surface would need to be further apart, reducing connectivity to the existing road network (also see point 2).
5. Utilities in the area adjacent to the train line would be greatly impacted with a tunnel section as it would require existing services to be relocated. This would impact anyone serviced by those utility connections. Utilities include the Sydney Trains substation on the eastern side of the rail line.
6. The existing natural underground watercourse flows under Burdekin Road from north to south, near the Sydney Trains substation, and crosses under the rail line further south along Siding Terrace. A tunnel would sever this natural watercourse and require a re-routing of flow to the north. This would require the installation of a new culvert under the railway line. This would also require that the existing drainage infrastructure that has been constructed along Siding Terrace be reconstructed which would result in major impacts to this area.

The alignment of the new road is positioned closer to Alcorn Street than Anson Street due to an existing drainage channel which is located on the boundary with Anson Street.

The number of traffic lanes on the bridge has been determined from traffic modelling which assessed the future needs of the road corridor. The length of the bridge is necessary to maintain maximum grades suitable for the operation of the road.

Options evaluated also included alignments south of the current proposal alignment, which would be closer to Quakers Hill Parkway. These options comprised:

- Southern option with full width corridor (Stage 1 project) - this considered moving the Stage 1 alignment south between Richmond Road and Victory Road, avoiding Townson Road. This option was considered as there is a single owner Luxeland Group, a property developer - which would potentially reduce the number of local residents directly impacted. An approved development application had, however been granted to Luxeland Group prior to further corridor investigations. In consultation with Luxeland Group, it was confirmed the southern option would have significant impacts on their redevelopment, and the cost involved in redesign would be significant. This option was therefore not considered further, as there was no other justification for the move other than convenience for property acquisition purposes.
- Alignment south of rail substation option – this option provided a better outcome for the shape of the road, and potentially reduced construction complexity and overall costs. However, earthworks would have impacted the Defence Housing Australia property located to the west of the rail line. Further investigation identified that the precinct of Schofields, which includes this portion of the alignment, has already been rezoned, and the development application for this land has already been approved. To accommodate this option, significant rework of the existing development application would be required, including impacts on construction that has already commenced. Therefore, despite its advantages from the road design perspective, this option was concluded to be undesirable.

Transport considered three alternate routes for a connection from Railway Terrace to the proposal, unfortunately these were not found to be feasible. The following issues were identified when these options were investigated:

- Traffic safety issues, with the merge and diverge of the eastbound and westbound connections to and from Railway Terrace. This connection was too close to the proposed intersection at Pelican Road / Alana Avenue.
- Traffic safety issues, with weaving concerns for eastbound vehicles turning into south.
- Subdivisions from developments to the south of Burdekin Road.
- Additional land requirements needed for the SP2 drainage land to the north of Burdekin Road to support future residential developments.
- The proposed northern drainage basin would have needed to be relocated.
- The bridge would have required extending further east.
- The bridge height on the eastern side of railway would have needed to be elevated to allow westbound vehicles from Burdekin Road to safely pass under.
- Safe access to Sydney Trains substation could not be accommodated.

- Constraints due to ground level differences and geometry would have resulted in a safety issue from vehicles merging from Railway Terrace onto Burdekin Road eastbound.
- Stoke Street access would have required reconfiguration for safe entry and egress.
- Proposed retaining walls would have needed to be extended to retain batter slopes, further impacting properties.
- Impacts to existing business along the northern side of Burdekin Road. This potentially would impact the viability of businesses as access would be severed from Burdekin Road.

It is acknowledged that upon closure of the connection between Railway Terrace and Burdekin Road there will be a redistribution of traffic throughout the network, which includes local roads. There are alternate routes within the local areas that provide access to the shopping centre and train station. Additional traffic assessment was carried out in 2023 by Transport to analyse the increase in travel time due to the closure of Railway Terrace (refer Section 3). This assessment predicts that the worst-case scenario using an alternate route would add an extra two-minute travel time. Upon implementation of the project, Transport and Blacktown City Council will monitor the State and local networks respectively and determine if additional upgrades or changes are required.

2.5 Issue 2: Description of the proposal

2.5.1 Design

Submission number(s)

22, 29, 32

Issue description

- Suggest raising the bridge over Eastern Creek to 1 in 100 or 1 in 500-year flood event to provide flood resistance.
- Suggest for bicycle paths and walking paths to be included in the proposal.
- Concerns about the level difference and suitable integration between the proposed Townson Road extension and adjoining subdivisions. The proposed level differences between the extension and subdivision were determined as being up to 1.3 metres. Continued discussion between Transport and the landowner is requested to ensure the proposed grading of Townson Road is suitable to address drainage requirements, level differences (through provision of retaining walls) and minimise any potential negative impacts on the future residential subdivision.

Response

Townson Road, including the bridge over Eastern Creek, has been designed to remain trafficable for the 1 in 100-year flood event. The bridge over Eastern Creek is not proposed to act as a flood evacuation route and hence the bridge and road have not been designed to provide flood immunity for events more extreme than 1 in 100-year.

The proposal includes provision of a 2.5-metre wide shared path for pedestrians and cyclists on the southern side of the carriageway up to Aerodrome Drive (Veron Road). East of Aerodrome Drive (Veron Road) a 1.5-metre wide footpath is provided to connect with the existing footpath on Burdekin Road.

A level difference of around 1.3 metres currently exists between the proposed road and the subdivision. During detailed design, the interface with the subdivision will be revisited, in consultation with the landowner, to reduce impacts to the adjacent property.

2.5.2 Construction

Submission number(s)

20, 30, 32, 33

Issue description

- Request for detail on timing and program of works.
- Request for detail on how the construction timeline can be minimised, including using latest technology.
- Concern that the proposal extends into the CSR residential subdivision and will impact the associated residential lots. CSR notes that the subdivision work will have been completed and construction work underway before construction of this proposal.
- A request for an alternate location for the compound site C1b. This is required as the compound location is in a future residential development that will be completed before the Stage 2 upgrade.

Response

For the purpose of the REF assessment, construction of the proposal was estimated to start in 2026, opening to traffic in 2028. Once construction commences, it is anticipated to take approximately 78 weeks to complete. Transport has completed the Final Business Case for the proposal which will be used to assist in requesting funding for construction of Stage 2. There is no timeline however, as to when this funding may become available.

Several safeguards and management measures have been identified in the REF, including measures to minimise impacts from plant and equipment. These measures are replicated in Section 4.2 of this report. Should the proposal proceed, these safeguards and management measures would be incorporated into the detailed design and applied during construction.

The duration of the construction works has been minimised where feasible and as separate sections of the alignment would be constructed in a staged manner, sensitive receivers would not be impacted for the full 78-week construction program.

A level difference of around 1.3 metres currently exists between the proposed road and the subdivision. During detailed design, the interface with the subdivision will be revisited, in consultation with the landowner, to reduce impacts to the adjacent property. At this location the road levels will be determined by the tie-in to Townson Road Stage 1 as well as the proposed Eastern Creek bridge levels.

Transport will continue discussions with CSR to consider the relocation of construction compound 1b, to:

1. Minimise impact to future residential construction.
2. Minimise impacts to their residential development subdivisions.

2.5.3 Operation

Submission number(s)

31

Issue description

The suggested pedestrian issues at roundabouts are not a good reason for installing traffic lights, and the issue can be overcome by solar/battery operated pedestrian push switches at the roundabouts.

Response

A signalised intersection has been proposed at Veron Road rather than a roundabout due to:

- A signalised pedestrian crossing being the safer option for pedestrians crossing a road.
- Spatial constraints for this proposal resulting from:
  - existing and proposed utilities

- existing and proposed drainage infrastructure
- existing property boundaries.

2.6 Issue 3: Consultation

2.6.1 Previous consultation

Submission number(s)

33, 34

Issue description

- Questions about the community engagement process and why there was no direct communication with residents directly impacted by the bridge.
- Concerns raised about lack of previous consultation.

Response

The corridor and alignment for the Townson Road Upgrade was identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017) and made available to the public for consultation at that time.

All documents related to the REF were provided on the website at: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/townson-burdekin-road.html.

Direct consultation with the local community was provided through an online live community information session carried out on 21 September 2022. A recorded copy of the event can be viewed here https://www.rms.nsw.gov.au/projects/north-west-growth-centre-strategy/townson-burdekin-road.html. In addition, a drop-in event was held at Schofields Public School on 17 September 2022.

2.6.2 Ongoing consultation

Submission number(s)

1, 2, 5, 6, 8, 10, 11, 13, 14, 15, 19, 33, 34

Issue description

- Request to be added to the mailing list (11 requests).
- Requests for information on future consultation activities and how residents will be informed about commencement of any works.
- Request for a representative of Transport to visit a property on Siding Terrace to discuss the visual impacts at this location.
- Request for a representative of Transport to visit residents to discuss alternative options of the space between Anson Street and Alcorn Street be utilised for childcare centre or a park.

Response

All documents related to the REF and community updates will be provided on the Transport website at: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/townson-burdekin-road.html.

Updates will continue to be provided to the local community during the construction planning phase and construction period of the proposal. Community updates will also be made available to the public via the Transport website and will be emailed to stakeholders where this has been requested. Representatives from Transport have met with residents directly impacted by the proposal. This comprised of residents whose properties would require alterations i.e. to driveways or may have land acquired to support the proposal. Transport has not met residents directly whose properties are indirectly impacted, such as by visual

intrusion. Opportunities were provided to the community at public events to speak to Transport representatives directly, as discussed in Section 2.6.1.

No alternative uses of the road corridor between Anson Street and Alcorn Street have been considered. The Townson Road to Burdekin Road project had been planned for this location, and this precedes any residential development in the area.

2.7 Issue 4: Traffic and transport

2.7.1 Construction

Submission number

16

Issue description

- Concerns about the haulage route and the size of construction vehicles that would use local roads.

Response

The traffic generation associated with heavy vehicles has been based on the concept design and it is assumed that heavy vehicle truck movements are in the order of five to 10 vehicles per hour at each construction area. Trucks are expected to deliver material and to remove spoil. These increases in traffic movements are low and would fall within typical daily fluctuations with no expected adverse impacts to the operation of the adjoining road network.

At the time of this assessment construction traffic haulage routes have not been finalised. These would be selected prior to construction commencing.

A Traffic Management Plan (TMP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The TMP will be prepared in accordance with the *Roads and Maritime Traffic Control at Work Sites Manual* (RTA, 2010). This plan will include the confirmation of haulage routes, which will be communicated to residents via a community notification by the construction authority (Transport or Council). Vehicle sizes will be constrained by existing restrictions of local roads or bridges and haul routes will be appropriately selected to accommodate these constraints.

2.7.2 Operation

Submission number(s)

2, 12, 24, 25, 27, 28, 31, 33

Issue description

- Concern raised that the proposal will create a north-south road network barrier at Burdekin Road and will restrict access to Schofields railway station and shopping precinct.
- Raised concern about the lack of improvement to traffic flow.
- Concern raised about access with the proposed cul-de-sac of Railway Terrace, including:
  - restricting access to the shopping centre
  - restricting access to Schofields Station
  - directing more traffic onto the Burdekin Road extension from Stanhope Parkway through a residential area and off Schofields Road/South Street to Richmond Road.
- Raised concerns about access from the Burdekin Road/Hambledon Road/Alex Avenue area, with the proposed cul-de-sac of Railway Terrace restricting access to the shopping centre.
- Concern raised about traffic congestion on Alex Avenue due the removal of Railway Terrace and Burdekin Road, and how this will be managed.
- Request for detail about speed limits for the roads.

Response

Existing roads within the North West Growth Area will be required to support significant increases in travel demand associated with the population, land use and economic growth forecasts for the region. The proposal has been developed to continue east-west connectivity within the proposed road corridor, which allows for a connection to Durham Road and provide access to Jersey Road. A Traffic and Transport Impact Assessment was prepared as part of the REF which considered the following:

- A review of existing road features, traffic volumes and turn counts at major intersections, public transport, pedestrian and cyclist facilities and traffic survey data
- Traffic modelling for peak traffic conditions during operation
- Assessing the impacts of construction of the proposal on the road network
- Predicting the impacts of the operation of the proposal for future traffic scenarios in 2026 and 2036.

The results demonstrated that while the four-lane Townson Road would accommodate the predicted traffic by the forecast year 2036, additional capacity is likely required at Townson Road and Aerodrome Drive (Veron Road) intersection. This assessment considered where there could be issues on the wider network and where further assessment or upgrades are recommended to maintain capacity and safety.

A discussion regarding the cul-de-sac of Railway Terrace is provided in Section 2.4.2.

The bridge over the T1 Western Line would provide an east-west link for the North West Growth Area. Currently east-west access is restricted by the T1 Western Rail line. Existing crossings of the rail line are limited, with only two grade separated crossings at Schofields Road and Westminster Bridge, and two at-grade, level crossings at Garfield Road and Bandon Road. There is also a private level crossing north of Garfield Road. This limits access for residents to key facilities either side of the railway line and restricts commuters from modifying their route to avoid incidents or congestion on Richmond Road.

There are concerns raised that there will be traffic congestion on Alex Avenue due the removal of Railway Terrace and Burdekin Road. The Alex Avenue Precinct Plan 2010 (DPIE 2020), which is part of the North West Growth Area, indicates that Pelican Road will continue north to the intersection of Schofields Road and Junction Road. Likewise, Jacqui Avenue is also shown to continue to west from its current point of termination at Grima Street to the intersection with Railway Terrace south of Schofields Village. Pelican Road and Jacqui Avenue are Council-owned roadways and therefore Transport does not have any control over the timing of the development and construction of these roadways. In addition there are a number of alternate routes that could be utilised following the closure of Railway Terrace. These are discussed in Section 3.1.

Relevant standards and guidelines have been adopted to the proposal for a safe, effective, well-planned and easily maintained design. The design speeds adopted for Townson Road would be:

- 70 km/h with a posted speed of 60 km/h
- 60 km/h with a posted speed of 50 km/h for local roads.

2.7.3 Cumulative

Submission number(s)

31

Issue description

Raises concern of cumulative issues of surrounding roads and projects that add to poor traffic outcomes.

Response

The objective of the proposal is to facilitate the anticipated residential growth in the North West Growth Area and improve network efficiency across the North West Growth Area. In combination with Stage 1 of the Townson Road Upgrade, the proposal would contribute to network benefits to the planned residential developments. This proposal will be one of a number of projects and upgrades in the area by Blacktown City Council and the NSW Government to support the predicted growth and manage intersection capacity in the North West Growth Area.

The potential for cumulative traffic impacts during operation of the proposal has been assessed within the REF. This considered traffic generation estimates for 2026 and 2036 which included proposed residential development in the traffic modelling. Future traffic impacts and road network performance in the study area arising as a result of cumulative development were modelled and informed the proposal. The cumulative assessment included the following developments:

- Luxeland development
- Altrove development
- CSR development.

The results demonstrated that while the four-lane Townson Road would accommodate the predicted traffic growth by the forecast year 2036, additional capacity is likely required at Townson Road and Aerodrome Drive (Veron Road) intersection. This assessment considered where there could be capacity issues on the wider network after 2036, and made recommendations for further assessment or upgrades to maintain capacity and safety.

Cumulative impacts arising from construction traffic from developments listed will be managed with the implementation of the construction traffic management plan and mitigation measures outlined in Section 4.2. Operation of the proposal has considered future traffic volumes within its corridor and intersection design.

2.7.4 Alternatives and options considered

Submission number(s)

2, 24, 26, 31

Issue description

- Suggests alternate options to maintain access between Burdekin Road and Railway Terrace:
  - a roundabout
  - traffic signal
  - on/off-ramp.
- Requests that access to Schofields train station is maintained without the removal of the Railway Terrace and Burdekin Road link.
- Suggest roundabouts be a priority intersection design as they are not affected by traffic lights, are safer and traffic lights impede traffic flow and are a primary cause of congestion.
- Suggests a tunnel under the rail and intersection to improve connectivity.

Response

The corridor and alignment for the Townson Road Upgrade was identified in the North West Priority Growth Area Land Use and Infrastructure Implementation Plan (Department of Planning and Environment, 2017). The alignment was further refined during an optioneering process in 2019. The optioneering process assessed a number of factors which influenced the final alignment including: impacts to property, constructability, road safety, utilities and physical constraints such as environmental and geotechnical issues. One key constraint for this proposal was an alignment that connected to a suitable location on the eastern side of the rail line. The final alignment provided the best overall outcome for the road alignment. Unfortunately, not all impacts, including impacts to property, could be entirely avoided by any option considered.

Optioneering was undertaken to assess the viability of maintaining connection to Railway Terrace. However, the existing connection with Railway Terrace cannot be maintained due to geometric and level constraints and associated traffic safety issues. Further details about the constraints preventing a connection with Railway Terrace are provided in Section 2.4.2. Future access is planned to Jacqui Avenue via Pelican Road, however until this is developed, alternate routes would be via the current traffic network such as through Jerralong Drive, and Schofields Road. Additional traffic assessment was carried out in 2023 by Transport to analyse the increase in travel time due to the closure of Railway Terrace. This assessment is outlined in Section 3 and predicts that the worst-case scenario using an alternate route would result in an increase of just over two minutes of journey time.

A roundabout, traffic signals or on/off ramps are not feasible options for the connection between Townson Road and Burdekin Road due to:

- Spatial constraints for this proposal resulting from:
  - existing and proposed utilities
  - existing and proposed drainage
  - existing property boundaries
- Ground level differences, in that the grade from the rail crossing does not tie-back to existing levels until further east, closer to Pelican Road, so an intersection between Burdekin Road and Railway Terrace is not physically possible.
- Traffic signals are preferred for many intersections to provide improved traffic flows at locations where flows may be dominated from one principal direction. These provide improved flows to all traffic directions rather than just the main flow direction and support safer and dedicated crossing points for pedestrians.

Further details about the constraints associated with a tunnel under the rail line are provided in Section 2.4.2.

2.8 Issue 5: Hydrology and flooding

Submission number(s)

17, 21, 22, 33

Issue description

- Concerns about drainage for Kerry Road and the flood evacuation route for Kerry Road.
- Concerns for access impacted by flooding events and future changes to flooding.
- Concerns raised that the Townson Road upgrade will be closed at 1 in 20-year flood event due to flooding from Eastern Creek. This road should be designed to meet 1 in 100-year events.
- Request details about flood management.

Response

Blacktown City Council Growth Centre Precincts Development Control Plan 2010 requires that all road systems in the Schofields precinct affected by the maximum flood level have a safe evacuation route. The proposal will not alter the opportunity for evacuation to higher ground during either a local or regional flood. Other routes that could be used for evacuation would also not be affected.

As Townson Road is not a designated flood evacuation route it does not have the same requirements as other State-designated flood evacuation routes. Stage 1 of the Townson Road and Burdekin Road upgrade project has been designed to the 0.2 per cent annual exceedance probability (1 in 500-year event) with a five per cent annual exceedance probability for Hawkesbury River tailwater. This will provide residents residing between Bells Creek and Eastern Creek, including Kerry Road, an evacuation route to Richmond Road, which is currently a designated flood evacuation route. The hydrology assessment for Stage 2 shows that flood levels for the 0.1 per cent annual exceedance probability (1 in 100-year event) could increase by up to 0.13 metres over the area assessed. The West Schofields Precinct rezoning is currently under review due to identified flooding risks. This review has proposed flood compatible open space land uses within the one per cent flood extent and that no new dwellings are to be constructed below the 1 in 100 year flood level. Townson Road would remain trafficable for the 1 in 100-year event.

The proposal would include various drainage structures including longitudinal and transverse drains, catch drains and table drains, sub-surface drainage and drainage associated with the bridges. All drainage requirements have been designed in accordance with relevant guidelines and standards.

A drainage basin located south of the road alignment just to the east of Kerry Road is designed to cater for the road run-off and it is anticipated the basin would be resized during detailed design once the overall growth area precinct is fully ascertained. This basin will be managed by Blacktown City Council.

2.9 Issue 6: Noise and vibration

2.9.1 Construction

Submission number(s)

33

Issue description

- Concern raised about traffic noise level over the bridge during construction impacting residents in the area, particularly in relation to the height of the bridge.
- Questions about the impacts of noise and vibration from heavy construction machinery affecting sensitive receivers.

Response

A noise and vibration impact assessment was prepared, and displayed with the REF, which considered the noise resulting from construction of the proposal. Where potential impacts were identified, design changes and mitigation measures to minimise these impacts have been recommended and incorporated in the design where feasible.

The construction assessment involved:

- Assessing the potential construction noise and vibration impacts by identifying the likely construction activities. This included the type of equipment expected to be used, the duration of use and the location of use.
- Assessing the potential noise impacts on the surrounding sensitive receivers including potential sleep disturbance.
- Assessing the potential construction vibration impacts to sensitive receivers.

Most construction would be undertaken during standard construction hours. However, some work outside of standard construction hours would be necessary to reduce major traffic disruptions at intersections along Townson Road. The predicted results indicate that up to 54 residential receivers are anticipated to exceed the sleep disturbance criteria during night-time construction work. The duration and which receivers are impacted would depend on which section of the proposal is being constructed, however the works within the Altrove development would impact the largest number of receivers.

A Noise and Vibration Management Plan would be prepared and implemented during construction in accordance with government guidelines to reduce the impacts on the sensitive receivers. This management plan would address construction noise and vibration due to machinery and would include ongoing monitoring and consultation with residents who may be impacted. Construction noise mitigation measures (NV4 to NV11) are provided in Section 4.2.

2.9.2 Operation

Submission number(s)

26, 33

Issue description

- Request for details of the noise assessment and impact to residents, particularly in relation to traffic noise from vehicles travelling on the bridge over the rail line.
- Concern raised about traffic noise level over the bridge during operation impacting residents in the area, particularly in relation to the height of the bridge.

Response

A noise and vibration impact assessment was prepared which considered the noise resulting from operation of the proposal. Where potential impacts were identified, design changes and mitigation measures to minimise these impacts have been recommended and included in the design where possible.

The operational assessment involved:

- establishing the noise study area in accordance with the *Noise Criteria Guideline* (Roads and Maritime, 2015)
- establishing the operational noise assessment criteria based on land uses within the study area
- developing a traffic noise model to predict noise levels for the baseline assessment year (2019), year of opening (2028) and the future design year (2038) for both build and no-build options, in accordance with the *Noise Criteria Guideline* (Roads and Maritime, 2015)
- assessing the potential operational traffic noise based upon the concept design and the traffic volumes developed through the traffic assessment
- assessing the potential noise impacts on the surrounding sensitive receivers including potential sleep disturbance.

Based on the operational road traffic noise modelling, the noise criteria are exceeded at 381 residential receivers, prior to mitigation being implemented. Most receivers are located within the Altrove development.

The Noise Mitigation Guideline (Roads and Maritime, 2015) recommends noise mitigation in the following order of preference:

- low noise road pavement surfaces
- noise mounds
- noise barriers (noise walls)
- at-property treatments.

Selection of the final treatments will consider what is feasible and reasonable with the local context and for each impacted receiver.

Low noise pavement would be considered in locations where there are four or more closely spaced receivers that trigger noise mitigation. Whilst low noise pavement is not considered feasible for a road bridge over the rail line within the Altrove development, a dense graded asphalt road surface could be considered instead of the concrete surface currently specified for the bridge sections to reduce road traffic noise levels.

Noise walls have been considered as mitigation to reduce the number of impacted receivers. A preliminary noise barrier analysis has been undertaken along the eastbound and westbound carriageways. From a noise perspective, noise walls would be considered a reasonable mitigation option along the alignment through the Altrove development. Further assessment would be carried out at detailed design to determine the height, position, and material of the barrier.

At-property noise mitigation would be considered where at-source controls such as barriers and quieter pavements were not feasible or reasonable or were unable to reduce noise levels to the relevant noise criteria. The need for these treatments would be considered following detailed design when the opportunity for other measures is completed. Homeowners would be directly consulted with at that time.

2.9.3 Mitigation

Submission number(s)

9, 23, 32, 33

Issue description

- Request details for noise barrier implementation.
- Request details for noise mitigation measures.
- It is requested that noise barriers be installed on Townson Road to minimise noise impacts on future CSR residential properties and subdivisions, like what is being proposed for properties along Alcorn Street (Stockland's Altrove development) and Anson Street. By the time Stage 2 of the Townson Road upgrade is under construction, the residential development within CSR's future development will be completed and the new road will therefore require noise mitigation measures.
- Concerns raised about how inappropriate activities during construction will be managed to prevent noise impacts.

Response

A noise and vibration impact assessment was carried out to assess the potential impacts arising from the proposal and to recommend mitigation measures to minimise impacts. This assessment considered the construction and operational noise resulting from the proposal and where impacts were identified, recommended design changes, such as low noise pavement and noise walls to minimise these impacts.

The assessment identified the potential for noise barriers along the eastbound alignment and along the westbound alignment within the Altrove development, subject to further design and assessment. Further analysis will need to be completed during detailed design, to determine the specific details of the mitigation, this includes aesthetics of the sound barrier treatment and the specific height required.

Additional feasible and reasonable considerations will be considered to determine the final barrier height that can be constructed. At-property mitigation will also be considered where at source controls such as barriers and quieter pavements are not feasible or reasonable or are unable to reduce noise levels to the *Noise Criteria Guideline* (Roads and Maritime, 2015).

Transport will maintain appropriate consultation with CSR with regards to noise mitigation in relation to the landowners, properties and subdivisions, considering that the project is not yet funded and construction

A Noise and Vibration Management Plan would be prepared and implemented in accordance with relevant guidelines to reduce the impacts on the sensitive receivers. This management plan would address construction noise and vibration due to construction activities and would include ongoing monitoring and consultation with residents who may be impacted. Measures included in this plan would require all employees, contractors and subcontractors to receive an environmental induction. This induction would specify appropriate behaviour from construction workers.

2.10 Issue 7: Air quality

Submission number(s)

33

Issue description

- How will air quality impacts during construction be managed to ensure the quality of air remains the same as it currently is.
- How will air quality during operation of the road be managed and the residents of Alcorn Street be protected.

Response

Construction

Air quality impacts as a result of dust generation during construction would be minimised through the implementation of the safeguards and management measures outlined in the CEMP, including the Air Quality Management Plan. This would include work activities around Alcorn Street. These measures comprise:

General air quality impacts - An air quality management plan will be prepared as part of the CEMP.

Dust emissions:

- dust suppression measures will be implemented as per the air quality management plan
- stockpiled materials will be covered, stabilised or stored in areas not subject to high wind
- all trucks will be covered when transporting material to and from the site
- work activities will be reprogrammed if the mitigation measures are not adequately restricting dust generation.

Exhaust emissions:

- construction plant and equipment will be maintained in a good working condition in order to limit impacts on air quality
- plant and machinery will be turned off when not in use.

Impacts on sensitive receivers - Local residents will be advised of hours of operation and duration of work and supplied with a contact name and number for queries regarding air quality.

Operation

The predicted concentration of pollutants during operation of the proposal remains below the assessment criteria, except for the annual average $PM_{2.5}$ (dust) concentration. The nearest monitoring station to Alcorn Street, with available long-term data is located at Prospect, about 10 kilometres southeast of the study area. Monitoring data for 2018 shows an elevated annual average background PM2.5 concentration (7.3 µg/m3) which is already above the annual National Environmental Protection (Ambient Air Quality) Measure (NEPC, 2021).

The $PM_{2.5}$ concentration is predicted to be above the criteria during the future year assessment (2038). This is largely due to the significantly elevated existing annual average background concentration measured at Prospect air quality monitoring station. The air quality assessment methodology assumes that worst-case daily traffic emissions and meteorological conditions occur for all days of the year, which is considered to lead to a highly conservative estimate of air quality impacts from traffic movement. Consequently, the exceedance of the $PM_{2.5}$ criteria on an annual average basis is not considered to be a true representation of the air quality risk associated with the proposal but provides a conservative assessment. Therefore, no mitigation measures were identified as needed to reduce air quality impacts from operation of the proposal.

2.11 Issue 8: Socio-economics and property and land use

Submission number(s)

33

Issue description

- Concern raised about the proposal affecting property values.
- Concerns raised about impacts to amenity to residents on Alcorn Street, Calder Street and Siding Terrace in Schofields. Notably changes to health and safety, levels of sunlight and impact to property values.

Response

The saleability or value of a property is not predetermined on any one characteristic. Living next to any transport infrastructure or proposed corridor comes with the inherent risk of potential increased or decreased traffic. However, unless the property is affected by an acquisition, there are no grounds for a claim for compensation.

A business impact assessment was carried out to consider potential impacts from the proposal to local businesses located within the Scofields town centre. This analysis and its findings is summarised in Section 3.2.

An urban design strategy was prepared to inform the concept design. The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the new road and bridge structures sensitively into the natural and suburban setting. These objectives have been integrated into the concept design and would be considered further in the detailed design phase of the proposal. Relevant standards and guidelines have been adopted for the design of the road and bridges to provide a proposal that is designed to be safe for road users and communities living close to the road structure, including residents of Alcorn Street, Calder Street and Siding Terrace.

Following the detailed design of the noise wall, a shadow diagram will be developed. This would predict the areas that would be impacted by shading from the bridge structure. Further consultation with the community may be carried out by the agency that delivers the proposal, on the treatment to the structure during the delivery stage.

2.12 Issue 9: Landscape character and visual impacts

Submission number(s)

32, 33, 34

Issue description

- CSR requests that a landscaping buffer be designed between the retaining walls and the residential development on CSR land, to screen the development and maintain visual amenity with CSR's future residential development.

- The view of the road and bridge needs to be sensitive to residents. Requests more trees and provision of a mini park towards Alcorn Street and the wall in front of the homes needs to be covered by green plants.
- Concern that privacy in residential properties on Alcorn Street would be impacted by pedestrians and cyclists crossing the road bridge.

Response

An urban design strategy was prepared to inform the concept design. The urban design strategy for the road corridor recognises the existing urban and landscape character and seeks to integrate the new road and new bridge structures sensitively into the natural and suburban setting.

Further details will be provided at detailed design stage, and this will include a native plant species schedule and details of street trees. Detailed plans will be developed including landscape general arrangement drawings, landscape cross sections, hard details (pavements and street furniture, where relevant), planting details, material sketch schedules and specification notes. Landscape buffers would be designed to be appropriate for the space available and the location. A park has not been included within the proposal due to limited space, however planting along the road corridor within the Altrove development has been proposed. These details are to be finalised in consultation with Blacktown Council Landscape Designers and the Design Review Panel.

The concern relating to privacy has been noted and will be considered further at detailed design. Opportunities to mitigate the potential privacy impacts to residential properties on Alcorn Street and Anson Street would be investigated in consultation with property owners.

2.13 Issue 10: Resource use and waste

Submission number(s)

33

Issue description

- Questions about construction waste and mitigation measures to ensure there is no contamination to soil and water.
- Concerns raised about how inappropriate activities during construction will be managed to prevent waste impacts.

Response

The proposal would be designed and constructed to provide the responsible management of unavoidable waste and promote the reuse of such waste in accordance with the resource management hierarchy principles outlined in the *Waste Avoidance and Resource Recovery Act 2001*. The resource management hierarchy principles, in order of priority are:

- avoidance of unnecessary resource consumption
- resource recovery including reuse, reprocessing, recycling and energy recovery
- disposal.

By adopting the above principles, the proposal would aim to efficiently reduce resource use, reduce costs, and reduce environmental harm in accordance with the principles of ecologically sustainable development. These measures would form part of the CEMP which will be implemented for the project during construction.

Safeguards and management measures to protect the soil and water environment were developed in the REF and would be included within the CEMP. A resource and waste management plan will be prepared and included as part of the CEMP. This plan will define how waste is categorised, stored and disposed of.

2.14 Issue 11: Out of scope

2.14.1 Other projects

Submission number(s)

3, 4, 12, 26, 28, 29, 31

Issue description

- Suggestion for an upgrade of Grima Street for joining Pelican Road and Jacqui Avenue.
- Suggestion for a roundabout on Burdekin Road to allow access to an extension for Pelican Road.
- Request detail of upgrades at Pelican Road and Jacqui Avenue.
- Request for detail of upgrade works at Pelican Road, Buckton Street and Burdekin Road intersection.
- Raised safety concerns related to the Alex Avenue / Burdekin Road roundabout for the safety of pedestrians and children due to the potential increase in traffic. Specific concerns at this roundabout include:
  - The raised position of the east arm resulting in vehicles being difficult to see
  - Vehicles approaching at speed on the west arm and joining Alex Avenue without braking
  - Vehicles approaching on the west arm and driving at speed towards Hambledon Road. Previously a child was severely injured at the pedestrian crossing in this location
  - Vehicles driving at speed south on Alex Avenue.
- Suggestions related to the Richmond Road corridor included:
  - Suggest the lane description sign near M7 to be moved further back
  - Suggest replacing arrows on the overhead bridge for the M7 with “two lanes Blacktown, two lanes M7, single lane Rooty Hill Road” sign (attached to the M7 overpass)
  - Raises concern with unnecessary signage
  - Suggest connection of Hollingsworth Road to Daniels Road as an alternative option would reduce the volume of traffic on Richmond Road.
- Transport noted that the reason for not having traffic lights at the former sub arterial Grange Avenue was that traffic light spacings on arterial roads should be at least 1km apart. Various projects shown on webcasts have traffic lights closer than 1km apart.
- Suggest the North West Metro should reach Schofields Station.

Response

The areas of concern listed above fall outside the operational study area of the proposal. The main objective of the proposal is to improve capacity along Townson Road between Jersey Road and Burdekin Road. A Transport and Transport Impact Assessment was prepared as part of the REF which considered the following:

- A review of existing road features, traffic volumes and turn counts at major intersections, public transport, pedestrian, and cyclist facilities within the study area.
- Traffic modelling for peak traffic conditions during construction.
- Assessing the impacts of construction of the proposal on the road network.
- Predicting the impacts of the operation of the proposal for future traffic scenarios in 2026 and 2036. Assessment of cumulative impacts of the operation of the proposal.

This assessment considered where there could be impacts to network capacity on the wider network and where further assessment or upgrades are recommended to maintain capacity and safety. The study area comprised the Townson Road and Burdekin Road corridor with intersection analysis at the Townson Road and Veron Street intersection. Impacts to traffic flows outside the study area, on local roads, will need to be discussed with Blacktown City Council who owns and maintains them.

An upgrade to Pelican Road is outside the scope of the proposal. Any future upgrade of the Pelican Road intersection is the responsibility of Blacktown City Council.

The Alex Avenue Precinct Plan developed by the DPHI also proposes upgrades and a connection between Burdekin Road and Alex Avenue via Pelican Road and Jacqui Avenue.

The suggestion to reduce the volume of traffic via Richmond Road/Rooty Hill Road/Luxford Road and connect the end of Hollingworth Road is outside the scope of the proposal. Details such as road signs and markings on roads other than the proposal are also outside the scope of the proposal. The NSW Government is planning the upgrade of Richmond Road from Elara Boulevard to Heritage Road, Marsden Park. Consultation and display of the REF for the project was carried out in 2020. Details of the Richmond Road project can be found on the Transport website: https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/richmond-road-upgrade.html.

Transport will work with Blacktown City Council to assure that impact to traffic and local residents is minimised when the proposal is constructed. Transport will work with Council to meet driver safety requirements if the proposal is funded.

The alignment of the North West Metro is outside the scope of this proposal.

2.14.2 Stage 1

Submission number(s)

16, 20

Issue description

- Suggest a roundabout be placed near Victory Road.
- Requests detail of work to be undertaken outside of 55 Townson Road and how this property will be impacted.

Response

The REF display at this time is only for Stage 2 of the project. The Stage 1 REF was displayed in February of 2021 and more information is available on the project website https://roads-waterways.transport.nsw.gov.au/projects/north-west-growth-centre-strategy/townson-burdekin-road.html. The Concept Drawings that are currently displayed on the project website as part of Stage 1 show both an interim two-lane scenario, as well as the four-lane ultimate scenario. Temporary access has been designed for all properties, if required during construction.

In relation to 55 Townson Road a small strip of acquisition has been identified along the front of the property due to requirements of the future roadway widening. Also, as part of the permanent works the driveway, drainage, service connections, fencing, gates etc. would need to be relocated and/or re-established.

The interim phase of Stage 1 will involve the upgrade of the roundabout at Townson Road and Victory Road. At the ultimate stage of phase 1, the roundabout will be replaced with a signalised intersection.

A stub for Victory Road north would be constructed to provide for a future subdivision development. The final layout would be determined as the design progresses. Victory Road south is proposed to be upgraded for a length of about 120 metres with one lane in each direction (northbound and southbound) and a central median. Right turn lanes would also be provided in all directions to and from Townson Road and Victory Road. This would allow for all traffic movements.

3. Environmental assessment

3.1 Traffic and Transport

3.1.1 Methodology

Additional traffic and transport assessment was undertaken in February 2023 to analyse the alternate transport routes likely to be used after the closure of Railway Terrace. Three alternate routes were explored and the journey time for each option was recorded across two days (a week day and a weekend day) in both directions. The assessment considered traffic movements from Railway Terrace and Schofields Road intersection (Point 1) to the Hambledon Road and Burdekin Road intersection (Point 2). A business impact assessment has also been carried out to consider these road network alterations on the Schofields town centre. This analysis is summarised in Section 3.2.

Baseline route option

The baseline option is the existing route between Schofields Road / Railway Terrace intersection via Railway Terrace to the Burdekin Road and Hambledon Road intersection. The approximate distance along this route is 2.6 kilometres.

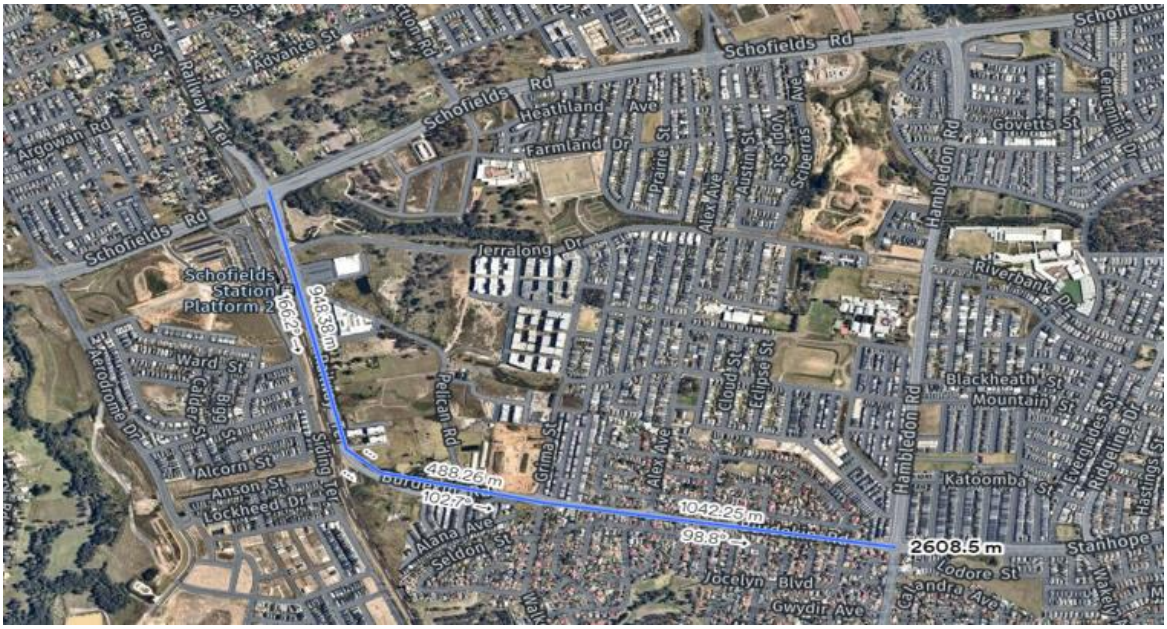

Figure 3.1: Baseline option

Option 1

Option 1 traverses the road from Schofields Road / Railway Terrace via Railway Terrace, along Jerralong Drive, Alex Avenue, and Burdekin Road to the Hambledon Road intersection. The approximate distance along this route is 3.2 kilometres.

Figure 3.2: Option 1

Option 2

Option 2 traverses the road from Schofields Road / Railway Terrace via Schofields Road, Alex Avenue, and Burdekin Road to the Hambledon Road intersection. The approximate distance along this route is 3.8 kilometres.

Figure 3.3: Option 2

Option 3

Option 3 traverses the road from Schofields Road / Railway Terrace via Schofields Road, and Hambledon Road to the Burdekin Road intersection. The approximate distance along this route is 4.0 kilometres.

Figure 3.4: Option 3

3.1.2 Potential impacts

The predicted journey times following the closure of Railway Terrace south of Stoke Street are shown in Table 3.1 and Figure 3.5.

The results show that all three alternative routes will result in an increased journey time for either day and for the measured time periods when travelling between the Schofields Road/Railway Terrace intersection and the Hambledon Road/Burdekin Road intersection.

The predicted journey times in Table 3.1 show the smallest change on a weekend day (Sunday) via Option 3 requiring an additional 58 seconds travelling time around midday while the largest change is via Option 2 requiring an additional 94 second travelling time during the later afternoon/ evening period.

The journey times measures in Table 3.1 show the smallest change on a weekday (Tuesday) is via Option 3 which results in an additional 72 seconds traveling right/down (3PM to 7PM). The largest change is via Option 2 with an additional 128 second travelling right/down (6AM to 10AM).

Overall, the longest additional journey time is predicted to be 128 seconds or just over two minutes.

Currently Railway Terrace provides access to Schofields town centre and the retail facilities. It should be noted that there are several other retail facilities that service the local community within the wider area, in addition to the facilities at Schofields town centre. These include Woolworths The Ponds and Coles Stanhope Gardens. In consideration of other community services the following points are noted:

- Schools - there are no schools in the area reliant upon Railway Terrace (Riverbank Public or Galungara or Hambledon Public) as there are several more direct access points.
- Health facilities - the Burdekin Medical Centre and Alex Avenue Medical Centre are not accessed from Railway Terrace.

Table 3.1: Travel time and changes

Direction	Weekday Name	Time period	Base option (seconds)	Option 1 (seconds)	Option 2 (seconds)	Option 3 (seconds)	Option 1 Change (seconds)	Option 2 Change (seconds)	Option 3 change (seconds)
Right/Down (Point 1 to Point 2)	Sunday	11am to 3pm	208	282	291	266	74	83	58
Left/Up (Point 2 to Point 1)	Sunday	11am to 3pm	186	266	270	266	80	84	80
Right/Down	Sunday	3pm to 7pm	200	275	294	268	75	94	68
Left/Up	Sunday	3pm to 7pm	183	266	267	264	83	84	87
Right/Down	Sunday	6am to 10am	190	266	274	255	76	84	65
Left/Up	Sunday	6am to 10am	181	257	255	244	76	74	63
Right/Down	Tuesday	11am to 3pm	211	324	324	293	113	113	82
Left/Up	Tuesday	11am to 3pm	198	322	293	282	124	95	84
Right/Down	Tuesday	3pm to 7pm	229	302	314	301	73	85	72
Left/Up	Tuesday	3pm to 7pm	211	300	303	296	89	92	85
Right/Down	Tuesday	6am to 10am	212	331	340	301	119	128	89
Left/Up	Tuesday	6am to 10am	206	324	313	296	118	107	90

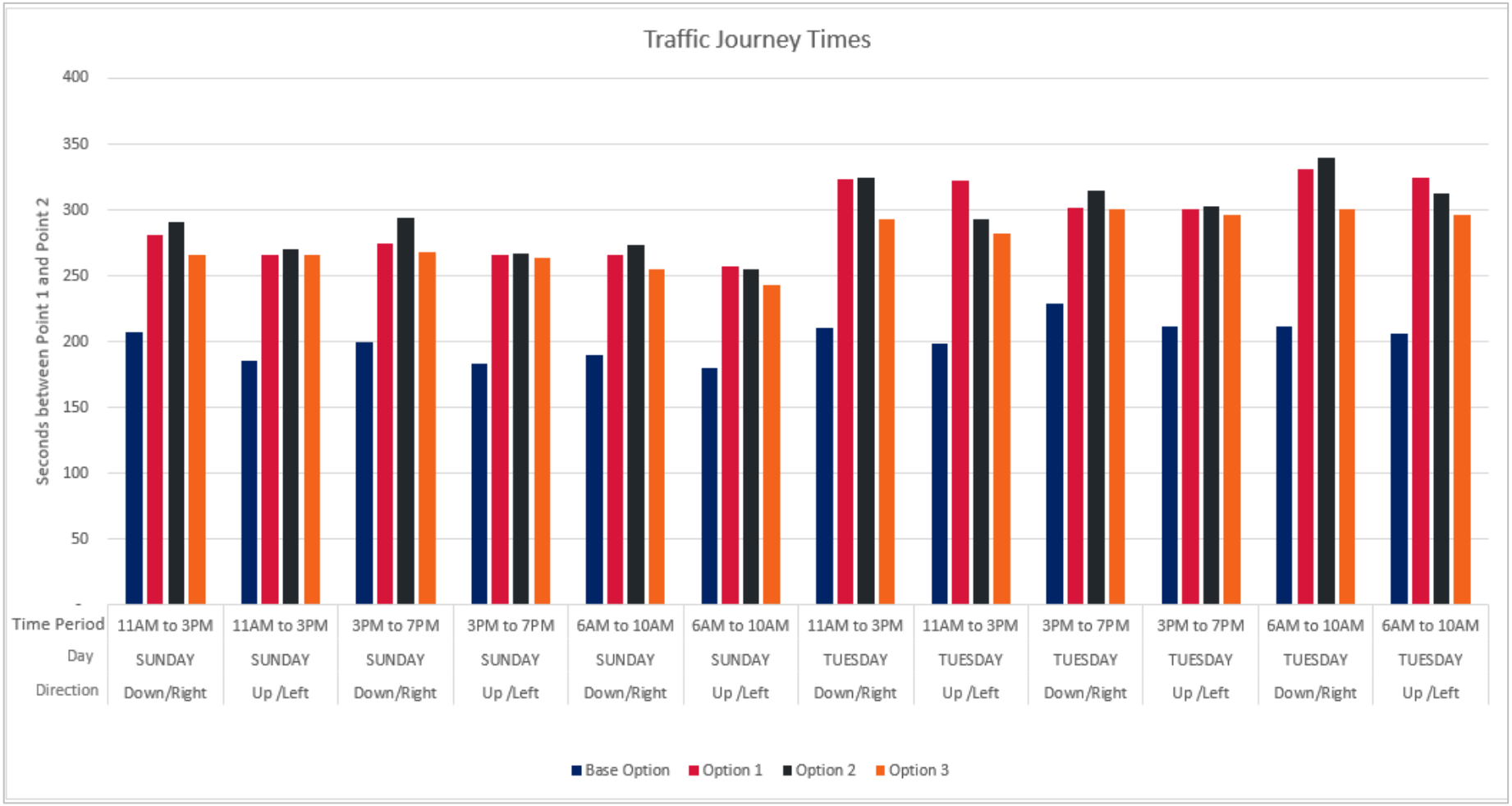

Figure 3.5: Traffic journey times

3.1.3 Revised safeguards and management measures

The REF for the Townson Road Upgrade between Jersey Road and Burdekin Road Stage 2 identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

Following completion of the additional traffic assessment, no new or amended safeguards are required. Should the proposal proceed, the environmental management measures in Table 4.1 will guide the proposal.

3.2 Business impact assessment

3.2.1 Existing baseline

A business impact assessment was carried out by Transport in 2022 (HillPDA Consulting, 2022) and is provided in Appendix A of this report. This study analysed the Schofields town centre trade catchment. This analysis characterised the surrounding retail environment, environment, through considered the following local attributes:

- composition of the centre
- the presence of artificial/natural barriers
- current and proposed transport connections, and the impact these have upon travel times.

This identified the main trade area for the precinct as a catchment which includes the areas of Schofields, Riverstone, Marsden Park, Greenway Village and Quakers Hill. The population for this catchment was estimated at around 63,000 in 2021, rising to around 67,000 in 2041.

A summary of the findings of this report (HillPDA Consulting, 2022) are provided below.

3.2.2 Impact assessment

The assessment considered three options across one baseline year and five future scenarios. These options are summarised in Table 3.2 which outline the total potential retail sales under each road option. A summary from the report findings is provided below (HillPDA Consulting, 2022).

Table 3.2: Estimated impact on potential trade at Schofields town centre ($m)

Option	2021	2026	2031	2036	2041	2026-2041
Option 1 (base case)						
Total potential retail sales	148.3	234.6	347.5	409.0	463.0	314.6
Option 2						
Total potential retail sales	148.3	227.1	335.6	394.7	446.4	303.1
Difference to base case ($)		-7.6	-11.9	-14.4	-16.5	-11.5
Difference to base case (%)		-3.2%	-3.4%	-3.5%	-3.6%	-3.7%
Option 3						
Total potential retail sales	148.3	217.8	322.5	379.6	429.7	292.4
Difference to base case ($)		-16.8	-24.9	-29.4	-33.2	-22.2
Difference to base case (%)		-7.2%	-7.2%	-7.2%	-7.2%	-7.1%

Source: HillPDA Consulting, 2022

Base case

This option assumes no changes to the current road network. The proposal is not included in the base case.

Under the base case it is estimated that Schofields town centre could achieve total retail sales of around $235 million in 2026 increasing to around $463 million by 2041.

Option 2 – Railway Terrace through route remains open

In this option the new connection between Townson Road and Burdekin Road is implemented. However, the connection between Railway Terrace and Burdekin Road is not severed. It is noted that resulting from physical constraints development of this option is not feasible and is only being used to show comparisons to the other options.

When compared to the base case, the estimated impact resulting from proposed road changes is an initial 3.2 per cent loss on potential sales in 2026, increasing to a 3.6 per cent loss in 2041.

There are no universal measures of significance of economic impact. There are references in various consultancy reports and statements in the NSW Land and Environment Court which suggest that a loss of trade below 5.0 per cent is considered insignificant, 5.0 per cent to 10.0 per cent is low to moderate, 10.0 per cent to 15.0 per cent is moderate to high, and above 15.0 per cent is a strong or significant impact. As such, the potential loss in trade under Option 2 at 3.2 per cent is considered insignificant.

Due to population growth in the main trade area, potential retail sales at Schofields is expected to increase from $148 million in 2021 to $227 million in 2026 notwithstanding the immediate impacts of the road proposal. Hence there is no threat to the viability of the centre under Option 2. Population growth will see an increase in potential retail sales regardless of the proposal.

Option 3 – Railway Terrace through route is closed

In this option the new connection between Townson Road and Burdekin Road is implemented. However, the connection between Railway Terrace and Burdekin Road is severed. The severing of access is mitigated with an alternative route to the town centre via connection of Pelican Road and Jacqui Avenue.

When compared to the base case, the estimated impact resulting from proposed road changes is an initial 7.2 per cent impact (reduction) on potential sales in 2026. As such, the potential loss in trade under Option 3 is in the low to moderate range.

The assessment concluded that the predicted population growth would offset the loss to the existing catchment resulting from the proposal. Potential trading levels are expected to increase by 47.0 per cent over five years from 2021 to 2026, excluding the immediate impact of the proposal.

3.2.3 Revised safeguards and management measures

Preparation of this business impact assessment has fulfilled the existing commitment set out in management measure S1:

- S1, Impact to businesses - A business impact assessment will be carried to identify the effects of the closure of Railway Terrace on local businesses. This will be carried out before detailed design commences to inform the design.

In response to the recommendations outlined in the business impact assessment (refer to Appendix A) an additional safeguard and management measure has been added. This measure recommends the following:

- S4, Impacts on businesses - Street signage will be provided that clearly identifies alternative routes to the Schofields town centre. This will include relevant signage along Burdekin Road.

4. Environmental management

The REF for the Townson Road Upgrade between Jersey Road and Burdekin Road – Stage 2, identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Section 7 of the REF).

After consideration of the issues raised in the public submissions and additional assessment, the safeguard and management measures have been revised. These changes relate to:

- Impacts to businesses: A measure to undertake a business impact assessment has been completed, therefore this commitment has been met and the measure removed. An additional measure providing street signage to support local businesses has been added.
- Drainage and flood management measures. Several measures have been updated to strengthen the commitment to managing impacts to the existing drainage network and mitigating flood impacts.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

4.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Project Environmental Management Plan (PEMP) and a Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The PEMP and CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The PEMP and CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The PEMP and CEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 – Traffic Management.

4.2 Summary of safeguards and management measures

The REF for the Townson Road Upgrade between Jersey Road and Burdekin Road – Stage 2, identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the proposal (refer to Section 7 of the REF) have been revised. Should the proposal proceed, the environmental management measures in Table 4.1 will guide the subsequent phases of the proposal. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been underlined and deleted measures, or parts of measures, have been struck out.

Table 4.1: Summary of environmental safeguards and management measures

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
General					
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement of the Blacktown City Council 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 proposal 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.	Future Delivery Agency ~~Blacktown City Council / Contractor~~	Pre-construction/ detailed design	Core standard safeguard GEN1
GEN2	General – notification	All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Future Delivery Agency ~~Blacktown City Council / Contractor~~	Pre-construction	Core standard safeguard GEN2

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
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. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • Areas of Aboriginal heritage sensitivity • Threatened species habitat and areas of ecological sensitivity and requiring protection • Adjoining residential areas requiring particular noise management measures.	Future Delivery Agency ~~Blacktown City Council / Contractor~~	Pre-construction/ detailed design	Core standard safeguard GEN3
Traffic and Transport					
T1	Traffic and transport	A revised traffic assessment will be prepared prior to detailed design to account for the changes to the built environment and road network. This should include: • Review of the network traffic model to confirm and update the network capacity and flow assumptions into the intersection modelling for an accurate representation of intersection performance • New traffic counts • Review and revise if necessary, the opening and future scenario years • Review the Aerodrome Drive (Veron Road) intersection arrangement • Consider if the study area should extend further east of the proposal area.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
T2	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). 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 related 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	Additional safeguard
T3	Emergency services access	Consultation with emergency service authorities will be undertaken during development of the detailed design and maintained throughout construction as the proposal progresses.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design and Construction	Additional safeguard
T4	Access during construction	Current traffic movements and property accesses are to be maintained during the work. Any disturbance is to be minimised to prevent unnecessary traffic delays and businesses/residences informed.	Contractor	Construction	Core standard safeguard T1
T5	Management of heavy vehicles	An assessment of heavy vehicles from construction and through traffic (on diversion routes) will consider: • Vehicle types/maximum size which can negotiate the road network. • Coordination to prevent queuing or double parking.	Contractor	Construction	Additional safeguard
T6	Worker parking	Provision of parking within the compound sites for workers and construction vehicles.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
T7	Road closures	• Traffic guidance schemes (TGS) will be developed in accordance with Roads and Maritime Traffic Control at Work Sites manual (2018) and AS1742.3 – Traffic Control for Works on Roads. • Residences and businesses in the local area will be notified on any road closures.	Contractor	Construction	Core standard safeguard T3
T8	Pedestrian and cyclists	• Safe pedestrian and cyclist access around and past the work site will be provided. Pedestrians will be clearly directed to utilise formed paths where possible or temporary paths will be provided as a short-term measure. • Clear visibility at the site egress along the road network and the pedestrian pathway will be maintained.	Contractor	Construction	Additional safeguard
Noise and vibration					
NV1	Construction traffic noise	When the detailed construction staging of this proposal has been finalised, it is recommended that a construction traffic noise assessment is undertaken.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard
NV2	Noise and vibration	An Addendum Noise and Vibration Impact Assessment will be prepared to capture any newly constructed residential developments since this publication of this report, for inclusion in the assessment and consideration for mitigation treatments where required. The assessed buildings would be reviewed during detailed design to ensure impacts at structures that have been constructed or approved prior to approval of the proposal have been considered.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard
NV3	Operational noise	Consideration of noise walls will be further assessed during detailed design. This would determine the feasible and reasonable position, extent and height of structures.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV4	Noise and vibration	A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP 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 approach and procedures for road and maritime infrastructure planning, design and construction, (TfNSW 2020). • 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	Pre-construction	Core standard safeguard NV1 Section 4.6 of *QA G36 Environment Protection*
NV5	Community consultation	All sensitive receivers (e.g. schools, local residents) likely to be affected will be notified at least 7 days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The ENMM Practice Note (vii) provides community consultation procedures for road work outside normal working hours. The notification will provide details of: • the proposal • the construction period and construction hours • contact information for proposal management staff • complaint and incident reporting • how to obtain further information.	Contractor	Pre-construction/ Construction	Core standard safeguard NV2
NV6	Building vibration	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage.	Contractor	Pre-construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV7	Construction noise from inappropriate practices	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All relevant project specific and standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Construction traffic routes • Site opening/closing times (including deliveries) • Environmental incident procedures.	Contractor	Construction	Additional safeguard
NV8	Construction traffic noise	Management of construction related traffic or traffic reroutes should as a minimum include the following controls: • Scheduling and routing of vehicle movements. • Speed of construction related heavy vehicles should be limited to 40 km/h along haul routes on local roads. • Driver behaviour and avoidance of the use of engine compression brakes. • Ensuring vehicles are adequately silenced before allowing them to access the site. • Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. • Loading and unloading of materials/deliveries is to occur as far as possible away from sensitive receivers. • Select site access points and roads as far as possible away from sensitive receivers. • Dedicated loading/unloading areas to be shielded if close to sensitive receivers.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. • Avoid or minimise out of hours movements where possible.			
NV9	Construction noise from machinery and equipment	The use and selection of machinery and equipment will: • Use quieter and less vibration emitting construction methods where reasonable and feasible. • The noise levels of plant and equipment must have operating sound power or sound pressure levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix H of the CNVG. • The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG. • The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.	Contractor	Construction	Additional safeguard
NV10	Hours of construction activity	Where reasonable and feasible, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods. Further to this, it is recommended that the use of mulchers, jack hammers, concrete saws, rock breakers, compaction or other equipment used in very close proximity to the receivers should be limited where feasible and reasonable to the standard construction hours.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV11	Extended duration of noise and vibration activity	Where receivers are highly noise affected, noise and vibration generating activities may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block. Where receivers are highly noise affected, no more than four consecutive nights of high noise and/or vibration generating work may be undertaken over any seven-day period, unless otherwise approved by the relevant authority.	Contractor	Construction	Additional safeguard
NV12	Road noise	The NMG recommends noise mitigation in the following order of preference: • quieter road pavement surfaces • noise mounds • noise barriers (noise walls) • at-property treatments.	Contractor	Detailed design	Additional safeguard
NV13	Audio tactile device noise at pedestrian crossings	Noise mitigation measures applicable to the audio tactile devices to reduced potential sleep disturbance impacts should include volume adjustment limiting the devices to a sound pressure level of 68 dBA at 1 metre. These mitigation measures would also need to consider health and safety requirements.	Contractor	Detailed design	Additional safeguard
NV14	Post construction monitoring	To confirm that the noise level targets are achieved, the NMG refers to the ENMM Practice Note 8 which recommends that a post-construction noise monitoring program be undertaken.	Future Delivery Agency ~~Blacktown City Council~~	Operation	Additional safeguard
Hydrology and flooding					
FL1	Drainage design	Ensure appropriate integration with Council's stormwater network. Design will include: • The reinstatement of local scour protection work in unlined channels, where present. • Ensuring stormwater network alternatives are in place prior to any disconnection or diversion of stormwater infrastructure. • Ensuring that the detailed design will accommodate the passage of stormwater flows from Blacktown City Council's future trunk drainage network east of the T1 Western railway line	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
FL2	Stormwater runoff	Detailed design to result in no net increase in stormwater runoff rates in all storm events, unless it can be demonstrated that increased runoff rates as a result of the proposal would not increase downstream flood risk.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard
FL3	Piers in waterway	Where feasible and reasonable, the bridge is to be designed to ensure piers and associated scour protection are not constructed within the creek channel.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard
FL4	Western floodplain impact	~~If the road is planned to be constructed prior to the rezoning and property acquisition on the western floodplain, the design will include mitigation measures to prevent unacceptable flood level increases at existing properties. Existing buildings will be surveyed prior to commencement of the detailed design to enable design of suitable flood mitigation works, or identify if property acquisition should these be required.~~ To manage flooding impacts to existing properties, resulting from the project, further assessment will be undertaken during the detailed design development. This is in order to validate the flood modelling undertaken at concept stage and reduce flooding impacts prior to the road construction, if possible. A survey of existing building floor levels will be undertaken to inform the detailed design and to validate the concept design flood modelling. This will assist in identifying properties that may need to be acquired to facilitate the project.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design	Additional safeguard
FL5	Flood hazard	As part of the CEMP, a flood risk management plan will be prepared that details the processes for monitoring of flood alerts. The plan will specify the steps to be taken in the event a flood warning is issued including removal or securing of loose material in the floodplain and removal or securing of all fuels and chemicals.	Contractor	Pre-construction and Construction	Additional safeguard
FL6	Flood hazard	Storage of excess materials within the floodplain, including within compound areas will be minimised. As far as is practical materials are to be ordered on, or, as close as possible to, an as needs basis.	Contractor	Construction	Additional safeguard
FL7	Flood hazard	Install drainage work prior to or concurrent with road formation construction to minimise potential adverse impacts upstream and/or downstream of site.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
FL8	Management of water bodies	Work within or near the creek will be undertaken with consideration given to the NSW Department of Primary Industries (Water) *Guidelines for controlled activities on waterfront land – Riparian corridors* (2018).	Contractor	Construction	Additional safeguard
Surface and groundwater					
SW1	Erosion and sedimentation	A Soil and Water Management Plan will be prepared as part of the CEMP in accordance with the requirements of TfNSW contract specification G38. The SWMP would address the following: • TfNSW Code of Practice for Water Management, the Roads and Maritime Services' Erosion and Sedimentation Procedure • The NSW Soils and Construction – Managing Urban Stormwater Volume 1 'the Blue Book' (Landcom, 2004) and Volume 2 (DECC, 2008) • Technical Guideline: Temporary Stormwater Drainage for Road Construction (Roads and Maritime Services, 2011) • Technical Guideline: Environmental Management of Construction Site Dewatering (Roads and Maritime Services, 2011). • The SWMP would detail the following as a minimum: – Identification of catchment and sub-catchment areas, high risk areas and sensitive areas including separation of on-site and off-site water – Erosion and sediment control measures – Dewatering plan (including a map) which includes process for monitoring, flocculating and dewatering water from site (i.e. sediment basin and sumps) – Details of the management of groundwater in-flow during construction – Include progressive site specific erosion and sedimentation control plans to be updated fortnightly, as a minimum – Identify high risk activities (such as the bridge construction) and the details required for work method statements to be developed and signed by TfNSW prior to construction	Contractor	Pre-construction	Core standard safeguard SW2 QA *G38 Soil and Water Management*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		– The process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather with controls shown on the erosion and sedimentation control plans – Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.			
SW2	Erosion and sedimentation	Existing natural soils or reused dispersive materials adjacent to or beneath drainage lines or culverts should be stabilised with gypsum. Additional treatments to prevent erosion such as rock armour or rip-rap at culvert inlets/outlets should also be considered and designed according to the recommended standards (Austroads 2013, Catchments and Creeks 2014, 2015, 2017).	Contractor	Pre-construction and construction	Additional safeguard
SW3	Water quality monitoring	A monitoring program of surface water and groundwater quality will be included as part of the CEMP to measure water quality outcomes against the ANZECC (2000b) and ANZG (2018) guidelines.	Contractor	Pre-construction and construction	Additional safeguard
SW4	Impacts to GDEs	Where excavation activities are likely to occur in close proximity to GDEs and groundwater is likely to be intercepted, groundwater elevations will be monitored. This will be reported as part of the surface water and groundwater quality monitoring program.	Contractor	Construction	Additional safeguard
SW5	Spills	Further, existing open swale drains and any other open drainage channels provided through construction areas will help provide an opportunity to cut off, via emergency bunding where required, any spills and leaks that may begin running off-site or into underground stormwater drainage networks. This would be in the unlikely event of chemical spills or leaks occurring within the construction footprint.	Contractor	Construction	Additional safeguard
Soils and contamination					
SC1	Soil and water	A site specific Erosion and Sediment Control Plan will be prepared and implemented as part of the Soil and Water Management Plan. The Plan will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Pre-construction	Core standard safeguard E2 Section 2.2 of QA *G38 Soil and Water Management*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
SC2	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 Blacktown City Council Environment Manager and/or EPA.	Contractor	Construction	Section 4.2 of QA *G36 Environment Protection*
SC3	Accidental spill	A site specific emergency spill plan will be developed and include spill management measures in accordance with the Roads and Maritime *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 Blacktown City Council and EPA officers).	Contractor	Pre-construction and construction	Section 4.3 of QA *G36 Environment Protection*
SC4	Storage of materials	Hazardous materials such as fuel and chemicals will be stored in suitably located bunded areas, in accordance with DECC's *Storing and Handling Liquids: Environmental Protection Participants Manual* (DECC, 2007).	Contractor	Construction	Additional safeguard
SC5	Excess spoil	Excess spoil not required or able to be used for backfilling would be stockpiled in a suitable location before being reused or removed from the site, and disposed of at an appropriately licensed facility.	Contractor	Construction	Additional safeguard
SC6	Use of water for construction	Should surface or groundwater be used during construction, further assessment and analysis of potential contamination will be undertaken prior to its adequate use and disposal.	Contractor	Construction	Additional safeguard
Biodiversity					
BIO1	Construction management	A Flora and Fauna Management Plan will be prepared in accordance with the *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	Contractor	Pre-construction	Core standard safeguard B1 Section 4.8 of QA *G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• surveys for the Cumberland Plain Land Snail are to be completed within areas of potentially suitable habitat in non-certified land in the construction footprint. • Procedures for unexpected threatened species finds and fauna handling in accordance with the Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines 2011 – Guide 1 (Pre-clearing process) and Biodiversity Guidelines - Guide 9 (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 in accordance with Biodiversity Guidelines - *Guide 6 (Weed Management)*. • Erosion and sediment control measures would be established prior to construction in accordance with the principles and guidelines included in *Managing Urban Stormwater: Soils and Construction - Volume 1* (Landcom, 2004) and *Volume 2D of Managing Urban Stormwater: Soils and Construction* (DECC 2008).			
BIO2	Vegetation removal	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 B2
BIO3	Impact to connectivity	Bridge design will consider the provision of dry passage under the structure, to allow for improved connectivity for terrestrial species, where possible. Bridge design should also include features such as fauna furniture (e.g., ledges, bolted poles etc) to allow safe passage of fauna species along the bridge structure and consider 'bat friendly' roost designs. Detailed design of bridge structures should consider ways to minimise the impacts of shading on adjacent native vegetation and aquatic habitats. The design of the detention basins will consider the planting of semi-aquatic emergent vegetation, to recreate artificial wetland habitats in the locality.	Contractor	Detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
BIO4	Removal of threatened species habitat and habitat features	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).	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Pre-construction	Additional safeguard
BIO5	Removal of threatened plants	Pre-clearing surveys will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011). The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011) if threatened flora species, not assessed in the biodiversity assessment, are identified in the construction footprint.	Contractor	Prior to construction	Additional safeguard
Aboriginal cultural heritage					
AH1	Construction management	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.	Future Delivery Agency ~~Blacktown City Council~~	Pre-construction	Section 4.9 of QA *G36 Environment Protection*
AH2	Unexpected finds	• *The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains is found during construction. This applies where TfNSW does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. • Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Construction	Section 4.9 of QA *G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
AH3	Aboriginal heritage	An application for an AHIP will be made under section 90A of the *National Parks and Wildlife Act 1974* for the two Aboriginal archaeological sites. The application will be prepared in accordance with the DPHI ~~Department of Planning and Environment (DPE)~~ *Applying for an Aboriginal Heritage Impact Permit: Guide for Applicants* (OEH, 2011).	Future Delivery Agency ~~Blacktown City Council~~	Pre-Construction	Additional safeguard
AH4	Aboriginal heritage	The non-impacted portion of sites Kerry Road Eastern Creek PAD 1 and Schofields 3 (outside of construction and AHIP boundary) will be marked on the Construction Environmental Management Plan prior to construction activities to ensure these parts of the sites are avoided and not impacted by the proposed works. The site areas will be marked as an environmentally sensitive "no-go zone".	Contractor	Pre-Construction	Additional safeguard
AH5	Aboriginal heritage	Temporary fencing will be installed around the edge of the AHIP area prior to construction.	Contractor	Pre-Construction	Additional safeguard
AH6	Aboriginal heritage	Workers will be inducted as to appropriate Aboriginal heritage protection measures.	Contractor	Pre-Construction	Additional safeguard
Non-Aboriginal heritage					
H1	Non-Aboriginal heritage	The *Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) 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.	Contractor	Construction	Section 4.10 of QA *G36 Environment Protection*

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Landscape character and visual amenity					
LV1	Landscape character and visual impact	An Urban Design Plan will be prepared to support the detailed design and will be implemented as part of the CEMP. The Urban Design Plan will present an integrated urban design for the proposal, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for: • Location and identification of existing vegetation and proposed landscaped areas, including species to be used . • Built elements including retaining walls, bridges and noise walls. • Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings. • Fixtures such as seating, lighting, fencing and signs. • Details of the staging of landscape work taking account of related environmental controls such as erosion and sedimentation controls and drainage. • Procedures for monitoring and maintaining landscaped or rehabilitated areas. The Urban Design Plan will be prepared in accordance with relevant guidelines, including: • Beyond the Pavement: Urban design approach and procedures for road and maritime infrastructure planning, design and construction, (TfNSW 2020) • Landscape Design Guideline (TfNSW 2018) • Bridge Aesthetics (TfNSW 2019) • Design guideline to improve the appearance of noise walls in NSW, (TfNSW 2021) • Shotcrete Design Guideline (TfNSW 2016). • Relevant BCC council guidelines including Blacktown Local Environmental Plan and Blacktown City Council Growth Centre Precincts Development Control Plan 2010.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Detailed design/pre-construction	Standard safeguard V1

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
LV2	Visual impact from the rail bridge	During detailed design visual impact from the reinforced soil wall will be minimised through the use of different materials/colours/textures. Consider wall treatment opportunities such as public art to improve aesthetic quality of the structure.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design	Additional safeguard
LV3	Visual impact from the rail bridge	Consider a continuous bridge structure on piers with minimal rammed earth walls, to mitigate the proposed visual barrier the walls would create between two residential areas and allow for the retention of long views under the road bridge, reducing the visual impact to residents on Alcorn Street, Siding Terrace and Anson Street. Opening the bridge structure and under croft could also generate opportunities for open space for community benefit.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design	Additional safeguard
LV4	Visual impact from signage	Position signs in a non-visually obtrusive way and sensitively locate to consider views from residential areas, where possible.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design	Additional safeguard
LV5	Consultation on urban design	Recommendations from the Design Review Panel would be considered at all relevant stages of the project.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design, Construction and operation	Additional safeguard
LV6	Views from the construction work on sensitive receiver locations	Vegetation buffers will be maintained between site compounds and public roads wherever practicable.	Contractor	Construction	Additional safeguard
LV7	Views from the construction work on sensitive receiver locations	The hoarding of construction materials will be minimised as far as practicable.	Contractor	Construction	Additional safeguard
LV8	Changes to view from vegetation loss	The approved clearing extent, including environmental features within the construction footprint, will be identified with flagging, marking tape or similar.	Contractor	Construction	Additional safeguard
LV9	Views from the construction work on sensitive receiver locations	All temporary above ground infrastructure will be removed at the completion of construction.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
LV10	Light spill	Light generated during construction will be managed in general accordance with the requirements in *Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting*. Generally, lighting would be designed to minimise off site light spill.	Contractor	Construction	Additional safeguard
LV11	Landscape character	Reinstatement of construction site compounds will commence progressively post construction and will be undertaken as soon as practicable.	Contractor	Construction	Additional safeguard
Air quality					
AQ1	General air quality impacts	An air quality management plan will be prepared as part of the CEMP. The plan will include but not be limited to: • A map identifying locations of sensitive receivers. • Identification of potential risks/impacts due to the work/activities as dust generation activities. • Management measures to minimise risk including a progressive stabilisation plan. • A process for monitoring dust on-site and weather conditions. • A process for altering management measures as required.	Contractor	Pre- Construction	Core standard safeguard AQ1 Section 4.4 of QA G36 Environment Protection
AQ2	Dust emissions	• Dust suppression measures will be implemented as per the air quality management plan. • Stockpiled materials will be covered, stabilised or stored in areas not subject to high wind. • All trucks will be covered when transporting material to and from the site. • Work activities will be reprogrammed if the mitigation measures are not adequately restricting dust generation.	Contractor	Construction	Core standard safeguard A1
AQ3	Exhaust emissions	• Construction plant and equipment will be maintained in a good working condition to limit impacts on air quality. • Plant and machinery will be turned off when not in use.	Contractor	Construction	Additional safeguard
AQ4	Impacts on sensitive receivers	Local residents will be advised of hours of operation and duration of work and supplied with a contact name and number for queries regarding air quality.	Contractor	Pre-Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
Property and land use					
P1	Property acquisition	All property acquisition will be carried out in accordance with Blacktown City Council policy and the *Land Acquisition (Just Terms Compensation) Act 1991*.	Future Delivery Agency ~~Blacktown City Council~~	Pre-construction and construction	Core standard safeguard
P2	Property access	At detailed design, property access arrangements for properties impacted by the proposal, will be reviewed and revised to accommodate the built environment at that time.	Future Delivery Agency ~~Blacktown City Council~~	Detailed design	Additional safeguard
P3	Property adjustment	Property adjustment plans would be developed in consultation with the affected property owners.	Future Delivery Agency ~~Blacktown City Council~~	Pre-construction	Additional safeguard
Socio-economics					
S1	Impact to businesses	A business impact assessment will be carried to identify the effects of the closure of Railway Terrace on local businesses. This will be carried out before detailed design commences to inform the design.	Future Delivery Agency ~~Transport for NSW~~	Pre-detailed design	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
S2	Socio-economic	Prepare and implement a stakeholder engagement and community engagement strategy during detailed design which would include the following key actions: • Consultation with residents, landholders and businesses in close proximity to the proposal area to notify them about the proposal design, construction activities and timing of construction works. • Communication with residents in the local study area to provide an overview of the proposal, the likely nature, extent and duration of amenity and access changes as a result of construction. Particular attention would be given to ensuring vulnerable groups are appropriately consulted, including culturally and linguistically diverse communities. This would align with Construction Traffic Management Plan which would include other measures such as managing traffic staging during construction and maintaining safety and efficient travel for the public. • Communication with general community members about road and pedestrian access changes and bus stop changes, such as roadside signage and web-based information. • Targeted communication with businesses. • Targeted communication with emergency services regarding access and traffic changes. • Protocols for responding to construction fatigue experienced by residents, businesses and general community members. Methods would be provided to ensure community members can contact the project team to raise any concerns regarding amenity and access changes (e.g. 24 hour phone number).	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
S3	Impacts on businesses	Ongoing consultation with businesses should occur throughout the detailed design phase to ensure that businesses are given notice of any design features and construction activities that may impact their business operations. Engagement with affected business owners and employees should be undertaken to: • understand and address specific business impacts • identify potential changes to customer behaviours as a result of the proposal Manage potential vehicle access changes • identify potential parking constraints, including reliance on on-street parking • scope opportunities for social procurement.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Construction	Additional safeguard
S4	Impacts on businesses	Street signage will be provided that clearly identifies alternative routes to the Schofield town centre. This will include relevant signage along Burdekin Road.	Future Delivery Agency	Operation	Additional safeguard
Resource use and waste					
RW1	Demand on resources	Procurement will endeavour to use materials and products with a recycled content where that material or product is cost and performance effective.	Contractor	Pre-construction	Additional safeguard
RW2	Waste management	A resource and waste management plan will be prepared and included in the CEMP. The plan will include the following (as a minimum): • The type, classification and volume of all materials to be generated and used on-site including identification of recyclable and non-recyclable waste in accordance with NSW EPA Waste Classification Guidelines (2014). • Quantity and classification of excavated material generated as a result of the proposal. Refer Roads and Maritime Service's Waste Management Fact sheets 1-6, (2012). • Interface strategies for cut and fill on-site to ensure re-use where possible. • Strategies to 'avoid', 'reduce', 'reuse' and 'recycle' materials. • Classification and disposal strategies for each type of material.	Contractor	Pre-construction	Core standard safeguard W1 Section 4.2 of QA G36 Environment Protection

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility. • Details of how material will be stored and treated on-site. • Identification of available recycling facilities on and off-site. • Identification of suitable methods and routes to transport waste. • Procedures and disposal arrangements for unsuitable excavated material or contaminated material. • The types of waste collected, amounts, date/time and details of disposal are to be recorded in a waste register. Site clean-up for each construction stage.			
RW3	Waste management	Waste receptacles will be provided and recycling of materials encouraged. Rubbish will be transported to an appropriate waste disposal facility.	Contractor	Construction	Additional safeguard
RW4	Waste management	All wastes will be managed in accordance with the POEO Act.	Contractor	Construction	Additional safeguard
RW5	Waste management	Portable toilets will be provided for construction workers and will be managed by the service provider to ensure the appropriate disposal of sewage.	Contractor	Construction	Additional safeguard
RW6	Waste management	Weeds removed during work will be managed in accordance with the *Biosecurity Act 2015* requirements that relate to its classification status.	Contractor	Construction	Additional safeguard
RW7	Waste management	Site inductions will occur and be recorded by a Site Supervisor to ensure staff are aware of waste disposal protocols.	Contractor	Construction	Additional safeguard
RW8	Waste minimisation	The following resource management hierarchy principles will be followed: • avoid unnecessary resource consumption as a priority • avoidance will be followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery) • disposal will be undertaken as a last resort (in accordance with the *Waste Avoidance and Resource Recovery Act 2001*).	Contractor	Construction	Core standard safeguard M2
RW9	Demand on resources	Excavated material will be reused on-site for fill where feasible to reduce demand on resources.	Contractor	Construction	Additional safeguard

No	Impact	Environmental safeguards	Responsibility	Timing	Reference
RW10	Fill management	Where additional fill material is required, this will be sourced from appropriately licensed facilities and/or other projects wherever possible.	Future Delivery Agency ~~Blacktown City Council~~ / Contractor	Construction	Additional safeguard
RW11	Management of green waste	Clearing and grubbing, including mulching, will be undertaken. Where possible, mulch will be used on-site.	Contractor	Construction	Additional safeguard
RW12	Spoil management	Excavated material will be reused on adjoining projects where feasible to reduce waste.	Contractor	Construction	Additional safeguard
RW13	Spoil management	Excess excavated material will be disposed of at an appropriate facility or reused appropriately for fill.	Contractor	Construction	Additional safeguard
RW14	Spoil management	Excess soil requiring waste disposal will first be assessed against the *Waste Classification Guidelines- Part 1: Classifying Waste* (EPA 2014). Soil samples will be taken from stockpiled material and analysed. Transportation will be undertaken by a licensed contractor capable of transporting the waste and waste will be disposed of at an appropriately licensed waste facility with supporting waste classification documentation.	Contractor	Construction	Additional safeguard
RW15	Generation of construction waste	A post-construction land assessment will be undertaken of land that was used for ancillary construction purposes (compounds, storage, parking, etc) to determine the suitability for hand-back to the landowner. The assessment will be prepared in accordance with the *Roads and Maritime Environmental Procedure - Management of Wastes* on TfNSW land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.	Contractor	Construction	Additional safeguard
RW16	Wastewater contamination of soils and water	A dedicated concrete washout facility will be provided during construction so that run-off from the washing of concrete machinery and equipment can be collected and disposed of at an appropriate waste facility.	Contractor	Construction	Additional safeguard
Cumulative impacts					
C1	Cumulative construction impacts	The Contractor's Environmental Management Plan will be revised as required to consider potential cumulative impacts from surrounding development activities as they become known. This will include consultation with the proponent and/or lead contractor.	Contractor	Pre-construction and construction	Additional safeguard

4.3 Licensing and approvals

Prior to construction commencing, licences, permits, approvals or statutory consultation will be required as detailed in Table 4.2.

Table 4.2: Summary of licensing and approval required

Instrument	Requirement	Timing
Fisheries Management Act 1994 (s199)	Notification to the Minister for Primary Industries prior to any dredging or reclamation work.	A minimum of 28 days prior to the start of work.
National Parks and Wildlife Act 1974 (s90)	Aboriginal heritage impact permit from NSW Heritage.	Prior to start of the activity.

5. Definitions

Term	Definition
AHIP	Aboriginal Heritage Impact Permit
Alignment	The vertical and horizontal location of the road
ANZECC	Australia and New Zealand Environment and Conservation Council
CEMP	Construction environmental management plan
CSR	Private property development company
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water (formerly NSW Department of Planning and Environment)
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DPHI	Department of Planning, Housing and Infrastructure (formerly NSW Department of Planning and Environment)
DPI	Department of Primary Industries
DPE	NSW Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPA	Environment Protection Authority
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.
ICNG	Interim Construction Noise Guideline
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
PEMP	Project Environmental Management Plan
POEO Act	*Protection of the Environment Operations Act*
QA Specifications	Specifications developed by Transport for NSW for use with road work and bridge work contracts let by Transport for NSW.
REF	Review of Environmental Factors
RMS	NSW Roads and Maritime Services
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SWMP	Soil and Water Management Plan

Term	Definition
Transport	Transport for NSW
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021

6. References

Department of Planning and Environment, 2017. North West Priority Growth Area Land Use and Infrastructure Implementation Plan.

HillPDA Consulting, 2022. Townson Road to Burdekin Road Link Project, Business impact assessment. Prepared on behalf of Transport for NSW.

Transport for NSW, 2021, February. *Townson Road Upgrade between Richmond Road and Jersey Road – Stage 1 Review of Environmental Factors*.

Transport for NSW, 2022, May. *Townson Road Upgrade between Jersey Road and Burdekin Road –Stage 2 Review of Environmental Factors*.

Roads and Maritime, 2015. Noise Criteria Guideline.

NSW Department of Planning, Industry and Environment, October 2020. Schedule 1 Alex Avenue Precinct, Blacktown City Council Growth Centre Precincts Development Control Plan 2010.

Appendix A: Business impact assessment

NSW GOVERNMENT