Transport for NSW

M5 Motorway Westbound Traffic Upgrade

Submissions Report

March 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.

Prepared by Aurecon Australasia and Transport for NSW.

Executive summary

The proposal

Transport for NSW (Transport) proposes to upgrade the M5 Motorway westbound between Moorebank Avenue, Moorebank and the Hume Highway, Casula (the proposal). The proposal would ease congestion by improving connectivity between the M5 Motorway and the Hume Highway.

Key features of the proposal include:

- A new two-lane westbound M5 Motorway exit for Hume Highway traffic, located about 1.5 kilometres east of the existing Hume Highway exit. This exit ramp would include:
    - A grade separated underpass beneath Moorebank Avenue
    - A two-lane 290 metre long bridge over the Georges River, Southern Sydney Freight Line, and the T2 Inner West & Leppington and T5 Cumberland rail lines
- Removal of the current M5 Motorway westbound Hume Highway exit
- Upgrade of the M5 Motorway intersection with Moorebank Avenue to cater for future traffic demand
- Upgrade of the Moorebank Avenue westbound entry ramp maintaining access to the M5 Motorway and Hume Highway
- A new shared path on the southern side of the new Hume Highway exit ramp from Moorebank Avenue, across the Georges River on the new bridge and connecting to the Hume Highway and Lakewood Crescent
- Installation of new drainage infrastructure including:
    - Kerb and gutters, pits and pipes
    - Installation of a new operational spill basin under the new bridge, east of the Georges River
    - Removal of the existing spill basin near Yulong Close, Moorebank
- Intelligent Transport Systems (ITS) including installation and adjustments to traffic/SCATS detection, CCTV, a web camera, an emergency breakdown telephone and stopping bay, variable message signs (VMS) and backbone conduit
- Ancillary work associated with the proposal including:
    - Relocating, adjusting or protecting existing utility services that are in conflict with the proposal
    - Installation of new street lighting and various road furniture
    - Delineation including signage, line-marking and other items to facilitate road user safety of the new infrastructure
    - Landscaping
    - Property adjustments where necessary.

Construction is expected to take about 40 months to complete, assuming no unforeseen disruptions or extended wet weather delays. Construction would be staged to minimise disruptions to transport customers and the community. There would be six construction areas across the proposal, with construction stages occurring concurrently to reduce overall construction time.

Display of the review of environmental factors (REF)

Transport prepared a REF for the M5 Motorway Westbound Traffic Upgrade. The REF was publicly displayed for 32 days between Monday 29 August 2022 and Thursday 29 September 2022 on Transport's project website and made available for download through the link; https://roads-waterways.transport.nsw.gov.au/projects/m5-motorway-westbound/index.html. No physical copies of the REF were displayed.

The REF display period was advertised through the following activities:

- Community Update about the proposal was letterbox dropped to 5,500 properties within the local area. A copy of the community update is included in Appendix B.
- Three project emails were sent to all stakeholders registered on the project's communications database (about 300 recipients).
- A newspaper advertisement was placed in the local newspaper (The District Reporter) on Friday 9 September 2022. A copy of the newspaper advertisement is provided in Appendix C.
- Advertising campaign on Transport's Facebook page, comprising of five Facebook posts. A copy of these Facebook posts is provided in Appendix D. There were 269 reactions and 256 comments made across all Facebook posts. The most reactions (103) and comments (138) were made in response to the first Facebook post, which announced the public display of the REF.

During the public display of the REF, Transport encouraged project stakeholders and the community to provide feedback on the proposal. Transport also met with stakeholders who would be directly affected by the proposal.

Two face-to-face community consultation sessions were held in the local area at the following times and locations:

- Thursday 8 September 2022 (4pm – 6pm) – Piccolo Me Café, 400 Moorebank Avenue, Moorebank. This session was attended by 11 people
- Saturday 17 September 2022 (10am – 1pm) – Casula Powerhouse Arts Centre, 1 Powerhouse Road, Casula. This session was attended by eight people.

One online community session was also held by Transport via Microsoft Teams on Wednesday 14 September 2022 (4pm – 4:30pm) to provide further information on the proposal, answer questions from the community and encourage the community to provide a formal submission on the REF. This online session was attended by 19 people.

Summary of issues and responses

Transport received 45 submissions, of which 44 were from the community, and one from Liverpool City Council. Submissions were accepted up until 29 September 2022.

Of these submissions, 22 per cent were in support of the proposal, 13 per cent objected to the proposal and 13 per cent were partially supportive of the proposal. The remaining 52 per cent of submissions offered no position on whether they supported or objected to the proposal. One of the submissions received from the community included a petition with 68 signatures (requesting for noise walls to be constructed on the existing and proposed new M5 Motorway bridges). This petition was treated as a single community submission.

The main issues raised and responses to those issues are summarised below.

Traffic and transport – traffic modelling and proposed traffic design

A number of issues were raised regarding the traffic modelling and the proposed traffic design, including:

- **Concern that the study area was too small and only considered the M5 Motorway westbound.** The proposal objective is to improve safety and congestion by removing the existing weave movement that occurs with vehicles travelling westbound entering the M5 motorway from Moorebank Avenue. The study area was considered adequate as it included the immediate proposal area, surrounding roads and nearby intersections, encompassing an area larger than that of the proposal.
- **Concern that the traffic volumes used in the modelling were inaccurate.** The Sydney Greater Metropolitan Area Strategic Traffic Forecasting Model (STFM) was used to inform future year traffic models for the proposal. These inputs considered the wider extents, including the surrounding road network, as well as all future infrastructure and traffic generation. Future demand predictions for the traffic assessment examined the existing land zoning within the surrounding study area, identifying general industrial development near the centre of the study area including the Moorebank Logistics Park.

- **Concern about additional congestion and weaving movements created by the proposal, including around the Heathcote Road exit.** The proposal is not expected to introduce additional congestion or unsafe weaving movements upstream or downstream of the proposal. The traffic modelling did not highlight any issues that may result in unacceptable operation of the surrounding road network.

Noise and vibration – background noise monitoring and mitigation measures

A number of queries were raised regarding the background noise monitoring carried out for the proposal and the proposed noise mitigation measures, including:

- **How operational traffic noise will be managed and the inequity in not providing noise barriers for the residents of Liverpool and Casula.** Transport's commitment to avoiding or minimising noise impacts from road traffic on State roads is described in the *Road Noise Mitigation Guideline* (Transport 2022). This guideline outlines the approach Transport takes to the evaluation, selection and design of feasible and reasonable noise mitigation measures. A quieter pavement surface is the preferred form of noise mitigation as it reduces source noise levels. However, at-property treatments would be required for this proposal as other forms of mitigation (such as low noise pavements and noise barriers) would not achieve feasibility and reasonability requirements. The final noise mitigation strategy for the proposal would be further developed during detailed design in consultation with impacted receivers.
- **Requests for a noise wall to be constructed on the new and existing M5 Motorway bridges.** A noise barrier assessment was carried out for the proposal as part of the REF. This assessment found that a barrier on the southern side of the proposed new bridge would not meet the minimum performance requirements of Transport's *Road Noise Mitigation Guideline* and, therefore, is not a reasonable option for noise mitigation in this location. A noise barrier assessment was not carried out for the existing Georges River bridges to the north as part of the REF; however, an assessment was previously completed as part of the Noise Abatement Program. This assessment found that a four metre high extension of the noise barrier would achieve the minimum performance requirements. However, Transport has determined that a noise barrier on the northern side of the existing eastbound Georges River bridge would not be reasonable due to structural limitations of the bridge. For this reason, a noise barrier is not proposed to be included on the existing M5 Motorway Georges River bridge.
- **Why only a few noise monitoring locations were selected to inform the REF.** Noise monitoring was completed at a representative sample of locations, as per the requirements for road upgrade projects. It is not feasible or necessary to carry out monitoring at every single property potentially affected by the proposal to determine existing background noise conditions. Road traffic noise levels at each potential receiver in the study area was predicted in a calibrated noise model to ensure each property was assessed individually.
- **Why background noise monitoring was carried out during the Covid pandemic when traffic volumes would have been lower than typical**. It is acknowledged that traffic patterns may have changed as a result of the COVID pandemic; however, this would not have affected the validity of the operational noise model. This is because the measured noise levels were used to confirm the accuracy of the operational noise model. Specifically, the traffic noise levels measured in 2020 were compared to traffic noise levels predicted by the operational noise model. This process (known as model validation) confirmed that the operational noise model was accurately predicting the traffic noise levels measured in 2020. The validated operational noise model was then used to predict noise levels from the operation of the proposal to the surrounding receivers. The predicted traffic volumes for 2026 and 2036 were used for the operational traffic noise assessment. If lower background noise levels were experienced during the COVID pandemic, then a more conservative construction noise criteria would have been applied to the assessment and mitigation requirements, meaning mitigation measures will be triggered at a lower noise level than if these noise levels were monitored before the COVID pandemic. Therefore, the noise and vibration impact assessment is considered adequate.
- **Concern about the operational noise impact of the proposal to surrounding residents.** The REF identified that the proposal would not substantially change existing road traffic noise levels in the study area, with a change of within one decibel expected for most residential properties. A change of one or two decibels in noise is generally difficult for most people to perceive. However, given the high existing noise levels, 81 residential properties are predicted as exceeding the triggers for consideration of noise mitigation. The final noise mitigation strategy for the proposal would be further developed during detailed design in consultation with impacted receivers.

Proposal design and construction

A number of queries were raised regarding the design and construction of the proposal, including:

- **Whether vehicles travelling northbound on Moorebank Avenue will still be able to access the Hume Highway exit.** The proposal would not restrict drivers access from Moorebank Avenue northbound to the Hume Highway in Casula. Vehicles would still be able to safely access the Hume Highway at Casula if they entered the M5 Motorway at Moorebank Avenue. Drivers would be able to exit at the Hume Highway using the proposed new off-ramp from the M5 Motorway.
- **Whether vehicles travelling eastbound on the M5 Motorway will still be able to use the Moorebank Avenue interchange to make a U-turn to access M5 Motorway westbound and the Hume Highway exit.** U-turns are not permitted at the Moorebank Avenue interchange. The proposal would continue to prevent vehicles travelling eastbound on the M5 Motorway to use the Moorebank Avenue interchange to make a U-turn to access M5 Motorway westbound and the Hume Highway exit.
- **Whether the upgrade would include a toll in the proposal area.** The M5 Motorway in the location of the proposal is currently a toll-free road and Transport is not proposing to introduce a toll along this section of the road.
- **Requests for further refinements to be made to the proposed active transport provisions, such as inclusion of pedestrian footbridges and ensuring the shared path accommodates all types of bike riders and abilities.** Transport is committed to reviewing the active transport design suggestions raised and available in current policy frameworks and will continue to consider these principles during detailed design. Pedestrian footbridges have not be included as there is only one proposed signalised pedestrian crossings within the proposal area, which is at the Moorebank Avenue and M5 Motorway intersection. A footbridge would not be feasible due to space constraints. All cycle paths and infrastructure would be constructed in accordance with the Austroads Guide to Road Design Part 6A – Paths for Walking and Cycling (2017)AS1742 and AS1743 ensuring they are inclusive and accommodate all types of bikes and abilities.
- **Concern about the length of time it will take to construct the proposal and the associated impact this will have to traffic in the local area.** Transport acknowledges the respondents concerns regarding the length of time the proposal would take to complete. Construction of the proposal would be staged to minimise disruptions to the community and nearby businesses. The performance of the road network would continue to be monitored throughout construction of the proposal by the Traffic Management Centre. Where required, Traffic Management Centre may require Transport (and its Construction Contractor) to modify its Construction Traffic Management Plan to reduce the proposal's impact on the road network.

Socio-economic, property and land use

A number of concerns were raised regarding business impacts including:

- **Concern about the proposal's impact on business operations and continuity.** Transport would continue to consult with impacted stakeholders to manage the potential impacts and disruptions caused by the proposal. This would consider specific operation requirements (such as access and site security arrangement and/or vibration sensitive equipment) that could be compromised if not managed appropriately. Since the REF has been on public display, representatives from Transport's M5 Motorway Westbound Traffic Upgrade team have attended meetings with key stakeholders, including businesses and landowners potentially directly affected by the proposal. Additional mitigation measures have been proposed to assist in addressing concerns.
- **Concern about the property acquisition process.** All land acquisition would be carried out in consultation with affected landholders in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* and the supporting NSW Government Land Acquisition Reform 2016. Any claims made under this act would be reviewed accordingly with the impacted stakeholder contacted directly. Property acquisitions commenced in early 2023 for industrial and government properties impacted along the proposed M5 Motorway corridor; no residential properties would be acquired for this proposal. The final property acquisition and lease boundaries would be confirmed during detailed design and Transport would continue to consult with impacted stakeholders.

Changes to the proposal

Following public display of the REF, the proposed design has been refined due to ongoing design development and in response to feedback received in submissions. The proposed changes include:

- Extending the emergency telephone bay steel rail barrier east to allow for an overlapping barrier and parking area behind the barrier.
- Changes to the cyclists' provisions at various locations to improve cyclist safety and reduce confusion, including:
    - Relocating the shared user path connection for westbound M5 Motorway cyclists 50 metres east of the original design, removing the potential safety conflict that existed due to its location adjacent to the traffic merge on the Hume Highway exit ramp.
    - Providing a T-intersection connection between the proposed shared user path and Council's existing shared user path on the western bank of the Georges River. This change was made to improve shared user path safety for all active transport users.
    - Changing the kerb and footpath design at the eastbound Moorebank Avenue exit ramp to improve cyclist safety. Specifically, cyclists wishing to travel south along Moorebank Avenue would now be able to dismount on a raised concrete island (while waiting for a green traffic signal), rather than on the shoulder of the right turn traffic lane.
    - Cyclist wayfinding (signage and line marking) improvements at various locations.
    - Providing a T-intersection stub for the proposed shared user path near the eastern end of the Georges River bridge to allow for a future active transport connection on the eastern side of the Georges River (to be provided by others and not part of Transport's proposal).
- The proposed safety screen on the new bridge would be upgraded from mesh to a solid transparent barrier to comply with the latest rail safety regulations. An additional mesh safety screen would be added to the new bridge's northern parapet to comply with current rail safety requirements.
- The proposed construction access through the industrial premises at the northern end of Yulong Close would no longer be required, due to the difficulty of establishing a temporary access road at this location. However, Yulong Close may still be used by construction vehicles, where required.
- Revised property acquisition across the proposal to accommodate the proposed design changes, or as otherwise identified through updated land ownership details (for example, land identified in the REF as being road reserve subsequently being identified as being privately owned). Consistent with the REF, no residential property would be affected by the revised property acquisition boundary for the proposal.

No substantial changes have been made to the proposal since the REF was placed on public display; therefore, these changes do not need to be re-exhibited for public comment.

Environmental assessment

Additional assessments were carried out for the revised proposal. The purpose of these additional assessments was to identify the changes in the proposal's potential impacts (relative to those documented in chapter 6 of the REF) and to identify whether any additional safeguards or management measures would be required to address the change in impacts.

The additional assessments found that the proposed design changes would be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, the proposed design changes are not expected to result in any substantial changes in impacts compared to those outlined in the REF.

The key changes in impacts anticipated to be associated with the proposed design changes include:

- **Traffic and transport – road safety:** The proposed design changes would improve road safety around the proposed emergency telephone bay (relative to the design presented in the REF) by placing a crash barrier between parked vehicles and M5 Motorway through traffic. This design change would reduce the potential for an errant vehicle on the M5 Motorway westbound colliding with a stationary vehicle parked in the emergency telephone bay.
- **Traffic and transport – active transport:** The proposed design changes would improve road safety for cyclists by relocating the shared user path connection for westbound M5 Motorway cyclists away from the traffic merge on the Hume Highway exit ramp. The proposed design changes would also improve cyclist safety at the eastbound Moorebank Avenue exit ramp through refinements to the kerb and footpath design. Specifically, cyclists wishing to travel south along Moorebank Avenue would now be

able to dismount on a raised concrete island (while waiting for a green traffic signal), rather than on the shoulder of the right turn traffic lane (as was required for the design presented in the REF).

- **Biodiversity – impact to biobanking site:** The proposed design changes would reduce the proposal's impact on a biobanking site (reduction of 530 square metres), located near the south western corner of the Moorebank Avenue interchange. The total area of impact to this biobanking site would be 955 square metres.
- **Socio-economic – property acquisition:** Additional land acquisition (of about 2170 square metres affecting 5 properties) would be required to accommodate the proposed design changes or as otherwise identified through updated land ownership details (for example, land identified in the REF as being road reserve subsequently being identified as being privately owned). Consistent with the design presented in the REF, no acquisition of physical business premises or residential properties is proposed. Similarly, the acquisitions would not require any structures to be demolished and would be limited to strips of land that would not likely reduce the landowners current use of the property.

The additional assessments concluded that no additional safeguards or management measures would be required to address the proposed design changes. However, the environmental management measures for the proposal have been amended after consideration of the issues raised in the public submissions.

An additional microbat survey was also carried out for the existing Georges River bridge following the public display of the REF to address biodiversity mitigation measure B8 (documented in Chapter 7 of the REF and included in Table 6-1 of this report). The purpose of this survey was to confirm areas of potential microbat habitat on the existing Georges River bridge and to identify whether this structure is consistently being used by a large number of microbats (e.g. due to the presence of urine staining on the bridge structure).

No microbats (or signs of microbat activity, such as urine staining on the bridge structure) were observed during the survey; however, given the quantity of gaps beneath the Georges River bridge and survey limitations (i.e. the bridge being too high to adequately survey all areas), the presence of microbats in this structure cannot be ruled out.

The results of the microbat survey do not change the biodiversity impact documented in Section 6.6 of the REF. As the presence of microbats in the Georges River bridge cannot be ruled out, Transport proposes to retain mitigation measure B8 (as documented in in Chapter 7 of the REF and included in Table 6-1 of this report). This requirement would be further considered during detailed design.

Additional Transport and Infrastructure SEPP consultation

Following public display of the REF, amendments were made to the statutory consultation requirements under Part 2.2 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP).

Specifically, Transport is required to consult with the Western Parkland City Authority under section 2.15(2)(h) of the Transport and Infrastructure SEPP because the proposal would be carried out within a Western City operational area specified in the *Western Parkland City Authority Act 2018*, Schedule 2 and would have a capital investment value of more than $30 million.

Transport carried out this statutory consultation with the Western Parkland City Authority between August and September 2023. The Western Parkland City Authority noted its support for the proposal and the benefits that the proposal would deliver in terms of easing congestion and improving safety on the M5 Motorway for motorists and heavy vehicles. Western Parkland City Authority was also supportive of the following proposal benefits:

- Improvements to safety and access to Liverpool CBD
- Provision of pedestrian access across Georges River
- Provision of an efficient network between the Moorebank Logistics Park and the state road network

The Western Parkland City Authority's support for the proposal is noted.

Revised safeguards and management measures

The REF for the proposal identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts. These measures were documented in Section 7.2 of the REF.

After consideration of the issues raised in the public submissions (documented in Chapter 2 and Chapter 3 of this report) and changes made to the proposal (documented in Chapter 4 of this report), the environmental management measures for the proposal (refer to Section 7.2 of the REF) have been amended.

Should the proposal proceed, the environmental management measures will guide the subsequent phases of the proposal.

Next steps

Transport as the determining authority will consider the information in the REF and this submissions report and make a decision whether or not to proceed with the proposal.

Transport will inform the community and stakeholders of this decision and where a decision is made to proceed will continue to consult with the community and stakeholders prior to and during the construction phase.

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1. Introduction and background

1.1 The proposal

Transport for NSW (Transport) proposes to upgrade the M5 Motorway westbound between Moorebank Avenue, Moorebank and the Hume Highway, Casula (the proposal). The proposal would ease congestion by improving connectivity between the M5 Motorway and the Hume Highway.

Key features of the proposal, as documented in the *M5 Motorway Westbound Traffic Upgrade Review of Environmental Factors* (the REF, dated 8 August 2022), included (refer to Figure 1-2Figure 1-1):

- A new two-lane westbound M5 Motorway exit for Hume Highway traffic, located about 1.5 kilometres east of the existing Hume Highway exit. This exit ramp would include:
    - A grade separated underpass beneath Moorebank Avenue
    - A two-lane 290 metre long bridge over the Georges River, Southern Sydney Freight Line, and the T2 Inner West & Leppington and T5 Cumberland rail lines
- Removal of the current M5 Motorway westbound Hume Highway exit
- Upgrade of the M5 Motorway intersection with Moorebank Avenue to cater for future traffic demand
- Upgrade of the Moorebank Avenue westbound entry ramp maintaining access to the M5 Motorway and Hume Highway
- A new shared path on the southern side of the new Hume Highway exit ramp from Moorebank Avenue, across the Georges River on the new bridge and connecting to the Hume Highway and Lakewood Crescent
- Installation of new drainage infrastructure including:
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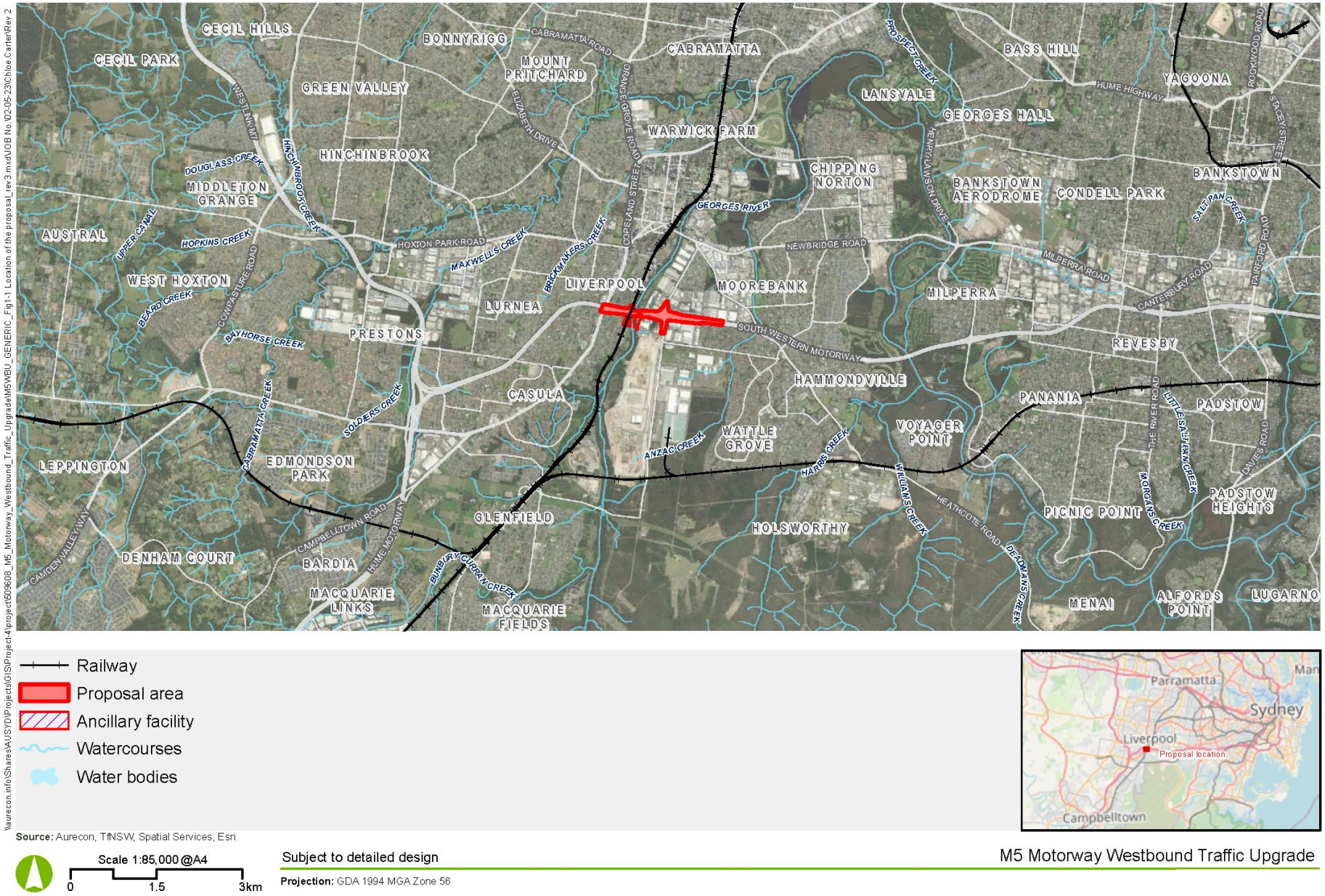

Figure 1-1 Location of the proposal

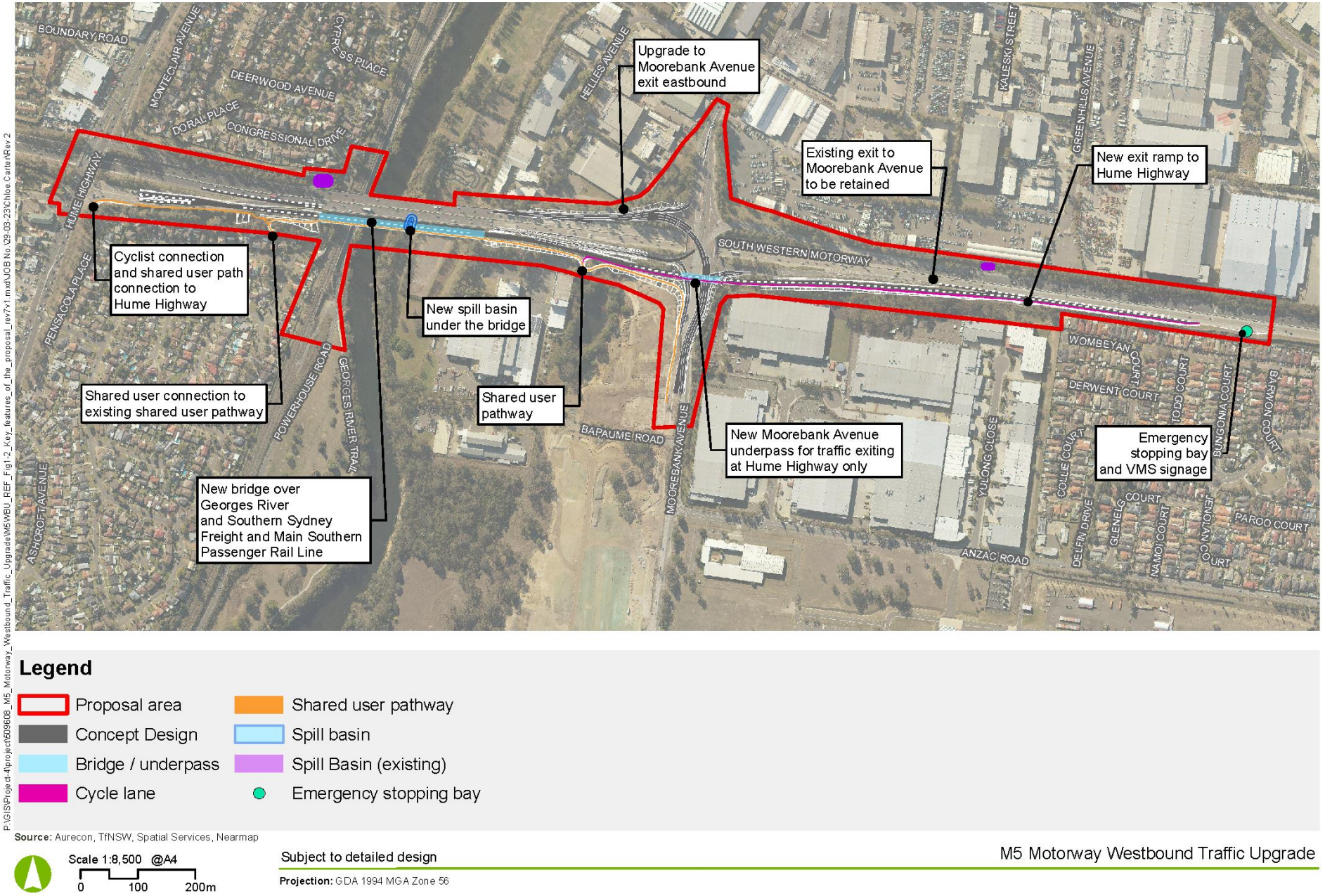

Figure 1-2 Overview of the proposal (as per the REF)

1.2 REF display

Transport prepared a review of environmental factors (REF) to assess the potential environmental impacts of the proposal. The REF was publicly displayed for 32 days between 29 August 2022 and 29 September 2022 on Transport's project website and made available for download through the link, https://roads-waterways.transport.nsw.gov.au/projects/m5-motorway-westbound/index.html. No physical copies of the REF were displayed.

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One online community session was also held by Transport via Microsoft Teams on Wednesday 14 September 2022 (4pm – 4:30pm) to provide further information on the proposal, answer questions from the community and encourage the community to provide a formal submission on the REF. This online session was attended by 19 people. Further information on the online project information session is provided in Section 2.1.1.

1.3 Purpose of this report

This submissions report relates to the REF prepared for the M5 Motorway Westbound Traffic Upgrade and should be read in conjunction with that document. No substantial changes have been made to the proposal since the REF was placed on public display; therefore, these changes do not need to be re-exhibited for public comment.

This submissions report summarises the issues raised and provides responses to each issue (Section 2 and Section 3). It details investigations carried out since finalisation of the REF (Section 4), describes and assesses the environmental impact of changes to the proposal (Section 5) and identifies new or revised environmental management measures (Section 5.15).

2. Response to community issues

2.1 Overview of issues raised

2.1.1 Issues raised in formal submissions received from the community

Transport received 44 submissions from the community, which included one petition with 68 signatures (requesting for noise walls to be constructed on the existing and proposed new M5 Motorway bridges). This petition was treated as a single community submission.

Submissions were accepted up until 29 September 2022. A list of respondents and each respondent's allocated submission number is attached in Appendix A. Appendix A also indicates where the issues from each submission have been addressed in Section 2 of this report.

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 to the issues 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.

Figure 2-1 provides a summary of the key issue categories raised by the community, including the number of times an issue was raised relating to each category.

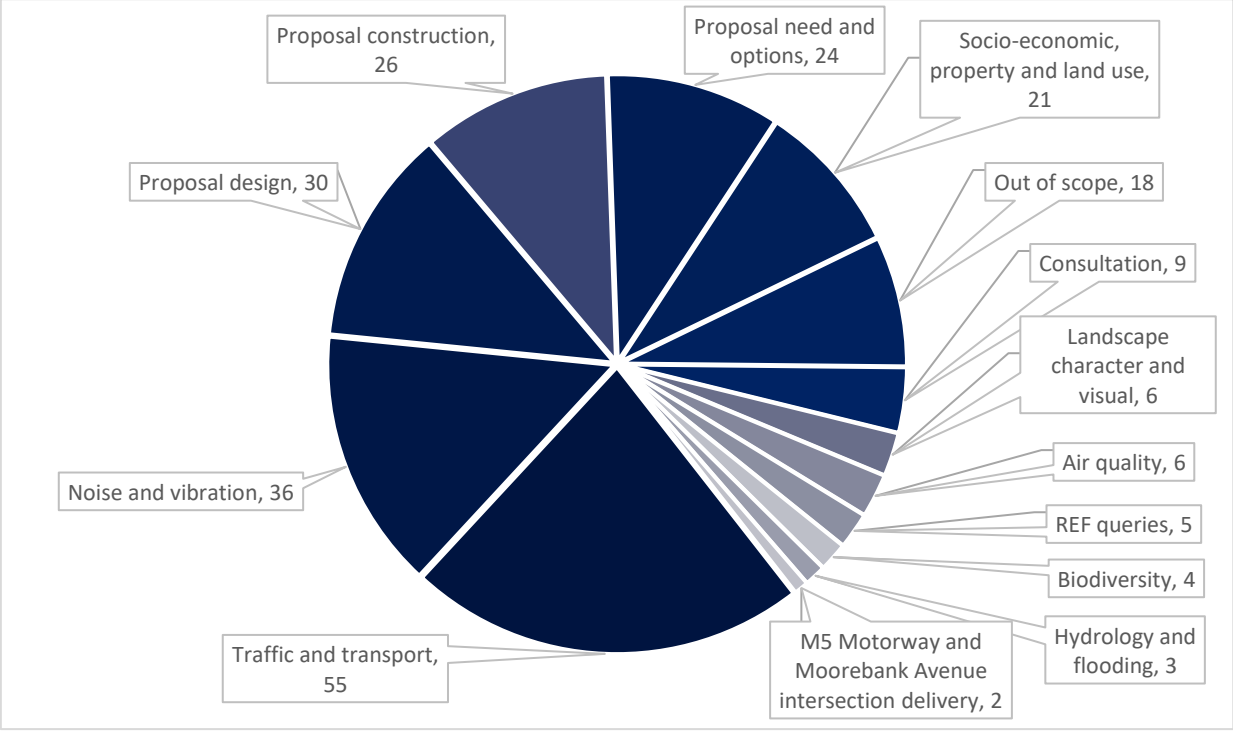

Figure 2-1 Summary of the number of times the key issues categories were raised by the community

Figure 2-1 shows that the top five key issue categories were:

- Traffic and transport (raised 55 times)
- Noise and vibration (raised 36 times)
- Proposal design (raised 30 times)
- Proposal construction (raised 26 times)
- Proposal need and options (raised 24 times).

2.1.2 Issues raised during the online community information sessions

The Transport project team for the M5 Motorway Westbound Traffic Upgrade responded to several issues and questions raised by the community during the online project information session. The online project information session was held during the public display period on Wednesday 14 September 2022. There were 19 attendees in the session.

During the session, attendees were encouraged to ask questions of the project team about the proposal and assessment contained within the REF. The issues and questions raised were verbally responded to by the project team during the session and, as such, are not directly addressed within this report.

Attendees were also encouraged to read the REF for more detailed information on the proposal and the environmental assessment, and to provide written submissions and feedback on the proposal.

2.1.3 Comments made on Transport's Facebook posts

Transport responded to several comments made by the community in response to Transport's Facebook advertising campaign (consisting of five Facebook posts advertising the proposal and the public display of the REF). There were 269 reactions and 256 comments made across all Facebook posts. The most reactions (103) and comments (138) were made in response to the first Facebook post, which announced the public display of the REF. The comments raised were not considered formal submissions and, as such, have not been directly addressed within this report.

2.2 Proposal need and options

2.2.1 Support for the proposal

Submission number(s)

6, 7, 8, 12, 15, 16, 17, 25, 30, 31, 43

Issue description

Respondents raised the following comments in support of the proposal:

- It will improve road safety and will remove the dangerous traffic weave.
- It will improve traffic congestion and will enhance and support the efficiency of the road.
- Supportive of the objectives to ease congestion and support the expected increase in traffic around the Moorebank Logistics Park.
- Support for the proposed new shared path along the M5 Motorway. The proposed shared path will provide crucial transport options within the M5 Motorway corridor.

Response

Transport has noted the respondents' support for the proposal and the benefits that the proposal would provide, including the opportunity to ease congestion and improve road safety and connectivity.

2.2.2 General opposition to the proposal

Submission number(s)

3, 11, 29, 35, 37, 42

Issue description

Respondents made the following comments in general opposition of the proposal:

- Overall opposition to the proposal as a short term solution to ease traffic congestion.
- More investments need to be made to the public transport network instead of road upgrades.
- The proposal is being pursued for the benefit of the proponent for the Moorebank Logistics Park at the expense of the local community.
- Requests that the developer for the Moorebank Logistics Park be required to pay for the proposal rather than the NSW Government.

Response

Transport acknowledges the respondents' comments. However, the proposal is catering for an increase in population and aims to improve the efficiency and safety of the M5 Motorway in this critical location and, therefore, ease congestion. The proposal supports present and future transport needs, removes restrictions to employment opportunities, allows for growth in industries and creates a more sustainable transport network.

Transport acknowledges the respondent's request for further investment to be made to the public transport network; however, public transport would not address the proposal's need to improve the safety and reliability associated with the use of the M5 Motorway, nor its objectives to:

- Provide efficient and reliable access between the Moorebank Logistics Park precinct and the State road network
- Support the M5 Motorway as the key through-traffic connection for south west Sydney
- Support the growth of and access to the Liverpool CBD through provision of an efficient arterial road network
- Provide solutions that contribute to improved road safety outcomes.

The proposal realises the importance of an integrated road and rail logistics network supported by intermodal terminals, dedicated and high performing pathways and major freight corridors.

The proposal would improve safety for cyclists and pedestrians by providing a new shared user path on the southern side of the M5 Motorway between Moorebank Avenue and the Hume Highway. The proposal specifically included two objectives related to active transport, comprising:

- Contribute to strategic land use outcomes including active transport and development of logistics facilities
- Incorporate necessary active transport measures to contribute to the improved performance of those travel modes.

These objectives would be addressed by the proposal.

The proposal design has been further refined following public display of the REF to further improve cyclist safety conditions and reduce confusion (relative to the design presented in the REF). These design refinements are described further in Section 4 of this report. Investment in this proposal does not preclude works to other parts of the transport network including public transport.

The M5 Motorway Westbound Traffic Upgrade was developed to address the proposal objectives described in Section 2.3.1 of the REF. While two of these objectives relate to the achievement of practical and strategic road network outcomes in connection with the Moorebank Logistics Park, the other proposal objectives seek to address broader road network efficiency and safety improvements, support the growth of, and access to, the Liverpool CBD and improve active transport measures associated with the use of the M5 Motorway in the Moorebank / Liverpool area.

While some components of the proposal would assist to provide efficient access to Moorebank Logistics Park, other components of the proposal have been driven by existing safety concerns for motorway users and the poor crash history westbound on the M5 Motorway between Moorebank Avenue and Hume Highway. The proposal is also aligned with several strategic policies and government strategies, such as *Future Transport Strategy 2056* (Transport for NSW, 2018a) and *Road Safety Plan 2021 – Towards Zero* (NSW Government, 2018a).

This means that the proposal would also deliver important and necessary benefits to the community, including:

- Improvement of road safety through the elimination of the existing weaving issue between Moorebank Avenue and the Hume Highway
- Improvement of traffic flow along the M5 Motorway, particularly westbound
- Improvement of motorist, cyclist, and pedestrian safety.

As outlined in Section 2.1 of the REF, road infrastructure upgrades to support the development of the Moorebank Logistics Park are required as part of the development approval for the Moorebank Intermodal Precinct East Stage 2 development (SSD 7628). These upgrades include an upgrade of the M5 Motorway and Moorebank Avenue intersection (development consent condition B.13 – Road Infrastructure Upgrades).

By incorporating the required upgrade to the M5 Motorway and Moorebank Avenue intersection as part of the REF proposal, Transport has sought to reduce the potential for substantial cumulative traffic impacts on its customers and the broader community living and working around the proposal that would be caused by:

- Transport's delivery of M5 Motorway upgrades to improve safety, traffic flow and active transport measures
- The separate delivery of the M5 Motorway / Moorebank Avenue intersection upgrade by the proponent of the Moorebank Logistics Park.

As indicated in the REF, Transport is in discussions with the proponent of the Moorebank Logistics Park and other external parties to secure a funding contribution for the delivery of the M5 Motorway / Moorebank Avenue intersection component of the proposal, having regard to the proponent's obligations under the Moorebank Intermodal Precinct East Stage 2 development consent.

2.2.3 Project justification

Submission number(s)

12, 28, 31, 32

Issue description

Respondents made the following comments related to the project's justification:

- General concern raised about future traffic growth associated with surrounding developments (including residential apartments in Liverpool and the new Western Sydney Airport) and the capacity of the road network to cater for this growth.
- The existing M5 Motorway does not service current road network requirements.
- The *Future Transport 2056 Strategy* (Transport for NSW, 2018a) acknowledges that "building our way out of congestion is not a sustainable solution". The NSW Government should focus its investment on public and active transport.
- Concern that the proposal will preclude future widening of the M5 Motorway without significant rework.

Response

Transport acknowledges the respondents concerns about current traffic conditions along this section of the M5 Motorway and the impact that future traffic growth will have on the road network. As discussed in Section 2.2.2 of the REF, the existing weaving issue between Moorebank Avenue and Hume Highway intersections contributes to travel time delays for motorists travelling westbound on the M5 Motorway. This weaving issue also creates a potential safety risk for westbound traffic with 224 crashes reported within the proposal area between January 2014 and December 2018.

The M5 Motorway westbound, in its current configuration, is not expected to be able to accommodate future pressure on the road network associated with the operation of the Moorebank Logistics Park and local and

regional population growth. Upgrades to this section of the M5 Motorway are required to support current and future transport needs, whilst also improving access to employment opportunities, allowing for growth in industries and creating a more sustainable transport network overall.

The proposal has been designed to cater for an increased travel demand along this section of the M5 Motorway. Traffic modelling completed as part of the REF (documented in Section 6.2 of the REF) showed that the proposal is expected to result in improved efficiency with shorter queues and travel times westbound along the M5 Motorway. Traffic modelling was completed for the proposal for the 'year of opening (2026)' and '10 years after opening (2036)'. This traffic modelling confirmed that the proposal would result in overall improvements in performance of the M5 Motorway / Hume Highway intersection and the M5 Motorway / Moorebank Avenue intersections during the PM peak in 2036 (as outlined in Table 6-27 of the REF), compared to a 'do nothing' scenario. The traffic modelling also showed that, without the proposal, overall interchange performance would worsen for all assessed road intersections over time.

The proposal is aligned with several strategic policies and government strategies, which includes *Future Transport Strategy 2056* (Transport for NSW, 2018a) (the Strategy). Of the six outcomes included in the Strategy, the proposal aligns most closely with 'supporting a strong economy' and 'focusing on safety and performance'.

By improving the efficiency and safety of the M5 Motorway in this critical location, the proposal supports present and future transport needs, removes restrictions to employment opportunities, allows for growth in industries and creates a more sustainable transport network.

The Strategy also discusses the importance of an integrated road and rail logistics network supported by intermodal terminals, dedicated and high performing pathways and major freight corridors (Transport for NSW, 2018a). The proposal facilitates the realisation of the Strategy as it would provide effective and safe access to the Moorebank Logistics Park, as well as support connections for south west Sydney.

Further discussion on the proposal's need and benefits is provided in Sections 2.1 and 2.2 of the REF.

Transport acknowledges the respondent's request for further investment to be made to the public transport network; however, public transport would not address the proposal's need to improve the safety and reliability associated with the use of the M5 Motorway, nor its objectives to:

- Provide efficient and reliable access between the Moorebank Logistics Park precinct and the State road network
- Support the M5 Motorway as the key through-traffic connection for south west Sydney
- Support the growth of and access to the Liverpool CBD through provision of an efficient arterial road network
- Provide solutions that contribute to improved road safety outcomes.

Notwithstanding, the proposal would improve safety for cyclists and pedestrians by providing a new shared path on the westbound side of the M5 Motorway between Moorebank Avenue and the Hume Highway. Further discussion on active transport provisions proposed as part of the M5 Motorway Westbound Traffic Upgrade is provided in Section 2.7.7 and Section 2.7.8.

Transport notes the concern towards the proposal and the future capacity of upgrades within the proposal area. This proposed design does not preclude future upgrades and additionally proved to be the most economically viable, presented the least constructability issues and the best fit with existing and strategically planned future road infrastructure. Any future upgrades at this location of M5 Motorway were not included as part of the scope of the proposal and would be subject to a separate assessment and approval process.

2.3 Proposal design

2.3.1 Road design

Submission number(s)

5, 23, 38, 43

Issue description

Respondents sought the following clarifications about the road design and proposed changes to traffic movements:

- Will vehicles travelling northbound on Moorebank Avenue still be able to turn left onto the M5 Motorway and then exit onto the Hume Highway to access Casula?
- Will vehicles travelling eastbound on the M5 Motorway still be able to use the Moorebank Avenue interchange to make a U-turn to access M5 Motorway westbound and the Hume Highway exit?
- How will the proposal connect into Moorebank Avenue widening work currently being delivered by others as part of the Moorebank Avenue / Anzac Avenue Interchange (MAAI) work? Specifically, the proposal will provide three eastbound right turn lanes at the M5 Motorway exit at Moorebank Avenue; however, only two lanes are being provided on Moorebank Avenue (southbound) as part of the MAAI.
- Requests that the proposal is designed to maintain current speed limits noting the design speed of the proposed new Hume Highway exit ramp is 90km/h, with a posted speed limit of 80km/h.

Response

The proposal would not restrict drivers access from Moorebank Avenue northbound to the Hume Highway in Casula. Vehicles would still be able to safely access the Hume Highway at Casula if they entered the M5 Motorway at Moorebank Avenue. Drivers would be able to exit at the Hume Highway using the proposed new off-ramp from the M5 Motorway.

The proposal would not allow vehicles travelling eastbound on the M5 Motorway to use the Moorebank Avenue interchange to make a U-turn to access M5 Motorway westbound and the Hume Highway exit. U-turns are not permitted at the Moorebank Avenue interchange, as current road rules prescribe that drivers are not to make a U-turn at intersections with traffic lights unless there is a 'U-turn permitted' sign. Drivers would continue to be prevented from using Moorebank Avenue interchange to make U-turns on the M5 Motorway.

The proposal would include widening the eastbound exit from the M5 Motorway at Moorebank Avenue to provide an additional third right turn lane onto Moorebank Avenue southbound. Three lanes are proposed to allow a greater volume of vehicles to travel through the intersection during each green traffic signal. In addition to this, the third lane would provide an opportunity for heavy vehicles to be passed by faster moving traffic. A merge length of about 90 metres would be required from the outer left lane once the vehicles have entered Moorebank Avenue, as the three lanes would merge into two.

Transport does not propose to permanently lower the existing posted speed limit on the M5 Motorway as part of this proposal. However, temporary speed reductions are anticipated to be required on the M5 Motorway during construction to manage road safety. As documented in Section 3.3.7 of the REF, it is anticipated that the speed limit along the M5 Motorway would need to be reduced to 80km/h during some construction activities (this is subject to Road Occupancy Licence approval). Any proposed temporary speed reductions would be subject to further negotiation with the motorway operator.

Transport confirms that the design speed of the proposed new Hume Highway exit ramp would be 90 km/h, with a posted speed of 80 km/h. The posted and design speeds are in accordance with Transport's specifications and adopted from the Austroads guideline.

2.3.2 Bridge design

Submission number(s)

10

Issue description

The respondent raised the following questions about the proposed design of the new bridge over the Georges River:

- Will the proposed new bridge be a single span structure with no additional pylons located in the Georges River?
- Will the existing height clearances beneath the Georges River bridge be maintained for waterway users?

Response

Transport confirms that the proposed new Georges River bridge crossing would be a multi-span structure (consisting of six spans), similar to the existing M5 Motorway bridges. Bridge piers would be between 35 metres and 55 metres apart, with the longest distance between two piers being between pier four and pier five on either side of the Georges River. A single span structure (without supporting piers) would not be suitable at this location due to the length of bridge required to cross over the Georges River, local roads and adjacent rail lines.

Transport does not propose to place any new bridge piers in the Georges River, with proposed pier locations being similar to the existing westbound M5 Motorway bridge. The closest piers to the river would be located about one metre (eastern side) and six metres (western side) from the rivers normal water level.

Transport confirms that the new bridge has been designed to match the top of the existing bridge, although there may be minor differences in the exact height clearances between the two bridges. However, this would be very minor and would not impact any of the existing activities in the river. Therefore, clearances for existing waterway users would be maintained with the proposal.

2.3.3 Tolls

Submission number(s)

1, 2, 12, 14, 17, 32

Issue description

Respondents raised the following questions and comments relating to tolls:

- Will a toll be introduced on this section of the M5 Motorway as part of the proposal?
- Concern raised about the cost of tolls and subsequent levels of congestion experienced on the M5 Motorway.
- Requests that tolls are removed from the M5 Motorway.

Response

The section of M5 Motorway within the proposal area is currently a toll free road. Transport does not propose to introduce a toll along this section of the M5 Motorway as part of the proposal.

2.3.4 Road maintenance

Submission number(s)

22, 38

Issue description

Respondents raised the following issues regarding road maintenance:

- Concern about the volume of roadside litter (and who is responsible for removing it) and other debris located along this section of the M5 Motorway and the associated safety risks it poses to road users.
- Request that landscaping allow for Motorway maintenance access.
- Clarification sought around the responsibility for maintenance of the proposed new infrastructure along the M5 Motorway, such as bridges, shared path, additional CCTV.
- Respondent requests that an interface agreement be set out between Interlink Roads Limited and Transport regarding access to the M5 Motorway leased area and maintained access to all assets relating to the M5 Motorway, including where access to construction areas is required.
- Concern about the location of the proposed sediment basin beneath the Georges River bridge and on flood prone land, this will limit maintenance access, especially for excavators; while floodwaters may impact upon the basins structural integrity and accessibility for maintenance staff to capture the spill.

Response

During operation of the proposal, regular maintenance would be carried out as part of the M5 Motorway's maintenance regime and would include monitoring and collection of roadside waste. The Motorway operator would be responsible for the maintenance of new infrastructure, and access for maintenance activities would be maintained.

Transport confirms that landscaping proposed as part of the M5 Motorway Westbound Traffic Upgrade would comply with safety and maintenance requirements. Suitable species would be selected based on a number of considerations, such as site conditions (and the species growing requirements) and the ongoing maintenance risk that any planted vegetation could pose to the road network and adjacent land uses. The final landscaping strategy for the proposal would be developed during detailed design in consultation with relevant stakeholders (including Council and the Motorway operator).

Transport acknowledges the limitations associated with the location of the proposed spill basin and would continue to refine the drainage design of the proposal (including the location of the spill basin) during detailed design, including appropriate maintenance access requirements. The area of the new spill basin was selected as the most appropriate location due to limited available space around the M5 Motorway corridor. The proposed basin spillway level is higher than the top of the bank of the Georges River and, therefore, the basin is accessible for everyday access; however, access may be restricted during flooding events.

2.3.5 Road drainage

Submission number(s)

43

Issue description

The respondent sought clarification about whether Amiens Wetland (owned by the Commonwealth) is proposed to be used as a drainage structure for the M5 Motorway.

Response

Amiens Wetland is not proposed to be used as a drainage structure for the M5 Motorway. As per existing conditions there would be a stormwater drainage network to the Amiens wetland that would discharge surface water flow to the wetland. However, this would only accommodate low flows, with wet weather flows and any excess flow discharging directly to the Georges River via a new stormwater drainage system.

2.3.6 Other design suggestions

Submission number(s)

4, 15, 19, 26

Issue description

Respondents made the following design suggestions:

- Suggests the traffic weaving issue could be addressed by installing traffic barriers along the M5 Motorway to prevent vehicles merging into the Hume Highway exit lane from the inner lanes of the M5 Motorway.
- Suggests the Moorebank Avenue turn off lane headed west is changed to a Moorebank Avenue or Hume Highway lane to stop weaving.
- Suggest the Hume Highway exit storage capacity is increased prior to construction by sealing the existing verge as a Pinch Point Project.
- Suggests an overhead exit bridge to eliminate congestion between Moorebank Avenue and the Hume Highway.
- Suggests a bridge that goes past the Hume Highway before heading towards Liverpool CBD.

Response

The suggested alternative designs to address congestion and weaving on the M5 Motorway are noted. The proposed design, as presented in the REF, was one of eight options considered for the proposal. Of the eight preliminary options identified, the collector ramp with an underpass at Moorebank Avenue (Option 1B) was selected as the recommended option weighing up economic factors, constructability, best fit with existing and strategically planned future road infrastructure and minimising road traffic noise impacts. This option would meet the proposal objectives, as presented in Section 2.3 of the REF, and would improve safety by removing the weaving issue on the M5 Motorway.

The suggested road work to increase storage capacity on the Hume Highway exit ramp is noted. However, this is not considered feasible as the existing shared user path is located adjacent to this area. Additional space would also be required for construction of the proposal.

An overpass at Moorebank Avenue was considered in place of the underpass (option 2B in the REF). This option provided similar benefits, however, was more expensive and was, therefore, not further explored. Shortlisted option 4B in the REF, included braided ramps (elevated roadway) west of the Georges River with an overpass at the Hume Highway exit ramp and an overpass of the Hume Highway. This option was eliminated as it was the least cost effective option, had greater environmental impacts, and potentially restricted future upgrades at the proposal location. Therefore, a bridge that goes past Hume Highway was not further considered.

2.4 Proposal construction

2.4.1 Construction methodology and timing

Submission number(s)

9, 10, 13, 30, 44

Issue description

Respondents raised the following comments and queries regarding construction methodology and timing:

- Concern about the length of time it will take to construct the proposal.
- Clarification sought about when construction of the proposal is due to commence.
- Requests that Transport clarifies the proposed timing and duration of the proposed work, particularly those proposed to be carried out on and around Secombe Place.
- Requests that construction work is programmed to minimise disruption to the Moorebank Logistics Park and its tenants and that Transport consults with potentially affected businesses to manage these disruptions.

Response

Construction of the proposal is expected to take 40 months to complete, assuming no unforeseen disruptions. Construction would be staged to minimise disruptions to the community and nearby businesses. There would be six construction areas across the proposal, with construction stages occurring concurrently to reduce construction time. The staging would take into consideration operation of projects in the surrounding area to manage potential cumulative impacts. Construction timing would be further refined during detailed design and communicated to impacted stakeholders.

While work is being completed along the M5 Motorway adjacent to the Moorebank Business Park, an inter-property access via Secombe Place would be required. The work to be completed at this location comprises part of the work scheduled for construction areas 1 and 2.

2.4.2 Existing environmental controls within the M5 Motorway

Submission number(s)

38

Issue description

The respondent requested that all existing environmental controls along the M5 Motorway remain in operation until the proposed new environmental controls are established, this includes spill basins and utilities. It is requested that the proposal also minimises the removal of existing noise barriers until feasible and reasonable mitigation measures are implemented to minimise impacts on the existing acoustic amenity of sensitive receivers.

Response

All existing environmental controls including spill basins, utilities and noise walls (where feasible) would remain in place and operational until the proposed new infrastructure is established.

Transport acknowledges the benefits that noise walls and other forms of proposed noise mitigation (including at-property treatments) would have in managing construction noise impacts. For this reason, Transport would seek to not remove existing noise walls until the new noise walls are built (subject to space constraints and whether the new wall can reasonably be built with the existing noise wall in place). Transport would also seek to provide at-property noise treatments to eligible receivers early in the construction program (ideally before the commencement of noise intensive work).

Further discussion on the management of construction noise impacts is provided in Section 2.6.4 of this report.

2.4.3 Road work speed reductions

Submission number(s)

38, 43

Issue description

The respondents raised the following queries, concerns and requests about road work speed reductions:

- Clarification sought about the proposed construction speed reduction on Moorebank Avenue. The REF indicates that the speed limit on Moorebank Avenue will be reduced to 40km/h during construction. Clarification sought about whether this speed reduction will be in place at all times (i.e. 24 hours per day) for the entire duration of construction. Clarification also sought about how these changes will be communicated.
- Concern raised about the proposal's impact on the operational performance of the Moorebank Logistics Park due to speed reductions and congestion caused by construction vehicles.
- Interlink Roads request to review the construction phasing and design to reduce the need and timing of a reduced speed limit on the M5 Motorway during construction of the proposal.

Response

Construction of the proposal would require traffic switches on Moorebank Avenue during the construction of the underpass. Speed limits on the M5 Motorway may be reduced to 80 kilometres per hour, and other areas within the proposal area, including Moorebank Avenue, may be reduced to 40 kilometres per hour. The duration of this reduced speed would be minimised where possible; however, it may be required for an extended period of time during the construction of the underpass. The speed restrictions on Moorebank Avenue would apply for Stage 1 through to Stage 4 and is anticipated to be up to 30-32 months with allowance for weather. This is subject to Road Occupancy Licence (ROL) approval and is required to ensure worker safety during construction. This would be confirmed during detailed design and reviewed throughout construction. Key stakeholders, such as Council, Interlink Roads and LOGOS (as the representative for tenants in the Moorebank Logistics Park), would be consulted throughout detailed design and during the preparation of construction staging.

The performance of the road network would continue to be monitored throughout construction of the proposal by the Traffic Management Centre. Where required, Traffic Management Centre may require Transport (and its Construction Contractor) to modify its Construction Traffic Management Plan to reduce the proposal's impact on the road network.

Further discussion on the management of construction traffic impacts is provided in Section 2.7.9 of this report.

2.4.4 Construction access arrangements

Submission number(s)

43, 44

Issue description

The respondents raised the following queries about construction access arrangements:

- Questions if the construction access arrangements described on Page 93 of the REF involve the use of the new roundabout that LOGOS is currently constructing near Bapaume Road (which is located within the Moorebank Logistics Park).
- Request that approval is sought from ABB for its construction access arrangements around Bapaume Road. Bapaume Road will be restricted to left-turn exit only in early 2023. Following this change, access to the ABB site will only be achievable via an easement over the private road in favour of the occupant.
- Requests access details during construction of proposed works on Secombe Place.
- Concern raised that a recent warehouse expansion constructed on 2-8 Secombe Place does not appear to have been identified in the REF. This warehouse may have implications for Transport's proposed construction access strategy.

- Clarification sought as to whether there will be impacts due to the proposed traffic switches and the proposed 'left turn into the construction area from Moorebank Avenue northbound.' The Moorebank Avenue and Anzac Road Intersection is critical for the operation of the Moorebank Logistics Park.
- Requests that Transport monitors the performance of Moorebank Avenue and Anzac Road Intersection throughout construction of the proposal and consider whether any construction vehicle movement restrictions should be implemented during the AM/PM peaks.

Response

Transport confirms that the proposed construction access strategy, including access to the ancillary facility, would involve use of the new roundabout that LOGOS is constructing near Bapaume Road. The use of this section of road would be subject to further consultation with the relevant road authority, LOGOS and ABB. This would be ongoing to establish the necessary agreements and arrangements for leasing and access prior to construction. There would be no access to private property where there is no prior consultation or agreement.

Transport acknowledges the recent warehouse expansion constructed on 2-8 Secombe Place and the implications that this may have for the proposed construction access strategy. Inter-property access via Secombe Place would be required to access construction activities being completed on the M5 Motorway, east of Moorebank Avenue and adjacent to Moorebank Business Park. This work comprises part of the work scheduled for construction areas 1 and 2. Transport would continue to consult with impacted businesses detailed design regarding the proposed construction access arrangements. The impacted businesses would be updated about the proposed access arrangements and temporary construction leases obtained prior to work commencing.

There are expected to be minor impacts from the proposed 'left turn into the construction area from Moorebank Avenue northbound'; however, vehicles would use the dedicated left turn lane to minimise impacts to the road network. These impacts would be attributed to the increase in construction vehicles; however, this increase would be negligible compared to existing traffic volumes on Moorebank Avenue.

As part of the Traffic Management Plan the performance of affected intersections, such as the Moorebank Avenue and Anzac Road intersection, would be monitored and appropriate mitigation measures would be put in place if required.

2.4.5 Cumulative impacts

Submission number(s)

29, 30, 35, 43

Issue description

The respondents raised the following requests regarding cumulative impacts:

- Requests that Transport establish a Construction Communication Coordination Group to manage potential cumulative impacts. This should involve relevant leads from Construction Contractors on major projects to manage the communications interface between community notifications of upcoming works and consultation events of each party in order to minimise community confusion.
- Concern about the cumulative construction impacts to residents and business owners associated with traffic and access impacts, multiple disruptions and outages of public utilities (due to a number of projects being carried out in this location). This includes impacts around the Moorebank Avenue interchange and impacts to businesses along Secombe Place.
- Concern about the environmental impact of over development of the Moorebank area and the cumulative impacts with the Moorebank Logistics Park.

Response

Transport would form a Communication Coordination Group to manage potential cumulative construction impacts, such as traffic and access impacts, disruptions and outages to public utilities. These potential impacts would be refined during detailed design and informed by Transport's ongoing consultation process. Mitigation measures SC1 and CI1 have been amended to address this requirement (refer to Section 6.2 of this report).

As part of the consultation process there would be ongoing communication between major projects in the area to manage community notifications of upcoming works and consultation events of each party to minimise community confusion.

The CEMP would also consider potential cumulative impacts from known surrounding development activities as well as new planned development activities near the proposal. This would include a process to regularly review and update mitigation measures as new works are identified that may lead to cumulative impacts or if complaints are received due to cumulative impacts.

The REF assessed the cumulative impacts of other major projects in the vicinity of the proposal (refer to Section 6.12 of the REF). As part of the assessment other potential environmental impacts were identified for construction and operation. This included the clearance of native vegetation during construction that may have a minor cumulative impact of biodiversity in the region, potential minor changes to stormwater drainage and flooding during operation. The proposal is located within an urban environment with existing infrastructure. It may not be possible to directly safeguard or manage impacts from other projects; however, there is the opportunity to work with other developers to minimise cumulative environmental impacts.

2.5 Consultation

2.5.1 Consultation with impacted businesses

Submission number(s)

18, 30, 43, 44

Issue description

Respondents raised the following requests and concerns related to impacted properties:

- Requests that LOGOS is included as a key stakeholder to be consulted about the proposal due to its potential impact on the Moorebank Logistics Park.
- Requests Transport to consult with the Moorebank Intermodal Community Committee.
- Requests that Woolworths Group is included as a stakeholder for ongoing consultation about the proposal.
- Requests that Transport promptly advises the owner and tenant's of 2-8 Secombe Place about any decisions it makes regarding the next steps of the project.
- Concern raised that Goodman Property Services (Aus) Pty Limited (Goodman) has not been contacted to discuss the proposal's impact on 2-8 Secombe Place within the Moorebank Business Park. Goodman understands that Transport has recently been in discussions with the tenants of this property; however, is concerned that Goodman has not been involved in these discussions.

Response

Transport is committed to continue the engagement of the community and stakeholders throughout the development of the proposal. All stakeholders that have identified an interest in the proposal during the REF public display period would be consulted as the proposal progresses. These stakeholders will include LOGOS, the Moorebank Intermodal Community Committee, Woolworths Group, Goodman Property Services (Aus) Pty Limited and businesses located in 2-8 Secombe Place, Moorebank.

Since the REF has been on public display, representatives from Transport's M5 Motorway Westbound Traffic Upgrade team have attended meetings with key stakeholders, including businesses and landowners potentially directly affected by the proposal. Stakeholders consulted include Amtek Pty Ltd's (Amtek), Goodman Property Services (Aus) Pty Limited, National Intermodal Company and other industrial businesses in the local area.

Feedback received during these meetings have been, and will continue to be, used by Transport to inform detailed design and construction of the proposal. As a result of this feedback, Transport has included the following additional mitigation measures to further manage the proposal's impact on adjacent businesses and landowners:

- NV11 – included to further mange construction vibration impacts to the occupants of 2-8 Secombe Place, Moorebank
- B19 and B20 – included to manage the proposal's impact on Biobanking Agreement No. 341
- LCVIA7 – included to manage privacy concerns around 2-8 Secombe Place, Moorebank.

These additional mitigation measures are documented in Section 6.2 of this report.

Transport's commitment to further consultation with key stakeholders is also documented in amendments to mitigation measures SC1 and CI1, which requires Transport to establish a Construction Communication Coordination Group as part of the Communication Plan (refer to Section 6.2 of this report). Mitigation measure SC5 has also been amended to require Transport (and its contractor) to consult with Liverpool City Council, LOGOS (as the representative for tenants within the Moorebank Logistics Park) other project teams and the community to reduce cumulative construction impacts. These revised mitigation measures are documented in Section 6.2 of this report.

Transport acknowledges the respondent's request to receive timely updates about the proposal, including Transport's decision about whether it will proceed with the proposal. Transport will inform the community and stakeholders of this decision in a timely manner.

2.5.2 Consultation with active transport users

Submission number(s)

31

Issue description

The respondent made the following requests relating to active transport consultation:

- Bicycle User Groups are consulted during the development of the Construction Traffic Management Plan.
- Bicycle User Groups are regularly consulted about the design of active transport provisions (including temporary provisions required to manage construction impacts) to minimise inconvenience to cyclists and communicate temporary changes to the wider cycling community.
- Bicycle NSW is provided the opportunity to give further feedback once detailed designs for the junctions, landscaping, signage and ancillary facilities are finalised.

Response

Consultation would continue with Bicycle User Groups during detailed design to understand how best to minimise inconvenience to cyclists. This would include Liverpool City Council, who would be responsible for providing active transport provisions on Council roads. The community would continue to be updated about the progress of the proposal and provided notification of any road closures or night work in advance of the work occurring.

2.5.3 Length of REF display period

Submission number(s)

42, 44

Issue description

The respondents made the following comments:

- Concern about the length of time that was available for people to make a submission about the proposal. Four weeks was not an adequate length of time to review the REF and supporting technical studies.

- Requests that an estimated timeframe in which Transport expects to reach a final decisions on the next steps of the project is provided.

Response

Transport notes the frustration with the length of time the REF was on public display. The REF was on public display for 32 days, between 29 August 2022 and 29 September 2022, which is in accordance with Transport's 'Environmental Assessment Procedure' (Transport, 2023).

To assist with community concerns and provide real-time information two face-to-face community consultation sessions were held in the local area on 8 September 2022 and 17 September 2022. One online community session was also held by Transport via Microsoft Teams to provide further information on the proposal, answer questions from the community and encourage the community to provide a formal submission on the REF.

Transport is committed to continue the engagement of the community and stakeholders throughout the development of the proposal. All stakeholders that have identified an interest in the proposal during the REF public display period would be consulted as the proposal progresses.

2.6 Noise and vibration

2.6.1 REF assessment methodology

Submission number(s)

34, 41, 43

Issue description

Respondents raised the following queries and concerns around the assessment methodology for noise and vibration:

- Queries why the proposal was classified as a 'redevelopment of an existing road' for the purposes of the operational traffic noise assessment, rather than being classified as a 'new road' as it involves the construction of a new bridge along the M5 Motorway.
- The REF incorrectly identifies part of the Moorebank Logistics Park as open space (land use classified as 'Other (outdoor active)'). The intended industrial land use of this area is known and should have been considered in the noise and vibration assessment.
- Concern raised that traffic noise from the M5 West Widening Project has not been verified 10 years after that project opened to traffic. Requests that Transport verifies the '10 years after opening' traffic noise levels for the M5 West Widening Project to confirm that these noise levels are consistent with the noise levels predicted in that project's environmental assessment. Requests that such an assessment is completed for residential dwellings on St Andrews Boulevard, Phoenix Crescent, Woodbrook Avenue and Segefield Place, Congressional Drive and Deerwood Avenue.

Response

The proposal was correctly classified as a 'redevelopment of an existing road' for the purposes of the operational traffic noise assessment. This is because the proposal (including the proposed new bridge) is located along an existing road corridor (i.e., the M5 Motorway) and would involve the duplication of existing road infrastructure. When determining whether a proposed road upgrade is classified as a 'new road' or a 'redevelopment of an existing road', the proposal is evaluated based on its offset from the existing road alignment as per the *Road Noise Criteria Guideline* (Transport 2022) and not as individual elements, such as a new bridge. Therefore, the proposal overall sits within the 'redevelopment of existing road' category rather than as a 'new road' category. This approach is consistent with the *Road Noise Criteria Guideline* (Transport 2022) and the *Road Noise Policy* (RNP) (NSW EPA 2011).

Transport acknowledges that the REF incorrectly identified parts of the Moorebank Logistics Park (industrial land currently under construction) as a non-residential 'other (outdoor active)' sensitive receiver (as indicated on Figure 6-1 of the REF). Notwithstanding, the noise and vibration assessment is still considered to be valid as a more conservative land use (and thus more restrictive noise criteria) was assessed for this location. For this reason, no additional noise assessment or mitigation measures are proposed. Transport would complete

additional noise assessments during detailed design and post construction, which would consider any land use changes within the study area.

Transport confirms that there is no requirement in its policy to verify (through additional noise monitoring) traffic noise from the M5 West Widening project 10 years after that project opened to traffic. In accordance with Preparing a Post Construction Noise Assessment Report Procedure, a Post Construction Noise Assessment would be completed for that project during the opening year to verify the noise level predictions made in the REF for both the year of opening and design year scenarios (i.e. 10 years after project opening). This Post Construction Noise Assessment reviews and updates the suitability and applicability of all assumptions and inputs used in the noise predictions, where considered necessary. Concerns related to existing traffic noise can be raised through Transport's Noise Abatement Program. The respondent is requested to raise this noise concern with the Noise Abatement Program by visiting Transport's Noise Abatement Program website via the following weblink: https://www.transport.nsw.gov.au/operations/roads-and-waterways/environment-and-heritage/reducing-road-traffic-noise/noise-abatement.

2.6.2 Existing road traffic noise impacts

Submission number(s)

34, 41

Issue description

The respondents raised the following comments and concerns about the impacts of existing road traffic noise:

- Concern about the ongoing history of noise pollution from the M5 Motorway for residents of Liverpool and Casula Links and the NSW Government's resistance to build noise walls along the M5 Motorway bridge crossings of the Georges River.
- Notes that noise impacts have affected residents' quality of life (health and wellbeing) as well as property values.

Response

Transport acknowledges the frustration of existing noise impacts in the area surrounding the proposal and the historical developments that have attributed to this. Transport considers areas with high existing noise levels through the use of the cumulative noise limit and acute noise level triggers for consideration of noise mitigation. Where receivers have exceeded these triggers, noise mitigation has been considered according to feasibility and reasonability requirements in accordance with the *Road Noise Mitigation Guideline* (Transport 2022). Historically, the area has undergone discrete developments that individually provided mitigation, where considered reasonable and feasible. The historic discrete developments have either not identified the requirement to consider noise walls or determined noise walls not to be feasible or reasonable under the relevant guidelines.

The *Noise and Vibration Impact Assessment* for the proposal identified that the proposal would not substantially alter the existing road traffic noise levels in the study area. The ambient noise environments are influenced by road traffic along the M5 Motorway, including compression braking, motorbikes accelerating and truck air horns at the end of merge lanes, in addition to other existing (non-traffic) noise sources experienced near the proposal. It is anticipated that there would be an increase in traffic noise of up to two decibels for some residential receivers, compared to existing traffic noise levels. This change does not exceed the trigger of greater than a two decibel increase for the requirement of consideration of noise mitigation. A change of one or two decibels is generally difficult for most people to hear.

Although, as the existing noise levels exceed the relevant noise criteria, mitigation measures would be provided to impacted sensitive receivers. Examples of the mitigation measures include at property treatment and noise walls. The final noise mitigation measures, including those offered to those 81 residential properties that qualify for mitigation, would be confirmed during detailed design and in accordance with Transport's *Road Noise Mitigation Guideline*. Further details on noise mitigation are provided in Sections 2.6.6 and 2.6.7.

2.6.3 Background noise monitoring data

Submission number(s)

34, 41

Issue description

Respondents raised the following queries and concerns around the background noise monitoring data for noise and vibration:

- Why the Noise and Vibration Assessment only carried out background noise measurements at three residential sites in Liverpool and Casula? Why weren't additional residential properties selected for background noise measurements, particularly those dwellings located closer in elevation to the M5 Motorway?
- Why background noise monitoring data was collected during the Covid pandemic just after associated lockdowns had concluded. Traffic volumes would have been much lower during this period. Why wasn't noise monitoring carried out post Covid lockdowns to reflect normal traffic volumes?
- Concern raised about the validity of the background noise levels documented in the REF. The noise levels presented in the REF are lower than noise measurements that Transport (and the former RTA) completed previously (for example in 2009). How can road traffic noise be lower now that it was in earlier years, where traffic volumes have significantly increased on the M5 Motorway?

Response

It is not feasible to carry out monitoring at every single property potentially affected by the proposal. Unattended and attended noise monitoring was completed at a representative sample of locations within the REF proposal area, as per the requirements of the NSW *Road Noise Policy* (RNP) (DECCW 2011) and Transport's *Noise Criteria Guideline* (NCG) (Roads and Maritime 2015) for road upgrade projects. Road traffic noise monitoring locations are selected and conducted at the potentially most affected and representative locations. The locations selected are representative of appropriately grouped noise sensitive receivers. The guidelines also note that the monitoring should be carried out at distances from the existing alignment that allows for verification of the noise model over the study area (600 metres from the centre line of the outermost traffic lane on each side of the subject road).

If there is a risk of interference from extraneous noise sources (i.e. non-traffic related noise such as dogs barking and air conditioners etc) which may amplify the measured noise levels, noise measurement may be conducted in the free field (i.e. away from any noise reflecting surfaces such as building facades or fences) and façade correction added to the measured L_{Aeq} noise levels. The results of the noise monitoring have been analysed to exclude noise from extraneous events and data affected by adverse weather conditions, such as strong wind or rain, to establish representative existing noise levels for each NCA. All equipment used carried current National Association of Testing Authorities (NATA) calibration certificated and calibration was checked before and after each measurement.

The noise monitoring was carried out for the proposal between 29 October and 6 November 2020. While this monitoring coincided with the Covid-19 pandemic, Sydney was not in a government mandated lockdown. It is acknowledged that traffic patterns may have changed as a result of the pandemic, however, this would not have affected the validity of the operational noise model. This is because the measured noise levels were used to confirm the accuracy of the operational noise model. Specifically, the traffic noise levels measured in 2020 were compared to traffic noise levels predicted by the operational noise model. This process (known as model validation) confirmed that the operational noise model was accurately predicting the traffic noise levels measured in 2020. The validated operational noise model was then used to predict noise levels from the operation of the proposal to the surrounding receivers. The predicted traffic volumes for 2026 and 2036 were used for the operational traffic noise assessment. For this reason, the background noise data is considered valid for the purposes of assessing the proposal's operational noise impact.

It is also to be noted that if background noise levels were lower than what is typically expected prior to the Covid pandemic then more stringent construction noise criteria would have been applied for the assessment and mitigation requirements. This would result in a more conservative assessment, meaning noise mitigation measures will be triggered at a lower noise level during construction than if these noise level were monitored before the COVID pandemic. Therefore, the noise and vibration impact assessment is considered adequate. The need for further assessment or mitigation measures would be determined during detailed design.

The respondent's concern relating to potential inconsistencies between noise levels presented in the REF and those recorded during earlier investigations is noted. Multiple factors can affect noise measurements, including acoustic shielding, topography, elevation and line of sight. It is understood that various aspects of the motorway have changed over recent years which would potentially affect noise emissions, including construction of additional noise walls and pavement re-surfacing. Monitoring conducted in similar but different locations can also contribute to difference in measured noise levels. The measured noise levels are an average of the noise you would expect, whereas real-time measured noise could be higher or lower at certain times.

2.6.4 Construction impacts

Submission number(s)

35, 44

Issue description

Respondents raised the following concerns and requests relating to construction noise and vibration impacts:

- Requests detailed construction noise impacts for 2-8 Secombe Place, which were not included in the REF.
- Concerns raised by Amtek about predicted construction noise impacts to their facility.
- Concern raised about potential construction vibration impacts to Amtek's vibration sensitive equipment.

Response

Amtek's concerns regarding the proposal's construction noise impact around its facility is acknowledged. Figure 7 and 8 of the *Noise and Vibration Impact Assessment* (Appendix C of the REF) illustrate that 2 – 4 Secombe place are not predicted to have construction noise impacts above the noise management level (NML). However, the Amtek facilities located at 6 Secombe Place are expected to have 'moderately intrusive' impacts during peak utility adjustment and earthworks, with predicted noise levels to be 82 dB. This falls into the 11 – 20 dB NML exceedance category based on a criterion for a commercial premises of 70 dB. 8 Secombe Place is expected to have clearly audible impacts during peak utility and earthworks, with a 0 – 10 dB NML exceedance. This is the worst-case scenario, particularly when noise intensive equipment such as rockbreakers or concrete saws are in use near to receivers. The impacts are assuming work is being completed in all locations at the same time. In reality, for most scenarios, work would occur in one area before moving to the next location which would limit the impacts to the surrounding receivers. Temporary mitigation measures would be put in place to manage this impact, as outlined in Section 6.2.

Transport acknowledges Amtek's concerns about the potential for construction vibration to interfere with vibration sensitive equipment. Transport will continue to consult with Amtek during detailed design and throughout construction to manage this potential issue. Management measures that would be developed in consultation with Amtek include:

- Identification of applicable vibration limits for sensitive equipment being operated at Amtek's facility
- Review of potential construction vibration impacts around Amtek's facility to confirm whether vibration levels are likely to exceed the applicable vibration limits for sensitive equipment
- Where vibration limits are predicted to be exceeded, construction methods would be reviewed and may include the consideration of alternative construction plant and equipment with lower source vibration levels
- Attended vibration measurements would be carried out at the start of the work to determine actual vibration levels at Amtek's facility. Different construction methods would be considered where possible if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria (refer to mitigation measure NV8)

Mitigation measure NV11 has now been included to ensure the above requirements are implemented during construction of the proposal.

2.6.5 Operational impacts

Submission number(s)

34, 35, 37, 41, 44

Issue description

Respondents raised the following concerns and requests relating to operational noise and vibration impacts:

- How are surrounding residential receivers to live with noise levels in excess of the acute measure L_{Aeq} 60 dB during the day and L_{Aeq} 55 db at night.
- Concern about the loss of vegetation along the southern side of the M5 Motorway and the associated noise impacts to surrounding properties as the vegetation provides some reduction in road noise traffic.
- Concern the proposed lengthening of the westbound M5 Motorway on ramp from Moorebank Avenue will result in an increase in road noise with more space for heavy vehicles to accelerate before merging onto the motorway.
- Concern raised about traffic noise impacts on the value of residents properties, particularly those residents living in Liverpool and Casula Links.
- Concern raised about the increase in road traffic noise from the proposal following the opening of the Moorebank Logistics Park.
- Concern the proposed use of at-property treatments to mitigate operational road noise impacts does not protect residents backyards and prohibits residents ability to open their windows due to noise levels.
- Clarification sought about how Transport proposes to manage noise associated with heavy vehicle compression braking while using the proposed new/upgraded exit ramps.
- Requests detailed operational noise impacts for 2-8 Secombe Place, including Amtek's facility. The proposal will involve bringing the road corridor much closer to Amtek's facility as well as remove existing sound barriers (including the earth mound and trees). The building that Amtek occupies is not designed to mitigate noise; the building façade has large open vents, which do not provide adequate noise attenuation.

Response

The respondents' concerns about the proposal's operational noise impact is acknowledged. Transport's commitment to avoiding or minimising noise and vibration impacts from road traffic on State roads is described in *Road Noise Criteria Guideline* and *Road Noise Mitigation Guideline* (Transport 2022). The *Road Noise Criteria Guideline* provides a practical approach to applying the *Road Noise Policy* (RNP) (NSW EPA 2011). The RNP is a government endorsed policy that sets the criteria of $L_{Aeq(15hour)}$ 60 dB for daytime and $L_{Aeq(9hour)}$ 55 dB for night-time road traffic noise for redeveloped roads such as this project. These criteria are established with the goal that about 90 per cent of residents are not highly annoyed by noise.

A *Noise and Vibration Impact Assessment* was prepared for the proposal. This assessment considered the proposal design documented in the REF, including the effect that the proposed new traffic arrangements (such as the longer Hume Highway exit ramp) would have on operational traffic noise levels (now and into future). The assessment identified that the proposal would not substantially change existing road traffic noise levels in the study area, including at the Amtek's facilities, with a change of within one decibel expected for most residential properties. A change of 1 or 2 decibels in noise is generally difficult for most people to perceive. Notwithstanding, 81 residential properties would exceed the triggers for consideration of mitigation due to high existing road traffic noise levels. In accordance with the *Road Noise Mitigation Guideline* (Transport 2022), all 81 residential properties would be considered for additional noise mitigation.

Vegetation is not considered to provide effective noise mitigation or noise attenuation, and the removal of vegetation required for the proposal is not a contributor to predicted noise impacts associated with the proposal. Although vegetation may provide a visual screening, as it is not a solid obstruction, the amount of vegetation currently in place does not minimise noise impacts. The impacts to the properties in Moorebank Logistics Park have been considered and modelled in the *Noise and Vibration Impact Assessment.* The noise mitigation strategy prepared for the proposal would be used to determine the appropriate noise mitigation measures for impacted properties.

The noise assessment carried out for the proposal considered residential and non-residential receivers that may be affected by noise and vibration generated by the proposal. EPA's Road Noise Policy provides operational

criteria for noise sensitive receivers and land uses in Table 3 and Table 4. The Road Noise Policy does not classify commercial or industrial premises as noise sensitive and there are no mandatory operational criteria. The proposal is not predicted to substantially alter operational road traffic noise levels. The properties at Secombe Place are predicted to have a change of less than 1 dB increase, with Figure 2-2 showing predicted operational noise levels for the ground floor. A change of one or two decibels in noise is generally difficult for most people to perceive. Transport will continue to consult with impacted receivers and monitor the noise levels as required. Additionally, the increase in operational road traffic noise following the opening of Moorebank Logistics Park is expected to be minimal. Current construction traffic in the area currently uses the existing busy roads such as the M5 Motorway and Moorebank Avenue and due to the high existing volumes of traffic on these major roads operational noise would be generally difficult to perceive.

Transport is aware of the distress noisy heavy vehicle compression brakes can cause when used near residential areas. These issues are typically addressed through inspections, a Compression Brake Sign Education Strategy and by installing signs. Transport has found that installing additional compression brake signs following a resident complaint does not reduce the incidence of compression braking in the long term. Installing multiple signs along every section of arterial road where compression braking is an issue could also detract from other road safety sign messages and increase visual impacts. Therefore, no signage for compression braking is proposed to be installed within the study area as part of the proposal. However, the improved traffic flow, as a result of the reduced congestion, improves the steady state traffic flow. This would reduce the need for heavy vehicles to use brakes, therefore reduce the frequency of occurrences of noise from heavy vehicle compression braking.

The impacts to property values are difficult to predict as they are influenced by a number of market-based factors. The noise and vibration assessment completed for the REF identified that the proposal would not substantially change existing road traffic noise levels in the study area, with a change of within one decibel expected for most residential properties. A change of 1 or 2 decibels in noise is generally difficult for most people to perceive.

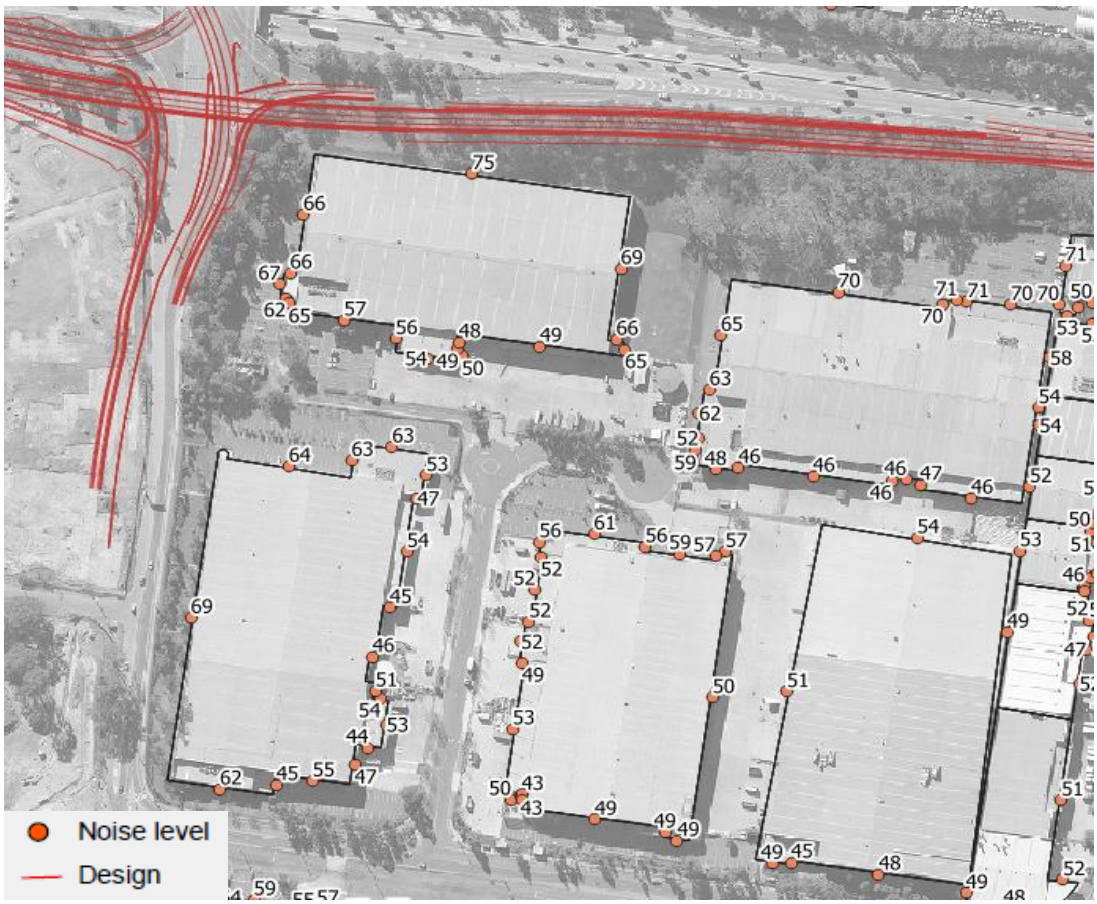

Figure 2-2 Predicted operational noise levels for the ground floor along Secombe Place

2.6.6 Principles for selecting operational noise mitigation

Submission number(s)

41

Issue description

The respondent raised the following query and concern regarding the principles for selecting operation noise mitigation:

- Questions the fairness in not providing noise walls at this location when other sections of the motorway have had noise walls installed.
- Concern about the ongoing history of noise pollution from the M5 Motorway for residents of Liverpool and Casula Links and the NSW Government's resistance to build noise walls along the M5 Motorway bridge crossings of the Georges River.

Response

Transport's commitment to avoiding or minimising noise impacts from road traffic on State roads is described in the *Road Noise Mitigation Guideline* (Transport 2022). This guideline outlines the approach Transport takes to the evaluation, selection and design of feasible and reasonable noise mitigation measures. A quieter pavement surface is the preferred form of noise mitigation as it reduces source noise levels. However, at-property treatments would be required for this proposal as other forms of mitigation (such as low noise pavements and noise barriers) would not achieve feasibility and reasonability requirements. The final noise mitigation strategy for the proposal would be further developed during detailed design in consultation with impacted receivers.

Transport acknowledges the respondents' concerns regarding existing road traffic noise and the perceived inequity of noise mitigation provided during previous stages of road work along other areas of the M5 Motorway. As described in the *Road Noise Mitigation Guideline* (Transport 2022), Transport adheres to the following principles when considering whether noise mitigation is feasible and reasonable:

- Communities should receive reasonable and equitable outcomes.
- Noise mitigation should be designed to reduce noise levels to the criteria at qualifying receivers.
- Priority should be first given to reducing noise during corridor planning and road design where there may be greater opportunity to provide cost effective and integrated outcomes with better urban design.
- Following corridor and road design residual exceedances of noise criteria may be addressed at qualifying receivers using in order of preference: quieter road surfaces, then barriers; then at-property treatments.
- Noise barrier evaluation processes must:
    - Give preference to reducing outdoor noise levels and the number of at-property treatments.
    - Provide efficient barrier heights and extents without disregarding lengths of effective noise barrier in front of eligible groups of receivers.
- Noise mitigation shall be evaluated and installed where feasible and reasonable.

The final noise mitigation measures would be determined during detailed design and would be delivered in accordance with these principles. Further detail on the mitigation measures selected for the proposal are detailed in Section 2.6.7.

2.6.7 Mitigation measures, including noise barrier assessment

Submission number(s)

9, 21, 34, 37, 39, 41

Issue description

Respondents raised the following queries and requests relating to noise mitigation:

- Concern that there is no indication of how operational traffic noise will be managed to reduce impacts to surrounding residential properties.
- Requests that appropriate noise barriers are provided along the westbound M5 Motorway on ramp from Moorebank Avenue to manage noise impacts from accelerating vehicles.
- Request that noise barriers are upgraded for residents living along the M5 Motorway, the proposed bridge overpass and the Heathcote road overpass.
- Questions the noise reduction performance considered for noise walls. Why is the noise reduction consideration not from 66-70 dBA levels down to 56-60 being considered, which would give a +10dBA noise reduction.
- Clarification as to why 8 metre high noise barriers are required for the proposal. Why can't the road level be lowered by 2 metres to reduce the overall height of the noise barriers to 6 metres?

Response

Feasible and reasonable noise mitigation options considered for the proposal are discussed in Section 6.1.5 of the REF and are considered below in the following order of preference:

1. At source mitigation: low noise pavements
2. In corridor mitigation: Noise barriers which includes consideration of noise wall or noise mounds
3. At property mitigation: Architectural treatment

Low noise pavements (such as open graded asphalt) are considered feasible where there are four or more closely spaced receivers that exceed the operational road traffic noise criteria. The proposal includes low noise pavement on parts of the proposed new off ramps from the M5 Motorway. Low noise pavements, however, are unlikely to be included on the proposed new M5 Motorway Georges River bridge. To achieve the noise benefits of replacing these surfaces, the existing M5 Motorway would require resurfacing which is unlikely to be reasonable for the carriageway where work is not proposed. Replacing the M5 Motorway surfaces lie outside the scope of works.

For these reasons low noise pavements would need to be used in conjunction with other forms of noise mitigation (such as noise barriers and at-property treatments). Notwithstanding, low noise pavements would be considered further during detailed design.

Noise barriers are generally considered reasonable where there are four or more closely spaced receivers with exceedances of the operational road traffic noise criteria. The noise assessment identified that a noise barrier in the following locations within the proposal area would be a reasonable noise mitigation treatment:

- Existing barriers – NW01 (adjacent to Congressional Drive) and the existing section of NW04 (adjacent to Wombeyan Crescent) are recommended to be retained at the existing height. No existing barriers are recommended to be increased in height.
- Relocated barriers – NW02 (adjacent to Phoenix Crescent) and the western end of NW04 (which would both be physically impacted by the widen work) are recommended to be relocated to the edge of the widened carriageway retaining the same top of barrier height as the existing barriers.

The proposed noise wall alignment does not cover every property near the proposal as there are some locations where installation of noise walls are not considered reasonable and feasible. In regard to existing traffic noise concerns at other locations along the M5 Motorway (such as around Heathcote Road), Transport does not propose to provide noise mitigation as part of the M5 Motorway Westbound Traffic Upgrade. The assessed noise and vibration study area is limited to the scope of works for the proposal. Concerns related to the existing traffic noise can be raised through Transport's Noise Abatement Program. The respondent is requested to raise this noise concern with the Noise Abatement Program by visiting Transport's Noise Abatement Program website

via the following weblink: https://www.transport.nsw.gov.au/operations/roads-and-waterways/environment-and-heritage/reducing-road-traffic-noise/noise-abatement.

Noise barriers are effective where direct line of sight between the noise source and the resident is completely obstructed by an impervious material. The noise reduction of noise walls is dependent on multiple aspects such as topography, elevation, distance between noise source and resident, and the height of barrier. The *Road Noise Mitigation Guideline* (Transport 2022) states for a barrier to be considered reasonable and feasible a 5dBA reduction must be achieved for noise walls up to five metres in height and 10dBA reduction for noise walls up to a height of eight metres. These factors have been considered and incorporated into the noise barrier optimisation process, which assesses the predicted performance at 0.5 metre incremental increases in height from 0 metres to 8 metres.

The suggestion to lower the existing height of the M5 Motorway (to reduce the need for an eight metre high noise barrier) is not feasible when considering available funding and the requirements of the relevant road design standards. An assessment of indicative noise barriers was completed that reflects the optimised barrier height of eight metres, which is the height that provides the most reasonable noise benefits. The process for determining the optimised barrier height is defined in the *Road Noise Mitigation Guideline* (Transport 2022). All recommended barrier heights are subject to further considerations, such as construction limitations, overshadowing, urban design and community preference. Barriers which are lower than the optimised height can still provide appropriate noise benefit and, in some cases, it may be justified to consider barrier heights that are less than the optimised height and this would be further investigated in detailed design. Noise treatment along the M5 Motorway westbound on-ramp from Moorebank Avenue was not triggered as part of this assessment.

As discussed in the REF, the above measures would not provide sufficient mitigation, which is why at-property treatments were identified as a feasible noise mitigation option for the proposal. The final approach would consider community preference where appropriate. Inspection and assessment of individual receivers would also be required to determine feasible and reasonable measures where at-property treatment is considered suitable.

A post-construction noise monitoring program will be carried out within 12 months of opening of the proposal to verify the predicted noise levels, in accordance with the *Road Noise Mitigation Guideline* (Transport 2022). An additional mitigation measure (NV12) has been included in Section 6.2 of this report to document this commitment.

2.6.8 Construction vibration management

Submission number(s)

35

Issue description

The respondent requests further assessment to identify additional mitigation measures to address the construction vibration impacts to Amtek's facility.

Response

The construction vibration assessment carried out for the proposal identified the vibration intensive equipment as an excavator, vibratory roller and pilling rig. Without mitigation, front-row receivers near the work are likely to be within the minimum working distance for cosmetic damage during construction of the proposal. When vibration intensive work is occurring, this would impact certain receivers in the study area but would only be apparent for relatively short durations.

Several mitigation measures have been proposed to be implemented during detailed design and construction to minimise the risk of any vibration related damage from construction of the proposal (refer to Section 6.2). Mitigation measures to be implemented where work is within the minimum working distances and considered likely to exceed the cosmetic damage (8 Secombe Place) criteria include:

- Different construction methods with lower source vibration levels to be investigated and implemented, where feasible
- Attended vibration measurements would be carried out at the start of the work to determine actual vibration levels

- Work should be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.
- Building condition surveys to be completed before and after the work where buildings or structures are within the minimum working distances and considered likely to exceed the cosmetic damage criteria during the use of vibration intensive equipment.

2.6.9 Noise barriers on the M5 Motorway bridges

Submission number(s)

33, 34, 39, 41

Issue description

The respondents raised the following queries and requests around noise barriers on the bridges:

- Requests a noise wall is constructed along the full length of the proposed new bridge crossing over the Georges River to provide noise mitigation for residents living in Casula.
- Why are noise walls not being provided along the proposed new Georges River bridge crossing and the inconsistent approach that has been followed previously in constructing noise walls along the M5 Motorway within the Moorebank area.
- Requests the cost of building a noise wall along the proposed new Georges River bridge crossing is provided. Transport's former Director General has previously stated that it would cost about $10 million to build a barrier on the southern bridge and $3 Million to build a barrier on the northern bridge. Why can't these barriers be built?

Response

Transport's commitment to avoiding or minimising noise impacts from road traffic on State roads is described in the *Road Noise Mitigation Guideline* (Transport 2022). This guideline outlines the approach Transport takes to the evaluation, selection and design of feasible and reasonable noise mitigation measures.

Discussion on the feasible and reasonable noise mitigation options considered for the proposal – and the reasons why particular forms of mitigation (including noise barriers on the Georges River bridges) were not selected for further consideration during detailed design – is provided in Section 2.6.6 and 2.6.7 of this report. Transport acknowledges the previous implementation of noise walls along the motorway and the historic development within the area. The historic discrete developments have either not identified the requirement to consider noise walls or determined noise walls not to be feasible or reasonable under the relevant guidelines.

Similarly, a noise barrier assessment was carried out for the proposed new Georges River bridge (barrier placed on the southern side of the bridge) as part of the *Noise and Vibration Impact Assessment*. This assessment found that an optimised barrier with a height of eight metres on the proposed new bridge would not achieve the minimum performance requirements of the *Road Noise Mitigation Guideline* (i.e., it would not provide a 10dB benefit for barriers over five metres in height). Therefore, a noise barrier along the southern side of the proposed new bridge would not be included as part of the design. The most cost effective solutions to deliver project outcomes are always a priority for Transport and in this situation, based on an assessment against relevant guidelines and policies, a noise barrier on the new Georges River Bridge is not considered a viable solution as such, detailed costing associated with building such noise barriers has not been calculated by Transport.

A noise barrier assessment was not carried out for the existing Georges River bridges on the north side as part of the *Noise and Vibration Impact Assessment* completed for the REF. However, an assessment was previously completed as part of the Noise Abatement Program. This assessment found that a four metre high extension of the noise barrier would achieve the minimum performance requirement. However, Transport has determined that a noise barrier on the northern side of the existing eastbound Georges River bridge would not be reasonable due to structural limitations of the existing bridge. For this reason, a noise barrier is not proposed to be included on the existing M5 Motorway Georges River bridge.

2.7 Traffic and transport

2.7.1 Existing environment

Submission number(s)

13 Issue description

The respondent raised concern about additional travel time for road users wanting to access Casula and Lurnea with the closing of the Hume Highway exit and limited public transport.

Response

The proposal would not create additional travel time for road users wanting to access Casula and Lurnea. The proposal would not remove access to the Hume Highway from the M5 Motorway westbound. Rather, the proposal relocates the start of the Hume Highway exit ramp about 1.5 kilometres east of the existing Hume Highway exit. In doing so, the proposal would:

- Improve road safety through the elimination of the existing weaving issue between Moorebank Avenue and the Hume Highway
- Improve traffic flow along the M5 Motorway, particularly westbound.

2.7.2 Road safety

Submission numbers(s)

40

Issue description

The respondent raised concern that the assessment did not consider road safety issues associated with higher speed traffic incidents as the remaining traffic stream will now travel at a faster speed with less congestion, and traffic incidents will occur at a higher speed and likely more serious in nature.

Response

Traffic incidents should not increase when traffic density is improved (resulting in higher speed traffic). Difficult traffic manoeuvres would be removed as they are created when there are limited gaps and room to move in high traffic density environments.

The road has been designed for a high-speed environment with a design speed of 110km/hour and posted speed limit of 100km/hour. Although the assessment did not specifically model high speed traffic incidents at the proposal, this is not considered required as the reduction in traffic density and unsafe traffic movements are considered key components to increasing the road safety. The modelling results showed that traffic conditions improved along the M5 Motorway at this location and at key intersections within the study area.

2.7.3 Traffic assessment report clarification

Submission number(s)

38

Issue description

- Clarification around the reduced values shown in Table 6.7 resulting in higher densities and LoS E.
- Notes that there appear to be a number of errors in some of the tables of the *Traffic and Transport Impact Assessment* Report (Appendix D of the REF). This includes:
    - Table 6.2 – Average flows for #1 do not equal the volumes noted in Figure 6.2
    - Table 6.4 – Average flow for #1 do not equal the volumes noted in Figure 6.4.
    - Table 6.5 – Reduced values are shown resulting in higher densities and LoS E, which needs to be clarified
    - Table 6.6 – Average flows for #1 showing LoS D across all lines, volumes exceeding 6,000 vph across three lanes may offer LoS E at best, when converted into PCU to account for the percentage of trucks using a principle freight route (say 8%, 2.5 factor), the utilisation increases again (6000 vph = 6,725 PCU) increasing the density impacting LoS
    - Table 6.8 – Average flows for #1 showing LoS D across all lanes.
    - Table 6.37 – The proposed design combines the traffic of Moorebank Avenue and Hume Highway exits, with traffic volumes that appears too low.
- The respondent notes the REF also states that in 2036, the intermodal traffic in the westbound direction is 689 vehicles and in the eastbound direction it is minus 7 vehicles (i.e. a reduction in traffic).

Response

Transport confirms that the traffic modelling results are accurate and clarifies that Level of Service (LoS) is dependent on traffic densities. In the traffic scenario #1, all lanes have traffic densities falling within the LoS D range for basic segments. Although overall traffic volumes are lower in the without proposal scenario versus with the proposal scenario, traffic densities are higher per lane as traffic conditions are unstable with the existing arrangement. This is due to the upstream weaving and lane merge.

There are minor discrepancies between the volumes presented in Table 6-2 and Table 6-4 versus those presented in Figure 6.2 and Figure 6.4 of the *Traffic and Transport Impact Assessment.* This is due to the different methodologies used to calculate the lane specific volumes versus Origin-Destination volumes. These originate from two different sets of modelling outputs from the traffic model. Both are used but in different circumstances, depending on what you are assessing, including:

- Per lane data focusing on a detailed look at the network as shown in the data presented in the figures. These results are an average over the roadway.
- Whole carriageway data focusing on the network performance, as shown in the data presented in the tables. These results are averaged per lane.

The flows indicated in the table are from the M5 Motorway west of the new bridge (after the lanes reduce to three lanes), whereas the location of the flows on the figure are pointed to directly (by the red arrows) and differ slightly to the locations measured in the table. The differences are minor (about three per cent) and therefore this does not change the result and the modelling outcome is correct.

The Moorebank Logistics Park traffic numbers were not separately assessed as an individual project, as the Sydney Greater Metropolitan Area STFM was used for future traffic growth. This model includes the surrounding environment, including a combination of all proposed developments; therefore, the anticipated traffic models have been inbuilt to the model. Section 7 of the *Traffic and Transport Impact Assessment* also discusses the cumulative impacts expected from operation of the Moorebank Logistics Park. It notes that when the Moorebank Logistics Park is fully operational, around 2030, it is expected to generate a total of about 6,600 heavy vehicle trips and 10,000 light vehicle trips a day.

Traffic volumes are noted to be close to 6,000 vehicles per hour (vph); however, they do not exceed it and, therefore, while traffic densities are nearing LoS E, they are still within the LoS D range as per the Highway Capacity Manual (HCM). The different vehicle types were modelled in the VISSIM model prepared for the proposal. Lane density was calculated from the model output (including the light and heavy vehicles); therefore, Table 6.6 average flows for #1 should not be converted to PCU as it would result in heavy vehicles being double counted.

Transport has revised the format of Table 6.37 to provide a clearer summary in Table 2-1. No new data has been included.

Table 2-1 Revised Table 6-37 in the Traffic and Transport Impact Assessment

Location	Scenario	Movement	Weaving volume (vph)				Notes
			AM		PM		
			2026	2036	2026	2036	
Between Moorebank Ave and Hume Highway - Westbound	Existing arrangement	Ramp to motorway	495	630	1,270	1,330	-
		Motorway to ramp	1,150	1,150	1,070	1,060	
		Total	1,645	1,780	2,340	2,390	
	Proposed design	Ramp to motorway	495	630	1,415	1,535	Weave on freeway removed, only merge
		Total	495	630	1,415	1,535	
Between Heathcote Road and Moorebank Avenue - Westbound	Existing arrangement	Ramp to motorway	1,200	1,225	1,180	1,300	-
		Motorway to ramp	350	345	280	250	
		Total	1,550	1,570	1,460	1,550	
	Proposed design	Ramp to motorway	775	795	865	950	-
		Motorway to ramp	1,075	1,065	1,115	1,010	
		Total	1,850	1,860	1,980	1,960	

2.7.4 Traffic impact assessment

Submission number(s)

38

Issue description

The respondent requests that new freeway segment performance tables are provided with and without the proposal side by side in the same table similar to how the intersection analysis was presented in the REF.

Response

Table 6-26 and Table 6-27 in the REF have been prepared to show the difference in the performance with and without the proposal. These tables show the freeway segment performance and intersection performance in a similar way to the impacts on the weaving performance in the REF. Refer to Table 2-2 and Table 2-3 for the revised tables.

Table 2-2 Freeway segment performance with and without the proposal

Location	Period	Without the proposal	With the proposal
Between Moorebank Avenue and Hume Highway – Westbound	AM peak	Without the proposal all freeway segments would result in a LoS C to D.	With the proposal the road would experience good performance with acceptable delays (LoS B and C). The new road would operate at a LoS B.
	PM peak	Without the proposal all freeway segments would result in LoS F, indicating that the road would experience congestion.	The proposal would improve this section of the M5 Motorway, with all segments operating at LoS D or better, apart from one lane on segment 4 (diverge) which may operate at a LoS E.
Between Moorebank Avenue and Hume Highway – Eastbound	AM peak	Without the proposal the road would experience congestion (LoS E or F).	The proposal would result in an overall improvement of traffic, with lower densities and higher speeds. Segment 4 (diverge), as well as isolated lanes on other segments, may however operate at LoS E.
	PM peak	Operation of the proposal would not result in any significant changes.	Operation of the proposal would not result in any significant changes.
Heathcote Road and Moorebank Avenue – Westbound	AM peak	Higher densities and lower speeds.	Overall improved performance with lower densities and higher speeds.
	PM peak	Without the proposal the road would experience congestion (LoS E or F).	The proposal would result in an overall improvement for this section of the M5 Motorway, all segments operate at LoS D or better, apart from one lane on segment 11 (basic) which may operate at a LoS E.
Heathcote Road and Moorebank Avenue – Eastbound	AM peak	Operation of the proposal would not result in any significant changes.	Operation of the proposal would not result in any significant changes.

Location	Period	Without the proposal	With the proposal
	PM peak	Operation of the proposal would not result in any significant changes.	Operation of the proposal would not result in any significant

Table 2-3 Intersection performance with and without the proposal

Intersection	Scenario	Without the proposal	With the proposal
Hume Highway	PM peak 2026	LoS C (41s delay)	LoS C (30s delay)
	PM peak 2036	LoS D (52s delay)	LoS C (32s delay)
Moorebank Avenue	PM peak 2026	LoS F (71s delay)	LoS C (32s delay)
	PM peak 2036	LoS F (74s delay)	LoS C (39s delay)

2.7.5 Traffic design

Submission number(s)

36, 37, 38, 39

Issue description

The respondent raised the following concerns and queries relating to the traffic design:

- There will be three traffic weaving movements in the proposal design. These weaves are located in the following areas and only two have been assessed:
    - On the M5 Motorway between Heathcote Road and Moorebank Avenue
    - On the new internal ramp between Moorebank entry and Hume Highway/M5 motorway split
    - On the new ramp between the Hume Highway/M5 motorway split and traffic signal approach lanes.
- Concern the proposal will result in congestion and weaving issues for M5 Motorway westbound traffic around the Heathcote Road / M5 Motorway intersection with the relocation of the Hume Highway exit ramp further east and the shortened length of the merging lane for the Heathcote Road on ramp.
- Concern about the short distance between the westbound M5 Motorway entry from Moorebank Avenue and the split lanes to the M5 Motorway and Hume Highway, being too short to accommodate the large number of heavy vehicles entering the M5 Motorway from the Moorebank Logistics Park could lead to accidents.
- Concern raised that these weaving movements will reduce capacity of the Moorebank off ramp and impact of traffic queuing back onto the M5 Motorway creating unsafe situations and resulting in reduced capacity of the motorway.
- Concern the proposal will not address congestion as westbound through traffic on the M5 Motorway will still need to slow down to allow vehicles to merge onto the motorway from Moorebank Avenue.
- Concern raised that the proposal will cause congestion on the southern side of the Moorebank Avenue intersection by only providing one lane for vehicles continuing westbound on the M5 Motorway.
- Was ramp metering considered as a traffic management option for the proposal? If not, why not as it may be a feasible response to help manage the flow and density and LoS issues.

Response

The three areas queried were modelled and achieved acceptable traffic performance as summarised below (refer to Section 6.2 of the REF):

- **1. M5 Motorway between Heathcote Road and Moorebank Avenue (westbound):** This area was assessed for freeway segments 6, 7 (the weaving area) and 8 for the proposal. These segments operated acceptably at LoS D, or better, on all lanes during both the AM and PM peak periods, in 2026 and 2036. The traffic pattern at the Heathcote Road intersection is different to the proposal as there is no right turn allowed for traffic from Heathcote Road southbound. The weaving issue is mainly caused by Heathcote Road northbound on ramp to the M5 Motorway. The model results indicate overall performance would improve significantly around the Heathcote Road intersection with the proposal with the removal of the downstream bottleneck.
- **2. New internal ramp between Moorebank entry and Hume Highway/ M5 Motorway split:** This area was not specifically assessed as a weaving area, as the approaches from Moorebank Avenue would comprise two approach lanes, each clearly signed and marked for a specific destination. The majority of traffic would therefore align to the correct lane at the Moorebank Avenue intersection stop lines. Traffic Modelling did not highlight any issues at this point. This is shown in the Moorebank Avenue interchange performance results with the design proposal, with an overall LoS B in AM peak for 2026 and 2036, and LoS C in PM peak for 2026 and 2036. The model results indicate overall performance would not decrease and would either remain the same or improve for some movements.
- **3. New ramp between the Hume Highway/ M5 Motorway split and traffic signal approach lanes (westbound):** This area was assessed for freeway segment 12 with an overall LoS C. The model results indicate overall performance would not decrease and would either remain the same or improve for some movements.

The proposal is not expected to introduce additional congestion or unsafe weaving movements upstream or downstream of the proposal. The traffic modelling did not highlight any issues that may result in unacceptable operation of the surrounding road network.

Ramp metering was not considered for the proposal as the proposal would improve safety, with a smaller risk of crashes, and result in a decrease in volume of weaving traffic which could not be achieved through ramp metering. Therefore, ramp metering would not achieve the required safety and road performance outcome at this location.

2.7.6 Traffic modelling

Submission number(s)

31, 37, 38, 40, 43

Issue description

The respondent raised the following queries:

- Concern raised that the traffic model used a study area concentrated only on the M5 Motorway.
- Notes that the traffic modelling results show in the base year traffic densities sit very comfortably in the Austroads' Incident situation operation which translated identifies traffic incidents are expected to occur extremely frequently along the M5 Motorway.
- Clarification sought about whether any constraints to flow were applied west of the Hume Highway for westbound traffic to stimulate the LoS conditions shown in the traffic model.
- Construction stage 10 to 12 removes the slip lane for northbound traffic turning left combining the through traffic and left turn. Has heavy vehicle turn paths and subsequent impact to performance (due to slow acceleration) been considered in the modelling of the LoS at the M5 Motorway interchange and its impact to northbound and southbound traffic on Moorebank Avenue?
- Concern about the validity of the traffic modelling results, specifically, the base year numbers. For example, the REF shows that between 2026 and 2036, traffic on the M5 Motorway between Moorebank Avenue and the Hume Highway is expected to increase by 74 vehicles per hour in the westbound direction and 16 vehicles per hour in the eastbound direction.
- Clarification about the traffic growth rates documented in Section 6.1.1 of the Traffic and Transport Impact Assessment Report. Specifically, the following:

- Data shown in Figure 6.2 (AM 2026) and Figure 6.4 (AM 2036) indicates that there is 0.5% growth over 10 years on the M5 Motorway from 2026 to 2036 compared with a 28% growth over 10 years for the Moorebank Avenue entry ramp.
- Data shown in Figure 6.10 (PM 2026) and 6.12 (PM 2036) indicates that there is a 0.1% growth over 10 years on the M5 Motorway from 2026 to 2036, compared with 9% growth over 10 years for the Moorebank Avenue entry ramp. The growth rates documented in these report figures do not appear to be correct.

- Concern raised about the additional capacity the proposal will provide for future traffic growth. The proposal is likely to induce further traffic demand, which will reduce the effectiveness of the proposed upgrade.
- Concern the assessment did not consider existing traffic congestion and the introduction of additional freight vehicles from the Moorebank Logistics Park along the Hume Highway located north of the M5 Motorway.
- Clarification sought about whether the modelling assessed the cumulative impacts of concurrent construction of the Moorebank Avenue Realignment and future operations Moorebank Logistics Park.
- Concern that the traffic modelling did not consider the application of 'Wardrop's first principle' of route choice. Wardrop's will apply to parallel routes and also to all the four westbound routes by adding additional capacity to the network.

Response

Transport undertook an initial scoping evaluation of the likely traffic impacts of the proposal and the extent of assessment required to evaluate traffic impacts. The traffic model study area that was considered for the proposal was defined having regard to that evaluation and based on the proposal's objectives as set out in Section 2.3.1 of the Review of Environmental Factors dated August 2022.

Transport acknowledges comments regarding the potential for safety issues arising within the study area and in large part this has been the driver for the proposal. In particular, the project would achieve safety benefits associated with removing the existing weaving movement between Moorebank Avenue and the Hume Highway.

The Sydney Greater Metropolitan Area Strategic Traffic Forecasting Model (STFM) was used for the proposal, and this considered the wider extents, including the surrounding road network. No specific constraints to flow were applied during the modelling. However, during the base model calibration and validation process, the modelled travel time was within the 15 per cent cumulative observed travel time band in peak times for both eastbound and westbound directions. The original developed base case model required changes to the default driving behaviour parameters to accurately reflect the existing conditions. This was carried out as the nature of the model required the complications resulting from weaving movements to be manually included. This was also carried out to complete the required modifications following removal of the weave segment for the 'with' proposal scenarios. No specific alterations were made to vehicle performance on turns, however, by default the modelling software adapts vehicle performance. This includes slow acceleration from heavy vehicles.

The performance of construction stages 10 to 12 is a combination of the adopted vehicle performance and the decreased capacity during construction. It is shown that this impacts the northbound and southbound traffic on Moorebank Avenue, with longer travel times during construction. This lane configuration is considered necessary given the space constraints of the proposal to construct, while keeping site personnel safe. This has been considered as part of the construction staging and would be further refined during detailed design to minimise the time this disruption is in place. Appropriate mitigation measures would be put in place to ensure safety of the road network during this time is not compromised.

The referenced base year traffic modelling results refer to traffic in the existing condition, as extracted from the VISSIM operational model. Due to the capacity constraints along the M5 Motorway, without additional capacity from an upgrade, there would only be provision for a small increase in traffic. Similarly, the referenced traffic growth rates are also derived from the VISSIM operational model. This means the referenced rates also consider the existing constraints to the network and are representative of the congestion. The low numbers for both of these are considered accurate and highlight the need for the proposal.

Future demand predictions based on the traffic assessment examined the existing land zoning within the surrounding study area, identifying general industrial development near the centre of the study area that includes the proposed Moorebank Logistics Park accessed off Moorebank Avenue. Surrounding land uses were considered in parallel with socio-economic factors for the population and employment projections within the study area including from Moorebank Logistics Park. The projections showed the highest employment (7,958 people) and the largest percentage growth between 2016 and 2056 for Defence Land Moorebank, followed by

Moorebank Industrial (3,126 people). Therefore, the Moorebank Logistics Park traffic has been assessed in the traffic assessment.

The timing for the commencement of construction is still being considered. Construction staging and management would be further refined during detailed design. There would be a clearer indication of the surrounding projects, and potential cumulative construction impacts. This would be further assessed when the construction commencement date has been determined.

Wardrop's first principle is not considered applicable to the proposal as the defined study area did not identify route choices. This is a requirement of the principle and is used to assess its need to apply it. Origin to destinations derived from the Greater Metropolitan Area SFTM considered the wider extents, which included in-built route changes. The proposal objective was to improve safety and congestion by removing the existing weave movement. As a result, no additional routes are being introduced as part of the proposal, as the additional bridge over the Georges River provides direct access to the Hume Highway, which is a current route in the existing environment.

2.7.7 Active transport and shared user path provisions during construction

Submission number(s)

27, 31

Issue description

The respondent raised the following comments relating to active transport and shared user path provisions during construction:

- Concern raised about the proposed closures and detours for cyclists and pedestrians during construction of the proposal. The REF does not indicate when these impacts will occur and how long they will be experienced. New shared paths or separated bicycle facilities should be provided before establishing the detour.
- Concerned about the movement of construction vehicles across pedestrian and cycling paths. The REF did not contain detailed traffic management plans and, therefore, it is difficult to assess the impact of the proposal on active transport.
- Requests that the M5 Motorway's viability as an active transport corridor during construction of the proposal is maintained and construction impacts mitigated to maintain access to safe active travel in accordance with the Austroads Guide to Temporary Traffic Management.
- Access routes to work sites should be designed to minimise inconveniences to all road users, including pedestrians and cyclists.

Response

During construction of the proposal there would be temporary changes to the access of some areas, with the temporary disruption to pedestrian and cyclist access near construction work in Casula and on the M5 Motorway. This may result in longer travel distances to access paths and connection in the study area. Construction would require temporary partial closures with the staging and timing to be determined during detailed design. Some people, especially those who are older or who have mobility requirements may be less adaptable to this temporary change; however, potential impacts would be managed through the Construction Traffic Management Plan in accordance with the relevant Austroads guidelines. The existing cycle lane and shared user pathway on the M5 Motorway would remain open for as long as practicable. During traffic switching periods required for construction, particularly during the construction of the new underpass beneath Moorebank Avenue, temporary short-term closures of the cyclist lane are expected.

Currently cyclists travelling west on the M5 Motorway can leave the motorway upstream of the existing Georges River bridge to go to the Casula or to ride along the Georges River. However, construction activities within Areas 4 and 5 may require the diversion of cyclists from the existing cycle path until the new underpass is operational. The detour would be in place for up to 30 -32 months accounting for weather events.

The potential impacts on cycling would be minimised through community consultation to understand the travel patterns of cyclists. The community inclusive of Bicycle NSW and Bicycle User Groups, would be consulted to understand the travel pattern of cyclists and inform the cyclists of any alternate access arrangements including provision of signage along the M5 Motorway and the associated on-ramps to advise cyclists of any path

closures (refer to mitigation measure TT8 in Section 7.2). Any potential closures, detours and signage would be managed in accordance with the Construction Traffic Management Plan and addressed during detailed design.

2.7.8 Active transport and shared user path provisions during operation

Submission number(s)

27, 31

Issue description

The respondent raised the following comments relating to active transport and shared user path provisions during operation:

- There is a need for more active transport infrastructure to be provided in the Liverpool area.
- It is recommended that Transport for NSW align the active transport elements of the proposal to current Transport for NSW Movement and Place frameworks and policies. People walking and cycling must not be inconvenienced in favour of driving, either during construction or once the upgraded motorway is operating. Improved safety, directness and comfort in the cycling network is a net gain for the road network through decongestion.
- The project team must refer to the new Cycleway Design Toolbox and the 2017 Austroads Cycling Aspects of Austroads Guides (AP-G88-17) to ensure that the paths are constructed to current best practice.
- Concern raised about the small investment being made in active transport along this section of the M5 Motorway compared to other Transport for NSW projects. Transport should be considering providing further active transport infrastructure to improve shared paths within a wider area.
- If access to the M5 Motorway from the new shared path is provided for bikes, what measures will be in place to ensure that pedestrians will be prevented from walking onto the M5 Motorway?
- Requests clarification for how cyclists would rejoin the M5 Motorway mainline shoulder from the western end of the proposed new shared path.
- Request that wayfinding is used to support active transport users by clearly communicating the safest and most efficient route, the signage should be consistent with the LGA.
- Requests that pedestrian footbridges are provided instead of the proposed signalised pedestrian crossings to improve pedestrian safety.
- Requests that cycle infrastructure is inclusive and accommodates all types of bikes and abilities.
- Request to prioritise pedestrians and bicycle riders at intersections and paths, and implement traffic light phasing and sensors favouring active modes.
- Requests that bicycle paths continue over signalised crossings so people riding bikes are not required to dismount.
- Requests that raised crossings at unsignalised intersections are installed to slow cars and improve safety.

Response

It is to be noted that the proposal is aligned with the *Road Safety Plan 2021 – Towards Zero* (the Road Safety Plan) (NSW Government, 2018a). This plan establishes a commitment from the NSW Government to improve safety on NSW Roads whereby the proposal would contribute to an improved 'safety and performance' outcome. The inclusion of a shared pathway however also provides a sustainable solution contributing to liveability and safety through safer connectivity and access for active transport users. Transport is committed to reviewing the active transport design suggestions raised and available in current policy frameworks and will continue to consider these principles during detailed design.

The proposal is expected to improve active transport provisions in the area with the shared user path and on road paths providing improved cycling network accessibility and connectivity. The proposal specifically included two objectives related to active transport, comprising:

- Contribute to strategic land use outcomes including active transport and development of logistics facilities
- Incorporate necessary active transport measures to contribute to the improved performance of those modes.

These objectives would be addressed by the proposal.

The proposal design has been further refined following public display of the REF to further improve cyclist safety conditions and reduce confusion (relative to the design presented in the REF). The proposal design now also includes provisions for the shared path to be connected to future extensions of Council's active transport network. These design refinements are described further in Section 4 of this report. Investment in this proposal does not preclude works to other parts of the transport network including public transport.

After the underpass of Moorebank Avenue, there would be an entry to the shared user path for cyclists wanting to use the path to travel westbound or onto Moorebank Avenue. Cyclists can enter onto the shared user pathway to travel westbound on the new bridge to Casula. Cyclists wanting to continue travelling westbound on the M5 Motorway would need to take the same entry onto the shared user path as those travelling towards the Hume Highway exit. At this point they would then be required to return back east to continue to the Moorebank Avenue/ M5 Motorway intersection. Upon re-entering the Motorway via the westbound entry ramp cyclists would be required to cross a single lane of traffic to then re-join the M5 Motorway via the existing entry ramp. Refer to Figure 2-3 for an illustration of this movement.

There would be signage for cyclists travelling westbound on the M5 Motorway within the road shoulder, between the Heathcote Road exit and Moorebank Avenue, to direct them to continue onto the new exit ramp toward the Hume Highway. There would also be signage after the new underpass to direct cyclists wanting to continue westbound on the M5 Motorway. These cyclists would need to travel to the M5 Motorway / Moorebank Avenue intersection and re-join the M5 Motorway via the existing entry ramp.

The shared user path is designed with safety barriers with the only direct pedestrian access onto the M5 Motorway at the cyclist entry point to the shared user path. Signage at this location would be installed advising pedestrians that there is no legal access onto the M5 Motorway at this point. Standard regulatory and warning signs would also be installed on the M5 Motorway corridor.

Transport is committed to reviewing the active transport design suggestions raised and available in current policy frameworks and will continue to consider these principles during detailed design. The following responses address the active transport design suggestions:

- Pedestrian footbridges have not been included as there is only one proposed signalised pedestrian crossings within the proposal area, which is at the Moorebank Avenue and M5 Motorway intersection. A footbridge would not be feasible due to space constraints.
- All cycle paths and infrastructure would be constructed in accordance with the Austroads Guide to Road Design Part 6A – Paths for Walking and Cycling (2017) AS1742 and AS1743 ensuring they are inclusive and accommodate all types of bikes and abilities.
- Pedestrians and bicycle rider prioritisation at key road intersections, and traffic light phasing and sensors have not been considered as part the proposal. However, the inclusion of the shared user path would provide a dedicated path for active transport users to travel to the Hume Highway from Moorebank.
- Cyclists travelling westbound on the M5 Motorway wanting to exit at the Hume Highway, would be able to travel without dismounting via the shared user path. However, those wanting to continue travelling westbound on the M5 Motorway would need to dismount at the Moorebank Avenue intersection before rejoining the M5 Motorway. A continued bike path was not considered as part of the design as this would not be feasible at key intersections such as Moorebank Avenue.
- There is one unsignalised crossing for cyclists proposed. This is located at the merge on the M5 Motorway westbound entry ramp. It is not considered feasible to have a raised crossing at this location as it would interrupt the flow of vehicles merging onto the motorway and result in reduced overall safety of the network.

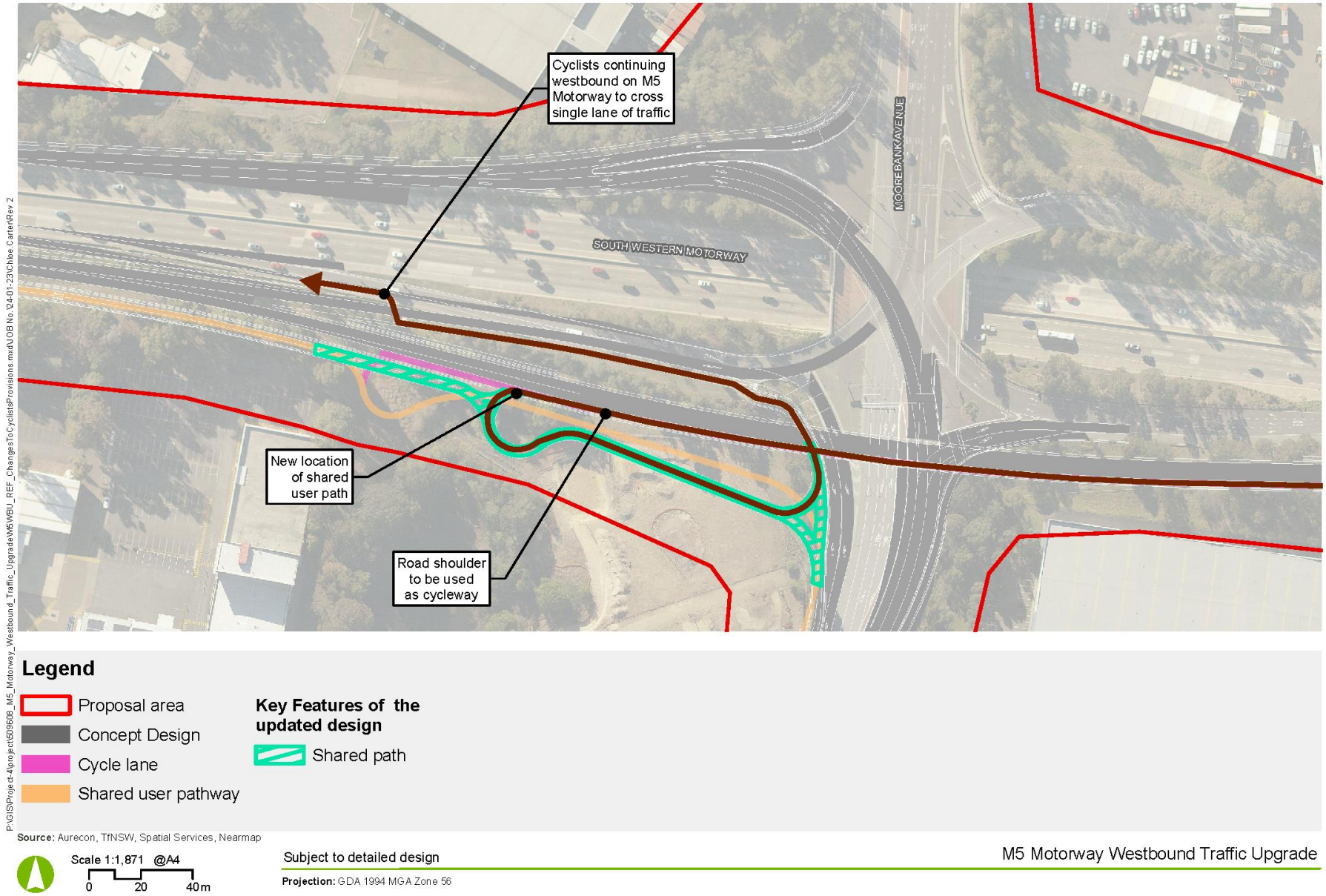

Figure 2-3 Revised cyclist route westbound on the M5 Motorway

2.7.9 Traffic impacts during construction

Submission number(s)

23, 30, 35

Issue description

Respondents raised the following concerns and requests relating to construction traffic impacts:

- Concern raised that construction traffic would use the surrounding local roads as an alternative travel route to access the Hume Highway to avoid congestion on the M5 Motorway.
- Request to ensure adequate construction and traffic management is put in place to minimise disruption to Woolworths.
- Ensure the proposal does not impact on the performance of the Moorebank Avenue / Anzac Avenue intersection.
- Concern about the construction impact on Amtek's facility; particularly the ingress of construction vehicles into their property. Amtek does not have the capacity to reduce the size and footprint of their operations to facilitate the land required to construct the proposal.

Response

The access strategy for the proposal would be developed to avoid introducing construction access directly from the M5 Motorway, where possible. This is required to manage safety issues resulting from the high-speed motorway environment. The proposal area is well serviced by roads suitable for heavy vehicles, including the M5 Motorway, Hume Highway, Moorebank Avenue, Heathcote Road and sections of Anzac Road. Some local roads in Moorebank, Liverpool and Casula would need to be used to provide rear access to areas of the proposal during construction. Where this is required, the number of vehicles would be limited, and monitoring would occur to understand if this is placing a strain on the network. Vehicles would not be using the surrounding local roads as shortcuts. Consultation with impacted stakeholders adjacent to these local roads would be carried out to minimise impacts.

Inter-property access arrangements would be required to access the M5 Motorway for parts of the proposal. Consultation with impacted landowners and businesses, including Amtek, would be ongoing to establish necessary agreements and arrangements for leasing and access prior to construction. There would be no access to private property where there is no prior consultation and agreement.

A Construction Traffic Management Plan would be prepared and implemented as part of the Construction Environmental Management Plan (CEMP) and include measures to manage potential construction traffic impacts. This plan would outline the construction hours, haulage and access routes, consultation procedures and other contingency measures to be implemented during construction to minimise disruptions to traffic. Transport would maintain property access where feasible and reasonable and consult with property owners before starting any work that may temporarily restrict or control access (refer to mitigation measure TT1 in Section 6.2).

2.7.10 Georges River traffic impacts

Submission number(s)

10

Issue description

The respondent sought clarification about the proposal's construction impact on the NSW Barefoot Water Ski Club's operations and ability to host competitions. Will this section of the Georges River still be able to be used for barefoot water skiing? Will the proposal impact access to the NSW Barefoot Water Ski Club's boat ramp during construction and operation, including use of Helles Park as the main construction compound?

Response

Partial and full closures of the Georges River may be required for structural works including craning and stabilisation of the new bridge. A crane barge would be anchored adjacent to the existing bridge and would be in place for about nine months, weather permitting. This may restrict access and would result in impacts to fishing and recreational boats and marine vessels, and people who use the NSW Barefoot Water Ski Club.

Transport understands that the Barefoot Water Ski Club typically hosts the annual Australian Barefoot Water Ski Championships during January and April. Other tournaments are also hosted by the club, which operates primarily between August and June. Continued consultation would be carried out with impacted stakeholders using the Georges River, and any temporary closures scheduled outside competition times, where feasible.

It is not anticipated that the existing boat ramp would be directly impacted during construction; however, access to the boat ramp would need to be managed during construction as current access would pass through the proposal's construction site. If the existing boat ramp is impacted by design, an alternative nearby access point would be provided to the Georges River. The management of construction access would be determined in consultation with impacted stakeholders.

2.7.11 Operational impacts

Submission number(s)

22, 37, 38, 39

Issue description

Respondents raised the following concerns and queries relating to operational traffic impacts:

- Safety concerns around the placement of Moorebank Avenue exit sign on the M5 Motorway eastbound to address the safety concerns caused by the short merging lanes and weaving traffic.
- Concern local bottlenecks congestion may alleviate but could transfer downstream to overwhelm other parts of the network, such as the M31 and M7 southbound, impacting a broader community.
- Concern the proposal will not ease congestion and will fail to make roads safer.
- What additional mitigations are proposed to address a number of performance results exceeding LoS D for the M5 entry and exit ramps and the M5 mainline, particularly westbound?
- Concern that some M5 Motorway exit ramp LoS delays and queue lengths are worse or unimproved and unacceptable when compared with the performance of competing approaches.
- Concern that trucks entering the M5 Motorway westbound from Heathcote Road will be forced to use the right lane. This may reduce the entry capacity causing flow breakdown and potential crashes, mitigation measures are required to alleviate this risk.
- Requests improvements to queue lengths and optimised signal timings be considered to minimise delays and improve safety.
- Requests a red light camera is installed at the M5 Motorway / Moorebank Avenue interchange to address congestion as vehicles turning right onto the M5 Motorway (westbound) from Moorebank Avenue (southbound) often block the Moorebank Avenue intersection.

Response

The proposal design selected was deemed the most suitable option as it provides benefit with the removal of a significant source of congestion that impacts upon the wider Sydney Road network. The *Traffic and Transport Assessment* reviewed the existing and future conditions of the transport network within and surrounding the proposal. The proposal is not expected to introduce additional congestion or overwhelm upstream or downstream of the proposal. The traffic modelling did not highlight any issues that may result in unacceptable operation of the surrounding road network.

The short merge on the Moorebank Avenue westbound on ramp to the M5 Motorway would be removed. The two lanes on the Moorebank Avenue westbound on ramp would split into the traffic heading towards the M5 Motorway and traffic heading towards Hume Highway. Sufficient warning signage and lane markings would also be installed. Trucks entering the M5 Motorway from Heathcote Road and wanting to continue westbound, would need to move over from the left lane prior to coming up to the proposed separated new off-ramp for the

Hume Highway. This is not expected to have a substantial impact as there is a sufficient distance (about 850 metres) between the interchanges for this movement, and existing conditions currently require the same movement as the left lane becomes the Moorebank Avenue off-ramp.

The traffic modelling has identified that all scenarios either remain the same LoS or improve with the proposal. While there are no specific mitigation measures proposed at this stage for areas remaining at LoS D, it is expected the overall efficiency of the network would be improved. As a result, travel time and traffic incidents should reduce across the area.

The new exit ramp would provide better efficiency and minimise queuing delays through traffic separation for access to the Hume Highway. The upgrade of the Moorebank Avenue intersection would aim to support heavy vehicle movements and their ability to enter and exit the M5 Motorway. The proposal would not restrict access for heavy vehicles to the Hume Highway from Moorebank Avenue, which would be accessible via the new exit ramp. Further information is provided in Section 2.3 and Chapter 6.2 of the REF.

The design suggestion for a red light camera at the M5 Motorway and Moorebank Avenue intersection would be further investigated during detailed design; however, it is not currently proposed. The equipment currently proposed meets the objectives in the NSW Road Safety Plan 2021 through the provisions of upgraded road infrastructure that adheres to current safety standards. This includes Intelligent Transport Systems (ITS), including installation and adjustments to traffic/SCATS detection, CCTV, a web camera, an emergency breakdown telephone and a stopping bay, variable message signs (VMS) and backbone conduit.

2.7.12 Operational impacts surrounding the Moorebank Logistics Park

Submission number(s)

29, 37, 39, 42

Issue description

The respondent raised the following concerns:

- Requests that the Moorebank Logistics Park is not provided with enhanced access to the M5 Motorway; the motorway is already congested and the Moorebank Logistics Park will only add to this congestion and facilitate additional congestion.
- Concern about the increase in heavy freight vehicles using this section of the M5 Motorway following the opening of the Moorebank Logistics Park.
- Requests that heavy vehicle traffic from the Moorebank Logistics Park should be accessing the M5 Motorway network via Cambridge Avenue rather travelling northbound on Moorebank Avenue.

Response

The elimination of the existing weaving movement between Moorebank Avenue and the Hume Highway would alleviate congestion and overall improve the traffic performance of the M5 Motorway. This would create a safer network, with a decrease in traffic incidents expected. A proposal benefit is to enhance efficiency for freight access to the M5 Motorway. The upgrade of Moorebank Avenue intersection would aim to support heavy vehicle movements and their ability to enter and exit the M5 Motorway. This includes vehicles using the Moorebank Logistics Park.

While some components of the proposal would assist to provide efficient access to Moorebank Logistics Park, other components of the proposal have been driven by existing safety concerns for motorway users and the poor crash history westbound on the M5 Motorway between Moorebank Avenue and Hume Highway. The proposal is also aligned with several strategic policies and government strategies, such as *Future Transport Strategy 2056* (Transport 2018) and *Road Safety Plan 2021 – Towards Zero* (NSW Government 2018).

This means that, in addition to any benefits to the Moorebank Logistics Park, the proposal would also deliver important and necessary benefits to the community, including:

- Improvement of road safety through the elimination of the existing weaving issue between Moorebank Avenue and the Hume Highway
- Improvement of traffic flow along the M5 Motorway, particularly westbound
- Improvement of motorist, cyclist, and pedestrian safety.

Heavy vehicle traffic from the Moorebank Logistics Park would be able to safely merge onto the M5 Motorway and would not be restricted in travelling northbound along Moorebank Avenue.

2.7.13 Additional traffic assessment

Submission number(s)

38

Issue description

The respondent requests further traffic assessment is carried out for the westbound segment of the M5 Motorway between Moorebank Avenue and the Hume Highway where the number of lanes on the M5 Motorway will drop from four lanes to three lanes as entry flows from Moorebank Avenue are high and the M5 Motorway mainline is close to capacity.

Response

The traffic modelling carried out for the proposal focused on the westbound segment of the M5 Motorway between Moorebank Avenue and the Hume Highway for scenarios with and without the proposal (assessed as freeway segment #12). The modelling results showed that traffic conditions improved with the proposal, both by easing congestion and improving the safety conditions by removing the existing weave movement. Westbound through traffic along the M5 Motorway has three lanes in existing conditions, with the fourth lane a dedicated turn-off for the Hume Highway. Therefore, the design would match existing conditions. The need for further traffic assessments would be identified during detailed design.

2.8 Hydrology and flooding

2.8.1 Assessment methodology

Submission number(s)

43

Issue description

The hydrology and flooding assessment did not consider changes to topography / surface levels on Lot 100/DP1049508 associated with the Moorebank Logistics Park and Moorebank Avenue Upgrade. The respondent requests that the cumulative impact of Transport's proposal, the Moorebank Logistics Park and Moorebank Avenue Upgrade is assessed.

Response

The hydrology and flooding assessment did not consider the continual changes of topography and surface levels during construction as these impacts would be temporary. Operational usage of the site was not deemed to be required as a one per cent annual exceedance probability (AEP) event is not anticipated to impact the Moorebank Logistics Park as this lies outside the Georges River flood extent.

Lot 100/DP1049508 is west of Moorebank Avenue and spans across Amiens Wetland and the Moorebank Logistics Park development. Based on the available information, the proposed development for Moorebank Logistics Park on this lot appears to be outside the flood prone zone of the Georges River in the flood events up to and including a one per cent AEP event. It is understood that the Amiens Wetland is not proposed for development and, therefore, no topographical changes are expected. Only Amiens Wetland is anticipated to be flooded in the one per cent AEP due to flooding from the Georges River.

Therefore, changes to the topography and surface levels associated with development of the Moorebank Logistics Park would not change the characteristics of the Georges River flood extent as this lies outside the extent to be impacted by a one per cent AEP event. The Moorebank Logistics Park site that is to the east of Moorebank Avenue would not be affect by the Georges River flood extent for up to and including a one per cent AEP event.

2.8.2 Impact to Amiens Wetland

Submission number(s)

43

Issue description

The respondent raised the following queries and suggestions relating to the Amiens Wetland:

- Clarification sought about whether the proposal will increase surface water flow rates into Amiens wetland.
- Concern raised that the road drainage network being delivered as part of the Moorebank Avenue / Anzac Road intersection upgrade (MAAI) has not been considered in the Hydrology and Flooding Report. The Hydrology and Flooding Report identifies water flows to Amiens wetland as being from overland flow; however, this is the primary outlet (via a piped system) for MAAI's road drainage network.
- Clarification sought about whether there was an error in the REF relating to the predicted flooding impact on the Amiens Wetland. The REF identifies an increase of 200mm in the one per cent AEP flood event; should this be 20mm?

Response

The proposal is not expected to increase or decrease surface water flow rates into Amiens Wetland. A pipe connection would be provided from the stormwater drainage network to the Amiens Wetland. The pipe connection to the Amiens Wetland would discharge surface water flow to the wetland as per the existing condition and any excess flow from the stormwater system would discharge directly to the Georges River. The size of the pipe connection and the flow rate to the wetland would be determined during detailed design.

Transport confirms that there was not an error in the REF in relation to the predicted flooding impact on the Amiens Wetland. The changes in flood behaviour are as a result of additional losses imposed by the sub-structure (piers) of the proposed bridge. Increases in peak flood levels (affluxes) of up to approximately 20 millimetres in a one per cent AEP design event and the probable maximum flood (PMF) are predicted upstream of the proposed bridge. Appendix E of the REF provides further clarification and notes that there is no significant changes in the flood behaviour of the Georges River predicted as a result of the proposal.

Seven residential properties (to the west of the Georges River) and two commercial properties (to the east of the Georges River) were identified to be within the one percent AEP zone of flooding. The potential impacts on the buildings within these properties would be investigated in detailed design with detailed building floor level surveys. However, the predicted affluxes of up to 20 millimetres are not expected to impose significant risk to the buildings due to the following:

- These properties are predicted to have substantial inundation of up to about one metre in the existing environment and that the predicted increases in the inundation depth of up to 20mm is considered minimal.
- The flow velocities in the existing environment are low (less than 0.2m/s) and that no increase in flow velocities is predicted as a result of the proposal.
- No changes to the flood hazard classification is predicted as a result of the proposal.

The only exception to this general predicted afflux is an area with a three metre deep depression, located on the eastern floodplain of the river, south of the proposed road embankment and west of Moorebank Avenue within Titalka Park. The one per cent AEP floodwaters break out from the main Georges River channel and flow towards this depression where the floodwaters pond. An afflux of about 200 millimetres is predicted in this depression (within Titalka Park) under the one per cent AEP flood event. This area is currently zoned as General Industrial. However, this specific part of the site forms a natural pond and is not recommended for built type developments. It is not anticipated that the afflux would impact on the current land use.

2.9 Biodiversity

2.9.1 Revegetation of the M5 Motorway corridor

Submission number(s)

38

Issue description

The respondent requested that replanting proposed along the M5 Motorway not include threatened species or ecological communities as any ongoing maintenance operations impacting this vegetation will be complicated by the requirement for the motorway operator to obtain further environmental approvals and biodiversity offsets.

Response

The *Urban Design report* (refer to Appendix J of the REF) outlines the proposed landscape design strategy and reinforces the use of indigenous trees, where possible. The proposed tree species include the Cumberland Shale Plains Woodland, Hunterland Riverflat Eucalypt Forest and the Cumberland Riverflat Forest. Low shrubs and native grasses have also been proposed. However, plant species for revegetation would be further developed and determined during detailed design. Suitable species would be selected based on a number of considerations, such as site conditions (and the species growing requirements) and the ongoing maintenance risk that any planted vegetation could pose to the road network and adjacent land uses.

Future impacts to vegetation planted as part of the proposal (such as due to maintenance requirements) would be managed in accordance with the *No Net Loss Guidelines* (Transport, 2022). This guideline outlines certain activities do not require offsets to be obtained for impacted vegetation. These activities include:

- Work on cleared land, plantations, exotic vegetation where it is unlikely there are threatened species or habitat present
- Work within the disturbed zone or to maintain required operational clearances
- Work within areas that are reasonably likely to naturally regenerate.
- Work involving clearing of vegetation planted as part of an infrastructure corridor landscaping program (this includes where threatened species or species comprising listed ecological communities have been used for landscaping purposes).

2.9.2 Impact to Biodiversity Agreement no. 341

Submission number(s)

43

Issue description

The respondent raised the following issues:

- Concern raised about the proposal's impact on Biodiversity Agreement no. 341 and the consequential impact that this will have on Moorebank Logistics Park's ability to comply with its State Significant Development Conditions of Consent. The biodiversity credits generated from Biodiversity Agreement no. 341 have already been retired and were used to offset the impact of the Moorebank Logistics Park.
- The REF did not include a mitigation measure requiring Transport to obtain approvals for any impact to Biodiversity Agreement no. 341, in consultation with National Intermodal Company. These approvals will need to be obtained prior to construction.
- Clarification sought about the proposed acquisition of Commonwealth land that is subject to a 99 year lease to LOGOS. Some of this land is subject to a biobanking agreement, which was used to secure biodiversity credits to offset the impact of the Moorebank Logistics Park.

Response

Transport proposes to acquire about 955 square metres of land that is subject to a biodiversity stewardship agreement (Biobanking Agreement no. 341). While the proposed acquisition of part of the biodiversity stewardship site would require a variation to be made to the biodiversity stewardship agreement, the acquisition of this land would not impact on the substantive operation of the MPW Stage 2 Consent (SSD7709) conditions relating to biodiversity or the proponent's ability to comply with those conditions. This is because the biodiversity related conditions of the MPW Stage 2 Consent require the proponent to:

- Offset the biodiversity impacts of the MPW Stage 2 development through the retirement of biodiversity credits (Conditions B157 and 1587); and
- Manage the carrying out of the MPW Stage 2 development in a way that does not impact on biodiversity or biodiversity offset areas on the development site (e.g. Conditions B2(c), B45, B159 and B169).

These obligations apply to the carrying out of the MPW Stage 2 development, not Transport's proposed M5 Motorway Westbound Traffic Upgrade.

Transport would be separately required to offset the biodiversity impacts of its proposal, including to the biodiversity stewardship site, in accordance with:

- The conditions of any REF determination (if it is determined that the proposal can proceed); and
- Its obligations under the NSW *Biodiversity Conservation Act 2016* (BC Act), including as part of its application for consent from the NSW Minister for Environment to carry out the proposal on the biodiversity stewardship site under section 5.16 of that Act.

Transport understands that the proponent has already satisfied its obligations under Conditions B157 and 158 of the MPW Stage 2 Consent (in whole or in part) through the retirement of the biodiversity credits created under the biodiversity stewardship agreement, so no compliance issue arises as a consequence of the proposed acquisition of part of the biodiversity offset area for the proposal. In terms of the proponent's other obligations to manage the carrying out of its MPW Stage 2 development so as to not impact on biodiversity or biodiversity offset areas, Transport's proposed acquisition of part of the Moorebank Precinct West development site, including part of the biodiversity stewardship site, does not otherwise affect the proponent's ability to comply with these obligations.

The proponent may need to make minor administrative modifications to its consent, following variation of the biodiversity stewardship site and transfer of the required land to Transport.

Mitigation measures B19 and B20 have been added to address any proposed impacts to the Biobanking Agreement No. 341 site. These detail that any impacts would be in accordance with relevant guidelines and approvals, and that work on the site would not commence until any required approvals/consents have been obtained. These additional mitigation measures are documented in Section 6.2 of this report.

2.10 Landscape character and visual impacts

Submission number(s)

9, 31, 35, 38

Issue description

Respondents raised the following comments and suggestions relating to landscape character and visual impacts:

- Request to maximise the tree canopy over the proposed shared path, ensuring that the correct types of trees are selected for this location based on climate, soil, topography and heat resilience.
- Concern that trees planted too close to the motorway will cause safety hazards. Landscape plantings should be limited to shrubs in areas where a mature tree could impact on the motorway (e.g. by falling or dropping branches). This includes batters sloping towards the motorway and islands between lanes.
- Concern about the proposal's overshadowing impact, with proposed new structures (including the new Georges River bridge) shading and structures reducing the amount of sunlight some properties will receive.

- Concern about the loss of vegetation along the southern side of the M5 Motorway (east of Moorebank Avenue) and the associated visual amenity impacts to surrounding properties.
- Concern about the proposal's impact on site security for businesses located around Secombe Place, Moorebank due to the removal of vegetation and increased opportunities for views into these premises from the surrounding area.

Response

Transport acknowledges the respondents concerns about the proposal's landscaping strategy and would further consider the issues raised during detailed design. The current landscaping strategy for the proposal incorporates maximum opportunities for landscape plantings to reduce the visual impact of the project (particularly around the Moorebank Avenue interchange). There is limited space surrounding the shared user path and as a result it may be difficult to maximise the tree canopy over this path (with it not being possible on the new bridge). However, where possible, the landscaping strategy would seek to achieve this, with the option explored further during detailed design.

The proposed tree species include the Cumberland Shale Plains Woodland, Hunterland Riverflat Eucalypt Forest and the Cumberland Riverflat Forest. Low shrubs and native grasses have also been proposed. However, plant species for revegetation would be further developed and determined during detailed design. Suitable species would be selected based on a number of considerations, such as site conditions (and the species growing requirements) and the ongoing maintenance risk that any planted vegetation could pose to the road network and adjacent land uses. Motorway maintenance issues are also discussed in Section 2.3.4 of this report.

The proposal would not reduce the amount of sunlight to properties in proximity of the proposal. This is due to the east-west orientation of the bridge and the distance of about 50 metres from the bridge to the nearest residence. In addition, construction safety screen elements would be of a light colour to limit contrast with the sky backdrop and maximise sunlight. The proposed new bridge would be designed in accordance with *Bridge Aesthetics – Design guideline to improve the appearance of bridges in NSW* (Centre for Urban Design, 2019). The design of the proposed new bridge would be in a way that is sympathetic to the adjacent existing bridge and the outer face of the bridge balustrades on the bridge would be tilted outwards to catch the sunlight. Any reduction in sunlight would be minimal with pier locations and bridge height aligned to ensure visual integration and maximise sunlight throughout the day.

Transport acknowledges the respondents concerns about the loss of vegetation along the southern side of the M5 Motorway (east of Moorebank Avenue) and the associated visual amenity impacts and privacy concerns for surrounding properties. The REF assessed that the proposal would have a 'moderate' visual impact on assessed viewpoints at this location (viewpoints 9 and 10, as shown in Figure 6-23 of the REF and described in Table 6-51 of the REF), with the following mitigation strategy proposed:

- Mitigation measure LCVIA4 – Consider opportunities to establish dense vegetation including shrubs and stands of trees to provide for effective screening
- Mitigation measure LCVIA6 – Maximise large scale tree planting along the south eastern verge to provide for visual screening and re-establish the green character that the current interchange has.

These mitigation measures are documented in Section 6.2 of this report would be considered during the development of the proposal's Landscape and Urban Design Plan.

An additional mitigation measure (LCVIA7) has been included in Section 6.2, outlining that Transport would continue to consult with businesses located within 2-8 Secombe Place, Moorebank to develop site specific measures to limit opportunities for views into sensitive areas of these premises. This additional mitigation measure is documented in Section 6.2 of this report.

2.11 Socio-economic, property and land use

2.11.1 Property acquisition

Submission number(s)

38, 43, 44

Issue description

Respondents raised the following issues relating to property acquisition:

- Clarification sought about the amount of land that Transport proposes to acquire from Lot 100/DP1049508. The area of land being acquired from this lot was inconsistently described in the REF (Table 3-10 states the acquisition area is 5,117 square metres; however, Section 6.10.3 states this as being 4,980 square metres).
- Requests clarification about the timing of any proposed property acquisitions from business' along Secombe Place.
- Requests that Transport reimburses Goodman Property Services (Aust) Pty Limited for any expenses it incurs seeking peer reviews of project documentation (such as the REF). Any costs incurred as part of this exercise will form part of a claim for compensation from you in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.
- Interlink Roads Limited requests further detail about the proposed acquisition of land within the M5 Motorway corridor.

Response

Transport notes that Section 6.10.3 of the REF incorrectly stated that 4,980 square metres of land would be acquired from Lot 100/DP1049508. Transport confirms that 5,560 square metres of land would be acquired from Lot 100/DP 1049508. Although the correct land acquisition area was documented in Table 3-10 of the REF as 5,117 square metres, design revisions have resulted in amendments to this. Refer to Section 5.10 for more information.

All land acquisition would be carried out in consultation with the relevant landholders in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* and the supporting NSW Government Land Acquisition Reform 2016. Any claims made under this act would be reviewed accordingly with the impacted stakeholder contacted directly. Property acquisitions commenced in early 2023 for industrial and government properties impacted along the proposed M5 Motorway corridor. The final property acquisition and lease boundaries would be confirmed during detailed design and Transport would continue to consult with impacted stakeholders including Interlink Roads Limited to minimise impacts such as property access, where possible.

Transport would also need to abide by the requirements of the *Crown Lands Management Act 2016* and *Crown Land Legislation Amendment Act 2017* when seeking to acquire or lease Crown Land and the *Local Government Act 1993* when seeking to acquire or lease Council-owned land for construction of the proposal.

2.11.2 Impacts to NSW Barefoot Water Ski Club

Submission number(s)

10

Issue description

The respondent raised the following concerns about the proposal's impact on the NSW Barefoot Water Ski Club:

- Concern about the proposal's impact on the NSW Barefoot Water Ski Club's operations and ability to host competitions due to the proposed construction work within the Georges River (including partial and full closures of the river).
- Clarification sought about whether the proposal would impact access to the NSW Barefoot Water Ski Club's boat ramp.

- Concern about the effect that the proposal will have on existing water conditions (such as boat wash and wave bounce back) due to the installation of new infrastructure within the Georges River (e.g. piers, scour protection). This section of the Georges River is the only dedicated barefoot water skiing facility in NSW.

Response

Transport acknowledges the respondent's concerns about the proposal's potential impact on the NSW Barefoot Water Ski Club. Partial and full closures of the Georges River may be required during construction of the proposal, which would result in impacts to the NSW Barefoot Water Ski Club at times when these closures are in place. Transport would continue to consult with the NSW Barefoot Water Ski Club during detailed design and construction with the objective to schedule any temporary closures of the Georges River outside of competition times, where feasible.

The following mitigation measures are proposed to manage the proposal's impact on the NSW Barefoot Water Ski Club:

- Mitigation measure TT3 – Consultation would be carried out with the NSW Barefoot Water Ski Club to confirm temporary closures of the Georges River during construction
- Mitigation measure SC6 – Transport would work with Liverpool City Council through the construction period to minimise impacts during events, such as the NSW Barefoot Water Ski Club Championships to minimise any adverse impacts on the road network and surrounding areas.

These mitigation measures are documented in Section 6.2 of this report.

It is not anticipated that the existing boat ramp would be directly impacted during construction; however, access to the boat ramp would need to be managed during construction as current access would pass through the proposal's construction site. If the existing boat ramp is impacted by design, an alternative nearby access point would be provided to the Georges River. The management of construction access would be determined in consultation with impacted stakeholders.

Impacts to existing water conditions (such as boat wash and wave bounce back) during construction of the proposal are anticipated to be minimised by the selected construction methodology of using moveable crane barge. Structures and equipment anticipated to be required within the Georges River include:

- Sheet pile on the western bank of the Georges River to stabilise Powerhouse Road and the riverbank
- Floating barge that would be mobilised during bridge work (the barge would be anchored to the riverbed and riverbank, as required)
- A temporary wharf (comprising a sheet piled structure with possible tie-back anchors) to provide construction access to the barge
- Environmental controls, such as silt booms.

During operation there would similarly be minimal changes to existing water conditions as minimal permanent structures are proposed to be established in the water. There are permanent measures proposed in close proximity to the river, such as scour protection around the piers and new drainage structures. However, these are not designed to sit within the river during normal water levels.

Further discussion on the proposal's impact to navigation through the Georges River is provided in Section 2.7.10 of this report.

2.11.3 Business impacts

Submission number(s)

35, 43, 44

Issue description

Respondents raised the following comments and requests relating to the proposal's business impacts:

- Concern about the impact the proposal will have on Amtek operations and its ability to maintain business continuity for its customers. The REF identifies that Amtek's facility will be the most adversely impacted property by the proposal, with substantial construction activities proposed in close proximity to its facility for a duration of 3.5 to 4 years. The proposal would also bring the road much closer to Amtek's facility, which will adversely impact on the amenity and safety of the site (due to increased noise and air quality impacts).
- Requests that Transport provides the owner and tenants of 2-8 Secombe Place, Moorebank with all relevant proposal information to assist these stakeholders assess the proposal's impact on their property and/or business operations.
- Concern about the proposal's impact on site security for businesses around Secombe Place, Moorebank due to the removal of vegetation and increased opportunities for views into these premises from the surrounding area. This impact could limit the viability of this site for some businesses due to compromised site security. Requests that Transport further assesses and mitigates this impact.
- Concern raised about the classification of Amtek's facility as an 'industrial land use,' which has a less stringent criteria for traffic, noise and vibration, and air quality compared to residential receivers. Amtek has a large number of staff and clients who regularly occupy this facility, which is more sensitive than a typical industrial land use, such as warehousing.
- The REF did not specifically identify Moorebank Logistics Park as an operating business which will be impacted by the construction of the proposal. The REF incorrectly identifies the Moorebank Logistics Park as being in construction at the same time that the proposal is being constructed. Moorebank Logistics Park will be operational at the time that the proposal is constructed; therefore, the proposal's impact on the Moorebank Logistics Park should have been assessed in the REF.
- Clarification sought about whether fences will be installed between the proposal and its interface with the Moorebank Logistics Park to manage site safety and security.

Response

Transport acknowledges the concerns that nearby businesses have about the proposal and would continue to consult with these stakeholders to manage the potential impacts and disruptions caused by the proposal. Transport understands that some potentially affected businesses have specific operating requirements (such as access and site security arrangements and/or vibration sensitive equipment) that could be compromised by the proposal if not managed appropriately.

Transport consulted with the local business community early in the proposal's development. This included carrying out a business survey between 7 December 2020 and 19 March 2021 to understand how surrounding businesses interact with the M5 Motorway (including access and operational requirements). Feedback from the survey was used to inform the proposal's concept design and the REF's socio-economic assessment.

Since the REF has been on public display, representatives from Transport's M5 Motorway Westbound Traffic Upgrade team have attended meetings with key stakeholders, including businesses and landowners potentially directly affected by the proposal. Stakeholders consulted include Amtek, Goodman Property Services (Aus) Pty Limited, National Intermodal Company and other industrial businesses in the local area.

Feedback received during these meetings have been, and will continue to be, used by Transport to inform detailed design and construction of the proposal. As a result of this feedback, Transport has included the following additional mitigation measures to further manage the proposal's impact on adjacent businesses and landowners:

- NV11 – included to further manage construction vibration impacts to the occupants of 2-8 Secombe Place, Moorebank
- B19 and B20 – included to manage the proposal's impact on Biobanking Agreement No. 341

- LCVIA7 – included to manage privacy concerns around 2-8 Secombe Place, Moorebank.

These additional mitigation measures are documented in Section 6.2 of this report.

Transport's commitment to further consultation with key stakeholders is also documented in amendments to mitigation measures SC1 and CI1, which requires Transport to establish a Construction Communication Coordination Group as part of the Communication Plan (refer to Section 6.2of this report). Mitigation measure SC5 has also been amended to require Transport (and its contractor) to consult with Liverpool City Council, LOGOS (as the representative for tenants within the Moorebank Logistics Park) other project teams and the community to reduce cumulative construction impacts. These revised mitigation measures are documented in Section 6.2 of this report.

Transport acknowledges the respondent's request to receive timely updates about the proposal to enable businesses to assess the proposal's impact on their property and/or business operations. Transport is already in direct discussions with directly impacted landowners and would continue to consult with broader stakeholders in a timely manner throughout the development of the proposal.

Transport notes Amtek's concerns regarding the land use classification that was applied to their facility for the purposes of assessing the impacts of the proposal. The classification of Amtek's facility as an industrial land use is considered appropriate as the site primarily operates as a work site. It is noted that the facility is heavily populated; however, the site does not have the same requirements as residential receivers (for example, in relation to sleep disturbance due to noise). Noise criteria were developed for residential receivers considering internal noise disturbance to sleep and noise during the night-time. The industrial land use still considers that people would be present on site in a professional capacity. Transport would continue to consult with impacted stakeholders and would monitor the proposal's impacts on these stakeholders, as required.

Further discussion on how Transport proposes to manage the proposal's impact on surrounding properties (including businesses) is provided in the following sections of this report:

- Section 2.4.3 (Road work speed reductions)
- Section 2.4.4 (Construction access arrangements)
- Section 2.4.5 (Cumulative impacts)
- Section 2.5.1 (Consultation with impacted businesses)
- Section 2.6.4 (Construction noise and vibration impacts)
- Section 0 (Operational noise and vibration impacts)
- Section 2.6.6 (Principles for selecting operational noise mitigation)
- Section 2.6.7 (Noise and vibration mitigation measures)
- Section 2.7.9 (Traffic impacts during construction)
- Section 2.10(Landscape character and visual impacts)
- Section 2.12(Air quality).

Transport confirms that the REF identified and assessed the cumulative impact of the Moorebank Logistics Park being partly operational at the time that the proposal is constructed. Transport would continue to consult with LOGOS (as the representative for tenants within the Moorebank Logistics Park) and other potentially impacted businesses throughout the development of the proposal.

Transport confirms that fencing would be installed between the proposal and its interface with the Moorebank Logistics Park (where required and practical to do so) to manage site safety and security. Such arrangements would be determined in consultation with LOGOS.

2.12 Air Quality

Submission number(s)

35, 39, 42, 44

Issue description

Respondents raised the following comments and suggestions relating to air quality:

- Concern raised that the REF did not adequately assess the proposal's air quality impacts.
- Concern raised about long-term health effects associated with air pollution from the M5 Motorway.
- Concern raised about the proposal's construction and operational dust impacts to Amtek's facility. These include impacts on staff health, sensitive medical grade equipment, cleanliness of vehicles and equipment, air conditioning filtration systems and solar systems.
- Requests that Transport carries out a detailed assessment of the proposal's dust impacts to Amtek's facility (for both the construction and operational phases) and identifies further mitigation measures to address these impacts.

Response

Transport confirms that the REF adequately assessed the proposal's air quality impacts. A Tool for Roadside Air Quality (TRAQ) assessment was carried out for the proposal during the preparation of the REF. This assessment is summarised in Table 6-55 of the REF; however, Transport acknowledges that the full assessment was not included as an attachment to the REF. For completeness, the full TRAQ assessment is included in Appendix E of this report. Transport confirms that the air quality impacts described in Table 6-55 of the REF are consistent with the full TRAQ assessment provided in Appendix E and, therefore, further air quality assessment is not required for the proposal.

The respondents concerns regarding the proposal's air quality impacts are noted. Air quality impacts during construction of the proposal would primarily be associated with dust emissions. Construction activities with the greatest potential to generate dust emissions are anticipated to include:

- Clearing of vegetation
- Stripping, stockpiling and managing topsoil
- Earthworks
- Road sub-grade preparation
- Transport and handling of soil
- Vehicle movements on unsealed haulage roads.

The potential quantity of dust expected to be generated from these construction activities is expected to be relatively minor and able to be adequately managed through implementation of standard safeguards and management measures, as documented in Section 6.2 of this report. Notwithstanding, Transport has included an additional mitigation measure (AQ3) to further reduce the potential for dust impacts to occur to sensitive businesses around 2-8 Secombe Place, Moorebank. This additional measure is documented in Section 6.2 of this report.

The operation of the proposal is not anticipated to result in substantial changes in existing air quality at surrounding sensitive receivers, as the proposal would provide negligible increases in traffic compared to the existing environment. The TRAQ assessment in Appendix E of this report indicates that the annual average and maximum daily $PM_{2.5}$ concentrations and annual average and maximum daily PM_{10} concentrations are predicted to exceed the relevant current ambient air quality criteria at the nearest sensitive receptors located adjacent to the proposal. These predicted exceedances are minimal and are driven mainly by the existing background concentrations. Therefore, no further detailed assessment and mitigation measures are required. This is detailed further in Table 2-4 and Table 2-5.

The increases in the predicted cumulative annual average concentrations for all pollutants at 10 metres from the kerbside, as a result of the proposal, are minimal. TRAQ is a highly conservative screening model, which would overestimate actual impacts. The modelling was performed using conservative assumptions in relation to the assumed $PM_{2.5}/PM_{10}$ ratio, meteorological data and season options, and the fleet mix.

Table 2-4 2026 cumulative traffic emissions scenarios

	Heathcote Road to Moorebank Avenue		Moorebank Avenue to Hume Highway		Criteria
	Without proposal	With proposal	Without proposal	With proposal	
Maximum 24-hour PM_{10} concentrations	46.4	46.9	49.6	50.4	50
Annual PM_{10} concentrations	25.3	25.5	26.6	26.9	25
Maximum 24-hour $PM_{2.5}$ concentrations	25.5	25.9	28.2	28.8	25
Annual $PM_{2.5}$ concentrations	12.8	13	13.9	14.1	8

Table 2-5 2036 Cumulative traffic emissions scenarios

	Heathcote Road to Moorebank Avenue		Moorebank Avenue to Hume Highway		Criteria
	Without proposal	With proposal	Without proposal	With proposal	
Maximum 24-hour PM_{10} concentrations	45.8	46.4	49.2	50.1	50
Annual PM_{10} concentrations	25.1	25.3	26.5	26.8	25
Maximum 24-hour $PM_{2.5}$ concentrations	25.0	25.5	27.8	28.6	25
Annual $PM_{2.5}$ concentrations	12.6	12.8	14.1	14.1	8

2.13 Planning pathway under the EP&A Act

Submission number(s)

38, 42, 44

Issue description

Respondents raised the following comments and suggestions relating to other issues:

- Concern raised that this proposal is being assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Transport being able to determine to proceed with the proposal without approval from the NSW Minister for Planning. Requests that the Minister for Planning declares the proposal to be State Significant Infrastructure and for an Environmental Impact Statement to be prepared under Division 5.2 of the EP&A Act.
- There is no reference to the M5SW Ministers Conditions of Approval in the REF.

Response

As discussed in Chapter 4 of the REF, the proposal is categorised as development for the purpose of a road and/or road infrastructure facilities and is being carried out by or on behalf of a public authority. Under clause 2.108 of Transport and Infrastructure SEPP, the proposal is permissible without consent. The proposal is not State significant infrastructure or State significant development. The proposal can be assessed under Division 5.1 of the EP&A Act. Transport for NSW is the determining authority for the proposal.

The M5SW Minister's Conditions of Approval are not relevant to this proposal as it is a separate scope of work and approval. Transport will continue to consult with the motorway operator to manage impacts on their assets and any potential compliance issues that could arise as a result of our proposal.

2.14 M5 Motorway and Moorebank Avenue intersection delivery

Submission number(s)

43

Issue description

The respondent raised the following concerns regarding the delivery of the M5 Motorway and Moorebank Avenue intersection:

- The REF did not consider or assess the possibility that the M5MA component of work could be delivered as a separate project by LOGOS and National Intermodal Company. The M5MA proposal should be considered as a separate project until such opportunities for Transport to deliver the M5MA component of work are realised.
- Notes the cumulative effects of multiple simultaneous stages of construction in close proximity, including the Heathcote Newbridge and Moorebank Avenue intersections to be constructed by LOGOS and National Intermodal Company. Transport is to be advised that LOGOS and National Intermodal Company are seeking a modification to SSD 7628 to amend the dates for delivery of the M5MA and HMNA upgrades.

Response

As outlined in Section 2.1 of the REF, road infrastructure upgrades to support the development of the Moorebank Logistics Park are required as part of the development approval for the Moorebank Intermodal Precinct East Stage 2 development (SSD 7628). These upgrades include an upgrade of the M5 Motorway and Moorebank Avenue intersection (development consent condition B.13 – Road Infrastructure Upgrades).

By incorporating the required upgrade to the M5 Motorway and Moorebank Avenue intersection as part of the REF proposal, Transport has sought to reduce the potential for substantial cumulative traffic impacts on its customers and the broader community living and working around the proposal that would be caused by:

- Transport's delivery of M5 Motorway upgrades to improve safety, traffic flow and active transport measures

- The separate delivery of the M5 Motorway / Moorebank Avenue intersection upgrade by the proponent of the Moorebank Logistics Park.

As indicated in the REF, Transport is in discussions with the proponent of the Moorebank Logistics Park and other external parties to secure a funding contribution for the delivery of the M5 Motorway / Moorebank Avenue intersection component of the proposal having regard to the proponent's obligations under the Moorebank Intermodal Precinct East Stage 2 development consent.

Transport notes that on 4 September 2023 the delegate of the Minister for Planning and Public Spaces approved Modification 5 of the development consent SSD 7628.

2.15 Out of scope

2.15.1 Additional active transport provisions

Submission number(s)

7, 31

Issue description

Respondents raised the following suggestions and comments relating to active transport work that lies outside the proposed scope of work:

- Suggests that Transport and Council consider a shared path connection under the proposed new bridge over the Georges River to provide access to the eastern bank of the Georges River.
- Suggestions that the bridge across the weir at Liverpool is another much needed project as the bridge is often under water and unable to be used as a cycle path linking Liverpool to Chipping Norton Lakes.
- Concern towards shared user path continuity between the M5 Motorway Westbound Traffic Upgrade and the Moorebank Avenue / Anzac Road intersection being upgraded by another proponent. Requests coordination of the shared user path designs with Council and other private developers.
- Consider providing further active transport infrastructure to improve shared paths within a wider area. For example, the shared path spur to Lakewood Crescent should lead to a cycle and pedestrian bridge over the rail line to create much better access to the rail trail shared path and Powerhouse Road.

Response

Transport acknowledges the respondents concern towards shared user path continuity and interest in extending the shared user path outside the current scope of work. As discussed in Section 4 of this report, the proposed shared user path has been revised since public display of the REF to include a T-intersection on the eastern bank of the Georges River. This T-intersection would allow for a future shared user path connection on the eastern side of the Georges River (to be delivered by others). The proposed shared user path would also connect into the Moorebank Avenue shared user path (being delivered by the Moorebank Logistics Park).

Cyclist and pedestrian access to the rail trail shared path and Powerhouse Road would be via Woodbrook Road. This is currently being developed by Liverpool City Council and does not form part of the scope of this proposal. Any upgrades to the surrounding pedestrian and cyclist paths would be subject to separate assessment, approval, and funding. Consultation would continue with the community and relevant stakeholders during the design and construction of the proposal. Coordination will continue throughout this process as to not preclude further active transport infrastructure continuity within the wider area. Transport will provide comments relating to active transport links to Liverpool City Council for their future consideration in planning.

2.15.2 Design suggestions

Submission number(s)

8, 14, 21, 22, 28, 36, 37, 42

Issue description

Respondents raised the following comments and queries relating to work that lies outside the current proposal scope:

- Suggests an upgrade to the M5 Motorway near King Georges Road.
- Requests for upgrades to be made to the M5 Motorway eastbound as part of the proposal.
- Request for increased storage capacity of the eastbound on ramp from the Hume Highway as traffic queue's along the Hume Highway southbound often prevents Congressional Drive residents from turning left into Congressional Drive when travelling from Liverpool.
- Notes the proposal does not address existing congestion on the northern side of the Moorebank Avenue interchange associated with vehicles turning right onto the M5 Motorway (westbound) from Moorebank Avenue (southbound) as vehicles often block the Moorebank Avenue intersection.

Response

Transport acknowledges the respondents' interest in surrounding roads, infrastructure and developments and notes that the M5 Motorway eastbound and other identified roads are outside the scope of the proposal. These would be subject to separate assessment, approval, and funding.

The existing weaving movement on the M5 Motorway westbound at this location has been identified as a safety issue, and a cause of congestion on this section of the motorway. Although no work is proposed for vehicles turning right onto the M5 Motorway from Moorebank Avenue southbound, by incorporating the required upgrade to the M5 Motorway and Moorebank Avenue intersection as part of the proposal, Transport has sought to improve this key intersection. This would improve safety, traffic flow and active transport measures and minimise cumulative impacts.

2.15.3 Surrounding projects

Submission number(s)

20, 24, 39

Issue description

The respondents raised the following requests and concerns relating to surrounding projects not related to the proposal:

- Requests the Moorebank Avenue Realignment should include noise mounds to minimise noise impacts from the Moorebank Logistics Park.
- Concern raised that Transport has not upgraded the sound barriers on the Heathcote Road entry ramp to the M5 Motorway westbound as part of the previous upgrade work along the M5 Motorway. Requests that this work is completed to mitigate noise for residents who back onto this section of the motorway.
- Clarification sought as to why the M5 Motorway Westbound was not assessed at the same time as the Moorebank Intermodal Terminal.
- Request information about the proposed Anzac Creek footbridge at Wattle Grove with specific clarification towards the bridge design noise attenuation.

Response

The Moorebank Avenue Realignment is located to the north of the proposal. It is not a Transport project and is private developer project that has been approved by the NSW Department of Planning and Environment (now the NSW Department of Planning, Housing and Infrastructure (DPHI) following the departments restructure, effective from January 1, 2024). Any concerns regarding the Moorebank Avenue Realignment project (including

the request for noise mounds to be delivered as part of that project) should be addressed to the proponent and/or DPHI.

The Heathcote Road entry ramp to the M5 Motorway lies outside the proposal's scope of work. Therefore, any noise impact associated with this section of the M5 Motorway was not assessed as part of the REF. Concerns related to existing traffic noise around the Heathcote Road entry ramp can be raised through Transport's Noise Abatement Program. The respondent is requested to raise this noise concern with the Noise Abatement Program by visiting Transport's Noise Abatement Program website via the following weblink: https://www.transport.nsw.gov.au/operations/roads-and-waterways/environment-and-heritage/reducing-road-traffic-noise/noise-abatement.

The proposal does not form part Moorebank Intermodal Terminal and, therefore, did not form part of the EIS for that project. Transport is in discussions with the proponent of the Moorebank Logistics Park and other external parties to secure a funding contribution for the delivery of the M5 Motorway / Moorebank Avenue intersection component of the proposal having regard to the proponent's obligations under the Moorebank Intermodal Precinct East Stage 2 development consent. This is discussed further in Sections 2.2.2 and 2.15 of this report.

Transport notes that the Anzac Creek footbridge is not part of the proposal; however, the below information has been obtained regarding the bridge:

- The bridge is defence owned and operated, with Council engagement occurring as required
- Contractors, The Joss Group, have been mobilised to site and have obtained Sydney Water approval as well as liaised with local Council
- The construction program of the pedestrian bridge is scheduled to be complete by mid-2023.

Transports suggests that any further questions relating to Anzac Creek footbridge are presented to The Joss Group directly.

3. Response to government agency issues

3.1 Overview of issues raised

Transport received a submission from Liverpool City Council.

Figure 3-1 provides a summary of key issue categories raised by government agencies, including the number of times an issue was raised relating to each category.

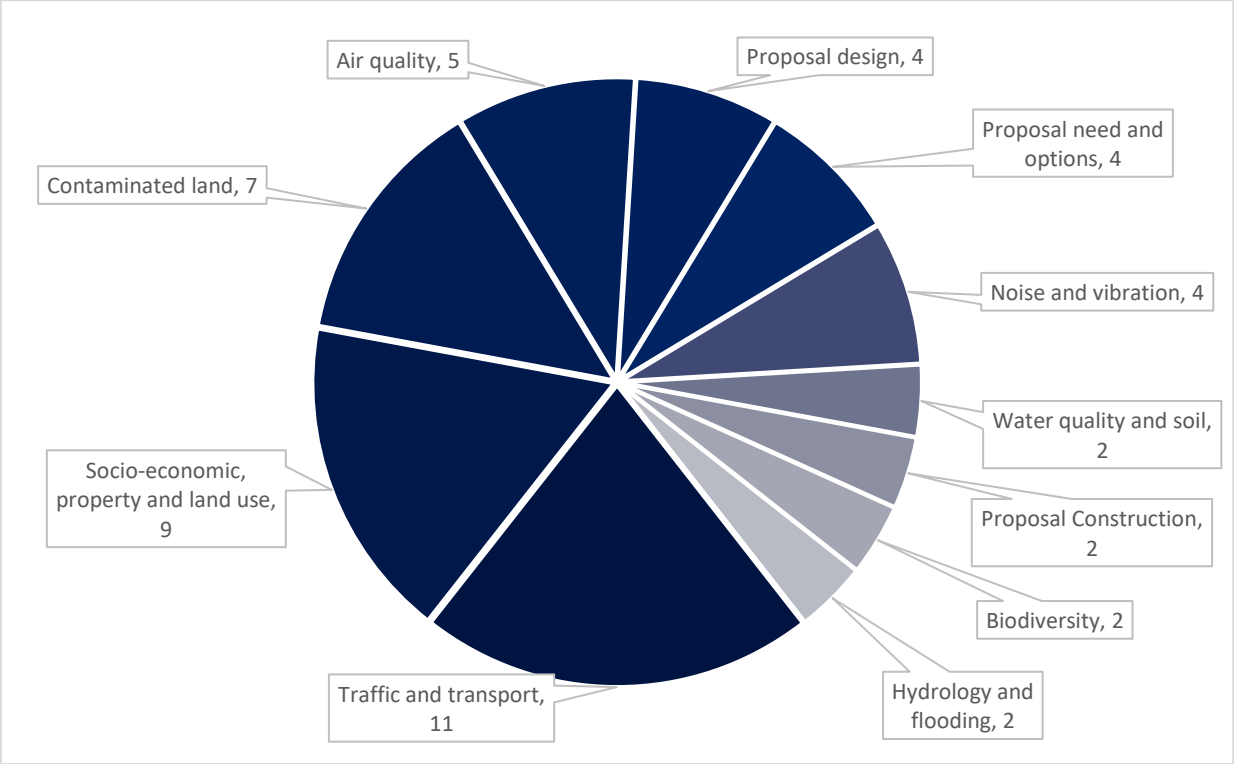

Figure 3-1 Summary of the number of times key issues were raised by government agencies

Figure 3-1 shows that the top key issue categories were:

- Traffic and transport (raised 11 times)
- Socio-economic, property and land use (raised nine times)
- Contaminated land (raised seven times)
- Air quality (raised five times)
- Proposal design (raised four times)
- Proposal need and options (raised four times)
- Noise and vibration (raised four times).

Transport has, and will continue to, consider any informal feedback provided by government agencies during detailed design and the construction of the proposal.

3.2 Liverpool City Council

3.2.1 Proposal need and options

Issue description

Liverpool City Council suggests the following in relation to the proposal need and options:

- Expresses general support of the proposal. The proposal will increase road capacity and will improve through traffic movements.
- Requests that Transport addresses the eastbound weaving issues on the M5 Motorway between the Hume Highway and Heathcote Road. The proposal will not resolve the eastbound weaving issues.

Response

Transport notes Council's support for the proposal and the benefits that the proposal would provide, including the opportunity to ease congestion and improve road safety and connectivity.

Transport acknowledges Councils' request for upgrades to be made to the M5 Motorway eastbound between the Hume Highway and Heathcote Road; however, this is outside the scope of the current proposal. Any upgrades to the surrounding roads would be subject to separate assessment, approval, and funding.

3.2.2 Proposal design

Issue description

Liverpool City Council notes and requests the following in relating to the proposal design:

- Requests that Transport continues to consult with Council during the design and construction of the proposal.
- Requests that Transport reclassifies the section of Moorebank Avenue located between the M5 Motorway and Anzac Road from a local road to a State road.
- Concern raised that the proposal could cause confusion for motorists wishing to exit the M5 Motorway at the Hume Highway. Specifically, those motorists would need to exit the motorway before the Moorebank Avenue exit. The proposal should include appropriate directional signs and pavement marking to provide clear guidance to motorists.
- Requests that the detailed landscaping and urban design report is submitted to Council for review, prior to completion of the detailed design.

Response

Consultation about the proposal has been ongoing since 2019 and has involved community information sessions, stakeholder meetings, participation in the submissions process and ongoing digital correspondence. Consultation would continue with the Council, the community and relevant stakeholders during the design and construction of the proposal.

Transport acknowledges Liverpool City Councils request to reclassify Moorebank Avenue between the M5 Motorway and Anzac Road to a state road. Transport is considering the formal request submitted by Council with the review process ongoing.

Standard regulatory and warning signs would be installed on the M5 Motorway corridor at the location of the proposal. There would be advanced directional signage (replacing existing signs) about 2.5 km and 800 metres prior to the exits. Signage has been included in the design and would be further refined during detailed design.

Transport would provide a copy of the landscaping and urban design report to Liverpool City Council for information.

3.2.3 Proposal construction

Issue description

Liverpool City Council requests the following in relation to the proposal's construction:

- Requests that Transport establishes an interface group with Council and the developer of the Moorebank Logistics Park to manage and coordinate construction activities around the Moorebank Avenue interchange.
- Requests that the proposal is constructed at the same time that other Moorebank Avenue intersection upgrades are being carried out by the developer for the Moorebank Logistics Park.
- Request that a project coordination group is established between Transport, Council and the developer of the Moorebank Logistics Park to manage and minimise cumulative construction traffic impacts and operational traffic impacts once the Moorebank Logistics Park is operational.

Response

Transport will form a Communication Coordination Group to manage potential cumulative impacts. This requirement has been included as mitigation measure SC1, with the original measure amended to include reference to the establishment of a Construction Communication Coordination Group as part of the Communication Plan. The consultation process would involve ongoing communication between major project teams in the area. This would assist to manage community notifications of upcoming works and consultation planned consultation activities for each project, to minimise community confusion.

Mitigation measure CI2 requires Transport to consider potential cumulative construction impacts from known surrounding developments and new planned developments near the proposal, as they become known. This would include a process to regularly review and update mitigation measures as new work is identified that may lead to cumulative impacts or if complaints are received due to cumulative impacts (refer to mitigation measure CI2 in Section 6.2).

As outlined in Section 2.1 of the REF, road infrastructure upgrades to support the development of the Moorebank Logistics Park are required as part of the development approval for the Moorebank Intermodal Precinct East Stage 2 development (SSD 7628). These upgrades include an upgrade of the M5 Motorway and Moorebank Avenue intersection (development consent condition B.13 – Road Infrastructure Upgrades).

By incorporating the required upgrade to the M5 Motorway and Moorebank Avenue intersection as part of the REF proposal, Transport has sought to reduce the potential for substantial cumulative traffic impacts on its customers and the broader community living and working around the proposal that would be caused by:

- Transport's delivery of M5 Motorway upgrades to improve safety, traffic flow and active transport measures
- The separate delivery of the M5 Motorway / Moorebank Avenue intersection upgrade by the proponent of the Moorebank Logistics Park.

As indicated in the REF, Transport is in discussions with the proponent of the Moorebank Logistics Park and other external parties to secure a funding contribution for the delivery of the M5 Motorway / Moorebank Avenue intersection component of the proposal having regard to the proponent's obligations under the Moorebank Intermodal Precinct East Stage 2 development consent.

3.2.4 Noise and vibration

Issue description

Liverpool City Council notes the following in relation to the proposal's noise and vibration impact:

- Requests that further assessment of the effectiveness of proposed noise mitigation measures is carried out in consultation with Council. A peer review is to be carried out to ensure that the proposed noise mitigation measures comply with the relevant EPA road noise policy.
- Requests that detailed designs of proposed noise treatments (including noise walls) is submitted to Council for review.
- Requests that Transport provides Council with contact details for it to refer any noise complaints related to the construction and operation of the proposal.

- Requests that Transport submits its Construction Noise and Vibration Management Plan for Council's review.

Response

The final noise mitigation measures would be determined during detailed design in accordance with *Road Noise Mitigation Guideline (Transport 2022)*. The proposed noise mitigation measures would be delivered in accordance with the principles outlined in Transport's *Road Noise Mitigation Guideline* (refer to Section 2.6.6). Liverpool Council would be provided with details of the mitigation strategy.

Council will continue to be consulted about the proposal design (including the design of noise walls and other forms of proposed noise mitigation). Transport would provide a copy of the detailed design of noise treatments (including noise walls) to Liverpool City Council for information.

A post-construction noise monitoring program will be carried out within 12 months of opening of the proposal to verify the predicted noise levels, in accordance with the *Road Noise Mitigation Guideline* (Transport 2022). An additional mitigation measure (NV12) has been included in Section 6.2 of this report to document this commitment.

Contact details for Council to refer construction related noise complaints to are not currently available and will be determined once the Construction Contractor has been appointed. These contact details will be provided to Council as soon as they become available. The contact details will also be made readily available to the community (e.g. through the project website and included in all community notifications), in accordance with the proposal's Construction Noise and Vibration Management Plan, Communications Plan and Environmental Protection Licence.

Noise complaints that Council receives related to existing road noise can be referred to Transport's Noise Abatement Program by visiting Transport's Noise Abatement Program website via the following weblink: https://www.transport.nsw.gov.au/operations/roads-and-waterways/environment-and-heritage/reducing-road-traffic-noise/noise-abatement.

Noise complaints that Council receives during operation of the proposal can be referred to Transport's M5 Motorway Westbound Traffic Upgrade project team. Relevant contact details will be provided to Council prior to operation of the proposal.

The Construction Noise and Vibration Management Plan (CNVMP) will be provided to Council for information.

3.2.5 Traffic and transport

Issue description

Liverpool City Council raised the following queries and concerns relating to traffic and transport:

- Clarification sought about whether the proposed 5.4 metre clearance provided at the underpass at Moorebank Avenue is sufficient for the largest Performance Based Standards (PBS) or oversized vehicle? The M5 Motorway is part of the national land transport network, while Hume Highway is a Performance Based Standards (PBS) route.
- Concern raised about construction traffic impacts associated with the proposal during partial and full closures of the M5 Motorway / Moorebank Avenue interchange; any closures of this interchange will have significant impacts on the wider community in South West Sydney.
- Concern raised about construction traffic impacts associated with the proposal due to the use of local roads as construction haulage routes.
- Requests that Intelligent Transport Systems (ITS) devices and advanced warning systems are included to redirect traffic during a traffic incident. An incident response and management plan should be developed to ensure the ITS system will operate during major incidents.
- Council's road occupancy permits are to be obtained for any partial or full local road closures. Approved permits are to be implemented during construction to minimise impacts on the local road network.
- Requests that Transport complete a road safety audit for the proposal. This audit is to include a review of the required sign and line marking guidance system. A copy of the road safety audit is to be submitted to Council for its information and review.

- Requests that Transport consult Council about road closure timeframes, particularly Powerhouse Road, to reduce construction impacts on the Casula Powerhouse Art Centre.
- Requests that Council and the local community are appropriately informed of local roads affected during construction. A community and stakeholder consultation plan is to be developed and submitted to Council for comment, and to be implemented during detailed design and construction.
- Requests that construction traffic management plans are developed in consultation with Council for all impacted local roads to minimise construction traffic impacts. The Construction Traffic Management Plan is to assess the cumulative traffic impacts of the proposal with other projects in the surrounding area.

Response

The checking vehicle used for the design was a Performance Based Standards (PBS) Level 3 A-double; however, there are no differences in vertical clearance requirements for Performance Based Standards (PBS) rated vehicles. The vertical clearance of 5.4 metres for the underpass is in accordance with AS5100.1 Table 13.7 and is sufficient.

Construction of the proposal would require traffic switches on Moorebank Avenue during the construction of the underpass. Speed limits on the M5 Motorway may be reduced to 80 kilometres per hour, and other areas within the proposal area, including Moorebank Avenue, may be reduced to 40 kilometres per hour during the construction of the underpass. The speed restrictions on Moorebank Avenue would apply for Stages 1 through to Stage 4 when works are complete. This is anticipated to be 25 months in dry weather and up to 30-32 months with allowance for weather. This is subject to Road Occupancy Licence (ROL) approval and is required to ensure worker safety during construction. This would be confirmed during detailed design and reviewed throughout construction.

Key stakeholders, such as Council, Interlink Roads and LOGOS (as the representative for tenants in the Moorebank Logistics Park), would be consulted throughout detailed design and during the preparation of construction staging. Consultation will be ongoing with Council, including when road closures are proposed. Consultation will also be ongoing with the community and regular community updates would be provided during construction to ensure they are informed of any closures prior to the work commencing. It is noted that during the construction stage of the proposal, a Communication Plan would be developed and implemented by the Construction Contractor. This document will be provided to Council for information.

The construction traffic management plan would be prepared and implemented as part of the CEMP and would include measures to manage potential construction traffic impacts (including cumulative traffic impacts with other locally occurring development). This plan would outline the construction hours, haulage and access routes, consultation procedures and other contingency measures to be implemented during construction to minimise disruptions to traffic. The TMP would be provided to Council for information.

The performance of the road network would continue to be monitored throughout construction of the proposal by the Traffic Management Centre. Where required, Traffic Management Centre may require Transport (and its Construction Contractor) to modify its Construction Traffic Management Plan to reduce the proposal's impact on the road network.

Further discussion on the management of construction traffic impacts is provided in Section 2.7.9 of this report. The construction traffic for delivery or removal of construction materials and equipment would generally be staged throughout the day, with a slight peak in construction traffic volumes during the morning period. The proposal area is well serviced by roads suitable for heavy vehicles, including the M5 Motorway, Hume Highway, Moorebank Avenue, Heathcote Road and sections of Anzac Road between Moorebank Avenue and Yulong Close. Some local roads in Moorebank, Liverpool and Casula would need to be used to access areas of the proposal that cannot be accessed directly from the main roads; therefore, the number of vehicles would be limited, and monitoring would occur to understand if this is placing a strain on the network. A Road Dilapidation Survey would be carried out prior to and post construction for all local roads used for the construction of the proposal. Consultation with impacted stakeholders adjacent to these local roads would be carried out to minimise impacts. Construction traffic numbers would be further investigated during detailed design.

Intelligent Transport Systems (ITS) that would be delivered as part of the proposal include installation and adjustments to traffic/SCATS detection, CCTV, a web camera, an emergency breakdown telephone and a stopping bay, backbone conduit and one variable message sign (VMS) relocated to the westbound off ramp approach. This would meet the objectives in the NSW Road Safety Plan 2021 through the provisions of upgraded road infrastructure that adheres to current safety standards.

The relevant permits, licences and approvals (including road occupancy licences) would be obtained prior to construction. A road safety audit has been completed for this stage of design; however, as part of normal procedure, a further road safety audit would be carried out in the detailed design stage. Transport notes Council's request for a copy of the road safety audit and this would be provided to Council for information.

3.2.6 Hydrology and flooding

Issue description

Liverpool City Council raised the following hydrology and flooding issues:

- Concern raised that the proposal will increase the flood level at private properties located on the western side of the Georges River by up to 20 millimetres. The permissible increase in flood level to private properties is 10 millimetres.
- Transport is to investigate measures to reduce the proposal's increase in flood level at impacted properties to the permissible limit of 10 millimetres.

Response

The changes in flood behaviour are as a result of additional losses imposed by the sub-structure (piers) of the proposed bridge. Increases in peak flood levels (affluxes) of up to approximately 20 millimetres in a one per cent AEP design event (1 in 100 year event) and the probable maximum flood (PMF) are predicted upstream of the proposed bridge. Appendix E of the REF provides further clarification and notes that there is no significant change in the flood behaviour of the Georges River predicted as a result of the proposal.

Seven residential properties (to the west of the Georges River) and two commercial properties (to the east of the Georges River) were identified to be within the one percent AEP zone of flooding. The potential impacts on the buildings within these properties would be investigated in detailed design with detailed building floor level surveys. The predicted affluxes of up to 20 millimetres are not expected to pose significant risks to the buildings due to the following:

- These properties are predicted to have substantial inundation of up to about one metre in the existing environment and that the predicted increase in the inundation depth of up to 20mm is considered minimal.
- The flow velocities in the existing environment are low (less than 0.2m/s) and that no increase in flow velocities is predicted as a result of the proposal.
- No changes to the flood hazard classification is predicted as a result of the proposal.

Mitigation measure F1 has been amended to ensure that the additional flood assessment to occur for properties impacted around Woodbrook Road considers Council's maximum permissible increase in flood level to private properties of ten millimetres.

3.2.7 Biodiversity

Issue description

Liverpool City Council notes the following biodiversity issues:

- The biodiversity measures are to be developed in accordance with the relevant planning policies and instruments and Council's Local Strategic Planning Statement (LSPS) and Development Control Plans (DCPs).
- Concern raised about the amount of native vegetation that will be removed as part of the proposal.
- Requests that details of the proposed safeguards and management measures to mitigate biodiversity impacts (identified in Table 6-40 of the REF) are submitted to Council, prior to construction. Requests that Transport consults with Council during the development of biodiversity mitigation measures.

Response

Transport would consider Liverpool City Council's Local Strategic Planning Statement and Development Control Plans during detailed design and would provide a copy of mitigation measures to Liverpool City Council for information.

Following the display of the REF the design has been revised and the amount of clearing required has reduced by about 955 m^2 in the biobank site; however, this would be further refined during detailed design. The biodiversity mitigation measures would be refined during detailed design and provided to Council for information.

3.2.8 Socio-economic, property and land use

Issue description

Liverpool City Council notes and request the following in relation to socio-economic, property and land use:

- Requests that Transport identifies possible impacts on Helles Park in consultation with Council. This includes opportunities to increase usage of the park with the proposed shared path and consideration of impact on the amenity of the park by the overshadowing of the proposed new structures (e.g. the new bridge and noise walls).
- Requests that early consultation for any temporary lease or acquisition of Council's land is carried out. The project team is to arrange meetings with Council's Property Section to discuss the required acquisition or temporary lease of Council's land for the proposal.
- Council notes that the project could generate employment opportunities for local residents during construction and requests that local businesses be given opportunity to tender for parts of upgrade works and be part of the proposal.
- Requests that procurement workshop(s) be held, inviting local businesses and interested contractors to attend.

Response

Potential impacts to Helles Park and active transport opportunities would be further investigated in detailed design. As discussed in Section 4 of this report, the proposed shared user path design has been revised to include a T-intersection on the eastern side of the Georges River, to allow for Council to provide a shared user path from this point.

Consultation regarding land acquisition would commence prior to construction starting and Transport will arrange a meeting with Council's property section to discuss required acquisitions. All land acquisition would be carried out in consultation with the relevant landholders in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* and the supporting NSW Government Land Acquisition Reform 2016. Transport would also need to abide by the requirements of the *Crown Lands Management Act 2016* and *Crown Land Legislation Amendment Act 2017* when seeking to acquire or lease Crown Land and the *Local Government Act 1993* when seeking to acquire or lease Council-owned land for construction of the proposal. The final property acquisition and lease boundaries would be confirmed during detailed design and Transport will continue to consult with Council to minimise impacts where possible.

Transport acknowledges the business opportunities that would be generated from the proposal. Local employment opportunities would be considered and further investigated during detailed design.

3.2.9 Contaminated land

Issue description

Liverpool City Council notes the following contaminated land issues:

- Requests that the required environmental management plans and details of mitigation measures identified in Table 6-36 of the REF are submitted to, and discussed with, Council prior to construction.
- Requests that remediation works planned for the proposed ancillary construction facility at Helles Park consider Council's Remediation Action Plan (RAP), and comply with the Site Long Term Environmental Management Plan and NEPM guidelines (relevant to asbestos and landfill gas).
- Requests that additional contamination/remediation reports, including waste and materials tracking, are developed and provided to Council for review.
- Requests that Transport implements an Unexpected Finds Protocols for contamination.

- Requests that Transport develops and implements control measures for potential uncontrolled fill around the Georges River embankment; and potential ex-situ hazardous materials, including from demolition of structures and illegal dumping.
- Council has notified the NSW EPA regarding contamination at Helles Park under Section 60 of the *Contaminated Land Management Act 1997*. Transport may need to inform the EPA of work proposed at Helles Park.
- The REF generally refers to soil investigations conducted by Council for Helles Park. EP Risk has conducted extensive investigations at Helles Park on behalf of Council with the site now managed under a Long Term Environmental Management Plan (LTEMP). Transport is required to comply with Council's LTEMP for Helles Park, including the requirement for further soil investigations to be conducted before remediation works to guide potential control measures and lawfully manage waste soil materials.
- Requests that Transport consider the possibility of hazardous materials to be present across the project footprint (e.g. due to existing structures and illegally dumped waste).

Response

A *Preliminary Site Investigation and Landfill Gas Assessment* was carried out for the proposal in accordance with relevant guidelines and is attached as Appendix G to the REF. Mitigation measures recommended to be implemented during detailed design and construction are outlined in Section 6.5.5.

A Contaminated Land Management Plan (CLMP) would be prepared and implemented as part of the CEMP to manage potential contamination impacts during construction of the proposal, as per mitigation measure CL1. The CLMP would identify further investigations required to determine the extent, concentration and type of contamination, management of remediation and subsequent validation of the contaminated land, including any certification required. It would also include measures to ensure the safety of site personnel and local communities during construction. Mitigation measure CL2 has been revised to detail the requirement for an unexpected finds procedure to be prepared and implemented during construction. This would include provisions for encountering hazardous material from any existing structures, demolition or ex-situ materials.

Transport acknowledges that Council has notified the NSW EPA regarding contamination at Helles Park and would work with Council and the EPA. However, as the site would be leased, Transport's responsibility to notify the EPA would be limited to when work would be commencing at the site. Mitigation measure CL7 outlines the requirement for Transport or the contractor to notify the EPA at least two days before work commences that would exhume waste at this site.

Transport would follow any directives and remediate the site, as required, with the use of the proposed ancillary facility conditional on implementation of a remedial strategy that mitigates the potential risks to human health and the environment. These works would be conducted in advance to construction work commencing and site suitability would be confirmed by the NSW EPA and/or a NSW EPA accredited Auditor through the appropriate regulatory process.

The CLMP, and any additional contamination reports, would also be provided to Council for information.

In addition to this a Waste Management Plan (WMP) would be prepared and implemented as part of the CEMP. The WMP would include but not be limited to:

- Measures to avoid and minimise waste associated with the proposal
- Classification of wastes and management options (reuse, recycle, stockpile, disposal)
- Statutory approvals required for managing both on and off-site waste, or application of any relevant resource
- recovery exemptions
- Procedures for storage, transport and disposal
- Monitoring, record keeping and reporting.

The WMP would be prepared taking into account the Environmental Procedure – Management of Wastes on Roads and Maritime Services Land (Roads and Maritime, 2014) and relevant Transport for NSW Waste Fact Sheets.

3.2.10 Water quality

Issue description

Liverpool City Council is concerned that the proposal does not include a water quality treatment system. Council requests that Transport provides a water quality treatment system for the proposal, in consultation with Council.

Response

Water quality treatment would be investigated further during detailed design; however, Transport notes that there are substantial constraints that could preclude the ability to provide water quality treatments. These constraints include a lack of available space within the motorway and limitations associated with constructing infrastructure on top of the Helles Park landfill site.

4. Changes to the proposal

Following public display of the REF, the proposal design was refined (referred to as 'the revised design') due to ongoing design development and in response to feedback received in submissions. The proposed design changes are shown in Figure 4-1 to Figure 4-8 and comprise the following:

- Extending the emergency telephone bay steel rail barrier east to allow for an overlapping barrier and parking area behind the barrier (as shown in Figure 4-1 and Figure 4-2). This change was made to improve road safety for all users, by placing a crash barrier between parked vehicles using the emergency telephone bay and M5 Motorway through traffic.
- Changes to the cyclists' provisions at various locations to improve cyclist safety and reduce confusion, compared to the design presented in the REF. These changes comprise:
    - Relocating the shared user path connection for westbound M5 Motorway cyclists (as shown in Figure 4-1 and Figure 4-4). Cyclists joining the shared user path from the M5 Motorway shoulder would now make this movement 50 metres east of the original design, removing the potential safety conflict that existed due to its location adjacent to the traffic merge on the Hume Highway exit ramp. The proposed second exit 200 metres further west has been removed. In addition to improving cyclist safety, relocating the shared user path connection would reduce the proposal's impact on a biobanking site (reduction of 530 square metres), located near the south western corner of the Moorebank Avenue interchange.
    - Providing a T-intersection connection between the proposed shared user path and Council's existing shared user path on the western bank of the Georges River (as shown in Figure 4-1 and Figure 4-6). This change was made to improve shared user path safety for all active transport users.
    - Changing the kerb and footpath design at the eastbound Moorebank Avenue exit ramp to improve cyclist safety (as shown in Figure 4-1 and Figure 4-4). Specifically, cyclists wishing to travel south along Moorebank Avenue would now be able to dismount on a raised concrete island (while waiting for a green traffic signal), rather than on the shoulder of the right turn traffic lane.
    - Cyclist wayfinding (signage and line marking) improvements at various locations
    - Providing a T-intersection stub for the proposed shared user path near the eastern end of the Georges River bridge (as shown in Figure 4-1 and Figure 4-4) to allow for a future active transport connection on the eastern side of the Georges River (to be provided by others and not part of Transport's proposal).
- The proposed safety screen on the new bridge would be upgraded from mesh to a solid transparent barrier to comply with the latest rail safety regulations. This change is required for safety reasons as the shared user path would be located over operational rail lines. The solid transparent barrier would extend over the rail line and Lakewood Crescent and connect to the proposed realigned noise wall on the western side of the Georges River. An additional mesh safety screen would be added to the new bridge's northern parapet to comply with current rail safety requirements.
- The proposed construction access through the industrial premises at the northern end of Yulong Close (as shown in Figure 3-12 and Figure 3-13 of the REF) would no longer be required, due to the difficulty of establishing a temporary access road at this location. However, Yulong Close may still be used by construction vehicles, where required. The revised property acquisition and temporary construction lease areas for the proposal is shown in Figure 4-9 and documented in Table 5-1.

Revised property acquisition across the proposal to accommodate the proposed design changes (as shown in

) or as otherwise identified through updated land ownership details (for example, land identified in the REF as being road reserve subsequently being identified as being privately owned). The revised property acquisition for the proposal is shown in

- and documented in Table 5-1. Consistent with the REF, no residential property would be affected by the revised property acquisition boundary for the proposal.
- As part of the property acquisition process at Lot 100/DP104508, subdivision of the land would be required to dedicate portions of it as a road or for the purpose of a road.

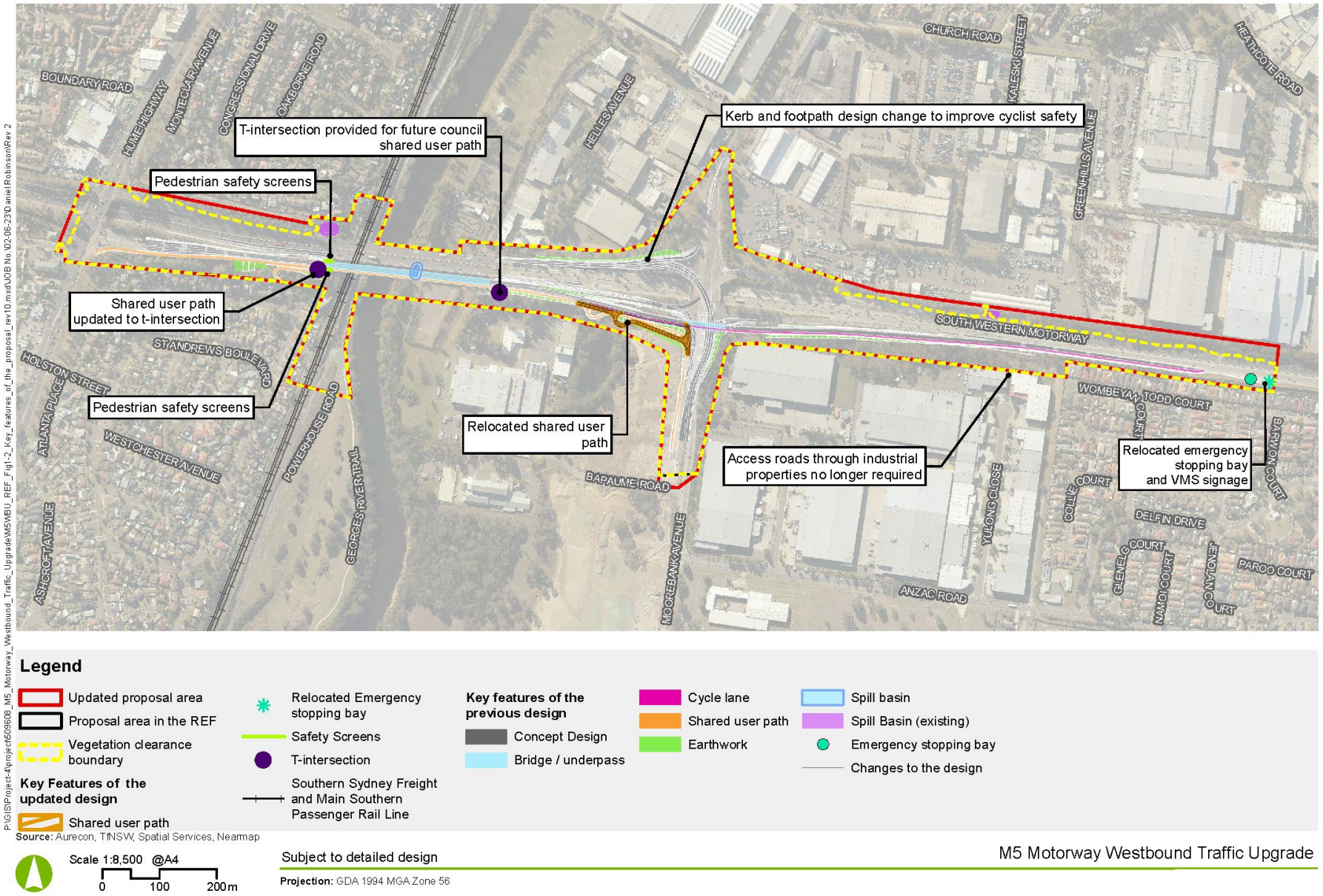

Figure 4-1 Revised proposal design

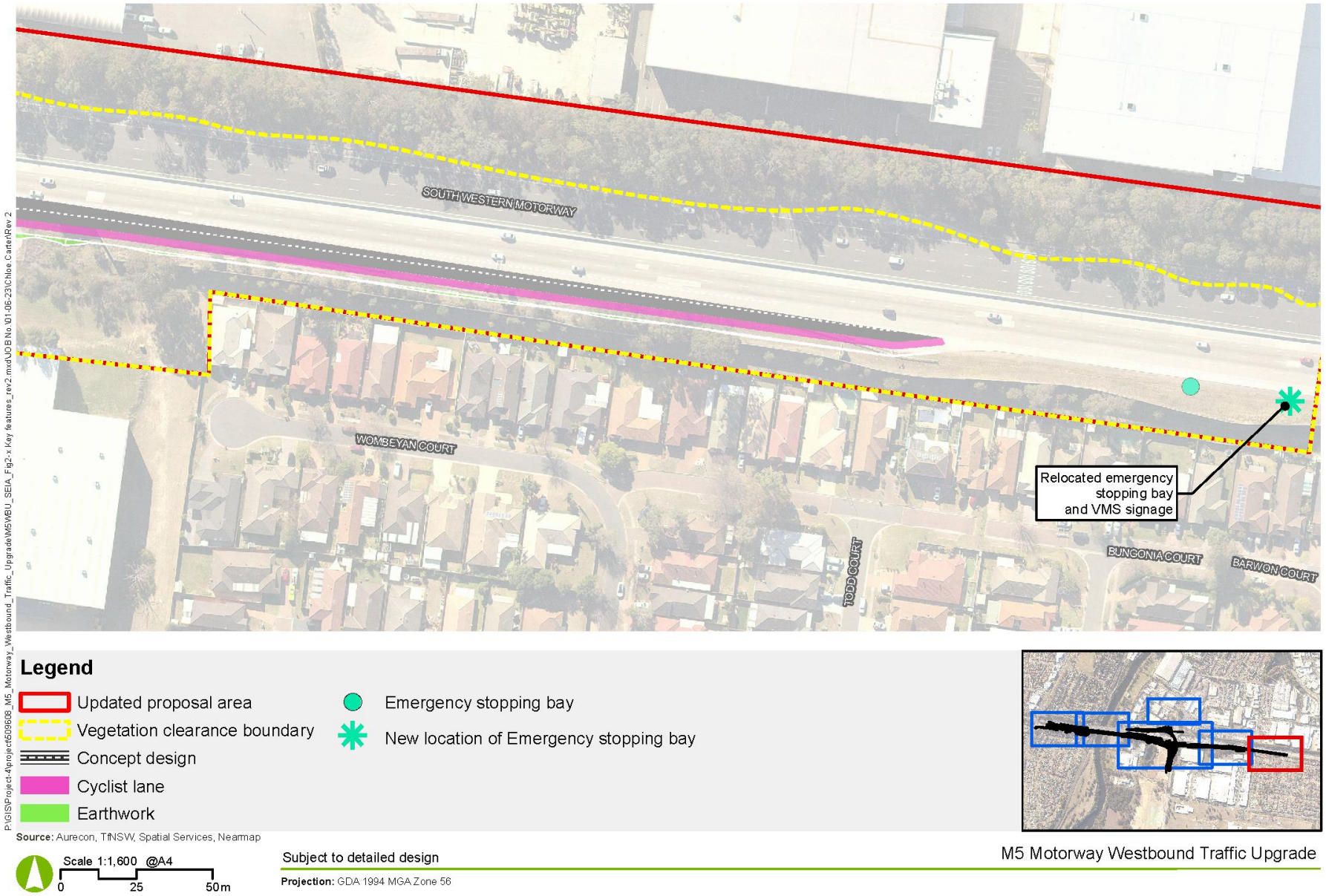

Figure 4-2 Revised proposal design

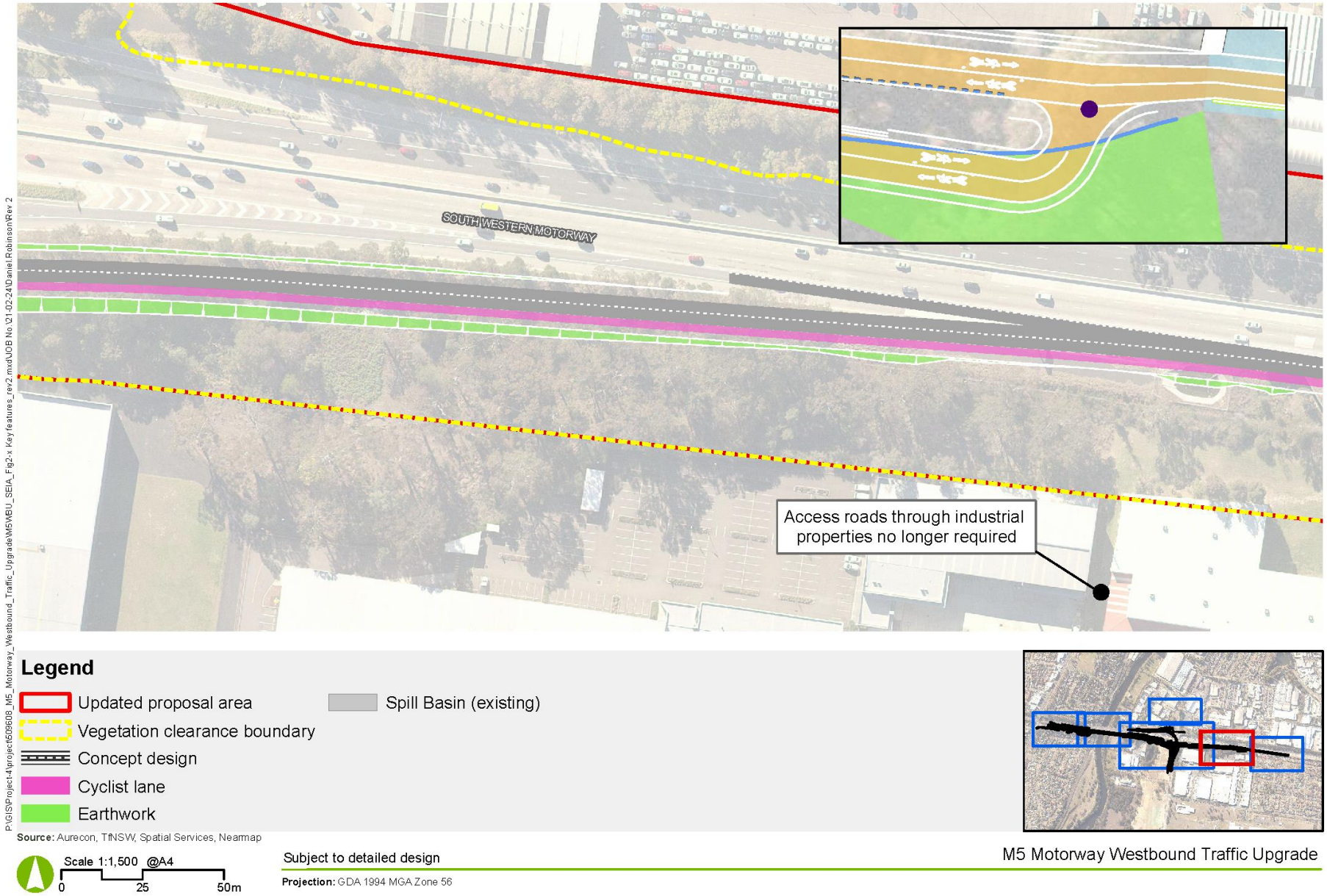

Figure 4-3 Revised proposal key features

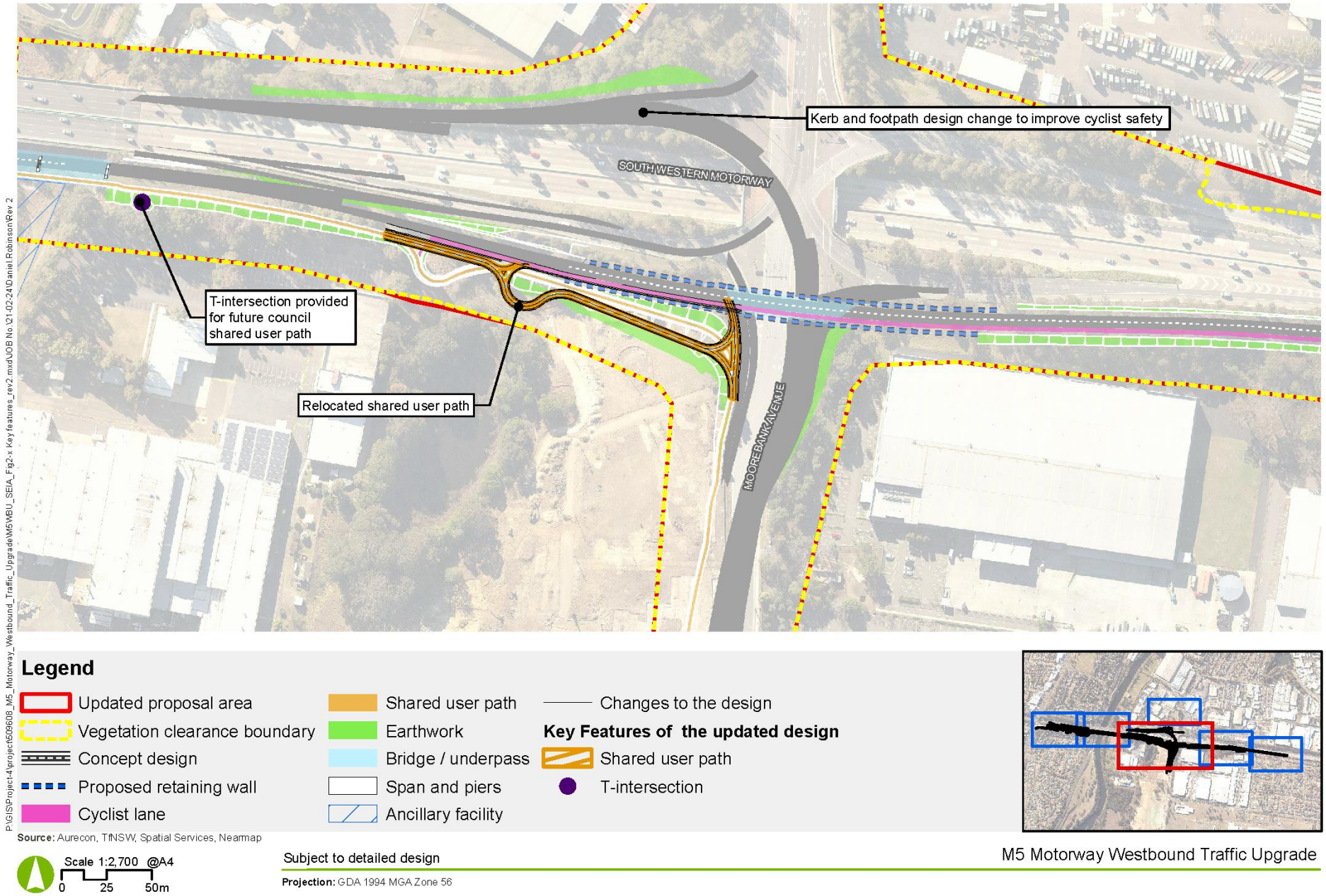

Figure 4-4 Revised proposal key features

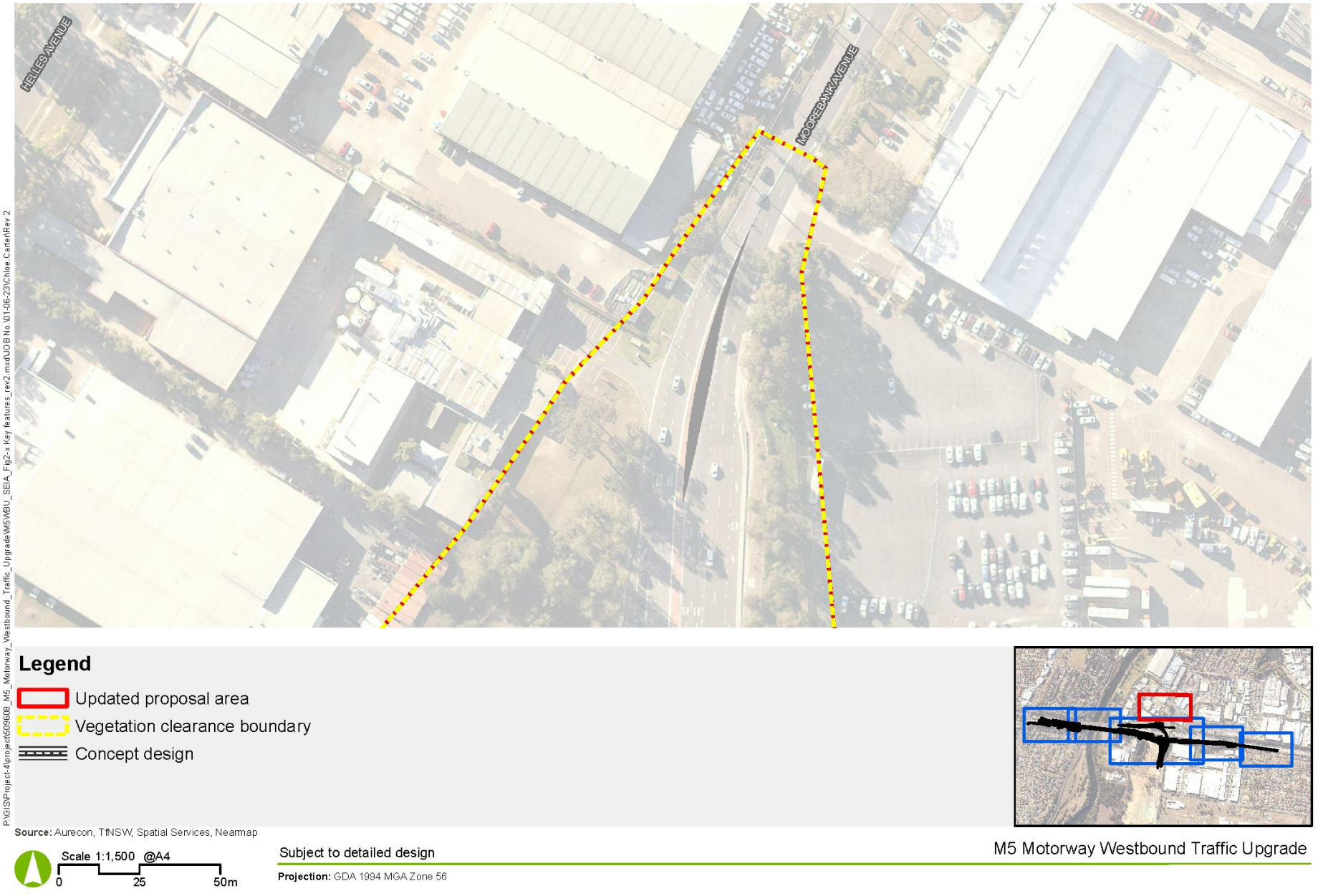

Figure 4-5 Revised proposal key features

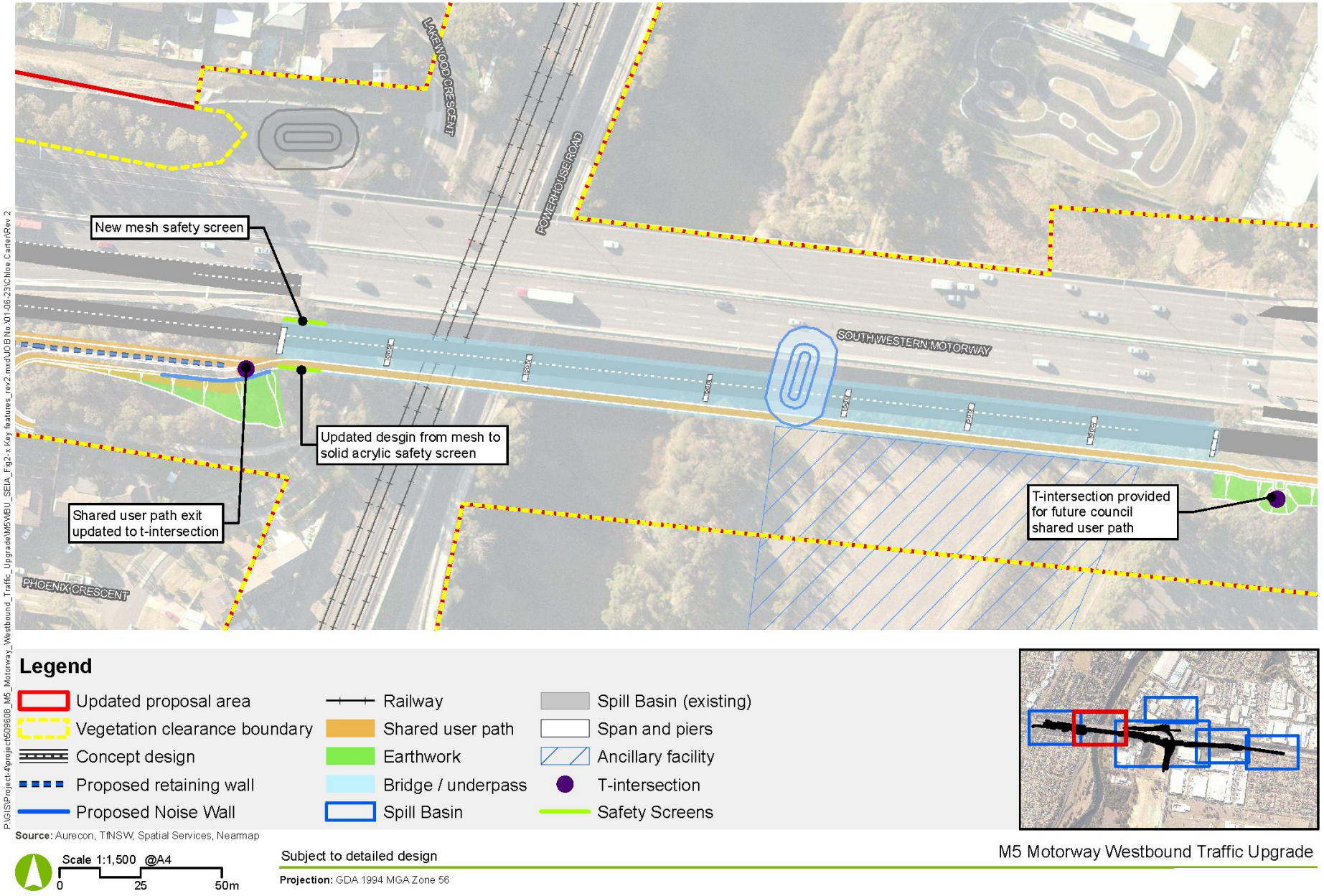

Figure 4-6 Revised proposal key features

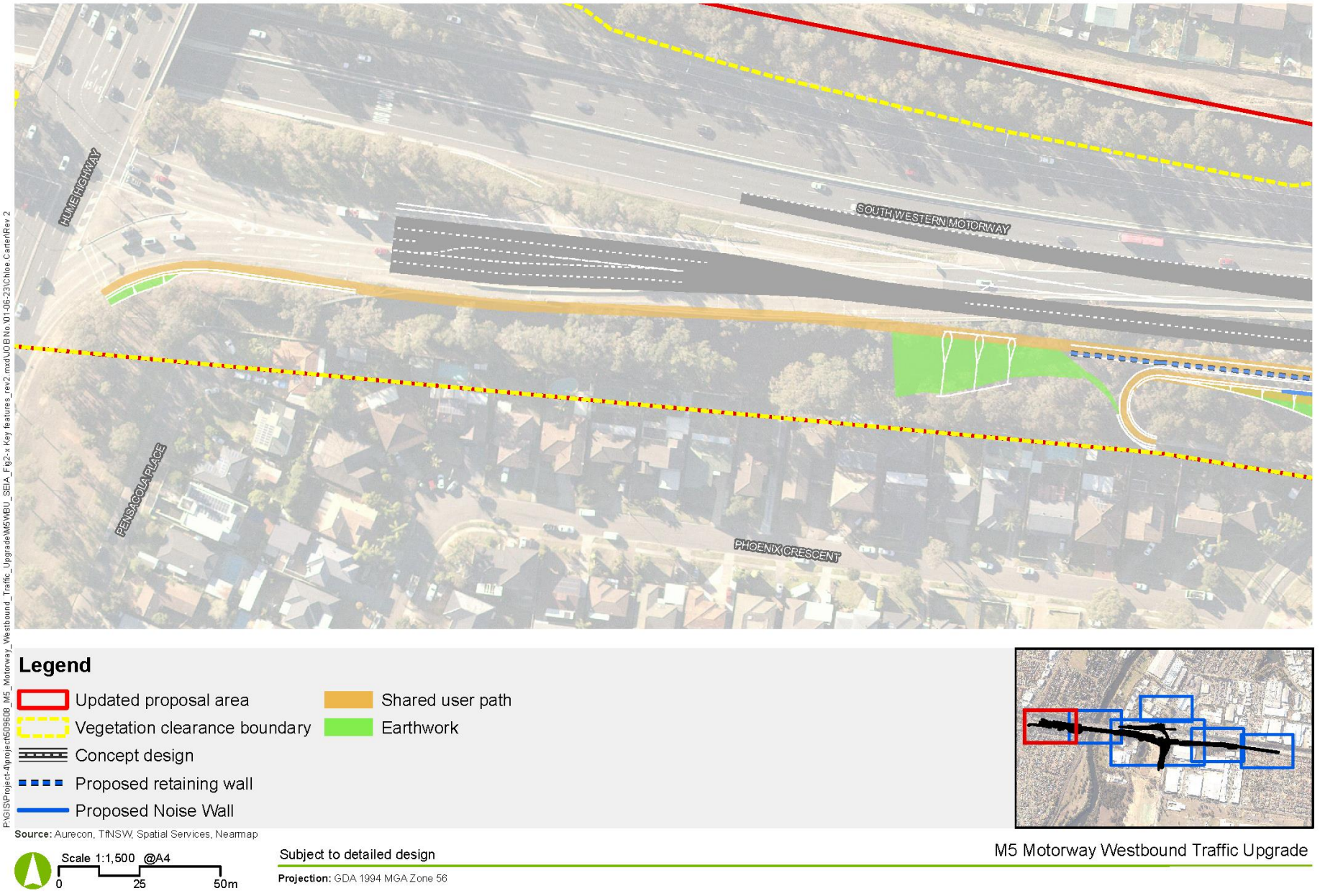

Figure 4-7 Revised proposal key features

Figure 4-8 Revised proposal key features

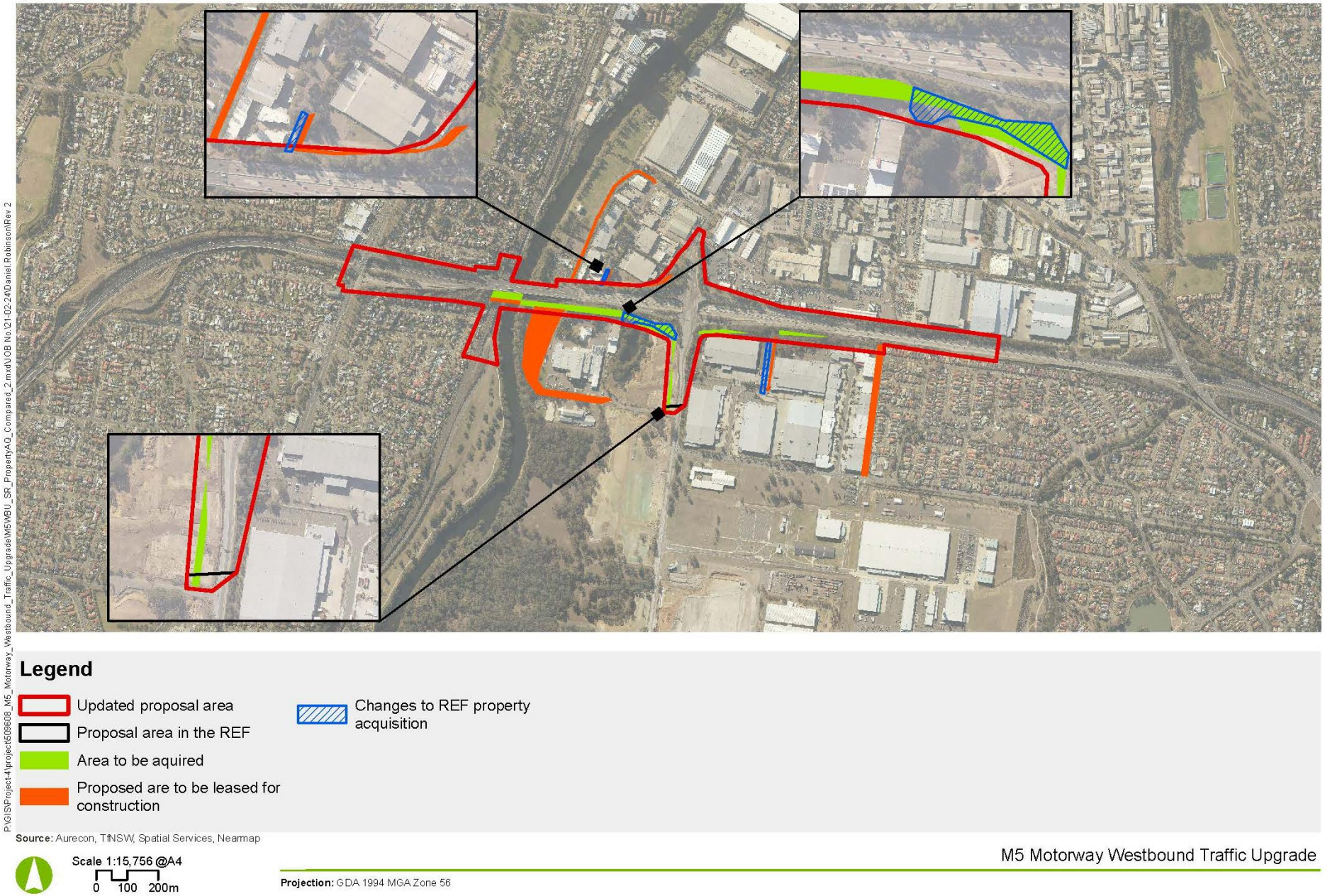

Figure 4-9 Revised property acquisition

5. Environmental assessment and statutory consultation

This chapter describes the additional assessments that were carried out for the revised proposal since the public display of the REF. This chapter also describes an additional microbat survey that was carried out to address biodiversity mitigation measure B8 (documented in Chapter 7 of the REF and included in Table 6-1 of this report) and additional Transport and Infrastructure SEPP consultation carried out with the Western Parkland City Authority.

This chapter identifies the changes in the proposal's potential impacts, relative to those documented in chapter 6 of the REF. This chapter also identifies whether any additional safeguards or management measures are required (compared to those presented in Chapter 7 of the REF) to address the impact of the revised proposal.

5.1.1 Noise and vibration

5.1.2 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional noise monitoring or modelling was required to assess the proposed design changes.

5.1.3 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any change to in potential noise and vibration impacts compared to those documented in Section 6.1 of the REF.

5.1.4 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.2 Traffic and transport

5.2.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional traffic modelling or detailed assessments are required. Traffic and transport impacts associated with the revised proposal have been assessed qualitatively.

5.2.2 Potential impacts

Road safety

The proposed design changes would improve road safety around the proposed emergency telephone bay (relative to the design presented in the REF) by placing a crash barrier between parked vehicles and M5 Motorway through traffic. This design change would reduce the potential for an errant vehicle on the M5 Motorway westbound colliding with a stationary vehicle parked in the emergency telephone bay.

Active transport

The revised design would have positive safety impacts to cyclists. Relocating the shared user path connection for westbound M5 Motorway cyclists further to the east (as shown in Figure 4-1 and Figure 4-4) would remove the potential safety conflict that existed with the design presented in the REF. Specifically, the original location for this connection was adjacent to the traffic merge on the Hume Highway

exit ramp, which had a greater chance of a vehicle encroaching on the shoulder. By relocating the shared user path connection further east, this safety issue has been substantially reduced.

Changing the kerb and footpath design at the eastbound Moorebank Avenue exit ramp would also improve cyclist safety. Specifically, cyclists wishing to travel south along Moorebank Avenue would now be able to dismount on a raised concrete island (while waiting for a green traffic signal), rather than on the shoulder of the right turn traffic lane (as was required for the design presented in the REF).

The addition of a T-intersection stub for the proposed shared user path near the eastern end of the Georges River bridge would allow for the proposal to connect with future active transport links. Additionally, the proposed T-intersection connection between the proposed shared user path and Council's existing shared user path on the western bank of the Georges River (as shown in Figure 4-1 and Figure 4-6) would provide a safer turning path for cyclists.

5.2.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.3 Hydrology and flooding

5.3.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no hydrology or flood modelling was required to assess the proposed design changes.

5.3.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes in potential hydrology and flooding impacts compared to those outlined in Section 6.3 of the REF.

5.3.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.4 Surface water and groundwater

5.4.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional surface water and groundwater modelling was required to assess the proposed design changes.

5.4.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes in potential surface water and groundwater impacts compared to those outlined in Section 6.4 of the REF.

5.4.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.5 Soils and contamination

5.5.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Additionally, none of the additional property acquisitions identified in Chapter 4 would affect land that was not assessed in the REF. Therefore, no additional contamination investigations were required to assess the proposed design changes.

5.5.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any change in soils or contamination impacts compared to those outlined in Section 6.5 of the REF.

5.5.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.6 Biodiversity

5.6.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional biodiversity assessments were required to assess the proposed design changes.

Notwithstanding, Transport carried out an additional microbat survey following the display of the REF to address biodiversity mitigation measure B8 (documented in Chapter 7 of the REF and included in Table 6-1 of this report), which requires the following:

- Mitigation measure B8: Targeted surveys would be carried out prior to construction for microbat species considered likely to occur within the study area. It is recommended these be carried out during the warmer nights (October to February). If species are found to occur, appropriate measures to minimise impacts would be developed. Including preparing a microbat management plan and incorporated into construction management plans.

An inspection of the Georges River Bridge was carried out on 25 October 2022 with the aim of confirming areas of potential microbat habitat and to trial the use of an inspection drone. The drone was operated by a representative from the drone company with direction from Transport environment staff, including a member of the biodiversity specialist team.

The drone was launched from the eastern bank of the Georges River and surveyed the vertical gaps between the super-T joins using a combination of thermal imagery and regular imagery. The drone was unable to survey the bridge past the western bank of the Georges River due to flight path limitations imposed by the active rail line.

Visual inspections of the bridge were also made using binoculars, with the aim of identifying roosting microbats and/or evidence that any part of the bridge is consistently used by a large number of microbats (i.e. urine staining).

5.6.2 Results of the microbat survey

No roosting microbats were observed during the microbat survey. Similarly, no evidence was observed to suggest that any part of the bridge is consistently being used by a large number of microbats (i.e. due to the lack of urine staining being identified). The inspection did identify that the Georges River bridge contains a large quantity of gaps that may, under the correct conditions, provide suitable roosting or breeding opportunities for microbats.

Although much of the bridge is too high to access, it was possible to get close to the underside of the bridge (next to the eastern abutment) during the inspection. It was noted that this area experiences high levels of existing noise and vibration. While these conditions may deter microbats from using the bridge, any microbats that do occur would have adjusted to the existing levels of noise and vibration.

Given the quantity of gaps beneath the Georges River bridge and survey limitations (i.e. the bridge being too high to adequately survey all areas), the presence of microbats in this structure cannot be ruled out.

5.6.3 Potential impacts

The proposed design changes outlined in Chapter 4 would reduce the proposal's impact on a biobanking site (reduction of 530 square metres), located near the south western corner of the Moorebank Avenue interchange. The total area of impact to this biobanking site would be 955 square metres.

The results of the microbat survey do not change the biodiversity impact documented in Section 6.6 of the REF. As the presence of microbats in the Georges River bridge cannot be ruled out, Transport proposes to retain mitigation measure B8 (as documented in in Chapter 7 of the REF and included in Table 6-1 of this report). This requirement would be further considered during detailed design.

5.6.4 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

Transport proposes to retain mitigation measure B8 (as documented in in Chapter 7 of the REF and included in Table 6-1 of this report) as the presence of microbats in the Georges River bridge cannot be ruled out. This requirement would be further considered during detailed design.

5.7 Aboriginal cultural heritage

5.7.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Additionally, none of the additional property acquisitions identified in Chapter 4 would affect land that was not assessed in the REF. Therefore, no additional detailed Aboriginal cultural heritage investigations were required to assess the proposed design changes.

5.7.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any change in potential Aboriginal heritage impacts compared to those outlined in Section 6.7 of the REF.

5.7.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.8 Non-Aboriginal heritage

5.8.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional detailed non-Aboriginal heritage investigations were required to assess the proposed design changes.

5.8.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes in potential non-Aboriginal heritage impacts compared to those outlined in Section 6.8 of the REF.

5.8.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.9 Landscape character and visual impacts

5.9.1 Methodology

An *Urban design report including landscape character and visual impact assessment* was prepared for the REF (refer to Section 6.9 and Appendix J to the REF) to assess the potential landscape character and visual impacts during construction and operation of the proposal. This assessment included identification of the visual catchment and landscape character zones (LCZ) for the proposal a site inspection of the proposal area and assessment in accordance with Transport guidelines.

This assessment was updated to include an assessment of the visual impacts from the inclusion of revised safety screens. No additional viewpoints or LCZ were needed to assess the revised proposal beyond those carried out for the REF.

5.9.2 Potential impacts

The changes to the proposal outlined in Chapter 4 would not result in any changes in potential landscape character and visual impacts compared to those outlined in Section 6.9 of the REF. The changes outlined in Chapter 4 identify that the design would remain generally the same, although there is a minor shift east in the location of the shared user path, it is still located in an area characterised by the same features and land uses, with no additional sensitive receivers. As such the impacts would remain as outlined in Section 6.9 of the REF and no negative impacts or additional potential impacts are anticipated.

The revised design also includes an adjustment to the proposed safety screen and inclusion of a new safety screen on the new bridge on the western side of the Georges River. This would involve replacing the proposed mesh panelling with a solid acrylic screen on the southern side of the new bridge. This is required as the new shared user path would make this area accessible to pedestrians, and this would minimise the risk of anything being thrown or dropped from the path. This would continue and connect to the proposed noise wall. There would also be a mesh panelled safety screen installed on the northern edge of the new bridge over the railway. Negligible visual impacts are anticipated from this change as the visual impacts from the development of the new bridge has already been assessed and it would be a minor addition.

5.9.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.10 Socio-economic, property and land-use

5.10.1 Methodology

A *Socio-economic Impact Assessment and working paper* was prepared by Aurecon for the REF (refer to Section 6.10 of the REF and Appendix K to the REF) to assess the potential socio-economic, property and land use impacts during construction and operation of the proposal. No changes to this methodology was required to assess the revised proposal beyond those carried out for the REF. Additionally, as all revised property acquisition areas were previously included in the assessment presented in the REF, no detailed additional assessment was required.

5.10.2 Potential impacts

Property acquisition

The proposed design changes outlined in Chapter 4 would require the acquisition of additional land to accommodate the proposed design changes (as shown in

) or as otherwise identified through updated land ownership details (for example, land identified in the REF as being road reserve subsequently being identified as being privately owned).

The proposed removal of the construction access through the industrial premises at the northern end of Yulong Close (as shown in Figure 3-12 and Figure 3-13 of the REF) would reduce the amount of land that would need to be temporarily leased for the proposal (relative to that described in the REF). The proposed removal of this construction access would reduce temporary construction leases for the following properties:

- 20 Yulong Close (Lot 11/DP1075884) – about 200 square metres of land would no longer be leased from this property; this property would no longer be subject to property acquisition or lease by the proposal.
- 17-19 Yulong Close (Lot 21/DP1260585) – about 170 square metres of land would no longer be leased from this property; however, about 2,200 square metres of land would still need to be leased from this property to establish a construction access from Anzac Road.

The revised property acquisition for the proposal is shown in Figure 4-9 and documented in Table 5-1.

The following additional partial acquisitions are proposed:

- Lot 101/DP1190263 – 75 square metres of land is proposed to be acquired to accommodate construction under the bridges. The design presented in the REF did not involve acquisition of this land and the proposed design changes would increase the total land acquisition of this property to 75 square metres.
- Lot 1/DP778777 – an additional 8 square metres of land is proposed to be acquired to accommodate construction access. The design presented in the REF already involved the acquisition of 132 square metres of this property. The proposed design changes would increase the total land acquisition of this property to 462 square metres.
- Lot 21/DP1075884 – a refined area of 475 square metres of land is proposed to be acquired to accommodate construction access. The design presented in the REF already involved the acquisition of 2,825 square metres of this property. The proposed design changes would decrease the total land acquisition of this property to 2,350 square metres.
- Lot 100/DP1049508 – an additional 298 square metres of land is proposed to be acquired due to a misunderstanding of land ownership. The design presented in the REF already involved the acquisition of 5,262 square metres of this property. The proposed design changes would increase the total land acquisition of this property to 5,560 square metres. As part of the property acquisition process, subdivision of this land would be required to dedicate portions of it as a road or for the purpose of a road. The subdivision would not result in an additional impacts.

Consistent with the design presented in the REF, no acquisition of physical business premises or residential properties is proposed. Similarly, the acquisitions would not require any structures to be demolished and would be limited to strips of land that would not likely reduce the landowners current use of the property. It is expected that the proposal would be easily absorbed by most businesses who have indicated resilience to similar changes in the study area.

Consistent with the assessment presented in Section 6.10.3 of the REF, the sensitivity of receivers to permanent changes to property is considered to be low. The magnitude of these changes is assessed as being low, resulting in the level of significance being low.

Table 5-1 Changes to property acquisition and lease

Lot and DP	Acquisition type	Total area (m^2 approximate only) in REF	Revised total area (m^2 approximate only)	Change from REF to revised total area (m^2 approximate only)
LOT 1/ DP778777	Partial - temporary	1,32	140	Increase of 8
LOT 11/DP881265	Partial – temporary	3,090	2,890	Decrease of 200
SP35510	Partial - temporary	425	0	Decrease of 425
LOT 21/ DP1075884	Partial - temporary	2,825	2,350	Decrease of 475
LOT 100 / DP1049508	Partial – permanent	5,262	5,560	Increase of 298
Lot 11 / DP1075884	Partial – temporary	Combined total of 8,810	Combined total of 8,610	Decrease of 200
Lot 21 / DP1260585	Partial – temporary	Combined total of 8,810	2,270	Decrease of 2,270 incorrectly shown as 455m^2 in the REF
Lot 2/ DP547293	Partial – temporary	401	370	Decrease of 31
Lot 2 / DP32998	Partial – temporary	3,130	3,170	Increase of 40
Lot 101/ DP1190263	Partial – temporary and permanent	0	285	Increase of 285
Crown land parcel	Partial – temporary	0	795	Increase of 795
SP87748	Partial – temporary	0	1,020	Increase of 1,020

Land use changes

The proposed design changes are not expected to result in any land use changes to properties surrounding the proposal. Consistent with the assessment presented in Section 6.10.3 of the REF, the sensitivity of land occupiers and owners to permanent changes in land use is considered to be negligible. The magnitude of these changes is assessed as being negligible, resulting in the level of significance being negligible.

Active transport

The revised design would have a positive impact on cyclists through providing a safer environment across the proposal. This includes:

- A change to the crossing point for westbound cyclists wanting to continue on the M5 Motorway. The westbound entry ramp cyclist crossing was moved further away from the Moorebank Avenue intersection to maximise the distance between the existing motorway traffic and traffic entering.
- Relocation of the entry point onto the shared user path from the M5 Motorway westbound east 50 metres. This design is safer as the original location was further in the merge and had a greater chance of a vehicle encroaching on the shoulder.
- The second exit point from the M5 Motorway onto the shared user path was removed as it is preferred that all cyclists use the first exit point.

- The cyclists connection from the north eastern traffic island to the M5 Motorway eastbound entry ramp was amended to ensure safer passage for cyclists. This included providing a raised kerbed island at the eastbound exit ramp where cyclists can wait prior to crossing the slipway to the traffic island as well as a raised island at the eastbound entry ramp corner.
- Addition of cyclist wayfinding at various locations to minimise confusion and improve safety conditions

These updates would have a positive impact on the community in the provision of safer options for cyclists. The revised design also allows provision for council to develop a shared user path facility south of the Georges River Bridge on the eastern bank of the river. Additionally, the proposed geometrical changes to the shared user path connection on the western bank of the river would improve the conditions for cyclists. The changed to a T-intersection would allow for safer turning at the end points of the shared user path. These would enable the development of opportunities for future pedestrian and cyclists connections.

5.10.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.11 Other impacts

5.11.1 Methodology

Other impacts of the proposal were assessed qualitatively in Section 6.11 of the REF, which included consideration of impacts of the proposal on:

- Air quality
- Waste and resources
- Utilities
- Hazard and Risk Management.

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional detailed assessments were required for the matters listed above.

5.11.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes in potential other impacts compared to those outlined in Section 6.11 of the REF.

5.11.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.12 Cumulative impacts

5.12.1 Methodology

Cumulative impacts of the proposal were assessed qualitatively in Section 6.12 of the REF. This assessment included a review of the NSW Major Project Register (DPE, 2021) and Liverpool City Council Major Projects (Liverpool City Council, 2020) databases to identify any projects which may result in cumulative impact with the proposal.

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity (nor the timing or duration of the activity) to that assessed in the REF. Furthermore, no additional developments have been identified since the public display of the REF that would substantially change the cumulative impacts assessed in the REF. Therefore, no additional detailed cumulative impact assessment is required for the proposed design changes.

5.12.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes in potential cumulative impacts compared to those outlined in Section 6.12 of the REF.

5.12.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.13 Sustainability

5.13.1 Methodology

Sustainability outcomes for the proposal were assessed in Section 6.13 of the REF in accordance with Transport for NSW's Environment and Sustainability Policy and Transport for NSW's Transport Sustainability Plan 2021.

5.13.2 Potential impacts

The proposed design changes outlined in Chapter 4 are not expected to result in any changes to the indicative project specific sustainability objective and performance outcomes identified in Table 6-60 of Section 6.13 of the REF.

5.13.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.14 Climate resilience

5.14.1 Methodology

The proposed design changes outlined in Chapter 4 are considered to be minor and would not result in a substantial change in activity to that assessed in the REF. Therefore, no additional detailed climate resilience investigations were required to assess the proposed design changes.

5.14.2 Potential impacts

The proposed design changes outlined Chapter 4 are not expected to result in any changes to the climate risk assessment and adaptation actions outlines in Section 6.14 of the REF.

5.14.3 Revised safeguards and management measures

No additional safeguards or management measures are required to address the proposed design changes outlined in Chapter 4.

5.15 Additional Transport and Infrastructure SEPP consultation

Following public display of the REF, amendments were made to the statutory consultation requirements under Part 2.2 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP).

Specifically, Transport is required to consult with the Western Parkland City Authority under section 2.15(2)(h) of the Transport and Infrastructure SEPP because the proposal would be carried out within a Western City operational area specified in the *Western Parkland City Authority Act 2018*, Schedule 2 and would have a capital investment value of more than $30 million.

Transport carried out this statutory consultation with the Western Parkland City Authority between August and September 2023. The Western Parkland City Authority noted its support for the proposal and the benefits that the proposal would deliver in terms of easing congestion and improving safety on the M5 Motorway for motorists and heavy vehicles. Western Parkland City Authority was also supportive of the following proposal benefits:

- Improvements to safety and access to Liverpool CBD
- Provision of pedestrian access across Georges river
- Provision of an efficient network between the Moorebank Logistics Park and the state road network

The Western Parkland City Authority's support for the proposal is noted.

6. Environmental management

The REF for the M5 Motorway Westbound Traffic Upgrade identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Section 7.2 of the REF). After consideration of the issues raised in the public submissions (documented in Chapters 2 and 3 of this report) and changes made to the proposal (documented in Chapter 4 of this report), the environmental management measures for the proposal (as documented in Section 7.2 of the REF) have been amended.

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

6.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the 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.

6.2 Summary of safeguards and management measures

The REF for the proposal identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts. These measures were documented in Section 7.2 of the REF.

After consideration of the issues raised in the public submissions (documented in Chapters 2 and 3 of this report) and changes made to the proposal (documented in Chapter 4 of this report), the environmental management measures for the proposal (refer to Section 7.2 of the REF) have been amended.

The amended environmental management measures for the proposal are documented in Table 6-1. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been <u>underlined</u> and deleted measures, or parts of measures, have been ~~struck out~~.

Should the proposal proceed, the environmental management measures in Table 6-1 will guide the subsequent phases of the proposal.

Table 6-1: Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
GEN1	General – minimise environmental impacts during construction	A Project Environmental Management Plan (PEMP) would be prepared to outline and describe the key environmental issues associated with the proposal. The PEMP would be the overarching document in the environmental management system for the proposal that includes a number of management documents. It is applicable to all staff and contractors associated with the development, design and construction of the proposal. • The PEMP would be prepared and implemented with the Environmental Management System (EMS) which has been prepared in accordance ISO14001:2016.	Construction Contractor	Pre-construction / Detailed design	Core standard safeguard
GEN2	General – minimise environmental impacts during construction	A CEMP would be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP would address the following: • Any requirements associated with statutory approvals • Details of how the proposal would 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 would be implemented during the undertaking of the activity.	Construction Contractor	Pre-construction / Detailed design	Core standard safeguard
GEN3	General – notification	All businesses, residential properties and other key stakeholders (e.g., schools, local councils) affected by the activity would be notified at least five days prior to commencement of the activity.	Construction Contractor / Transport for NSW	Pre-construction	Core standard safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
GEN4	General – environmental awareness	All personnel working on site would receive training to ensure awareness of environment protection requirements to be implemented during the proposal. This would include up-front site induction and regular 'toolbox' style briefings. Site-specific training would be provided to personnel engaged in activities or areas of higher risk. These include: • Areas of Aboriginal heritage sensitivity • Threatened species habitat.	Construction Contractor / Transport for NSW	Pre-construction/ Detailed design	Additional safeguard
NV1	Noise and vibration	A Noise and Vibration Management Plan (NVMP) would be prepared and implemented as part of the CEMP. The NVMP would generally follow the approach in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) and identify: • Nearby sensitive receivers • All potential significant noise and vibration generating activities associated with the activity • Description of work, construction equipment and hours the work would be completed • Feasible and reasonable mitigation measures to be implemented, taking into account *Beyond the Pavement: urban design policy, process and principles* (Transport for NSW, 2014) • Criteria for the proposal and relevant licence and approval conditions • 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 • Details on how respite would be applied where ongoing high impacts are seen at certain receivers • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Construction Contractor	Detailed design / Pre-construction	Section 4.6 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NV2	Noise and vibration	All sensitive receivers (e.g., residential properties and schools) likely to be affected by construction noise and vibration would be notified at least seven days prior to the commencement of noise and vibration intensive activities. The notification would provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information	Construction Contractor	Detailed design / pre-construction	Additional safeguard
NV3	Construction noise and vibration assessments	Location and activity specific noise and vibration impact assessments would be carried out prior to (as a minimum) activities: • With the potential to result in noise levels above 75 dBA at any receiver • Required outside standard construction hours and likely to result in noise levels greater than the relevant Noise Management Levels • With the potential to exceed relevant criteria for vibration. The assessments would confirm the predicted impacts at the relevant receivers in the vicinity of the activities to aid the selection of appropriate management measures, consistent with the requirements of the CNVG.	Construction Contractor	Pre-construction/ construction	Additional safeguard
NV4	Construction noise exceedances	Where noise intensive equipment is to be used near sensitive receivers, the work would be scheduled during standard construction hours, where possible. If it is not possible to restrict the work to the daytime, then they would be completed as early as possible in each work shift, where possible. Appropriate respite would also be provided to affected receivers in accordance with the CNVG.	Construction Contractor	Construction	Additional safeguard
NV5	Compounds with long term work	Hoarding, or other shielding structures, would be used where receivers are impacted near compounds or fixed work areas with long durations. To provide effective noise mitigation, the barriers would break line-of-sight from the nearest receivers to the work and be of solid construction with minimal gaps.	Construction Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NV6	Monitoring	Monitoring would be carried out at the start of noise and/or vibration intensive activities to confirm that actual levels are consistent with the predictions and that appropriate mitigation measures from the CNVG have been implemented.	Construction Contractor	Construction	Additional safeguard
NV7	Construction traffic	The potential impacts from construction traffic would be reviewed at a later stage when more information is available.	Construction Contractor	Pre-construction / Construction	Additional safeguard
NV8	Vibration work within minimum working distance	Where work is within the minimum working distances and considered likely to exceed the cosmetic damage criteria: • Different construction methods with lower source vibration levels would be investigated and implemented, where feasible • Attended vibration measurements would be carried out at the start of the work to determine actual vibration levels at the item. ~~Work would be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.~~	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
NV9	Vibration work within minimum working distance	The potential human comfort impacts and requirement for vibration intensive work would be reviewed as the proposal progresses.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
NV10	Vibration work within minimum working distance	Building condition surveys would be completed before and after the work where buildings or structures are within the minimum working distances and considered likely to exceed the cosmetic damage criteria during the use of vibration intensive equipment.	Construction Contractor	Pre-construction / Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NV11	Vibration work around 2-8 Secombe Place, Moorebank	Transport and its Construction Contractor will continue to consult with businesses at 2-8 Secombe Place, Moorebank during detailed design and throughout construction to manage potential impacts to vibration sensitive equipment. Management measures that would be developed in consultation with businesses will include: • Identification of applicable vibration limits for sensitive equipment being operated at these premises • Review potential construction vibration impacts around these premises to confirm whether vibration levels are likely to exceed the applicable vibration limits for sensitive equipment • Where vibration limits are predicted to be exceeded, construction methods would be reviewed and may include the consideration of alternative construction plant and equipment with lower source vibration levels • Attended vibration measurements would be carried out at the start of the work to determine actual vibration levels at these premises. Different construction methods would be considered where possible if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria (refer to mitigation measure NV8).	Transport and Construction Contractor	Pre-construction / Construction	Additional safeguard
NV12	Operational traffic noise	A post-construction noise assessment will be carried out within 12 months of opening of the proposal to verify the predicted noise levels, in accordance with Transport's *Road Noise Mitigation Guideline.*	Transport	Operation	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TT1	Traffic and transport	A Traffic Management Plan (TMP) would be prepared and implemented as part of the CEMP. The TMP would be prepared in accordance with the Roads and Maritime *Traffic Control at Work Sites Manual* (RTA, 2010) and *QA Specification G10 Control of Traffic* (Roads and Maritime, 2008). The TMP would include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Construction traffic control plans outlining 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 including between Campbelltown and Liverpool LGAs • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms.	Construction Contractor	Detailed design/pre-construction	Section 4.8 of QA G36 Environment Protection

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TT2	Construction site access	Construction site access would be designed and implemented in consideration of: • Road design guidelines and turning paths for heavy vehicles • Appropriate sight distances to allow traffic to safely enter and exit • Conspicuous temporary regulatory, warning and guide signs • Use of accredited traffic controllers, where appropriate and/or other controls to separate, slow down or temporarily stop traffic for safe entry/exit • Minimising use of local roads, where practical • Provision of deceleration lanes at accesses next to highly trafficked roads Minimising the size of heavy vehicles that would use local roads to access construction zones (particularly at Area 5).	Construction Contractor	Detailed design/ construction	Additional safeguard
TT3	Traffic impacts	Consultation would be carried out with the NSW Barefoot Water Ski Club to confirm temporary closures of the Georges River during construction.	Transport for NSW / Construction Contractor	Pre-construction / construction	Additional safeguard
TT4	Traffic impacts	For construction area 6, during stage 2 work further traffic ~~modelling~~ **assessment** would be carried out during detailed design **(if required)** following confirmation of the construction methodology and traffic staging to confirm the potential for traffic impacts and identify whether any additional mitigation measures or traffic control measures would be required.	Construction Contractor	Detailed design	Additional safeguard
TT5	Impact on rail operations	If any potential impact on rail operations is identified, Transport for NSW would consult with Sydney Trains and ARTC, as required, and obtain any necessary permits or licences.	Transport for NSW / Construction Contractor	Pre-construction	Additional safeguard
TT6	Impact on bus stops or routes	If any potential direct impacts on bus stops or routes are identified, Transport for NSW would consult with the relevant bus operator (Interline Bus Services or Transdev) to identify alternate arrangements.	Transport for NSW / Construction Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
TT7	Damage to local roads	A Road Dilapidation Report would be prepared by a suitably qualified person for local roads proposed to be used by heavy vehicles, before the commencement of use of the roads during construction. Any damage to the local road network identified to be caused by construction vehicles for the proposal would be remediated / rectified by the Construction Contractor to be similar to the existing road condition or compensation would be paid to the relevant road authority.	Construction Contractor	Pre-construction / Construction	Additional safeguard
TT8	Impacts on cycling	Community consultation would be carried out to understand the travel patterns of cyclists and inform the cyclists of any alternate access arrangements.	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard
TT9	Temporary access changes	Detours during temporary access changes would be implemented with directional signage along alternate routes. Signage along the M5 Motorway and the associated on-ramps would be provided to advise pedestrians and cyclists of any path closures.	Construction Contractor	Construction	Additional safeguard
TT10	Traffic management measures	Any temporary traffic diversions, clearways and road closures would be implemented in accordance with Transport Management Centre (TMC) requirements.	Construction Contractor	Construction	Additional safeguard
TT11	Property access	Property access would be maintained where feasible and reasonable and property owners (including ABB Australia) would be consulted before starting any work that may temporarily restrict or control access.	Construction Contractor	Construction	Additional safeguard
T12	Local road or shared path closures	Liverpool City Council would be consulted prior to any local road or shared path closures to identify suitable mitigation measures such as detour routes.	Construction Contractor	Construction	Additional safeguard
TT13	Parking	Off-road parking for construction vehicles would be provided within the ancillary facility and construction areas.	Construction Contractor	Parking	Additional safeguard
TT14	Cumulative traffic impacts	Transport for NSW and the Construction Contractor would coordinate with the project team for nearby road projects (including the Moorebank Avenue Realignment) and the Transport Management Centre with regard to the proposed timing of any road and lane closures and identify alternate routes or additional safeguards and management measures, as required.	Transport for NSW / Construction Contractor	Cumulative traffic impacts	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
F1	Flooding	A building floor level survey would be conducted for properties around Woodbrook Road impacted by up to 20 millimetre increase in flood level peak to allow a more detailed assessment during detailed design. This additional assessment will consider Council's maximum permissible increase in flood level to private properties of 10 millimetres. Council, and any impacted landowner, will continue to be consulted about the proposal's flooding impact during detailed design.	Transport for NSW	Detailed design	Additional safeguard
F2	Flooding	A survey of a limited section of the Powerhouse Road and rail corridor (where the precited flood overtopping in one per cent AEP design event occurs) would be conducted during detailed design. This would allow more detailed assessment of the flooding impacts in these areas.	Transport for NSW	Detailed design	Additional Safeguard
F3	Flooding	A flood warning and evacuation plan would be developed as part of the Construction Environmental Management Plan. This would include details on the prediction of floods of five per cent AEP or greater severity and provide safeguards to allow the safe evacuation of personnel during flood events.	Construction Contractor	Pre-construction / Construction	Additional safeguard
F4	Flooding	Facilities used by personnel during working hours such as semi-permanent offices ~~would~~ **may** be positioned ~~outside~~ **inside** the five per cent AEP flood extent, **with appropriate mitigation measures applied, dependent on the Detailed Design**.	Construction Contractor	Pre-construction / Construction	Additional safeguard
F5	Flooding	During flood events, the barge used for bridge construction would be moved to a safer location along the river.	Contractor	Construction	Additional safeguard
W1	Soil erosion and water pollution	A Soil and Water Management Plan (SWMP) would be prepared and implemented as part of the CEMP. The SWMP would identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks would be addressed during construction.	Construction Contractor	Detailed design / pre-construction	Section 2.1 of QA G38 Soil and Water Management
W2	Soil erosion and water pollution	A site-specific Erosion and Sediment Control Plan/s would be prepared and implemented as part of the Soil and Water Management Plan. The Plan would 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.	Construction Contractor	Detailed design / Pre-construction	Section 2.1 of QA G38 Soil and Water Management

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
W3	Accidental spill	A site-specific emergency spill plan would be developed and include spill management measures in accordance with the Transport for NSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan would address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers).	Construction Contractor	Detailed design / Pre-construction	Standard safeguard
W4	Soil erosion and water pollution	An assessment of the requirement for a temporary construction sediment basin would be conducted to inform the ESCP as part of the SWMP and CEMP. Investigation of alternative erosion and sedimentation control measures would be carried out in the event that spatial constraints restrict the implementation of basins.	Construction Contractor	Detailed design	Additional safeguard
W5	Construction water quality assessment	A construction water quality monitoring plan would be prepared and implemented as part of the SWMP. The plan would be prepared in accordance with the Transport for NSW *Guideline for Construction Water Quality* and EPA publication *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW.*	Construction Contractor	Construction	Additional safeguard
W6	Construction within the waterway	Control measures and mitigation measures that relate to working within the waterways would be outlined in the SWMP and in particular an Environmental Work Method Statement (EWMS) would be completed. This includes measures to reduce potential for spills into the river. Construction work should take into consideration the *Guidelines for instream works on waterfront land* (DPI, 2012). Instream erosion and sedimentation controls would be considered in line with *Code of Practice – Minor work in NSW waterways* (RMS, 2014) to keep sedimentation within the work area. Water quality monitoring to be conducted during construction would include visual monitoring and monitoring of turbidity.	Construction Contractor	Detailed design / pre-construction / construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
W7	Piling work of the bridge footings and excavation work to impact groundwater flow patterns	A Groundwater Management Plan (GMP) would be prepared to outline measures for interaction, dewatering and treatment of groundwater. The piling methodology should be chosen to reduce groundwater interface with groundwater flow. Piling activities should be closely monitored to ensure that contamination through leaks, spills or ambient groundwater does not accumulate within pile borings resulting in point source pollution with the potential to impact Groundwater Dependent Ecosystems (GDEs). Monitoring may include regular inspections of pile borings to monitor for any light non-aqueous phase liquids (LNAPL), oils, staining, or odours. Groundwater monitoring would be carried out. Groundwater impacts as a result of piling would be included in the GMP.	Construction Contractor	Detailed design / pre-construction	Additional safeguard
W8	Discharges	The discharges from any sediment basins would be assessed in line with the Guideline for Assessing the Impacts of Treated Water Discharge from Water Quality Treatment Controls (Transport for NSW, 2020). The results of such assessment would inform design of sediment basins to adhere to EPL discharge requirements.	Construction Contractor	Detailed design / pre-construction	Additional safeguard
W9	Construction across waterways leading to erosion or disturbance of the bed and banks	NSW DPE-Water Guidelines for watercourse crossings on waterfront land and NSW DPE-Water Guidelines for instream works on waterfront land guidelines would be adhered to for constructions across the Georges River.	Construction Contractor	Enabling work – Earthworks – Construction	Additional safeguard
W10	Flooding of ancillary facilities	Ancillary facilities would be designed to accommodate ~~local~~ **relevant** flood risk.	Construction Contractor	Detailed design / Pre-construction	Additional safeguard
W11	Disturbance of historical legacy contamination leading to water pollution	A contamination management plan would be prepared prior to the commencement of construction and implemented during construction by the Construction Contractor. Measures would be put in place to monitor the risk of contaminated water within the landfill site escaping into the underlying aquifer.	Construction Contractor	Detailed design / Pre-construction	Additional safeguard
W12	Aquifer interference from bridge footings	Design should consider impacts to groundwater during operation and piles be chosen to have the least amount of impact as possible on the aquifer.	Transport for NSW	Detailed design / Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
W13	Discharge associated with wet weather stormflows leading to water pollution	Design suitable stormwater infrastructure including pipes, culverts, pits, grass swales and appropriately sized water quality basin (sediment basin) to manage stormwater runoff from the site during operation and reduce loads of suspended solids entering waterways.	Transport for NSW	Detailed design / Pre-construction	Additional safeguard
CL1	Contaminated land	A Contaminated Land Management Plan would be prepared in accordance with the Guideline for the Management of Contamination (Transport for NSW, 2013) and implemented as part of the CEMP. The plan would include, but not be limited to: • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the detailed site investigation (Phase 2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction.	Construction Contractor	Detailed design / Pre-construction	Section 4.2 of QA *G36 Environment Protection*
CL2	Contaminated land	An Unexpected Find Protocol (UFP) would be prepared and implemented to manage the potential for soil or water quality contamination during construction of the proposal. If contaminated areas are encountered during construction, appropriate control measures would be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area would 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 Transport for NSW Environment Manager and/or EPA.	Construction Contractor	Detailed design / Pre-construction	Section 4.2 of QA *G36 Environment Protection*
CL3	Accidental spill	A site specific emergency spill plan would be developed and include spill management measures in accordance with the Transport for NSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan would address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers).	Construction Contractor	Detailed design / Pre-construction	Section 4.3 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
CL4	Gas monitoring	An Environmental Management Plan (EMP) would be prepared to manage the risks from methane and CO_2 during construction. The EMP would form a part of the overall Construction and Environmental Management Plan and focus on potential risks from the identified methane and carbon dioxide. The EMP would be reviewed by Transport for NSW to ensure it is adequate to address the potential risks. Active removal of methane and carbon dioxide could be considered prior to commencing construction activities. Demountable designs would consider the presence of these gases.	Construction Contractor	Pre-construction / construction	Additional safeguard
CL5	Contaminated land	If not already remediated by Council, ACM identified in the southern portion of Helles Park would be remediated prior to establishing the ancillary facilities on this property.	Construction Contractor	Pre-construction	Additional safeguard
CL6	Ancillary facility	The design of temporary offices would consider the presence of LFG in the southern portion of Helles Park if it is not addressed prior to establishing the site offices. In accordance with Appendix 5 of the NSW EPA's Assessment and Management of Hazardous Ground Gases: Contaminated Land Guidelines 2020, (NSW EPA, 2020), these design measures may include an installation of a gas membrane, allowing passive ventilation below the temporary offices, installation of active ventilation below the buildings, application of a positive pressure in the structures and / or internal gas monitoring. The exact mitigation approaches would be further evaluated when the nature and design of the ancillary facilities is finalised.	Construction Contractor	Pre-construction	Additional safeguard
CL7	Contaminated land	The EPA would be notified in writing at least two days before work commences that would exhume waste from a landfill site or former landfill site (located on the eastern side of the Georges River), in accordance with the requirements of Clause 110A of the Protection of the Environment Operations (Waste) Regulation 2014.	Transport for NSW / Construction Contractor	Pre-construction / construction	Additional safeguard
CL8	Contaminated land	If the Helles Park former landfill site were to become an EPA regulated site, work at the site would need to adhere to the sites Voluntary Management Proposal (VMP) as developed by the responsible party.	Construction Contractor	Construction	Additional safeguard
CL9	Contaminated land	Additional sampling would be carried out in the proposal area prior to construction to further characterise wastes likely to be encountered on site and the potential hazards and risks associated with handling and disposing of these materials.	Construction Contractor	Pre-construction / construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
CL10	Acid Sulfate Soils	An Acid Sulfate Soils Management Plan (ASSMP) would be prepared with reference to "*Guidelines for the Management of Acid Sulphate Materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulphidic Black Ooze*" (RTA, 2005).	Construction Contractor	Pre-construction / construction	Additional safeguard
B1	Biodiversity	A Flora and Fauna Management Plan would be prepared in accordance with Transport for NSW 's *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects* (RTA, 2011) and implemented as part of the CEMP. It would include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Requirements set out in the Landscape Guideline (RTA, 2008) • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling • Procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) • Protocols to manage weeds and pathogens.	Construction Contractor	Detailed design / Pre-construction	Section 4.8 of QA *G36 Environment Protection*
B2	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal would be investigated during detailed design and implemented where practicable and feasible.	Construction Contractor	Detailed design / Pre-construction	Additional safeguard
B3	Removal of native vegetation and habitat	Opportunities to further minimise native vegetation and threatened species habitat removal would be considered during detailed design.	Transport for NSW	Detailed design	Additional safeguard
B4	Removal of native vegetation and habitat	Pre-clearing surveys would be carried out in accordance with Guide 1: Pre-clearing process of the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Pre-construction	Additional safeguard
B5	Removal of native vegetation and habitat	Vegetation and habitat removal would be carried out in accordance with *Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
B6	Removal of native vegetation	Native vegetation would be re-established in accordance with *Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard
B7	Removal of native vegetation	The unexpected species find procedure is to be followed under Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) if threatened ecological communities or species, not assessed in the biodiversity assessment, are identified in the proposal site.	Construction Contractor	Construction	Additional safeguard
B8	Removal of threatened species habitat and habitat features	Targeted surveys would be carried out prior to construction for microbat species considered likely to occur within the study area. It is recommended these be carried out during the warmer nights (October to February). If species are found to occur, appropriate measures to minimise impacts would be developed. Including preparing a microbat management plan and incorporated into construction management plans.	Transport for NSW	Pre-construction	Additional safeguard
B9	Removal of threatened species habitat and habitat features	Habitat would be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock and Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard
B10	Aquatic impacts	Aquatic habitat would 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).	Construction Contractor	Construction	Additional safeguard
B11	GDE	Interruptions to water flows associated with groundwater dependent ecosystems would be minimised through detailed design.	Transport for NSW	Detailed design	Additional safeguard
B12	Changes to hydrology	Changes to existing surface water flows would be minimised through detailed design.	Transport for NSW	Detailed design	Additional safeguard
B13	Edge effects on adjacent native vegetation and habitat	Exclusion zones would be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard
B14	Injury and mortality of fauna	Fauna would be managed in accordance with *Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
B15	Invasion and spread of weeds	Weed species would be managed in accordance with *Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard
B16	Invasions and spread of pests	Pest species would be managed within the proposal site.	Construction Contractor	Construction	Additional safeguard
B17	Invasion and spread of pathogens and disease	Pathogens would be managed in accordance with *Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).	Construction Contractor	Construction	Additional safeguard
B18	Noise, light and vibration	Opportunities to reduce shading and artificial light impacts would be considered during detailed design. Microbat survey at the bridge location would identify if further vibration mitigation measures are required at specific locations of the bridge.	Transport for NSW	Detailed design	Additional safeguard
B19	Biodiversity offsets	Transport will offset the biodiversity impacts of the proposal, including impacts to Biobanking Agreement No. 341, in accordance with: • Transport's No Net Loss Guidelines (Transport for NSW, 2022) • Transport's obligations under the NSW Biodiversity Conservation Act 2016 (BC Act), including as part of its application for consent from the NSW Minister for Environment to carry out the proposal on land subject to Biobanking Agreement No. 341 under Section 5.16 of the BC Act. Transport will continue to consult with the owner of the land subject to Biobanking Agreement No. 341 and the proponent of Moorebank Precinct West Stage 2 (SSD 7709) regarding the proposal's impact on this site, any variations required to be made to the biodiversity stewardship agreement, any administrative modifications that may be required to the Moorebank Precinct West Stage 2 Consent (SSD7709) and the timing of any such variations / modifications.	Transport for NSW	Detailed design/construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
B20	Impact to Biobanking Agreement No. 341	Transport for NSW would comply with the following requirements before commencing work on the biodiversity stewardship site in accordance with its obligations under the BC Act: • Provide written notice of the proposed development to the NSW Minister for Environment and the owner of the biodiversity stewardship site (Commonwealth of Australia – Department of Infrastructure, Regional Development and Cities) • Receive consent from the NSW Minister for Environment prior to commencing work on the biodiversity stewardship site • Comply with any conditions of consent that may be imposed by the NSW Minister for Environment, including as part of any variation to the biodiversity stewardship agreement (Biobanking Agreement No. 341).	Transport for NSW	Detailed design/-construction	Additional safeguard
B21	Biodiversity offsets	A Biodiversity Offset Strategy would be prepared to: • Confirm which offsetting thresholds have been exceeded based on the final clearing boundary. • Calculate the offset and/or conservation requirement in accordance with these guidelines. • Establish what feasible and reasonable steps can be taken to meet this requirement including timing and delivery partners.	Contractor	Detailed design/pre-construction	Additional safeguard
AH1	Aboriginal heritage	An Aboriginal Heritage Management Plan (AHMP) would 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 would provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP would be prepared in consultation with all relevant Aboriginal groups.	Construction Contractor	Detailed design/pre-construction	Section 4.9 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
AH2	Aboriginal heritage	*The Standard Management Procedure – Unexpected Heritage Items* (Roads and Maritime, 2015) would be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport for NSW 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 would only re-commence once the requirements of that Procedure have been satisfied.	Construction Contractor	Detailed design / pre-construction	Section 4.9 of QA *G36 Environment Protection*
AH3	Aboriginal heritage	In the event of the discovery of Aboriginal objects, Heritage NSW should be notified in accordance with section 89(A) of the NPW Act.	Construction Contractor	Construction	Additional safeguards
AH4	Aboriginal heritage	If suspected Aboriginal object(s) outside the boundary of the destroyed Aboriginal site MA PAD1 (MA9) (AHIMS #45-5-4280) are encountered during the proposed works, any further excavation or ground disturbance in the area should cease and the find(s) managed in accordance with the Roads & Maritime Services' *Unexpected Heritage Items Procedure.*	Construction Contractor	Construction	Additional safeguards
AH5	Aboriginal heritage	AHIMS site #45-5-4281 should be protected through the installation of temporary fencing. The location of the site should be identified in the CEMP for the proposal.	Construction Contractor	Construction	Additional safeguards
NH1	Non-Aboriginal heritage	A Non-Aboriginal Heritage Management Plan (NAHMP) would be prepared and implemented as part of the CEMP. It would provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage.	Construction Contractor	Detailed design/pre-construction	Section 4.10 of QA *G36 Environment Protection*
NH2	Non-Aboriginal heritage	*The Standard Management Procedure – Unexpected Heritage Items* (Roads and Maritime, 2015) would be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered. Work would only re-commence once the requirements of that Procedure have been satisfied.	Construction Contractor	Detailed design/pre-construction	Section 4.10 of QA *G36 Environment Protection*
NH3	Non-Aboriginal heritage	Temporary fencing should be installed in front of the “Yulong” playing field entrance gates for the duration of the work to protect the physical curtilage and prevent accidental impacts from vehicles of mobile plant.	Construction Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
NH4	Non-Aboriginal heritage	Ground disturbance work would not commence in the area associated with former earthworks (training of practice trenches) until an Exception Notification under section 139(4) of the *Heritage Act 1977* or Excavation Permit under section 140 of the *Heritage Act 1977* is endorsed/issued by the Heritage Council.	Construction Contractor	Construction	Additional safeguard
NH5	Non-Aboriginal heritage	In the event of the discovery of relics of State significant, the Heritage Council of New South Wales should be notified in accordance with section 146 of the *Heritage Act 1977.*	Construction Contractor	Construction	Additional safeguard
NH6	Non-Aboriginal heritage	The location of the railway viaducts (Woodbrook Road item 12 LEP 2008) should be identified in the CEMP and include information relating to significance and ensure the need for care to avoid vehicle damage is included in site inductions.	Construction Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
LCVIA1	Landscape character and visual impact	A Landscape and Urban Design Plan would be prepared to support the final detailed proposal design and implemented as part of the CEMP. The Landscape and Urban Design Plan would 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 would 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 Landscape and Urban Design Plan would be prepared in accordance with relevant guidelines, including: • Beyond the Pavement urban design policy, process and principles (Roads and Maritime, 2014) • Landscape Guideline (RTA, 2008) • *Bridge Aesthetics* (Roads and Maritime 2012) • Noise Wall Design Guidelines (RTA, 2006) • Shotcrete Design Guideline (RTA, 2005).	Construction Contractor	Detailed design / Pre-construction	Standard safeguard
LCVIA2	Landscape character and visual impact	Consider using safety screen elements that are of a light colour to limit contrast with the sky backdrop.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
LCVIA3	Landscape character and visual impact	Consider opportunities to establish large scale vegetation intermittently situated in front of the bridge to visually settle the structure in its setting.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
LCVIA4	Landscape character and visual impact	Consider opportunities to establish dense vegetation including shrubs and stands of trees to provide for effective screening.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
LCVIA5	Landscape character and visual impact	Consider establishing stands of trees and dense shrubs along batters.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
LCVIA6	Landscape character and visual impact	Maximise large scale tree planting along the south eastern verge to provide for visual screening and re-establish the green character that the current interchange has.	Construction Contractor	Detailed design / Pre-construction / Construction	Additional safeguard
LCVIA7	Privacy screening around 2-8 Secombe Place, Moorebank	Transport and its Construction Contractor will develop site specific measures to limit opportunities for views into sensitive areas of 2-8 Secombe Place, Moorebank in consultation with property owner / occupiers.	Transport for NSW / Construction Contactor	Detailed design / Pre-construction / Construction	Additional safeguard
SC1	Community consultation	A Communication Plan (CP) would be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CP would include (as a minimum): • Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions • Contact name and number for complaints. ~~The CP would be prepared in accordance with the Community Involvement and Communications Resource Manual (RTA, 2008).~~ Transport would establish a Construction Communication Coordination Group as part of the Communication and Stakeholder Engagement Plan to manage communications interfaces with other locally occurring developments. The Construction Communication Coordination Group would involve Council, LOGOS (as the representative for tenants within the Moorebank Logistics Park), Bicycle User Group and construction contractors of surrounding developments.	Transport for NSW / Construction Contractor	Pre-construction	Standard safeguard
SC2	Property impacts	Transport for NSW would continue to consult with affected property owners and land occupiers until the completion of the proposal. Discussions, including the nature and timing of construction work, would be required to identify relevant mitigation measures for noise, traffic and visual impacts.	Transport for NSW	Pre-construction / Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
SC3	Changes in access	Temporary and permanent changes in access would be discussed with impacted land occupiers prior to commencement of construction and during construction activities should arrangements change. Temporary changes in access to social infrastructure facilities including the Casula Parklands and Georges River foreshore areas would be notified via signage and notification. Transport for NSW would confirm any realignment of street access or inter-property access under the proposal, in consultation with property owners.	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard
SC4	Social infrastructure	Access to social infrastructure facilities including parks and reserves would be maintained during construction, with safety measures in place for noise and amenity impacts. Key facilities that would be consulted include the John Grant International Raceway, Liverpool City Council (Casula Parklands) and the Barefoot Water Ski Club. Should any active pathways or routes require closure during construction, Transport for NSW would consult with Council and the community.	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard
SC5	Planning for construction pressures due to cumulative impacts	Transport for NSW and their contractor would consult with the Liverpool City Council, **LOGOS (as the representative for tenants within the Moorebank Logistics Park),** other project teams and the community throughout the construction period to reduce cumulative impacts during construction.	Transport for NSW / Construction Contractor	Pre-construction	Additional safeguard
SC6	Planning for construction pressures – events	Transport for NSW would work with the Liverpool City Council through the construction period to minimise impacts during events, such as the Barefoot Water Ski Club Championships to minimise any adverse impacts on the road network and surrounding areas.	Transport for NSW	Pre-construction	Additional safeguard
SC7	Visual impacts – lighting	During periods that require nightwork, lighting would be focused on the construction areas to avoid light spill and disturbance to surrounding properties and road users.	Construction Contractor	Construction	Additional safeguard
SC8	Cumulative impacts	Consultation with other projects including MLP and Moorebank Avenue Realignment would be carried out to reduce cumulative impacts to the community including traffic and amenity impacts.	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
AQ1	Air quality	An Air Quality Management Plan (AQMP) would be prepared and implemented as part of the CEMP. The AQMP would include, but not be limited to: • Potential sources of air pollution • Air quality management objectives consistent with any relevant published EPA and/or EES/DPIE guidelines • Mitigation and suppression measures to be implemented • Methods to manage work during strong winds or other adverse weather conditions A progressive rehabilitation strategy for exposed surfaces.	Construction Contractor	Detailed design / Pre-construction	Section 4.4 of QA *G36 Environment Protection*
AQ2	Air quality	Ongoing air quality monitoring would be carried out at the Helles Park former landfill site to detect any potential landfill gas leaks.	Construction Contractor	Construction / Operation	Additional safeguard
AQ3	Dust management around 2-8 Secombe Place, Moorebank	The Construction Contractor will develop, implement and maintain enhanced dust suppression measures around 2-8 Secombe Place, Moorebank for the duration of construction (or until such time that dust generating activities have been completed and the site has been adequately stabilised). Such measures could include the use of water misting systems, frequent use of soil binder and sealing haulage roads. The Construction Contractor will proactively monitor the effectiveness of any dust suppression measures implemented at this location and will implement additional controls if these measures are deemed to be ineffective. Measures to be implemented at this location are to be documented in the Air Quality Management Plan.	Construction Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
W1	Waste	A Waste Management Plan (WMP) would be prepared and implemented as part of the CEMP. The WMP would include but not be limited to: • Measures to avoid and minimise waste associated with the proposal • Classification of wastes and management options (re-use, recycle, stockpile, disposal) • Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • Procedures for storage, transport and disposal • Monitoring, record keeping and reporting. The WMP would be prepared taking into account the *Environmental Procedure – Management of Wastes on Roads and Maritime Services Land* (Roads and Maritime, 2014) and relevant Transport for NSW Waste Fact Sheets.	Construction Contractor	Detailed design / Pre-construction	Section 4.2 of QA *G36 Environment Protection*
U1	Utilities	Prior to the commencement of work: • The location of existing utilities and relocation details would be confirmed following consultation with the affected utility owners If the scope or location of proposed utility relocation work falls outside of the assessed proposal scope and footprint, further assessment would be carried out.	Construction Contractor	Detailed design / Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
HR1	Hazards and risk management	A Hazard and Risk Management Plan (HRMP) would be prepared and implemented as part of the CEMP. The HRMP would include, but not be limited to: • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. The HRMP would be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or DPIE publications.	Construction Contractor	Detailed design / Pre-construction	Additional safeguard
CI1	Cumulative construction impacts	Developers of the other projects would be consulted in accordance with the Community Stakeholder and Engagement Plan to: • Obtain information about project timeframes and impacts • Manage the interfaces of the proposal's staging and programming in combination with the other projects occurring in the area • Identify and implement appropriate safeguards and management measures to minimise cumulative impacts. • Coordinate community notifications about upcoming work to minimise the potential for consultation fatigue and confusion. **Transport would establish a Construction Communication Coordination Group as part of the Communication Plan to manage communications interfaces with other locally occurring developments. The Construction Communication Coordination Group would involve Council, LOGOS, (as the representative for tenants within the Moorebank Logistics Park), Bicycle User Groups and construction contractors of surrounding developments.**	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
CI2	Cumulative construction impacts	The CEMP would consider potential cumulative construction impacts from known surrounding development activities as well as new planned development activities near the proposal, as they become known. This would include a process to regularly review and update mitigation measures as new work is identified that may lead to cumulative impacts or if complaints are received due to cumulative impacts.	Transport for NSW / Construction Contractor	Pre-construction / Construction	Additional safeguard
SUS1	Sustainability	The indicative project specific sustainability objectives and performance outcomes in Table 6-60 of the project REF would be reviewed and finalised during detailed design and would be used to direct and shape how the proposal will be sustainably developed, delivered and operated.	Transport for NSW / Construction Contractor	Pre-construction and construction	Additional safeguard
CR1	Climate risk	A more detailed climate risk assessment and climate adaptation plan would be prepared accordance with AS 5334. This assessment would be supported by an evaluation to characterise the likely impacts for 'high' risks (and potentially some 'moderate' risks where the consequence is 'major' or 'moderate').	Transport for NSW	Pre-construction	Additional safeguard

6.3 Licensing and approvals

Table 6-2 summarises the licensing and approvals that would be required for the proposal.

Table 6-2: Summary of licensing and approval required

Instrument	Requirement	Timing
Protection of the Environment Operations Act 1997 (s43)	Environment protection licence (EPL) for scheduled activities [road construction] from the EPA.	Prior to start of the activity.
Heritage Act 1977 (s139)	Excavation permit from the Heritage Council of NSW / the Minister to allow historical archaeological testing to be carried out.	Prior to start of the activity.
Heritage Act 1977 (s139)	Excavation permit from the Heritage Council of NSW / the Minister if historical archaeological testing identify any relics.	Prior to the start of the activity
Crown Land Management Act 2016 (Divisions 3.4, 5.5 and 5.6)	Lease or licence to occupy areas of Crown land.	Prior to start of the activity
Roads Act 1993 (Section 138)	A road occupancy licence would be obtained	Prior to start of the activity
Biodiversity Conservation Act 2016 (Clause 5.16 (1))	Receive consent from the NSW Minister for Environment prior to commencing works on the biodiversity stewardship site	Prior to start of the activity

7. Definitions

Term	Definition
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information System
Alignment	The vertical and horizontal location of the road
ASRIS	Australian Soil Resource Information System
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016 (NSW).
Capacity	Maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or a road in one direction during a given time period under prevailing road and traffic conditions
CEMP	Contractors Environmental Management Plan
CSP	Liverpool City Council Community Strategic Plan
DPI	Department of Primary Industries
DPE	NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure
EEC	Ecologically Endangered Community
EIA	Environment impact assessment
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
EPA	NSW Environment Protection Authority
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
Georges River Catchment REP	Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment
Heritage Act	Heritage Act 1977 (NSW)
LCZ	Landscape character zone
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
MNES	Matters of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Term	Definition
NPW Act	Hazard and Risk Management Plan
NSW	New South Wales
OOHW	Out of hours work
PAD	Potential archaeological deposit
PCT	Plant community type
PEMP	Project Environmental Management Plan
PFAS	Per-and polyfluoroalkyl substances
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Proposal Area	The 'proposal area' refers to the area that may be directly impacted by construction and operation of the proposal (shown in Figure 1-1 and Figure 1-2).
REF	Review of Environmental Factors
Roads and Maritime	NSW Roads and Maritime Services, now known as Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
Study Area	The 'study area' consists of land in the vicinity of, and including, the proposal area. The study area is the wider area surrounding the proposal area, including land that has the potential to be indirectly impacted by the proposal beyond the immediate work area (for example, as a result of any noise or traffic diversions). The scope of the study area varies depending on the environmental factor being assessed.
SWMP	Soil and Water Management Plan
TEC	Threatened ecological community
TMP	Traffic Management Plan
WARR Act	Waste Avoidance and Resource Recovery Act 2001 (NSW)
WM Act	Water Management Act 2000 (NSW)
WQOs	Water Quality Objectives

8. References

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Aurecon 2022, M5 Motorway Westbound Traffic Upgrade – Socio-economic Impact Assessment

Aurecon 2022, M5 Motorway Westbound Traffic Upgrade – Traffic and Transport Assessment

Aurecon 2022, M5 Motorway Westbound Traffic Upgrade – Surface water and Groundwater Assessment

Aurecon 2022, M5 Motorway Westbound Traffic Upgrade – Preliminary Site Investigation and Landfill Gas Assessment

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Transport for NSW (2020) M5 Motorway Westbound Traffic upgrade – Traffic and Transport Impact Assessment

Transport for NSW (2021) Transport Sustainability Plan 2021

Transport for NSW (2022) M5 Motorway Westbound Traffic Upgrade – Review of Environmental Factors

Appendix A: Respondents

Respondent	Submission No.	Section number where issues are addressed
Individual	1	2.3.3
Individual	2	2.3.3
Individual	3	2.2.2
Individual	4	2.3.6
Individual	5	2.3.1
Individual	6	2.2.1
Individual	7	2.2.1, 2.15.1
Individual	8	2.2.1, 2.15.2
Individual	9	2.4.1, 2.6.7, 2.10
Individual	10	2.3.2, 2.4.1, 2.7.10, 2.11.2
Individual	11	2.2.2
Individual	12	2.2.1, 2.2.3, 2.3.3
Individual	13	2.4.1, 2.7.1
Individual	14	2.3.3, 2.15.2
Individual	15	2.2.1, 2.3.6
Individual	16	2.2.1
Individual	17	2.2.1, 2.3.3
Individual	18	2.5.1
Individual	19	2.3.6
Individual	20	2.12.2
Individual	21	2.6.7, 2.15.2
Individual	22	2.3.4, 2.7.11, 2.15.2
Individual	23	2.3.1, 2.7.9
Individual	24	2.15.3
Individual	25	2.2.1
Individual	26	2.3.6
Individual	27	2.7.7, 2.7.8
Individual	28	2.2.3, 2.15.2
Individual	29	2.2.2, 2.4.5, 2.7.12
Individual	30	2.2.1, 2.4.1, 2.4.5, 2.5.1, 2.7.9
Individual	31	2.2.1, 2.2.3, 2.5.2, 2.7.6, 2.7.7, 2.7.8, 2.10, 2.15.1
Individual	32	2.2.3, 2.3.3
Individual	33	2.6.9

Respondent	Submission No.	Section number where issues are addressed
Individual	34	2.6.1, 2.6.2, 2.6.3, 2.6.5, 2.6.7, 2.6.9
Individual	35	2.2.2, 2.4.5, 2.6.4, 2.6.5, 2.6.8, 2.7.9, 2.10, 2.11.3, 2.12
Individual	36	2.7.5, 2.15.2
Individual	37	2.2.2, 2.6.5, 2.6.7, 2.7.5, 2.7.6, 2.7.11, 2.7.12, 2.15.2
Individual	38	2.3.1, 2.3.4, 2.4.2, 2.4.3, 2.7.3, 2.7.4, 2.7.5, 2.7.6, 2.7.11, 2.7.13, 2.9.1, 2.10, 2.11.1, 2.13
Individual	39	2.6.7, 2.6.9, 2.7.5, 2.7.11, 2.7.12, 2.12, 2.15.3
Individual	40	2.7.2, 2.7.6
Individual – Petition signed by 68 people	41	2.6.1, 2.6.2, 2.6.3, 2.6.5, 2.6.6, 2.6.7, 2.6.9
Individual	42	2.2.2, 2.5.3, 2.7.12, 2.12, 2.15.2, 2.13
Individual	43	2.2.1, 2.3.1, 2.3.5, 2.4.3, 2.4.4, 2.4.5, 2.5.1, 2.6.1, 2.7.6, 2.8.1, 2.8.2, 2.9.2, 2.11.1, 2.11.3, 2.14
Individual	44	2.4.1, 2.4.4, 2.5.1, 2.5.3, 2.6.4, 2.6.5, 2.11.1, 2.11.3, 2.12, 2.13
Agency	Liverpool City Council	3.2

Appendix B: Community Update

Australian Government

NSW GOVERNMENT

Transport for NSW

M5 Motorway upgrade westbound from Moorebank Avenue to Hume Highway

Community Update | August 2022

M5 Motorway traffic from Moorebank Avenue looking toward the Hume Highway

Transport for NSW (Transport) is progressing with plans to upgrade the M5 Motorway westbound from Moorebank Avenue to Hume Highway and upgrade the M5 Moorebank Avenue interchange.

These upgrades will reduce congestion, improve the efficiency and safety of the road network for all road users. Upgrading the interchange will accommodate the increase in heavy and light vehicle traffic from the Moorebank Logistics Park.

Australian and NSW Governments' budget commitments

Recognising the need for this important upgrade, the Australian and NSW Governments have committed funding for this upgrade to assist with delivering the project.

Transport will be displaying the Review of Environmental Factors (REF) assessment to the public. The REF will be available for public comment until 29 September 2022.

The proposal is expected to result in benefits to road users including:

- improved efficiency with shorter queues and travel times westbound along the M5 Motorway
- increased road safety with the elimination of the weaving issue westbound from Moorebank Avenue onto the M5 Motorway
- new shared user path for cyclist and pedestrians connecting Moorebank Ave and Hume Highway, over the Georges River
- a potential decrease in the frequency of incidents and their associated traffic delays
- provide a reliable road network to support economic and residential growth in western Sydney
- improve safety and access to the Liverpool CBD.

M5 Motorway westbound traffic upgrade and M5 Moorebank Avenue interchange upgrade

MITRA (Moorebank Intermodal Terminal Road Access) Strategy

Transport developed the MITRA Strategy to address increasing traffic and freight movements in the Liverpool/Moorebank area over the next 10-20 years. The strategy identified road infrastructure improvements to meet the forecast growth of the Liverpool CBD and regional traffic, together with construction of the Moorebank Logistics Park (MLP). The Park will generate over 6,600 heavy vehicle trips and 10,000 light vehicle trips per day. The M5 Motorway westbound traffic upgrade is one of the road infrastructure improvements identified in the MITRA strategy.

M5 Motorway westbound traffic upgrade

Motorists travelling westbound on the M5 Motorway through Moorebank and Liverpool currently experience traffic congestion in the afternoon peak. This is caused by traffic entering the motorway westbound at Moorebank Avenue merging with through-traffic and vehicles exiting towards the Hume Highway. Increasing heavy vehicles travelling from MLP will also add to the congestion.

In late 2019, Transport consulted with the community on the design to upgrade the M5 Motorway westbound between Moorebank Avenue and Hume Highway to ease this congestion and improve safety.

The community consultation report was published in July 2020 and can be viewed at **nswroads.work/m5motorwaywestbound**

M5 Moorebank Avenue interchange upgrade

The M5 Moorebank Avenue interchange upgrade will improve the traffic efficiency of the M5 and Moorebank Avenue intersection to accommodate the increase in heavy and light vehicle traffic from the MLP.

Upgrading the M5 Moorebank Avenue interchange is a condition of planning consent for the Moorebank Precinct East Stage 2. It is also an important component of Transport's MITRA strategy.

Combining the two projects into one will assist with minimising the construction impacts for road users, residents and businesses, address future capacity requirements for the interchange and reduce the overall cost of the two projects.

Features of the combined M5 Motorway westbound traffic upgrade and M5 Moorebank Avenue interchange upgrade:

- T2, T5 railway lines and Sydney Southern Freight Line, connecting the M5 Motorway and Moorebank Avenue to the Hume Highway
- a new underpass at Moorebank Avenue for traffic exiting the M5 Motorway at Hume Highway
- a new exit east of Moorebank Avenue for the M5 Motorway westbound towards the Hume Highway (the current exit at Moorebank Avenue will be maintained)
- closing the existing exit from the M5 Motorway to Hume Highway between Moorebank Avenue and Hume Highway
- a two lane exit for motorists travelling east on the M5 Motorway to Moorebank Avenue
- a third right turn lane from M5 eastbound to Moorebank Avenue southbound
- widening Moorebank Avenue south of the M5 to accommodate a third through-lane before merging back to two lanes
- a second left turn lane from M5 westbound to Moorebank Avenue southbound
- a second left turn lane from Moorebank Avenue northbound to M5 westbound
- a new shared pathway along the M5 Motorway starting at Moorebank Avenue, across the Georges River on the new bridge
- upgraded traffic lights to accommodate changes.

Catering for Western Sydney's growth

Better, safer and more reliable trips for people, business and freight

Easing congestion

Improving safety

Other projects in the area

We are also planning other road upgrade projects, supporting the future Transport network in the south west, including:

1 Heathcote Road duplication between The Avenue and Princes Highway

In addition to the funding that has been committed for the full duplication of Heathcote Road between Infantry Parade and The Avenue, $35 million has also been committed to investigate the full duplication between The Avenue and Princes Highway.

Visit **nswroads.work/heathcoteroadcorridor**

2 Safety improvements for Heathcote Road bridge over Woronora River at Engadine

Work is now underway on widening the bridge to improve safety on Heathcote Road over Woronora River, improving travel time on Heathcote Road between New Illawarra Road, Lucas Heights and the Princes Highway, Engadine.

Visit **nswroads.work/heathcote**

3 Heathcote Road upgrade at Moorebank

Transport has been investigating a proposal to upgrade a section of Heathcote Road, Moorebank between Junction Road and the M5 Motorway. Widening this 300m section would remove the bottleneck and improve safety and traffic flow. Consultation on the strategic design was carried out with the community in 2021.

Visit **nswroads.work/heathcoteroadmoorebank**

4 Cambridge Avenue upgrade, Glenfield

Planning is underway for a future upgrade and extension of Cambridge Avenue, Glenfield to support future population and employment growth. Consultation was held in December 2020.

Visit **nswroads.work/cambridgeave**

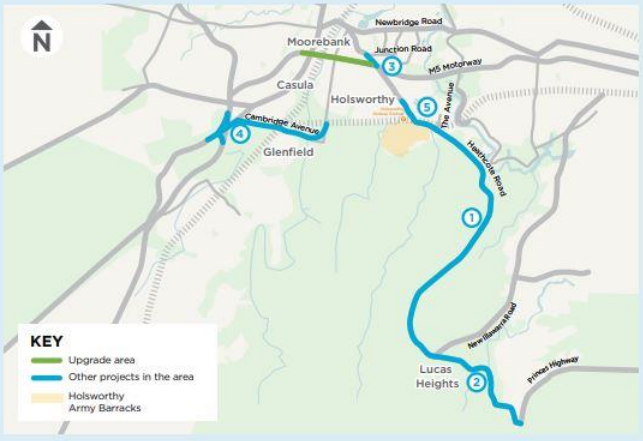
5 Heathcote Road upgrade between Infantry Parade, Holsworthy and The Avenue, Voyager Point

The Heathcote Road upgrade is an important project that will help reduce congestion, improve road safety and provide more reliable journeys for all road users.

The key features of the upgrade includes widening of the road to a two lane dual carriageway from Infantry Parade at Holsworthy to The Avenue at Voyager Point, and duplication of three existing bridges and replacement of two over Harris Creek, Williams Creek and the East Hills train line.

A shared path facility will be provided along the length of the upgraded road to improve cyclist and pedestrian connectivity to Holsworthy Train Station. Construction has now commenced on this major project.

Visit **nswroads.work/heathcoteroad**



Project impacts

Construction hours and duration

Once construction has been awarded, construction is expected to run for up to 40 months, assuming no unforeseen disruptions. Most work would be carried out during standard construction hours, but some out of hours work would also be required. Out of hours work would be undertaken in accordance with the Construction Noise and Vibration Guidelines (Road and Maritime 2016) and are likely to be required for work:

- that needs temporary access along sections of the M5 Motorway and Moorebank Avenue
- that needs traffic switches outside of peak times
- to adjust traffic signals at intersections
- that includes potential utility and drainage, including relocations and adjustments
- on the western side of the bridge over the Georges River that is around the rail corridor.

Environmental impacts

Noise and vibration

Construction noise impacts are expected to be relatively low compared with existing noise levels generated from the M5 Motorway.

The operational noise modelling results show that the nearest residents would experience an increase in traffic noise of no more than two decibels. Noise mitigation measures will be considered, including at-property treatment for properties that experience higher noise levels than the adopted criteria.

The main source of vibration would be vibratory rollers which are required for the road, pathway and intersection upgrade stages. Noise and vibration impacts during construction would be minimised and managed, as far as feasible and reasonable in accordance with the Construction Noise and Vibration Guidelines (Roads and Maritime 2016).

Traffic and transport

The proposal would have six construction areas. These areas would require different traffic arrangements, including reduction of speed limits along the M5 Motorway and Moorebank Avenue, temporary road layout modifications and temporary partial closures to the local road network. Transport would continue to consult with key stakeholders to minimise potential traffic impacts associated with construction in these areas.

Hydrology and flooding

The main construction compound is to be located on flood prone land at Helles Park due to the lack of suitable alternative locations. The delivery of the project would include careful positioning of portable buildings and unsecured construction objects.

During operation, there would be no significant changes in the flood behaviour of the Georges River due to the proposal.

Surface water and groundwater

Enabling work, earthworks and construction may impact surface water and groundwater through erosion, scouring of natural waterways, sedimentation and contamination. Mitigation measures would be implemented during construction to contain material on site and protect surface and ground water quality. Design of appropriate stormwater infrastructure will help manage what is expected to be negligible erosion and scouring during operation.

Soil and contamination

Some construction activities, such as removal of vegetation and heavy vehicle movements, would result in dust. Where possible, we would work to implement dust mitigation measures to minimise our impact. Some of these measures include covering materials, using designated routes, driving at low speeds while on and around our sites, and visually monitoring our sites daily. Mitigation measures will be put in place to reduce any soil erosion and loss of topsoil due to earthworks, excavation and vegetation removal.

During operation, impacts on soil and contamination as a result of run-off and drainage would be minimal. Further investigation and design solutions will be identified during detailed design.

Biodiversity

We understand the importance of managing the project's impact on the environment, and take environmental conservation and protection seriously. The design has been refined to minimise any impact, however, the proposal will require removal of some native vegetation and street trees and plantings.

Safeguards and mitigation measures have been proposed to manage and minimise impacts to fauna and flora where possible. Assessments of significance were undertaken for threatened ecological communities and threatened species in the proposal area. The proposal is unlikely to have a significant impact on any listed threatened species, populations or ecological communities.

Have your say

The REF for the M5 Motorway westbound traffic and M5 Moorebank Avenue intersection upgrade is on public display until midnight, 29 September 2022. The planning documents are available in both PDF format.

An animated flythrough of the project is available on **nswroads.work/m5motorwaywestbound**

To view the REF visit **nswroads.work/m5motorwaywestbound**

Feedback can be submitted directly through the digital platform or by:

- emailing **m5moorebank@transport.nsw.gov.au**
- phoning 1800 519 525
- writing to:
  M5 Motorway westbound traffic upgrade
  Transport for NSW
  PO Box 973, Parramatta NSW 2124

Your feedback will help inform our design and let us know what is important to the community. We will continue to engage with the community as the project progresses.

Information sessions

We are hosting a number of community information sessions to provide you with an opportunity to ask the project team questions and gain further information. A formal presentation will not be given, so feel free to drop in any time at one of the following sessions:

- Moorebank Logistics Park Sales Suite, above Piccolo Me, 400 Moorebank Avenue, Moorebank,
  Thursday 8 September — 4pm–6pm
- Casula Powerhouse Arts Centre
  1 Powerhouse Road, Casula,
  Saturday 17 September — 10am–1pm

Virtual information session

An online session via MS Teams will be held on:

- Wednesday **14 September 2022 — 4pm–4:30pm**.

The session can be joined at
nswroads.work/m5wbinfosession

Next steps

At the end of the REF display period, a submissions report will be published on the website. The report will include a summary of the community feedback received on the project and our responses.

We will continue to keep the community up-to-date as the project progresses. We encourage you to register for updates, so that we can get the latest information to you via email.

Project development process

Contact us

If you have any questions or would like more information please contact our project team:

1800 519 525

m5moorebank@transport.nsw.gov.au

nswroads.work/m5motorwaywestbound

M5 Motorway westbound traffic upgrade,
PO Box 973, Parramatta NSW 2124

131 450

If you need help understanding this information, please contact the Translating and Interpreting Service on 131 450 and ask them to call us on 1800 519 525.

NSW GOVERNMENT

August 2022
22.201

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Appendix C: Newspaper advertisement

Australian Government

NSW GOVERNMENT

M5 Motorway westbound traffic upgrade from Moorebank Avenue to Hume Highway

Display of Review of Environmental Factors, M5 Motorway westbound traffic upgrade, until Thursday 29 September

Speak to the project team

Face-to-face sessions

1. 4pm-6pm 8 September at the Sales Suite on top of Piccolo Me Café Moorebank
2. 10am-1pm 17 September at Casula Powerhouse Arts Centre

Online session

4-4:30pm 14 September via nswroads.work/m5wbinfosession

Find out more

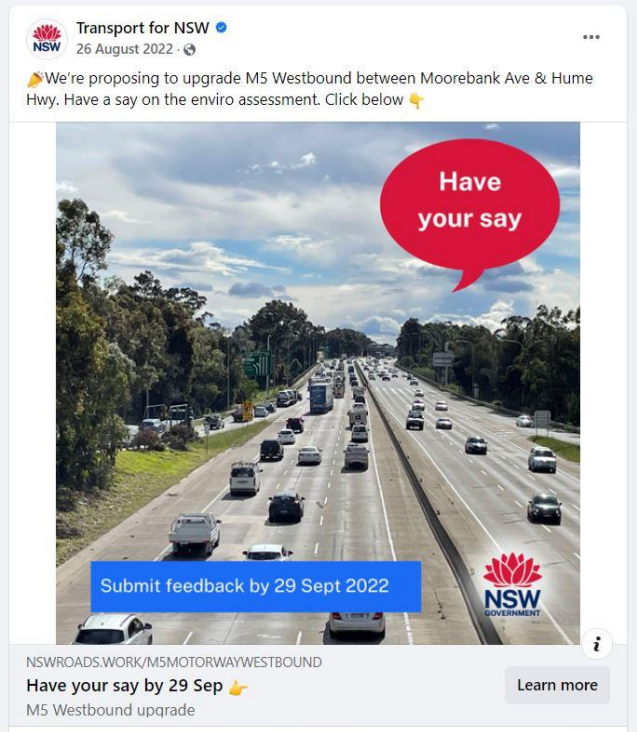
Phone: 1800 519 525
Email: M5moorebank@transport.nsw.gov.au
Web: nswroads.work/m5motorwaywestbound

BLZ_KE0534

Appendix D: Facebook posts

Have Your Say

29 Aug – 5 Sept



https://facebook.com/TransportForNSW/posts/pfbid02N73JUzepcDTrHJMRfHhbpWcELxcMrYZkiy5eRDDL69ekJM1ZnDEKHxDMUGuhPsn3l

Info session 1 – Piccolo Me Café

1 – 8 Sept

https://business.facebook.com/TransportForNSW/posts/pfbid02SZkzM7cuv7WPagJmXQ9iwinMNZjc7hV9AkMtgWEsS2hC2GroS9e2GPi8smGQiwmzl

Info session – Online

7 – 14 Sept

https://facebook.com/TransportForNSW/posts/pfbid0321z9FiEwLDdDGgWCrugQ2Udxzr59vA75mC2qWeWZFBmLsnnWgpy4xdGxRLxB5DaVl

Info session – Powerhouse Museum Casula

10 – 17 Sept

https://facebook.com/TransportForNSW/posts/pfbid0JFbcjZN6bTxT6nxh1xC1t97GddemPNor6yVNwCZSwt8BufnFJ7vSNVg7pqF2TVSzl

Final chance to Have Your Say

22 – 29 Sept

https://facebook.com/TransportForNSW/posts/pfbid0358HuhYwwuh2Fcde7uoukRr96PLaGStX7GLmye6mpNUkYn6CWRgyV7VBy5d1NfoYVl

Appendix E: TRAQ Assessment

Memorandum

To:	Rhys Adcock	**At:**	Aurecon Group
From:	Sahar Bagheri	**At:**	SLR Consulting Australia Pty Ltd
Date:	8 December 2021	**Ref:**	610.19362-M01-v1.0-20211208.docx
Subject:	M5 TRAQ Assessment		

CONFIDENTIALITY

SLR Consulting has been commissioned by Aurecon to undertake the TRAQ modelling component of the M5 Upgrade Project.

The aim of this letter is to list the inputs and outputs used in the TRAQ modelling.

We hope this letter meets your immediate requirements, but please feel free to contact the undersigned if you wish to discuss anything related to this submission.

Regards

Sahar Bagheri

Senior Project Consultant - Air Quality

0414 826 851

Checked/
Authorised by: VM

Assessment Methodology

The key potential air quality issue identified for the operational phase of the M5 Upgrade project is emissions of combustion products and particulate matter from vehicles travelling along westbound and eastbound links (ie Moorebank Avenue to Hume highway and Heathcote Road to Moorebank Avenue). To assess the potential air quality impacts of the project from vehicular emissions on surrounding sensitive receptors, the Tool for Roadside Air Quality (TRAQ) developed by Roads and Maritime Services (RMS) (now TfNSW) has been used.

Modelling was performed for four scenarios for each link (therefore 8 scenarios in total):

- Projected 2026 traffic flows with and without the project
- Projected 2036 traffic flows with and without the project.

Model Configuration

TRAQ requires a number of inputs to describe the project environment and emissions to air, including:

- Background pollutant concentrations
- Peak hour traffic volumes and vehicle speeds
- Traffic mix (heavy vehicle percentage)
- Road type, number of lanes and gradient
- Year of assessment (vehicle fleet)
- Location land use
- Season

The sources of the required data and assumptions made for the purpose of this assessment are summarised in **Table 1**.

Table 1 TRAQ Input Data

Parameter	Value		Description
Background pollutant concentrations	PM_{10} 24-Hour: 30.8 µg/m^3 PM_{10} Annual: 19.1 µg/m^3 $PM_{2.5}$ 24-Hour: 12.4 µg/m^3 $PM_{2.5}$ Annual: 7.6 µg/m^3 NO_2 1-Hour: 21 µg/m^3 NO_2 Annual: 7.9 µg/m^3 CO 1-Hour: 0.4 mg/m^3 CO 8-Hour: 0.4 mg/m^3		The 1-, 8- and 24-hour average values are the 90th percentile background air quality concentrations recorded by the St Marys and Prospect AQMSs as per TRAQ guidance. The values are based on records from 2016-2020 inclusive, except for PM_{10} and $PM_{2.5}$ which exclude the elevated levels recorded during the major bushfire event in November and December 2019.
Road Grade	**Moorebank Avenue to Hume Highway** (Westbound and Eastbound): 0 **Heathcote Road to Moorebank Avenue** (Westbound and Eastbound): 0		Average gradient estimated from road design information
Peak hour speeds	59 km/hr		TRAQ default for peak periods on arterial roads
Peak hour traffic volumes	Moorebank to	**2026: Without Project** Westbound: 7,219	Highest projected peak hourly traffic volumes from any eastbound and westbound link within each

Parameter	Value		Description
	Hume	Eastbound: 6,977 **2036**: **Without Project** Westbound: 7,293 Eastbound: 6,993 **2026: With Project** Westbound: 7,726 Eastbound: 7,009 **2036**: **With Project** Westbound: 7,902 Eastbound: 6,986	scenario. This is conservative, compared to adopting the highest westbound and eastbound from the same link, with and without the project.
	Heathcote to Moorebank	**2026: Without Project** Westbound: 5,913 Eastbound: 5,876 **2036**: **Without Project** Westbound: 5,898 Eastbound: 5,813 **2026: With Project** Westbound: 6,265 Eastbound: 5,866 **2036**: **With Project** Westbound: 6,267 Eastbound: 5,821	Highest projected peak hourly traffic volumes from any eastbound and westbound link within each scenario. This is conservative, compared to adopting the highest westbound and eastbound from the same link, with and without the project.
Peak hour percentage of daily traffic	Moorebank to Hume	**2026: Without Project** 7.5% **2036**: **Without Project** 7.7% **2026: With Project** 9.0% **2036**: **With Project** 9.2%	Calculated using the peak traffic data and 24h traffic data.
	Heathcote to Moorebank	**2026: Without Project** 7.3% **2036**: **Without Project** 7.3% **2026: With Project** 7.5% **2036**: **With Project** 7.7%	Calculated using the peak traffic data and 24h traffic data.
Traffic mix	The TRAQ default traffic mix was adjusted to contain 21.4% heavy vehicles (maximum of any links) as listed in **Table 2**.		Assumption based on the information provided by the client with a ratio of heavy vehicles comprising 9% of all vehicles for all routes.
Road type and number of lanes	Highway/Freeway, two lanes in each route (westbound and eastbound).		-

Parameter	Value	Description
Year of assessment (vehicle fleet)	**2026:** 2026 vehicle fleet **2036:** 2036 vehicle fleet	As per TRAQ default options
Location land use	Residential	-
Season	Worst-case	TRAQ default worst-case season
Cold start emissions	Included	-

The TRAQ default traffic mix for highway/freeway roads has a combined total of 21 per cent heavy vehicles. As shown in **Table 2**, the heavy vehicle proportion assumed in the modelling was assumed to be 9% based on the ratio of heavy vehicles. To do this, the default traffic mix was adjusted as shown in **Table 2**. The proportions of individual heavy and light vehicle classes within each group remained the same but the overall split between the two groups was modified to have a value of 9 per cent heavy vehicles.

Table 2 Adopted Traffic Mix Used in TRAQ

Vehicle Category		TRAQ Default Traffic Mix (%)*	Traffic Mix Used in this Assessment (%)
CP	Petrol passenger vehicles	64.0	73.7
CD	Diesel passenger vehicles	1.8	2.1
LDCP	Light-duty commercial petrol vehicles less than 3.5 tonnes	9.5	10.9
LDCD	Light-duty commercial diesel vehicles less than 3.5 tonnes	3.2	3.7
MC	Motorcycles	0.5	0.6
Percentage Light Vehicles		***79.0%***	***91.0%***
HDCP	Heavy-duty commercial petrol vehicles greater than 3.5	0.4	0.2
RT	Rigid trucks, 3.5-25 tonnes, diesel only	10.8	4.6
AT	Articulated trucks greater than 25 tonnes, diesel only	9.6	4.1
BusD	Heavy public transport buses, diesel only	0.2	0.1
Percentage Heavy Vehicles		***21.0%***	***9.0%***

Default TRAQ traffic mix for 'highway/freeway' road type

Model Results

The predicted concentrations at 10 m from the kerbside are summarised in **Table 3** and **Table 4** for all pollutants and averaging periods assessed for Moorebank to Hume and Heathcote to Moorebank respectively. As shown in the table, annual average and maximum daily $PM_{2.5}$ concentrations and annual average and maximum daily (with project – for Moorebank Avenue to Hume highway only) PM_{10} concentrations are predicted to exceed the relevant current ambient air quality criteria at the nearest sensitive receptor locations. These predicted exceedances are driven mainly by the background concentrations assumed in the calculations which are close to the criteria.

However, as shown in **Table 3** and **Table 4**, the increases in the predicted cumulative annual average concentrations at 10 m from the kerbside as a result of the upgrade are minimal. TRAQ is a highly conservative screening model, which will overestimate actual impacts, and the modelling was performed using conservative assumptions in relation to the assumed $PM_{2.5}/PM_{10}$ ratio, meteorological data and season options, and the fleet mix.

Table 3 TRAQ Model Results – Moorebank Avenue to Hume Highway – 10 m from the Kerbside

Pollutant and Averaging Period	Units	Incremental Impact		Background Concentration	Cumulative Impact*			Criteria
		Without Project	With Project		Without Project	With Project	Change due to Project	
2026 Traffic Emissions Scenarios								
Maximum 1-hour CO concentrations	mg/m^3	0.6	0.6	0.4	1.0	1.0	-	**30**
Maximum 8-hour CO concentrations	mg/m^3	0.4	0.4	0.4	0.8	0.8	-	**10**
Maximum 1-hour NO_2 concentrations	µg/m^3	37.6	39.2	21	58.6	60.2	2.7%	**246**
Annual NO_2 concentrations	µg/m^3	7.5	7.8	7.9	15.4	15.7	1.9%	**62**
Maximum 24-hour PM_{10} concentrations	µg/m^3	18.8	19.6	30.8	49.6	**50.4**	1.6%	**50**
Annual PM_{10} concentrations	µg/m^3	7.5	7.8	19.1	**26.6**	**26.9**	1.1%	**25**
Maximum 24-hour $PM_{2.5}$ concentrations	µg/m^3	15.8	16.4	12.4	**28.2**	**28.8**	2.4%	**25**
Annual $PM_{2.5}$ concentrations	µg/m^3	6.3	6.5	7.6	**13.9**	**14.1**	1.8%	**8**
2036 Traffic Emissions Scenarios								
Maximum 1-hour CO concentrations	mg/m^3	0.5	0.6	0.4	0.9	1.0	11.1%	**30**
Maximum 8-hour CO concentrations	mg/m^3	0.4	0.4	0.4	0.8	0.8	-	**10**
Maximum 1-hour NO_2 concentrations	µg/m^3	29.8	31.3	21	50.8	52.3	3.0%	**246**
Annual NO_2 concentrations	µg/m^3	6.0	6.3	7.9	13.9	14.2	2.2%	**62**
Maximum 24-hour PM_{10} concentrations	µg/m^3	18.4	19.3	30.8	49.2	**50.1**	1.8%	**50**
Annual PM_{10} concentrations	µg/m^3	7.4	7.7	19.1	**26.5**	**26.8**	1.1%	**25**
Maximum 24-hour $PM_{2.5}$ concentrations	µg/m^3	15.4	16.2	12.4	**27.8**	**28.6**	2.7%	**25**
Annual $PM_{2.5}$ concentrations	µg/m^3	6.2	6.5	7.6	**14.1**	**14.1**	-	**8**

* Predicted incremental impact plus assumed background concentration

Table 4 TRAQ Model Results – Heathcote Road to Moorebank Avenue – 10 m from the Kerbside

Pollutant and Averaging Period	Units	Incremental Impact		Background Concentration	Cumulative Impact*			Criteria
		Without Project	With Project		Without Project	With Project	Change Due to Project	
2026 Traffic Emissions Scenarios								
Maximum 1-hour CO concentrations	mg/m^3	0.5	0.5	0.4	0.9	0.9	-	**30**
Maximum 8-hour CO concentrations	mg/m^3	0.4	0.4	0.4	0.8	0.8	-	**10**
Maximum 1-hour NO_2 concentrations	µg/m^3	31.1	32.2	21	52.1	53.2	2.1%	**246**
Annual NO_2 concentrations	µg/m^3	6.2	6.4	7.9	14.1	14.3	1.4%	**62**
Maximum 24-hour PM_{10} concentrations	µg/m^3	15.6	16.1	30.8	46.4	46.9	1.1%	**50**
Annual PM_{10} concentrations	µg/m^3	6.2	6.4	19.1	**25.3**	**25.5**	0.8%	**25**
Maximum 24-hour $PM_{2.5}$ concentrations	µg/m^3	13.1	13.5	12.4	**25.5**	**25.9**	1.6%	**25**
Annual $PM_{2.5}$ concentrations	µg/m^3	5.2	5.4	7.6	**12.8**	**13.0**	1.3%	**8**
2036 Traffic Emissions Scenarios								
Maximum 1-hour CO concentrations	mg/m^3	0.4	0.5	0.4	0.8	0.9	12.5%	**30**
Maximum 8-hour CO concentrations	mg/m^3	0.3	0.3	0.4	0.7	0.7	-	**10**
Maximum 1-hour NO_2 concentrations	µg/m^3	24.4	25.3	21	45.4	46.3	2.0%	**246**
Annual NO_2 concentrations	µg/m^3	4.9	5.1	7.9	12.8	13.0	1.6%	**62**
Maximum 24-hour PM_{10} concentrations	µg/m^3	15.0	15.6	30.8	45.8	46.4	1.3%	**50**
Annual PM_{10} concentrations	µg/m^3	6.0	6.2	19.1	**25.1**	**25.3**	0.8%	**25**
Maximum 24-hour $PM_{2.5}$ concentrations	µg/m^3	12.6	13.1	12.4	**25.0**	**25.5**	2.0%	**25**
Annual $PM_{2.5}$ concentrations	µg/m^3	5.0	5.2	7.6	**12.6**	**12.8**	1.3%	**8**

* Predicted incremental impact plus assumed background concentration.

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